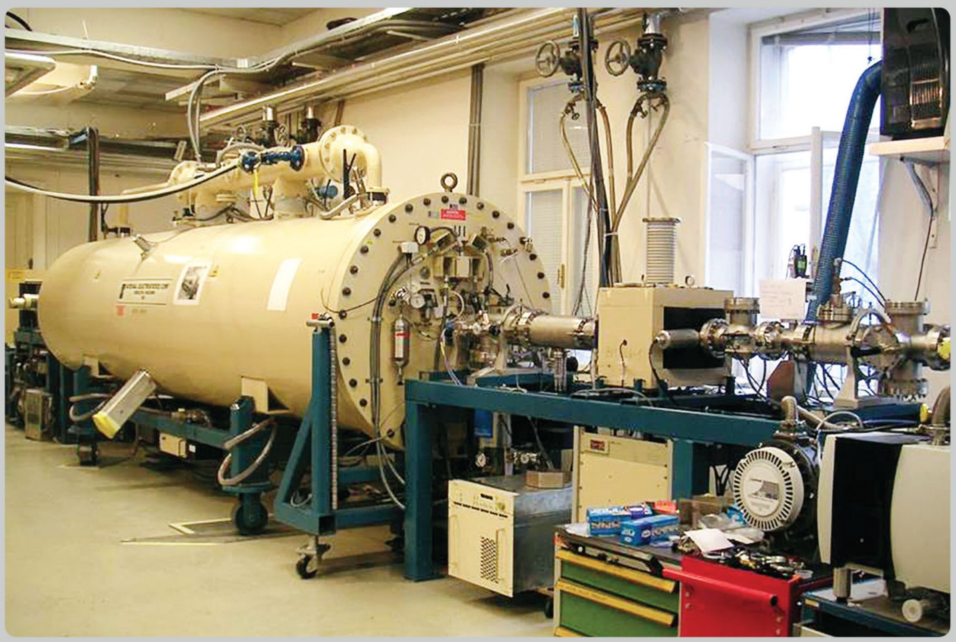
THE LATE THIRD MILLENNIUM IN THE ANCIENT NEAR EAST

CHRONOLOGY, C14, AND CLIMATE CHANGE

edited by

FELIX HÖFLMAYER



THE ORIENTAL INSTITUTE OF THE UNIVERSITY OF CHICAGO
ORIENTAL INSTITUTE SEMINARS • NUMBER 11
CHICAGO • ILLINOIS

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with contributions by

Matthew J. Adams, Aaron A. Burke, Michael W. Dee, Aron Dornauer, Donald Easton, Hermann Genz, Raphael Greenberg, Roman Gundacker, Felix Höflmayer, Sturt W. Manning, Peter Pfälzner, Simone Riehl, J. David Schloen, Thomas Schneider, Glenn M. Schwartz, Harvey Weiss, and Bernhard Weninger

Papers from the Oriental Institute Seminar

The Early/Middle Bronze Age Transition in the Ancient Near East: Chronology, C14, and Climate Change

Held at the Oriental Institute of the University of Chicago

7–8 March 2014

THE ORIENTAL INSTITUTE OF THE UNIVERSITY OF CHICAGO
ORIENTAL INSTITUTE SEMINARS • NUMBER 11
CHICAGO, ILLINOIS

Library of Congress Control Number: 2017930883
ISBN-13: 9781614910367
ISSN: 1559-2944

Published 2017. Printed in the United States of America.

The Oriental Institute, Chicago

THE UNIVERSITY OF CHICAGO
ORIENTAL INSTITUTE SEMINARS • NUMBER 11

Series Editors

Leslie Schramer

and

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with the assistance of

Rebecca Cain and Alexandra Cornacchia

Publication of this volume was made possible through generous funding from the Arthur and Lee Herbst Research and Education Fund

Cover Illustration

Vienna Environmental Research Accelerator (VERA) at the University of Vienna

Printed by King Printing Co., Inc., Lowell, Massachusetts USA

The paper used in this publication meets the minimum requirements of American National Standard for Information Services — Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

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Table of Contents

Preface

The present volume assembles papers that were given at the tenth annual University of Chicago Oriental Institute Seminar on the topic "The Early/Middle Bronze Age Transition in the Ancient Near East: Chronology, C14, and Climate Change" that brought together sixteen speakers from the United States, Canada, the United Kingdom, Israel, Lebanon, Germany, and Austria.

The topic was directly connected with the author's radiocarbon dating project CINEMA (Chronometric Investigation of Near Eastern and Mediterranean Antiquity), co-directed with Aaron Burke (University of California, Los Angeles) who also contributed to the conference and the present volume. While the ARCANE project (Associated Regional Chronologies of the Ancient Near East) produced convincing evidence for an earlier date for the end of the urbanized Early Bronze II–III period in the southern Levant, CINEMA was able to provide additional evidence for Jordan, and, most notably, Lebanon. The new high chronology of the Early Bronze Age in the southern and central Levant requires us to re-think regional interconnections, the cause and consequences of the climate change around 2200 B.C. (the 4.2 ka B.P. event) and to formulate a new narrative of Early Bronze Age decline and collapse. The speakers invited and those who contributed to the present volume address this topic from various perspectives and it is hoped that this book provides new insights into the highly complex network of differing chronologies, societal collapses and climate change at the turn from the Early to the Middle Bronze Age in the ancient Near East and beyond.

I would like to express my gratitude to all those who have contributed to the conference and the volume. My thanks go to Gil Stein, the director of the Oriental Institute of the University of Chicago for providing funds for the conference and the publication of its proceedings. I thank especially Tom Urban and Leslie Schramer from the publication office for producing the conference poster, the booklet, and, most important, for their editing work for the present volume. I would also like to thank D'Ann Condes for her help in all financial matters and Brittany Mullins for invaluable logistical support.

However, a very special thanks goes to Mariana Perlinac — without her continuous support in all matters, the conference would not have been possible.

Chicago – Vienna, April 2015
Felix Höflmayer

Abbreviations

A.D.	*anno Domini*
B.C.	before Christ
B.P.	before present
ca.	*circa*, approximately
cal.	calibrated
cf.	*confer*, compare
cm	centimeter(s)
e.g.	*exempli gratia*, for example
esp.	especially
et al.	*et alii*, and others
etc.	*et cetera*, and so forth
f(f).	and following
fig(s).	figure(s)
ha	hectare(s)
ibid.	*ibidem*, in the same place
i.e.	*id est*, that is
ka	thousand years
l	liter(s)
lit.	literally
m	meter(s)
mm	millimeter(s)
n(n).	note(s)
n.b.	*nota bene*, take careful note
no(s).	number(s)
p(p).	page(s)
pers. comm.	personal communication
pl(s).	plate(s)
sp.	species
ssp.	subspecies
s.v(v).	*sub verbo*, under the word(s)
vs.	versus

Seminar Participants

Upper: Peter Pfälzner, Aron Dornauer, Aaron A. Burke, Bernhard Weninger, J. David Schloen, Hermann Genz

Middle: Glenn M. Schwartz, Sturt W. Manning, Felix Höflmayer, Nadine Moeller, Roman Gundacker, Michael W. Dee, Raphael Greenberg, Mark T. Lycett

Lower: Walter Kutschera, Harvey Weiss, Elisabetta Boaretto, Thomas Schneider

Introduction

1

The Late Third Millennium B.C. in the Ancient Near East and Eastern Mediterranean: A Time of Collapse and Transformation

Felix Höflmayer, Austrian Academy of Sciences

A *Kopernikanische Wende*?

The second half of the third millennium B.C. of the ancient Near East and eastern Mediterranean witnessed the transition from what archaeologists call the Early Bronze Age to the Middle Bronze Age. Although one cannot *a priori* assume that transitions within the ubiquitously used Three-Age Model actually reflect major transformation and changes within history and archaeology, the time from ca. 2500 to 2000 B.C. *was* a time of multi-faceted transformations. In the Nile valley the centralized, pyramid-building state of the Old Kingdom came to an end and was followed by a period of political fragmentation and decline, a period termed the First Intermediate Period. In the southern Levant the civilization of the highly fortified first cities disappeared at the end of the Early Bronze III period and gave way to a seemingly more pastoral and maybe semi-nomadic society that settled in the small unfortified villages of what archaeologists call the Early Bronze IV or Intermediate Bronze Age period. In upper Mesopotamia the Akkad empire collapsed and was followed by a period of almost complete desertion or substantial settlement reduction throughout the area.

Since the beginning of academic archaeology, scholars have assembled evidence for this transition and hypothesized about possible causes and mechanisms without reaching a satisfying conclusion. Although the end of the Early Bronze Age can be regarded as well researched, it remains as enigmatic as many other major transformations, such as the end of the Late Bronze Age, the advent of the Sea Peoples, and the appearance of the Philistines in the southern Levant. But while for the latter transformation there is abundant textual evidence that sheds new (or a different) light on the archaeological remains, for the end of the Early Bronze Age, we mostly have to rely on archaeological evidence only. This absence of written records makes it even harder to define, analyze, and evaluate collapses of civilizations and their possible reasons and consequences.

Recent years saw a shift in the scholarly approach to the notion of collapse and transformation. While former generations have emphasized possible exogenous factors to societal change, such as military campaigns or migration of peoples, and up until recently climatic events, such as the so-called 4.2 ka B.P. event around 2200 B.C., current scholarship emphasizes the continuity in times of change and tries to identify the strings that held together seemingly disparate periods of time. Where once the urban cultures of the Early Bronze II/III period of the southern Levant were thought to have gone up in smoke and flames due to the bellicose advent of the Amorites and/or Egyptian military raids (Kenyon 1966), or a dramatic climate change all of a sudden annihilated a society's mode of subsistence (Weiss et al. 1993), we now theorize about deliberate change or adaptation, about conscious decision-making of a responsible society (Schloen, this volume), avoiding the term collapse (Greenberg, this volume). This shift from emphasizing the difference between two periods and looking for exogenous forces that trigger transformations, or that cause the collapse(s), to models emphasizing continuity and self-determined adaptation (maybe responding to exogenous factors that are usually not denied), to ultimately endogenous forces, could indeed be regarded as a *Kopernikanische Wende* in the field of Near Eastern archaeology.

But while the *Kopernikanische Wende* (derived from the acceptance of the heliocentric astronomical model after Nicolaus Copernicus) describes a progressive change of perspective that eventually is based on scientific evidence, the shift from emphasizing exogenous forces as triggers of transformation and/or collapse to endogenous causes resembles the proverbial pendulum that swings to the other side. However, sometimes this seems to be a forced new perspective for the sake of innovativeness and breaking with established scholarship, while the truth, more often than not, might very well be found in the middle.

Collapses and Transformations

In order to assess possible causes for, and evaluate the consequences of, the collapses and/or transformations that are dealt with in this volume, it is imperative to first *define* the changes that we witness between one period and the next. Are these changes apparent in the archaeology and the material culture or factoids of scholarly literature? And if there are changes, which part(s) or aspects of society changed? Every transformation is negotiated between the poles of continuation and disruption, between stagnation and revolution. No collapse of society is total, and some parts almost every time find ways to adapt to new requirements. No annihilation is complete. At the same time it is less important whether to call these changes "collapse" or "transformation" or "adaptation" or whichever aspects we may want to stress. The important point is, again, to *define* the social changes and to isolate the disruptions within the social order that eventually crystallizes in settlement patterns, architecture, or material culture.

Second, before causes or consequences can be assessed, the collapse has to be defined temporarily and spatially. A sound and secure absolute chronology is the backbone of every historical attempt and is of prime importance if one tries to argue for causality. Recent research has had considerable impact on our chronological framework, especially for the southern and central Levant (Regev et al. 2012; Höflmayer et al. 2014). But even if a modern scientific chronological approach shows contemporaneity of events, one has to be cautious to differentiate between correlation and causality. Invasions could cause collapse of societies, but collapse of societies could also provoke invasions to fill up a political vacuum.

Also, not every collapse can be regarded as a setback. The term "collapse" is frequently connoted with negative evaluations, implying loss or a worsening of the overall situation. However, these connotations reflect a personal, subjective judgment and are of no value for research. While the end of the Third Reich was obviously a collapse of the political and economic system and therefore for the society's elite due to the military advancement of the Allied forces and the Soviet Union, it can also be perceived as progress in terms of the advancement of democracy and for (re)instating Western values in Germany (Winkler 2011, pp. 1109–21). Although the final days of the Nazi regime can still be called *Untergang* (downfall) in popular culture,[1] the connotation of this very political collapse or breakdown within current German society is definitely positive.

Climate Change

Since the initial publication of the paper "The Genesis and Collapse of 3rd Millennium North Mesopotamian Civilization" by Harvey Weiss and colleagues in 1993, the rapid climate change around 2200 B.C. (the 4.2 ka B.P. event) is one of the most prominent factors in the discussion about decline, collapse, and transformation in the late third millennium B.C. The fundamental thesis of this and the many other publications that followed throughout the next twenty years or so was that the rapid climate change around 2200 B.C. either triggered or at least substantially contributed to the collapse of the Akkad empire in northern Mesopotamia, the decline of the first urban culture in the southern and central Levant at the end of the Early Bronze III period, and the end of the Egyptian Old Kingdom (see, e.g., Weiss 2000a; Weiss 2000b; Weiss and Bradley 2001; Staubwasser and Weiss 2006; Weiss 2012a).

Already in 1971 Barbara Bell argued that sudden drought, climate change, and conspicuously low Nile inundations triggered a "Dark Age" throughout the ancient Near East around 2200 B.C. (Bell 1971). Associating climate change with societal collapse was not new when Harvey Weiss and colleagues put forward their arguments in 1993, but the idea was taken up in scholarship quickly and has figured prominently since the 1990s, probably due to increased awareness and discussion about global climate change and its anthropogenic causes.[2] Most papers assembled in this book deal with the key regions for societal collapses and transformations of the late third millennium B.C., namely Egypt (Schneider, Dee, and Gundacker), the southern and central Levant (Greenberg, Genz, Schloen, and Schwartz), and Mesopotamia (Weiss, Pfälzner, Dornauer, and Burke), while papers by Manning, Weninger, and Riehl deal more broadly with climate change and human perception and discuss also case studies from the eastern Mediterranean, such as Crete or Troy. In the following we will assess each region individually and briefly outline recent research and scholarship.

The Collapse of the Early Bronze Age II–III in the Southern and Central Levant

The Early Bronze II–III period is regarded as the first phase of urbanization in the southern Levant. Heavily fortified sites such as Arad, ʿAi, Tel Yarmuth, Tell el-Fârʿah, Megiddo, Khirbet el-Batrawy, and Khirbet ez-Zeraqon characterize the landscape east and west of the Jordan River. Some of these sites reach more than 10 hectares in size; Tel Beth Yerah on the southern tip of the Sea of Galilee even covers more than 25 hectares. Sites are dominated by elaborate

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[1] Cf. the film *Der Untergang* by Oliver Hirschbiegel and Bernd Eichinger (2004).

[2] It seems that the relation of climate change and collapse of societies is currently a very fashionable topic. There is an ever-increasing number of publications on this topic appearing year after year, and it is almost impossible to reference all of them. See, among others, the following recent publications on this wider topic: Dalfes, Kukla, and Weiss 1997; Issar and Brown 1998; McGuire et al. 2000; Bawden and Reycraft 2000; Schwartz and Nichols 2006; Kuzucuoğlu and Marro 2007; Rosen 2007; McAnnay and Yoffee 2010; Butzer 2012; Weiss 2012b; Kerner, Dann, and Bangsgaard 2015; Meller et al. 2015.

fortification systems with glacis, ramparts, bastions with inner chambers, and city gates, and monumental architecture such as palatial buildings and/or temples. There is also abundant evidence for the integration of the southern Levant into the inter-regional trade network with Egypt and Syria, although commercial ties with the Nile valley already declined during Early Bronze III (see, in general, Miroschedji 2006; Philip 2008; Miroschedji 2009; Miroschedji 2014; Richard 2014).

This urban society came to an end within the Early Bronze III period, and the following Early Bronze IV (or Intermediate Bronze Age) was described as a "non-urban interlude between the first urban era in the Early Bronze Age in the third millennium BC and the renewed urban occupation in the true Middle Bronze Age in the second millennium BC" (Dever 1985, p. 113). Urban sites were abandoned and people settled in small unfortified rural villages like ʿEin el-Hilu in the Jezreel valley or pastoral encampments, such as the about 1,000 campsites known from the Negev (Haiman 1996; Covello-Paran 2009). Typical Early Bronze IV settlements were of a much reduced scale and lack any fortifications or public buildings such as palaces or temples. West of the Jordan there are no urban sites; only Khirbet Iskander in the east continues as a walled settlement during the Early Bronze IV (Richard and Long, Jr. 2007; Richard et al. 2010). In the central Levant also Byblos and Arqa remained fortified and retained their urban character, whereas in southern Lebanon walled Early Bronze III sites were abandoned as well (see also Genz, this volume). It is thought that the collapse of the urban society was also accompanied by a massive demographic decline. Further, the economy changed, and society is believed to have returned to small-scale agro-pastoralism (Dever 1980; Finkelstein 1989; Palumbo 1990; Dever 1995; Palumbo 2008; Parr 2009; Prag 2014).

In western Syria the Early Bronze IV period was the heyday of Early Bronze Age urbanism, best illustrated by Ebla's Palace G (see Matthiae and Marchetti 2012; Schwartz, this volume). While cities collapsed in the southern Levant, the north retained its urban character, the border between a de-urbanized south and an urbanized north running somewhere between Beirut and Byblos (Genz, this volume; Adams, this volume). But although Ebla's Palace G was destroyed at the turn from northern Levantine Early Bronze IVA to IVB (Calcagnile, Quarta, and D'Elia 2013), even during Early Bronze IVB, "evidence of urbanism and social complexity are still apparent in western Syria" (Schwartz, this volume). However, the urban "boom" only confines to western Syria, in the more arid regions of the east, we observe settlement reduction and desertion, as shown, for example, by the Qatna area survey (Morandi Bonacossi 2007; Schwartz, this volume), and also at Umm el-Marra there is an occupation gap until the later Middle Bronze I (Schwartz and Miller 2007; Schwartz, this volume).

Different reasons were put forward to explain the sudden collapse of the southern Levantine Early Bronze Age urban culture and the transformation to a de-urbanized and presumably semi-pastoral society in the Early Bronze IV. One of the exogenous causes put forward was the so-called Amorite hypothesis of Kathleen Kenyon, originally derived from earlier ideas of William F. Albright and G. Ernest Wright. According to this model, the southern Levant was overrun by Amorite nomadic tribes from the desert, causing the end of Early Bronze Age urban societies (Albright 1922, pp. 124–25 n. 3; Albright 1926, pp. 250–51; Albright 1938, p. 16; Wright 1938, p. 34; Wright 1961, p. 88; Kenyon 1966). Another exogenous cause was seen in increased Egyptian military activity in the southern Levant that might have put stress on the urban societies and triggered or contributed to their downfall, possibly by blocked trade routes (Mazar 1968, p. 66; Prag 1974, p. 103; Callaway 1978; Kempinski 1978, pp. 35–36; Richard 1987, p. 34).

A non-violent exogenous cause was climate change. Suzanne Richard proposed cautiously already in 1980 that for the decline of the Early Bronze Age urban system, "accumulating environmental data imply that probably the major factor was a shift in climate to drier conditions" (Richard 1980, p. 25). A few years later also Haya Ritter-Kaplan argued along similar lines: extreme desiccation and drought would have destroyed the economic basis of societies that had previously been accustomed to a wetter and warmer climate (Ritter-Kaplan 1984); and Arlene Rosen later on presented additional evidence for deteriorating environmental conditions around 2300/2200 B.C. (Rosen 1989). In recent years the 4.2 ka B.P. event figured prominently among the possible explanations for the collapse of the Early Bronze Age urban culture of the southern and central Levant (e.g., Weiss et al. 1993; Rosen 1995; Weiss and Bradley 2001; Staubwasser and Weiss 2006; Rosen 2007; Weiss 2012a; Weiss 2014).

Other scholars explained this transformation more as an economic and social adaptation to an urban crisis or changed economic settings, thus stressing possible internal factors for societal change (Dever 1985; Greenberg, this volume; Schloen, this volume). A weakened economy due to cessation of trade with Egypt might also have been more susceptible to external factors such as suddenly deteriorating climatic conditions as argued by Suzanne Richard (Richard 1980, p. 25). Finally, a combination of several factors, including climate, economic crisis due to increased nucleation process of the population, inter-site competition, and interruption of trade routes was also put forward to explain the end of the urban sites and the Early Bronze III period (Palumbo 1990, pp. 128–29).

In order to assess these hypotheses, the chronological evidence for dating the transition from Early Bronze III to Early Bronze IV has to be reviewed.

For a long time absolute calendar dates for the Bronze Age southern and central Levant were based on the synchronization with the historical chronology of Egypt. However, only a very general correlation could be achieved based on Egyptian objects found in contexts of the southern and central Levant and Levantine objects found in archaeological contexts of the Nile valley (Sowada 2009; Knoblauch 2010; Köhler and Ownby 2011). Traditionally the end of the Early Bronze III period was dated to ca. 2300/2200 B.C., and it was thought that the Early Bronze Age urban culture had collapsed sometime during the late Old Kingdom of Egypt (Miroschedji 2009; Sowada 2009; Harrison 2012).

In recent years radiocarbon data has seriously challenged the traditional chronological synchronization. New radiocarbon dating evidence for several sites, such as Khirbet ez-Zeraqon (Jordan), Khirbet el-Batrawy (Jordan), Tel Yarmuth (Israel), and Tell Fadous-Kfarabida (Lebanon) shows conclusively that the end of Early Bronze III had to be raised from 2200/2300 B.C. to ca. 2500 B.C.

Khirbet ez-Zeraqon is located in northern Jordan on the western bank of the Wadi el-Shallaleh and was excavated from 1984 to 1994 by Moawiyah Ibrahim and Siegfried Mittmann on behalf of the Yarmouk University Irbid and the University of Tübingen (Kamlah 2000; Genz 2002; Douglas 2007). Three different stratigraphic phases could be distinguished, the so-called früher, mittlerer, and später Horizont (early, middle, and late horizon). According to the meticulous analysis of the pottery by Hermann Genz, the early horizon could be dated to the Early Bronze II period, the middle horizon to the transition from the Early Bronze II to the Early Bronze III, and the late horizon to the earlier part of Early Bronze III. After the late horizon the site was abandoned (Genz 2002).

Already in Genz' work on the pottery, sixteen radiocarbon dates were reported, most of them coming from charcoal samples. It was noted that the dates were unusually high compared to the established chronological scheme for the southern Levant, but this was attributed to the fact that the charcoal samples might have come from, for example, timbers and thus only provide a general *terminus post quem* that is not necessarily representative for the respective archaeological context (Genz 2002). Recently, twelve additional samples were analyzed by the Oxford Radiocarbon Accelerator Unit, this time coming from short-lived botanical remains such as seeds (Höfmayer 2015). These samples come from both areas of excavation and span all three stratigraphic phases. Using these data a Bayesian model was created in order to refine the calibrated results and obtain more precision for the individual dates as well as for beginning and end of the respective stratigraphic phases (Buck et al. 1991; Steier and Rom 2000; Weninger et al. 2006; Bronk Ramsey 2009). Based on this model, Khirbet ez-Zeraqon was abandoned sometime during the twenty-ninth century B.C. (figs. 1.1 and 1.2). Apparently, the results indicate that the process of de-urbanization started considerably earlier than previously estimated.

Further radiocarbon evidence come from the site of Khirbet el-Batrawy in the upper Wadi az-Zarqa. Ongoing excavations directed by Lorenzo Nigro on behalf of Rome "La Sapienza" University have unearthed parts of the city's fortification system, the city gate, a temple, and parts of a palatial building (Palace B). In the destruction horizon of one of the storerooms of the palace, a storage jar filled with charred seeds was found. The palatial building itself was destroyed in a conflagration in Early Bronze III, and except for a small rural occupation in Early Bronze IV the site was abandoned afterward (Nigro 2006; Nigro 2008; Nigro 2010; Nigro 2012; Nigro 2013; Nigro 2014; Sala 2014).

From the contents of the storage jar, fourteen samples were analyzed at the Vienna Environmental Research Accelerator. Unfortunately the results fall to a flat part of the radiocarbon calibration curve, therefore resulting in considerably large date ranges. According to these results, Palace B was destroyed sometime between ca. 2900 and 2600 B.C. (fig. 1.3). Although the calibrated results span more than three centuries, it is clear that the Early Bronze III period at Khirbet el-Batrawy ended much earlier than could have been expected according to the conventional chronological scheme (Höflmayer 2014).

West of the Jordan a radiocarbon sequence for Tel Yarmuth was recently published by Johanna Regev and colleagues (Regev, Miroschedji, and Boaretto 2012). Tel Yarmuth, located in the Shephelah, was excavated by Pierre de Miroschedji since the early 1980s. In thirteen areas excavations revealed a long sequence of occupation, from the Early Bronze I down to the end of Early Bronze III. Massive fortifications, palatial buildings, a temple, and domestic structures have been unearthed (Miroschedji 1988; Miroschedji 1993; Miroschedji 2000; Miroschedji 2013). Forty samples have been submitted to radiocarbon dating and were analyzed at the Weizmann Institute of Science. Based on the archaeological date of the respective archaeological contexts, a Bayesian model was created and according to the results, Tel Yarmuth was abandoned around 2500 B.C.; again, considerably earlier than expected.

Another substantial radiocarbon sequence exists for the Lebanese site Tell Fadous-Kfarabida, excavated since 2007 by Hermann Genz on behalf of the American University of Beirut. Six stratigraphic phases ranging from the Chalcolithic period down to the Middle Bronze Age have been detected. Phases II–IV belong to the Early Bronze II–III periods and are characterized by domestic and public buildings, and a fortification system. Phase V dates to the Early Bronze IV period and is mainly represented by squatter occupation and pits (Genz and Sader 2007; Genz and Sader 2008; Genz et al. 2009; Genz et al. 2010; Genz, forthcoming). Thirty-three short-lived samples have been analyzed at the Leibniz-Labor

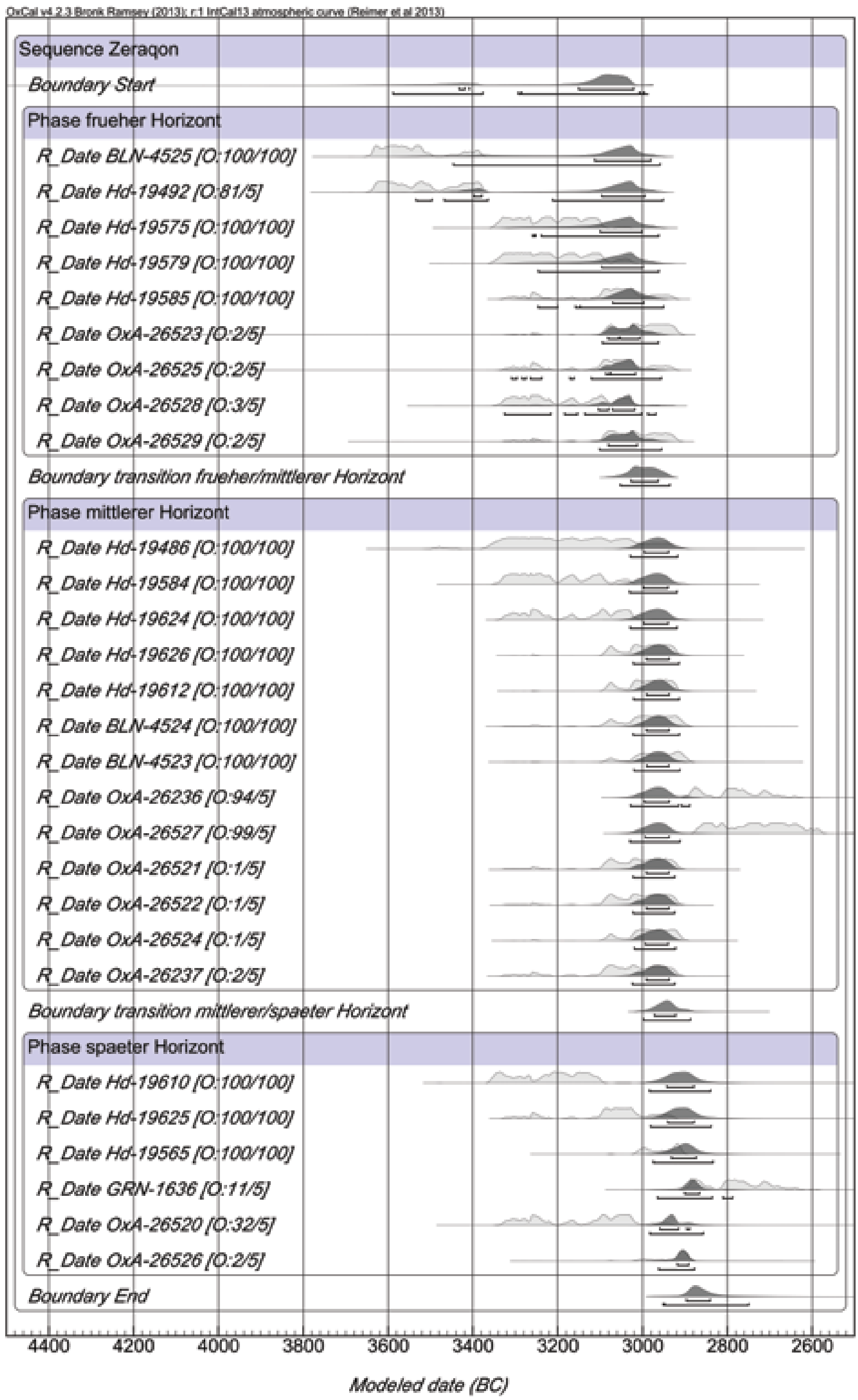

Figure 1.1. Modeled age ranges for samples of early, middle, and late horizon of Khirbet ez-Zeraqon. Light shaded areas represent individual calibrated radiocarbon determinations (without prior information), dark shaded areas represent modeled calibrated radiocarbon determinations (posterior probabilities) based on the prior information entered into the model

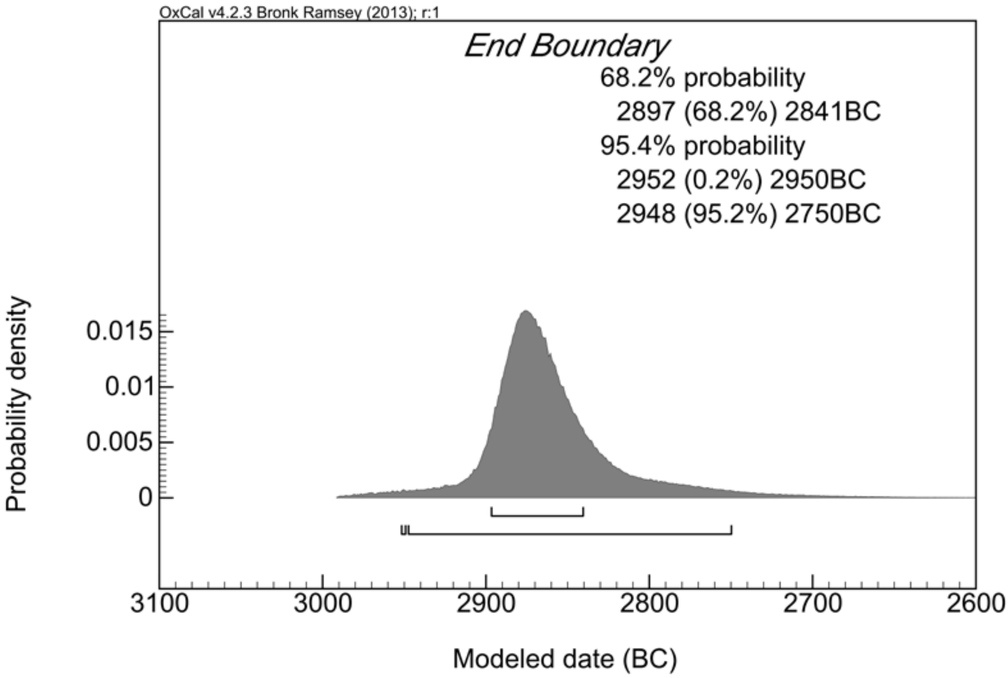

Figure 1.2. Calculated date for the end of the late horizon of Khirbet ez-Zeraqon based on model in figure 1.1

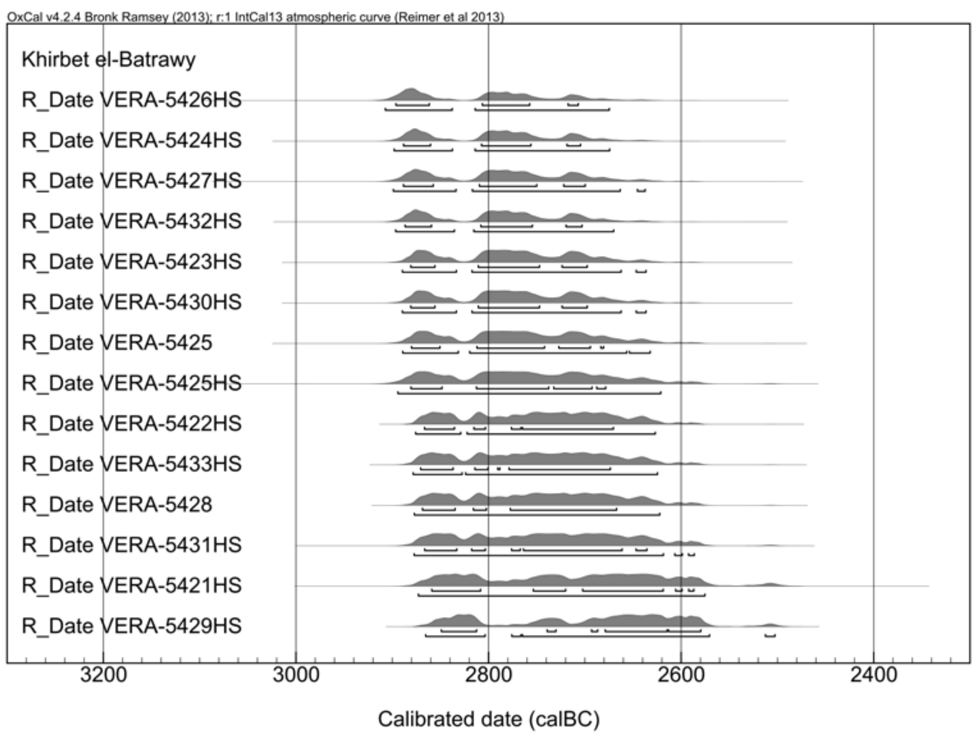

Figure 1.3. Calibrated radiocarbon determinations for charred seeds found in a pithos in the destruction layer of Early Bronze III Khirbet al-Batrawy

für Altersbestimmung und Isotopenforschung in Kiel, the Vienna Environmental Research Accelerator, and the Oxford Radiocarbon Accelerator Unit. A Bayesian model was created based on the stratigraphy of the site, and according to that model the transition from Phase IV to Phase V (the transition from Early Bronze III to Early Bronze IV) could be dated to the second half of the twenty-sixth century B.C. (figs. 1.4 and 1.5). However, there might be a possible hiatus between Phase IV and Phase V according to pottery analysis and comparison with ceramic material at the site of Arqa in northern Lebanon — although it has to be stated that this potential hiatus is not observable in the archaeological record of the site proper. Nevertheless, even with an assumed hiatus and removal of potential older samples from Phase V, the transition to Early Bronze IV could only be as late as ca. 2450 B.C. (1σ standard deviation; fig. 1.6; Höflmayer et al. 2014; Höflmayer et al., forthcoming).

Based on radiocarbon evidence, the end of the Early Bronze Age urban culture in the southern and central Levant has to be raised from ca. 2300/2200 B.C. to about 2500 B.C.[3] It has also become clear that apparently not all cities were abandoned at the same time — the process of de-urbanization was prolonged, starting early in the third millennium B.C. and continuing approximately until 2500 B.C. When the 4.2 ka B.P. event set in, the urban society in the southern Levant was already gone by about 300 years. Any sudden climatic change starting around 2200 B.C. can therefore be excluded as a causing or contributing event.

This new chronology allows us to reconsider the "collapse" of the Early Bronze Age urban society. As Raphael Greenberg points out in his contribution, "in order to distinguish 'collapse' from 'decline' this disintegration has to occur rapidly" (Greenberg, this volume). Contrary to the general picture evoked by traditional scholarship that an urbanized Early Bronze II–III period was followed by a de-urbanized agro-pastoralist Early Bronze IV period, the urban centers apparently gradually declined and collapsed. We are not dealing with a *single* collapse of a state or society (and Greenberg is probably right in pointing out that in fact there is nothing that could be "viewed as a regionally integrated urban system"; Greenberg, this volume), but instead with *multiple* collapses of single entities. The overall Early Bronze II–III system declined gradually, crystallizing in the abandonment (local collapses) of urban centers.

Collapse, decline, or adaptation? In this volume Greenberg and Schloen argue that the Early Bronze IV period in fact was oriented to the northern Levant: "The economic boom of northern Syria now offered an attractive, even lucrative alternative to the old citadel towns" (Greenberg, this volume). They argue that people of the southern Levant adapted their economic model and became integrated into the wool economy of the northern Levant. Schloen also questions "the use of the phrase 'urban collapse' to describe the transition from the Early Bronze III to Early Bronze IV in the southern Levant" (Schloen, this volume). Collapse becomes adaptation, and there is no need for exogenous forces where endogenous conscious decisions push forward this adaptation. A presumed setback becomes progress: "The rather dramatic disappearance of walled towns after several hundred years of urbanism in the southern Levant should not be seen as evidence of decline of failure but of the

[3] A ca. 2500 B.C. date finds also additional support from the re-analysis of previously published radiocarbon dates from several excavations throughout the southern Levant (Regev et al. 2012). Note that this shift in Levantine chronology is being bluntly refuted by Wiener (2014) — without presenting any evidence against it.

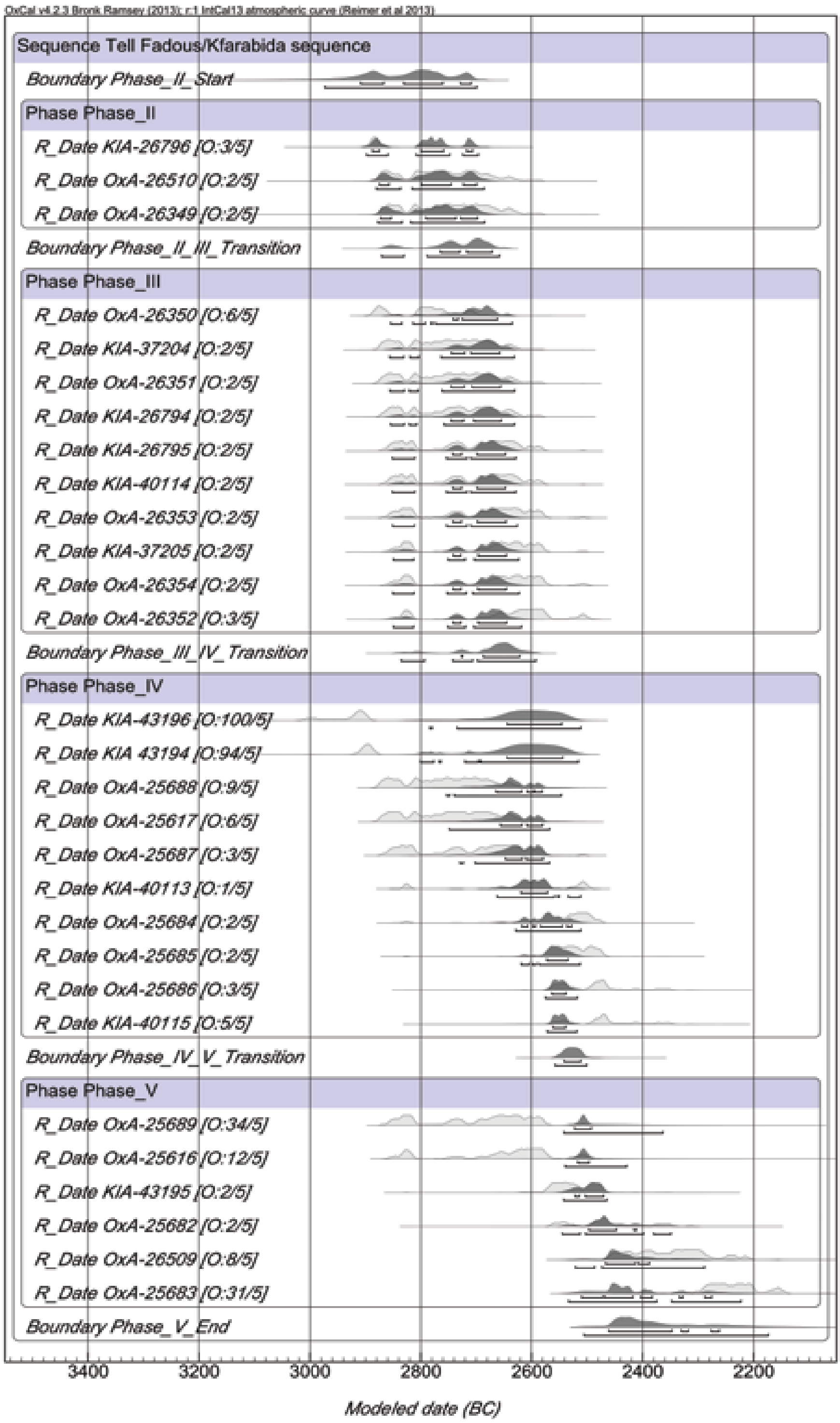

Figure 1.4. Modeled age ranges for samples of archaeological Phases II to V of Tell Fadous-Kfarabida. Light shaded areas represent individual calibrated radiocarbon determinations (without prior information), dark shaded areas represent modeled calibrated radiocarbon determinations (posterior probabilities) based on the prior information entered into the model

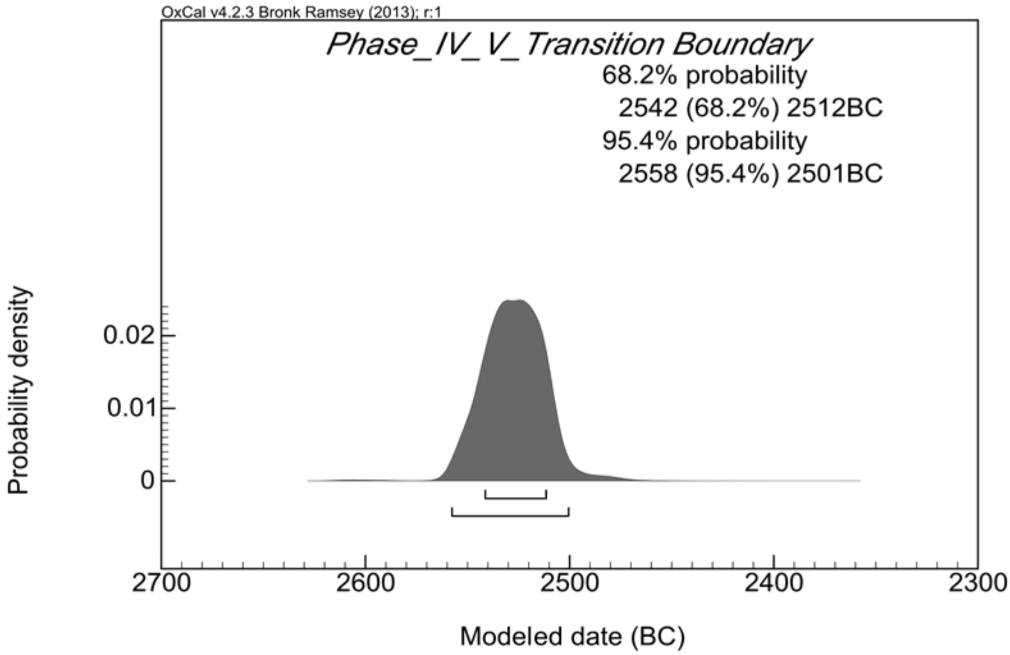

Figure 1.5. Calculated date for transition from Phase IV (Early Bronze Age III) to Phase V (Early Bronze Age IV) based on model in figure 1.4

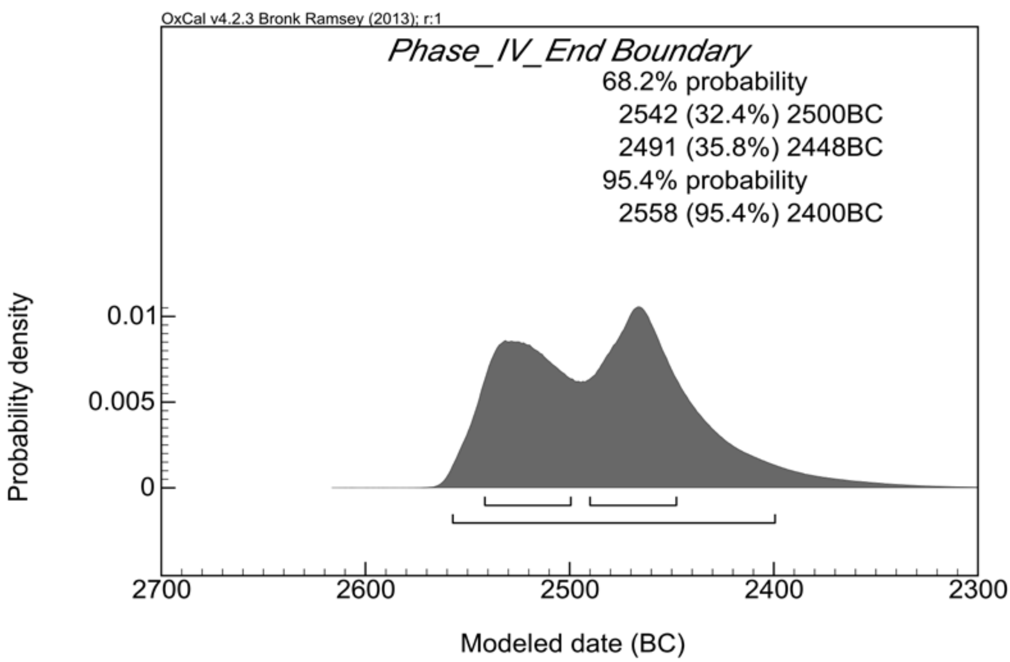

Figure 1.6. Calculated date for end of Phase IV (Early Bronze Age III) assuming a gap of unknown duration between Phase IV and V and excluding older dates from Phase V

opposite — as evidence of a new political and economic strategy for success by southern elites" (Schloen, this volume).

However, this does not explain why the first cities "collapsed" already much earlier than the economic boom of the Syrian mid-twenty-fifth century B.C. Again, we have to be cautious not to mix correlation with causality. A collapsing society could also offer the possibility for re-orientation, in this case perhaps the northern Levant wool economy. It still cannot be said with confidence whether (a) the southern Levant really *was* integrated into the northern economy, and (b) that this integration was actually chosen. Nevertheless, Amorites, Egyptian military campaigns, and climate change can obviously be ruled out as reasons for the many collapses of urban sites.

The End of the Old Kingdom in Egypt and the Advent of the First Intermediate Period

While the reasons that led to the decline of the urban culture of the Early Bronze Age II and III period in the southern Levant remain elusive, this very transition is at least well attested in the archaeological record, for example, in terms of settlement pattern, architecture, economy, and subsistence. The end of the Egyptian Old Kingdom and its transition to the First Intermediate Period is, however, much more difficult to define and to assess.

This transition represents one of the most enigmatic periods of Egyptian history and was extensively discussed in the scholarly literature (see, e.g., Stock 1949; Bell 1971; Müller-Wollermann 1986; Seidlmayer 1990; Seidlmayer 2000; Moeller 2005; Morris 2006; Jansen-Winkeln 2010; Schneider, this volume). As in the southern Levant, it remains unclear whether the end of the Old Kingdom should be addressed as a collapse or as a transformation, and whether the cultural and political breaks or rather the continuities should be emphasized. As Schneider (this volume) points out, this transition was "labeled a collapse, a decline, a revolution, or more vaguely, a time of crisis" (Schneider, this volume). The biggest problem in assessing the collapse of the Old Kingdom and its possible cause(s) is that we have no contemporary textual sources that even *tell* us about this collapse (Jansen-Winkeln 2010, p. 273).

In principle, the end of the Old Kingdom can be described as the collapse of the political system. This system used to control the Nile valley and the Delta, from Elephantine in the south to the shores of the Mediterranean in the north, whereas the First Intermediate Period was a period of political fragmentation with several local rulers struggling for control over larger territories. The royal capital at Memphis was abandoned, and local centers, such as Herakleopolis and Thebes, rose to power. No kings are mentioned in private inscriptions; local rulers act independently and claim to be able to provide for their people (Jansen-Winkeln 2010).

Earlier scholarship has greatly emphasized collapse and anarchy. "It was certainly clear that the Old Kingdom had perished in anarchy and internal disorder, with a disastrous breaking up of the central government," as Henri Frankfort put it in 1926 (p. 80). These views ultimately derived from later literary sources. Several texts seem to record the circumstances of the late Old Kingdom and the First Intermediate Period. From these sources we learn about anarchy, political disorder, economic breakdown, famine, and violence. The "Dialogue of Ipuwer and the Lord of All" (also known as "Admonitions of an Egyptian Sage"), known from a New Kingdom copy, is one example of a Middle Kingdom text that possibly refers to events happening during the First Intermediate Period (Gardiner 1909; Enmarch 2005;

Enmarch 2008). The text describes the collapse of order, and ensuing anarchy and famine. Some scholars suggest that the text should be regarded as an actual account of the political and social situation in Egypt and that these conditions were due to low inundations of the Nile, crop failure, and famine that triggered or contributed to the political collapse of the central government (Hassan 2007); others would attribute them to the general literary theme of "order versus chaos" (Lichtheim 1973, pp. 149–63).

The reasons for the political collapse are still debated among Egyptologists. Some scholars stress internal, political, and administrative factors, such as that "some offices became hereditary and were kept in the same family for several generations" or a weakened economic power of the king that undermined the ideological foundations of the Egyptian state (Málek 2000, pp. 116–17). Already in the late nineteenth century, Adolf Erman saw the reasons for the collapse in the increasing decentralization of power during the Sixth Dynasty (Erman 1885, p. 66; see also now Jansen-Winkeln 2010, p. 279 with references).

But also other potential reasons were put forward. As Kathleen Kenyon argued for Amorite invasions into Early Bronze III Canaan, in the early days of Egyptology, the idea of Asiatic invasions into the Nile Delta triggering the collapse of the Egyptian Old Kingdom was often brought forward. Flinders Petrie linked the geometrical motives of the button seals that emerged during the late Old Kingdom with Syrian and Mesopotamian designs. He argued that "an invasion of North Syrian people — the Amorites [...] — swept into Egypt" sometime during the late Sixth Dynasty, bringing an end to the Egyptian Old Kingdom (Petrie 1923, pp. 119–20; see also Petrie 1939, pp. 121–23; Frankfort 1926). However, it has been proven since that the button seals were of genuine Egyptian origin (Wiese 1996). Alan Gardiner suggested an Asiatic infiltration in the Delta based on the "Admonitions" (Gardiner 1909; Stock 1949, p. 21). The invasion theory was also proposed by archaeologists. In the 1990s Eliezer Oren suggested that the Early Bronze IV population of northern Sinai might have been the Asiatics of the Egyptian texts that allegedly infiltrated the Egyptian Nile (Oren 1993, p. 1388). This idea was recently revived by Karl Jansen-Winkeln, who also cautiously favors an invasion of Asiatics from the Sinai or the southern Levant into the Delta, as also described in the "Teaching for Merikare" (Quack 1992), as a possible reason for the political collapse of Old Kingdom Egypt, the abandonment of Memphis as the royal capital, and the rise of upper Egyptian provincial towns (Herakleopolis and Thebes) (Jansen-Winkeln 2010).[4]

Barbara Bell, on the other hand, argued for climatic factors, low Nile floods, and subsequent famine that brought the Old Kingdom to an end. She based her arguments *inter alia* on private inscriptions, such as the autobiography of Ankhtifi, a nomarch of Hierakonpolis and Edfu in upper Egypt during the early First Intermediate Period, who claims in his inscription in his tomb at Moʿalla to have fed the hungry during times of famine (Bell 1971). The depiction of starving foreigners is also a common feature already in the pyramid temples of the Fifth and Sixth Dynasties (Drioton 1942–1943). However, we should be cautious to take these images at face value. Ludwig Morenz argued convincingly that these pictures immortalize the inferiority of foreigners compared to Egyptians: While non-Egyptians suffer from famine,

[4] However, Jansen-Winkeln is aware of the fact that external causes for collapse are currently not en vogue: "Von außen kommende Ereignisse sind [...] gewissermaßen ein Fremdkörper im fachlichen Paradigma [...] man möchte 'Modelle' entwickeln, überraschende Angriffe der Hunnen sind dabei gänzlich unerwünscht." (Jansen-Winkeln 2010, p. 300). See also Schneider, this volume.

Pharaoh is able to feed his own people. According to him the principal difference between the fertile Nile valley and the chaotic foreign lands is depicted (Morenz 2012, p. 384).

However, with the onset of the discussion around the 4.2 ka B.P. event and its possible impact on ancient Near Eastern societies, the initial theory of Barbara Bell was often adopted in Egyptology (Hassan 1997; Morris 2006), and only few scholars argued against this hypothesis (Moeller 2005; Jansen-Winkeln 2010).

As in the case of the collapse of the urban sites in the southern and central Levant, this hypothesis is entirely dependent on absolute chronology. However, reconstructing the historical chronology of Old Kingdom Egypt is not an easy task. There are problems with the sequence of kings (Seidlmayer 2006), and establishing reign lengths for individual rulers is hampered by uncertainties regarding the regularity of the cattle count — usually thought to take place every second year — the basis for counting regnal years (Verner 2006). During the Fifth and Sixth Dynasties, however, where more historical sources are available, we reach more secure ground (Baud 2006). The editors of the fundamental volume on ancient Egyptian chronology, Erik Hornung, Rolf Krauss, and David Warburton, date the end of the Egyptian Old Kingdom to ca. 2150 B.C. (Hornung, Krauss, and Warburton 2006, pp. 490–91; see also Kitchen 2000, p. 48), while Jürgen von Beckerath argues for a slightly higher date, ca. 2200/2150 B.C. (Beckerath 1997, pp. 187–88).

A few years ago the University of Oxford conducted an extensive program to test absolute calendar dates for the Egyptian historical chronology with more than 200 new radiocarbon measurements of short-lived samples that could be securely dated to certain kings (Bronk Ramsey et al. 2010; Shortland and Bronk Ramsey 2013). Using a Bayesian probability approach based on the known succession of kings and their approximate reign lengths, the most likely dates for the beginning of individual reigns were calculated. While the results for the Third and Fourth Dynasties were in good agreement with the suggested dates based on the historical chronology, dates for the late Fifth and Sixth Dynasties suggested a slightly higher chronology.

According to this model, the start of the First Intermediate Period would fall somewhere between 2263 and 2145 B.C. (95% probability) or between 2240 and 2186 B.C. (68% probability) (Bronk Ramsey et al. 2010; Shortland and Bronk Ramsey 2013). The dataset for the Old Kingdom is limited, but a current project directed by Michael Dee will come up with a more precise dating framework in the near future (see also Dee, this volume). Nevertheless, from a chronological point of view, the end of the Egyptian Old Kingdom would coincide with a climatic event around 2200 B.C. — although it is not possible to prove any kind of causality at the moment. As Thomas Schneider (this volume) concluded, "The evidence is far too sketchy and too ambiguous to be assembled onto a reliable historiographical canvas."

As we have seen above, the end of the Early Bronze III period has now been dated to 2500 B.C., thus ca. 300 years earlier than the end of the Old Kingdom in Egypt. This has also considerable impact on textual evidence we have for this period from Egypt.

The autobiographical stela of Weni records several military campaigns to regions usually believed to be located somewhere in the southern Levant. The text itself describes the career of Weni at the court of the king from its beginnings under King Teti, his military campaigns under the reign of Pepi I (which are of particular interest for us here), until his burial under King Merenre (Sethe 1933, pp. 98–110; Lichtheim 1973, pp. 18–23; Kloth 2002, pp. 10–12, 189–95; Miroschedji 2012; Gundacker, this volume).

At the beginning of the respective part of his autobiography, Weni states that the king decided to campaign against the *ꜥꜣmw ḥrjw-šꜥ* (usually translated as "Asiatics, who are upon the sand," but see in detail Gundacker, this volume). The army destroys the "land of the sand-dwellers" or the "land of those who are upon the sand" (*tꜣ ḥrjw-šꜥ*) and its fortifications (*wnt*). After cutting down its figs and vines, slaying many tens of thousands of its troops, and taking a great number as captives, it returns home safely. Five times Weni marched against the "land of the sand-dwellers" or the "land of those who are upon the sand" (*tꜣ ḥrjw-šꜥ*). Later, he led a campaign to the "nose of the gazelle's head" (*šrt-tp-gḥs*) in order to quell a rebellion, in this case leading a part of his army by boat while the other part traveled by land.

The localization of Weni's military campaigns has been much discussed in the literature, and ranges from the eastern Nile Delta or the Sinai to Palestine in general, or the southern coastal plain in particular. However, although most scholars do not challenge the view that Weni campaigned in Palestine, conclusive evidence for this assumption is in fact lacking.

Most important is the localization of the *ꜥꜣmw ḥrjw-šꜥ* against which the king decided to campaign. The term *ḥrjw-šꜥ* was much discussed in the relevant literature (see Gundacker, this volume with references). While the term *ꜥꜣmw* referring to "Asiatics" is clear, *ḥrjw-šꜥ* means literally "those who are upon the sand." If one would interpret the term literally, one would think of people living in the desert. However, Weni reports that there are not only fortified settlements within the land of the *ḥrjw-šꜥ*, but by claiming to have cut their figs and grapes, the people must have also practiced some sort of agriculture or horticulture. Donald Redford argued therefore that the term *ḥrjw-šꜥ* should rather be translated more vaguely as "those who are at/beside/across the sand," in his opinion referring to the sedentary inhabitants of Early Bronze II–III Palestine, associating vineyards, houses, and fortifications of the *ḥrjw-šꜥ* with the Early Bronze Age phase of urbanization in the southern Levant (Redford 1986, p. 186). Pierre de Miroschedji argued recently for localizing the *ḥrjw-šꜥ* in Palestine, pointing out that figs and vine are also attested in the botanical remains found in the Early Bronze Age strata of Tell es-Sakan in the Gaza Strip (Miroschedji 2012).

However, the term *ḥrjw-šꜥ* appears not only in the autobiography of Weni but also in the account of a noble called *Ppj-nḫt* (Sethe 1933, pp. 131–35; Gundacker, this volume). This official from Elephantine was sent to *ḫꜣs.t ꜥꜣmw* (the land of the Asiatics) to retrieve the bodies of two officials called *Kꜣ-ꜥpr* and *ꜥnḫ-nḫt*, who, while engaged in constructing a so-called Byblos-ship (referring generally to sea-going vessels) that was bound for Punt, were slain by *ꜥꜣmw njw ḥrjw-šꜥ*. Sea-going expeditions to Punt, however, embarked from the coast of the Red Sea and therefore, one might suggest, the term *ḥrjw-šꜥ* can also refer to the people living at the Red Sea coast.

In his detailed analysis Roman Gundacker (this volume) concludes that it is "implausible that *ꜥꜣmw.w* designated all Semitic tribes and peoples or, even more generally, all peoples dwelling in the Levant" and he follows Schneider, who argued that *ꜥꜣmw* means "man from the southland (Negev)." Gundacker (this volume) further argues that this people or part of this people "had become displaced after they had to leave their original homeland, the Negev (perhaps for reasons of climatic change …)" and that the campaigns of Weni took place in the central and eastern parts of the Sinai Peninsula, being an "Egyptian reaction to a changing ethnic landscape in the Sinai region" (Gundacker, this volume).

Also the unique term "nose of the gazelle's head" (*šrt-tp-gḥs*) was often discussed in the literature and was usually associated with the Carmel Ridge (Couroyer 1971, p. 560 with n. 18; Redford 1992, p. 55 with n. 78), or, recently, by Pierre de Miroschedji, with the rocky hillock at Jaffa (Miroschedji 2012, pp. 272–74). Again we face the same problems as with most other toponyms from Weni's autobiography. The term is unique, and we learn nothing about the whereabouts of this mountain range from the text itself. Miriam Lichtheim rightly pointed out that its location is simply unknown (Lichtheim 1973, pp. 20 and 22 n. 7), and Wright argued that since we do not know where Weni started, we have no idea how long it took him to get to the mountain ridge, and the localization of the "gazelle's nose" has to remain unknown (Wright 1988, p. 154). Since we do not have any clear indication where this "nose of the gazelle's head" might have been, any suggestion remains purely speculative (Aḥituv 1984, p. 151).

Roman Gundacker (this volume) critically reviews the evidence and concludes that for most of the text we actually cannot be sure which locations are being referred to. We have no firm grounds to assume that Weni indeed ventured to the southern Levant, where, at the time of the Fifth and Sixth Dynasties, the urbanized settlements already were abandoned. The autobiography of Weni is one of the key examples where new chronological evidence leads scholars not only to re-think local or regional developments but even to re-read and re-interpret textual sources that have been known for decades. The re-dating of the end of the Early Bronze III period — while not really alluded to in the text in question — still has considerable impact on it, because scholars reassess the evidence at hand and critically re-evaluate its meaning and its interpretation in the literature. The high chronology of the Early Bronze Age period is like a stone thrown into a pond with rippling effects throughout the ancient Near East, effects that still have to be assessed in more elaborative form in the future.

The Collapse of the Akkad Empire in Upper Mesopotamia

While the nature of collapse and transformation during the decline of the Early Bronze II–III period or end of the Egyptian Old Kingdom remain to be discussed, the end of the Akkad empire in upper Mesopotamia is more easily assessed. Nevertheless, even here we face different interpretations regarding the possible causes that led to this collapse so well apparent in the archaeological record.

At the end of the Akkadian period (Early Jezirah IV), upper Mesopotamia witnessed a major transformation. It is evident that a shift in settlement patterns occurred and widespread regional abandonments took place. In the subsequent post-Akkadian period, only few sites were still occupied, usually at much reduced scale. The Tell Leilan regional survey showed an 87 percent reduction in settled area for the heart of the eastern Khabur plains during the Leilan IIc phase (the post-Akkadian period, Early Jezirah V; Weiss 2012a; Arrivabeni 2012; Weiss, this volume).

A similar pattern is also visible at other areas where extensive surveys have been undertaken. The Tell Brak Sustaining Area Survey confirms this picture. The survey covered an area up to 20 km around the site and found a radical settlement decline in the late third millennium B.C. that continued until the Khabur ware period. At Tell Brak the occupation retreated to the main mound in the immediate post-Akkadian period, and although the occupation continues, there is a visible shift to less dense and less monumental urban layout (Colantoni 2012; Emberling et al. 2012). A similar development has been observed at Tell Arbid that was not completely abandoned at the end of the Akkadian period (Level VII). A smaller post-Akkadian settlement was still present in Levels VI–V (Koliński 2012; see also

Pfälzner, this volume). Also the development of Tell Mohammed Diyab during the Akkadian and post-Akkadian periods is similar to Tell Leilan (Nicolle 2012).

Nevertheless, character and reason(s) for the collapse are under discussion. While Harvey Weiss and colleagues strongly emphasize abandonment and settlement disruptions, other scholars point to continuity of settlement. At Tell Mozan (Urkeš), for instance, even new economic establishments were founded during the post-Akkadian (Early Jezirah V, Ur III) period (Koliński 2007; Pfälzner 2010; see also Pfälzner, this volume), such as the merchant house of Puššam. However, that the end of the Early Jezirah IV period is connected with some kind of Akkadian retreat seems to be indisputable.

For a long time Harvey Weiss and colleagues argued that the north Mesopotamian and Akkadian regional collapse was caused by the 4.2 ka B.P. event that caused aridification and a massive (30–50%) drop of precipitation. This abrupt climate change would have forced massive reduction in dry farming and stimulated population movement. Not only would the Akkadians have left upper Mesopotamia due to narrowing cultivable land and declining cereal yield, but the bigger part of the local indigenous population as well, as evidenced by the massive reduction in settled area in the post-Akkadian Leilan IIc period (Early Jezirah V; Weiss et al. 1993; Cullen et al. 2000; Weiss et al. 2012; Weiss, this volume). Aaron Burke explores in this volume how the collapse of the Akkad empire, the 4.2 ka B.P. event, and the rise of the Amorites might have been interconnected.

While other scholars also agree that there were profound changes in settlement patterns at the end of the Akkadian period and afterwards, they seek reasons for this transformation in society itself. Peter Pfälzner argues that the "crisis at the end of the third millennium was not a general crisis of the society, but a crisis of the old centralized urban institutions" (Pfälzner 2012, p. 157) that is traceable in urban plans and settlement patterns all over the Khabur plains, including at sites like Tell Mozan, Tell Brak, Tell Chagar Bazar, and Tell Chuera (Pfälzner 2012; Pfälzner, this volume). He further points out that "crisis did not result in the disappearance of urban culture, but in contraction of it" (Pfälzner, this volume). Furthermore, there is no indication of deterioration of agricultural conditions at Tell Mozan during the post-Akkadian (Early Jezirah V) period that could be attributed to the 4.2 ka B.P. climatic event. In fact, paleoclimatic data from the site seem to imply that the ecological situation improves and that there is an increase in moisture (Deckers 2010; Riehl 2010; Pfälzner 2010). While two-row barley, a very stress-tolerant cereal, was dominant during the Early Bronze Age, with the beginning of Early Jezirah V (the post-Akkadian period) people at Tell Mozan switched to the more water-demanding free-threshing wheat, and the highly stress-tolerant hulled wheat (emmer) was abandoned (Riehl 2010, p. 67). The connection between climate change and crop data, also evident in cuneiform sources, is further explored by Dornauer in this volume.

In order to assess the character of abandonments and/or contractions of urban settlements, a very precise chronology is needed. Up to now only the site of Tell Leilan offers a high-precision radiocarbon sequence that is of utmost importance for comparing transformations in upper Mesopotamia with transitions in the southern Levant and Egypt. Additional radiocarbon evidence from, for example, Tell Mozan is of general importance for the Early/Middle Bronze Age transition but does not reach the dating resolution of the radiocarbon model for Tell Leilan (see Pfälzner, this volume; Manning, this volume).

Based on this high-precision radiocarbon sequence of over ninety samples from Tell Leilan, the end of the Akkad period that is represented by the Akkadian Administrative

Building during Leilan phases IIb2–1 (Early Jezirah IV) can be dated to 2254–2220 B.C. (1σ). This period is followed by the post-Akkadian phase (Tell Leilan IIc, Early Jezirah V) that lasted for some thirty to fifty years and ended between 2233 and 2196 B.C. (1σ). The region-wide re-settlement by the Amorites happened only several generations later, in the early second millennium B.C., between 1969 and 1919 B.C. (1σ) based on the radiocarbon sequence of Tell Leilan (Weiss et al. 2012).

Harvey Weiss rightly points out that according to radiocarbon data the start of post-Akkadian Leilan IIc was apparently more or less synchronous with the advent of the First Intermediate Period in Egypt (Weiss, this volume). But while he interprets this contemporaneity as "systemic similarities among and between societal megadrought responses" (Weiss, this volume), we should again remember to be careful not to mix correlation with causality. Based on radiocarbon data, the beginning of the First Intermediate Period is indeed contemporary to the end of the Akkad empire in upper Mesopotamia (within a century or so). But whether one or both of these events actually was *caused* by the 4.2 ka B.P. event is harder to assess, especially because the "societal responses" are in fact quite different. While survey projects actually were able to show that settlements in upper Mesopotamia were more or less abandoned in the post-Akkadian period, no such evidence exists for Egypt. As outlined above, the nature of the collapse of the Egyptian Old Kingdom is difficult to assess. A direct comparison with the decline of the urban settlements in the southern and central Levant or the end of the Akkad empire in upper Mesopotamia is therefore problematic.

The discussion concerning the causes and mechanisms which lead to the end of the Akkad empire in upper Mesopotamia is definitely far from finished. Nevertheless, the agreement of the results of the radiocarbon sequence from Tell Leilan with the onset of the 4.2 ka B.P. event is striking. Whether this climatic event indeed triggered the collapse of the Akkad period is difficult to determine. For this, high-precision radiocarbon sequences from other sites would be needed to assess the exact dating of similar events at other sites. A climatic event as the reason for the collapse seems plausible for the time being, although one would have to explain the markedly different situation at Tell Mozan.

Concluding Remarks

The notion of climate change and societal collapse will continue to play a prominent part in scholarship in the future, not only for the ancient Near East. Sturt Manning and Bernhard Weninger (both this volume) examine cultural changes on Crete and at Troy that might be linked to climatic change around 2200 B.C., and a recent conference held in Halle (Germany) in October 2014 was devoted to the 4.2 ka B.P. event and possible societal changes from the ancient Near East through the Mediterranean and continental Europe (Meller et al. 2015). I have noted above that more and more edited volumes are approaching this question. Whether or not one agrees with the concept of climate-driven societal change, most prominently advocated by Harvey Weiss since 1993 (Weiss et al. 1993; Weiss, this volume), the ensuing discussions greatly contribute to a better understanding of the transformations that we see in settlement patterns, material culture, and society throughout the ancient Near East at the turn from the Early to the Middle Bronze Age.

While the end of the Old Kingdom and the transition to the First Intermediate Period (Schneider, this volume) is definitely still a matter of debate and in need of a critical study that incorporates not only archaeological data but also the textual evidence and the integration of the Nile valley in the greater ancient Near Eastern system at the time, most progress in scholarship can be shown for the end of the first cities in the southern Levant. A rigorous application of scientific dating evidence to the archaeological record at hand has shown that we must assess the late Early Bronze Age in the southern and central Levant anew. For the first time, it is possible to reconstruct something like "world history" based on scientific evidence, that is, radiocarbon dating. The picture that emerges is considerably different from what we thought before. It could be shown that the "collapse" of the urban system was rather a decline or the sum of multiple, local, and independent societal collapses, whose reasons still elude us, although possible interpretations are offered in this volume by Greenberg and Schloen.

The second half of the third millennium B.C. remains an enigmatic period, but research in recent years has shed some light on the topic. As time and research progress, we will likely achieve a more nuanced picture of the transition from the Early to the Middle Bronze Age and its chronology, societal collapses, and adaptations. It is hoped that the present volume is one of many small steps forward on this path.

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Part I

Levant

2

No Collapse: Transmutations of Early Bronze Age Urbanism in the Southern Levant

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Like a black hole in a distant part of our galaxy, ancient societal collapse cannot be observed directly, but only inferred from its effects. In fact, even modern episodes of severe collapse are rarely recognized in real time, particularly at the institutional heart of the societies in question. We speak of collapse, in contrast to mere evolution or change, when it can be demonstrated that an integrated system, particularly a strongly marked political or economic one, disintegrates. Moreover, in order to distinguish "collapse" from "decline," this disintegration has to occur rapidly. The archaeological signature of collapse will usually consist of two snapshots, one representing a society "before," and one "after" the presumed event. Then, by virtue of hindsight, we seek the portents of disaster in the abandoned remains of the once-flourishing society and suggest possible culprits and plausible scenarios of "failure."

A sizeable body of writing has accumulated on the collapse of the urban Early Bronze Age (EBA) entities of the southern Levant in the last centuries of the third millennium B.C. (Dever 1989; Esse 1989; Esse 1991; Rosen 1995; Weiss 2000; Greenberg 2002; Rosen 2007; Miroschedji 2009). Stressing the dramatic difference between the massively walled towns of the Early Bronze III and the pastoral or rural villages, encampments, and cemeteries of the succeeding Intermediate Bronze Age (IBA), climatic, systemic, or cultural prime movers of urban collapse have been sought and named. Some scholars have, however, demurred. Offering a far less polarized picture of change between Early Bronze III and what they prefer to label Early Bronze IV, Philip (2001), Long (2003), Savage, Falconer, and Harrison (2007), and Richard (2014) have intimated that the "before" and "after" dichotomy is often over-stated. While this perspective may be an artifact of geography (Cisjordanian vs. Transjordanian viewpoints), it clearly rests on differing interpretations of south Levantine urbanism itself, and of the degree to which "type sites" such as Yarmuth, Ai, or Bet Yeraḥ may be construed as paradigmatic of south Levantine society (Greenberg 2011a).

In this essay, I wish to sidestep the question of urbanism (which I take, for the sake of argument, as given) and focus on the chronological, political, and systemic aspects of collapse: Can the study of relative chronologies and stratigraphies confirm the existence of an integrated urban system prior to collapse? Moreover, is there indeed evidence for a rapid dissolution of all urban polities, or, on the contrary, for other, less dramatic scenarios? Lastly, if not collapse, what then? What is it that existed "before," and what "after"?

The Chronology of South Levantine Urbanism

Comparative stratigraphy and Egyptian correlations (Greenberg 2002) and, now, absolute chronology (Regev et al. 2012) point to a very brief Early Bronze II, with a *maximum* span of 200 years (ca. 3050–2850 B.C.).[1] Within a span of a century or so at the turn of the third millennium B.C., the urban idea spread contagiously in the southern Levant, spawning a rapidly expanding network that, in many places, completely subsumed Early Bronze I village culture: Early Bronze II people willingly entered into a new social contract that entailed entry into fortified towns, reorganization of ceramic and other industries, and, where it was realized most fully, acceptance of planning constraints that disciplined daily space-time trajectories and filtered down to the household level (Kempinski 1992; Faust and Golani 2008; S. Paz 2010; S. Paz 2012; Greenberg and Paz 2014). This was an extraordinary, across-the-board change, characterized by stratigraphical discontinuity in settlement sites (i.e., abandonment of old structures and rebuilding on new plans), the simplification of material culture (Greenberg 2011b), the abandonment of ancestral burial grounds (Ilan 2004), and the forging of new networks of interaction (Milevski 2011). In order to be achieved, this change had to involve the mobilization of people and commodities, the imposition of a high degree of cultural and material uniformity, and the elevation of certain forms and media of consumption and habitation to iconic status (Getzov, Paz, and Gophna 2001; Sherratt 2004; Greenberg 1999; Greenberg 2011b; Greenberg 2014). Where Early Bronze II networks have been studied in detail — principally in relation to the desert polity headed by fortified Arad (Amiran and Ilan 1992; Herzog 1997, p. 44–62; Beit-Arieh 2003) and the three-tiered Hula valley network (Greenberg 2002) — they are characterized by a remarkable unity of vision and internal cohesiveness that attest to powerful urban concepts translated into a local idiom and embraced by a large number of people. The manner in which contradictions were tempered (or sublimated) in Early Bronze II society will be discussed at length in a future publication. The concept can, however, be appreciated through the following examples:

1. The contradiction between freedom of movement and the need for enclosure, control, and surveillance was mitigated in the Early Bronze II by the construction of town walls with numerous gaps or posterns. Thus inhabitants of Early Bronze II towns could slip out through the wall to their fields or corrals without supervision (and presumably slip back in as well).
2. The contradiction between newly centralized and standardized industries and old craft traditions was bridged by the melding of old forms with new techniques. Thus the Early Bronze II is marked by completely new ceramic industries that do not invent a single new form.
3. Stark differences in social empowerment that must have emerged with the onset of urban life were tempered by a uniform material culture and undifferentiated mortuary practices. Status has low archaeological visibility in the Early Bronze II.

[1] At some sites, where Early Bronze I ends late and Early Bronze III begins early, the intervening period may have been as brief as 100 years.

But this new state of affairs clearly proved unsustainable. At some point within the twenty-ninth century B.C. the Early Bronze II system began to fray; within a few decades it was largely defunct. The extent of this metamorphosis was certainly observed by earlier students of the period (e.g., Ben-Tor 1992, pp. 96–97; Getzov, Paz, and Gophna 2001, p. 289), but its significance was downplayed, perhaps due to imprecise relative and absolute chronologies that favored the concept of Early Bronze II–III continuity.[2] Now that chronology has been figured out with a high degree of precision, the end of Early Bronze II must be recognized as a period of social, political, and economic transformation hardly less dramatic than its beginning. The strongly marked transition to Early Bronze III involved the disappearance of many settlements — towns and villages — including, but not limited to, the fortified center of settlement, industry, and trade at Arad (Amiran and Ilan 1992); the fortified, orthogonally planned town of Tell el-Farᶜah (North) (Miroschedji 1993), Tell es-Saᶜidiya, with its elite quarter (Tubb 1998, pp. 40–48); Qiryat Ata, a prototypical town site of the Acco valley (Faust and Golani 2008); all sites surveyed in the Samarian hills (Getzov, Paz, and Gophna 2001); thirty-three of thirty-nine sites surveyed in the upper Galilee (Frankel et al. 2001, pp. 100–01); and no fewer than twenty villages and small fortified sites in the Hula valley (Greenberg 2002). In fact, wherever survey methodology allows one to distinguish between Early Bronze phases, the Early Bronze III stands out as a low point in the number of settled sites (e.g., Finkelstein et al. 2006, fig. 40.13). Along with the catastrophic drop in the number of settled sites came the reduction in scale of industries and the loss of specializations: the steep decline in the Metallic Ware and Golanite cooking pot industries of northern Canaan (Greenberg and Porat 1996; Greenberg 2000; Paz and Iserlis 2009), or of fine basalt products, as observed at Tel Bet Yeraḥ (Rosenberg and Greenberg 2014), are symptomatic. The contraction of networks that linked specialized and localized production, uniform demand, and effective distribution is a failure of communication and of a form of political economy: goods and people could no longer be synchronized over long distances.

The nature of the Early Bronze II–III transition can also be gauged by some marked alterations at sites, particularly the largest ones, that did survive the transition. Cultural diversity and inequality are noticeably more evident in the Early Bronze III iterations of sites such as Tel Hazor, where ceramic variety in the local tradition increases (Greenberg 2000), or at Tel Yarmuth, where a palace-centered economy is indicated, complemented by a marked increase in the sheer size of ceramic storage, preparation, and food-consumption vessels associated with the town's elite (Miroschedji 2000; Miroschedji 2006). A pervading sense of insecurity, doubtless linked to the comparative isolation of the fortified centers in the countryside, is expressed in an almost geometric progression in the size of the fortifications (I return to these Early Bronze III traits below). While the nature of the Early Bronze II–III transition is not the focus of this paper, the key to its explanation must lie in identifying the tensions and conflicts that had to be constantly attended to in the Early Bronze II: find these, and you will have located the sources of change.[3]

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[2] Even the most recently published synthesis of the period still combines Early Bronze II and III (Miroschedji 2014).

[3] Tel Yarmuth (Miroschedji 2006) constitutes an important outlier that seems to predict or pre-empt broader trends. Here we find late Early Bronze II investments in massive fortification while the Early Bronze III focuses on the growth of a powerful elite — perhaps a ruling dynasty — that invests its energy in the accumulation and redistribution of staple wealth.

In a previous publication I termed the Early Bronze II–III transition “collapse” (Greenberg 2002, p. 97). Upon reflection, and in view of the reduced Early Bronze II chronology, it would be more prudent — and productive — to view the Early Bronze II in its entirety as a period of urban experimentation and negotiation. Urban concepts were doubtless adopted, or “translated,” from a template that had come into existence in late fourth-millennium B.C. Mesopotamia (Greenberg 2011b; cf. Even-Zohar 2008), with varying degrees of commitment at different sites. But an inherent resistance to some of the uniformitarian principles that seem to underlie Levantine urbanism might be responsible for the rapid abandonment of some towns and villages and the retrenchment — and entrenchment — that is the Early Bronze III.

Characterizing Early Bronze III Stratigraphy and Chronology

For the next three or four centuries, until sometime in the twenty-fifth century B.C., the southern Levant apparently settled into a new state characterized by a discontinuous landscape of heavily fortified polities with few sedentary villages between them. In order to gauge the extent and stability of settlement at the surviving sites, I first look at the longest and fullest stratigraphic sequences, note criteria for dating them, and then attempt to establish which part of the sequence is covered by sites with a shorter span of occupation.

Tel Yarmuth serves as perhaps the prime example of Early Bronze III elaboration. A massively fortified city already in the Early Bronze II, Yarmuth maintained its preeminence through four successive Early Bronze III strata (Miroschedji 1988), the latest marked by the meticulously planned palace complex (Palace B1), which was only one component in what appears to have been a complex of administrative structures (Miroschedji 2006). The rich ceramic repertoire of Yarmuth (Miroschedji 2000) has served as a yardstick for relative chronologies in southern Israel/Palestine, with sites such as Tell er-Rumeida (Hebron) and Tell eṣ-Ṣafi (Shai et al. 2014, p. 38) establishing their contemporaneity in late Early Bronze III by virtue of strong ceramic parallels with Yarmuth. It is therefore of particular interest to discover that radiocarbon dating places the earliest part of the Yarmuth sequence before 2800 B.C. and the latest Early Bronze phases at Yarmuth and Hebron (Regev, Miroschedji, and Boaretto 2012), as well as at Ṣafi (Shai et al. 2014), within the twenty-sixth century B.C., probably near its beginning. Thus, the successive episodes of construction, abandonment, and rebuilding at these three sites all occurred within the first two or two-and-a-half centuries of the Early Bronze III.

Megiddo, in the Jezreel valley, presents a three- or four-stage sequence (Strata J5–7, in the terminology of the Tel Aviv University expedition) comprising (earlier) palatial/cultic (J6) and (later) cultic (J7) complexes. Here as well, a detailed radiocarbon sequence spans the twenty-eighth to twenty-sixth centuries B.C. (Regev et al., 2014), but does not appear to include the latest state of the triple-temple compound, which had a complex history (Kempinski 1989; Herzog 1997). Ussishkin (2013) and Adams (2013) would appear to place all of it in the Intermediate Bronze Age (IBA), but a terminal Early Bronze III date, perhaps around the turn of the twenty-fifth century B.C., might be more consistent with our expectations from Early Bronze Age and Intermediate Bronze Age societies (Finkelstein 2013 pp. 1332–33, and, in fact, ibid., p. 1327).

Tel Bet Yeraḥ, in the northern Jordan valley, exhibits, in some parts of the site, an extensive six-stage sequence (Greenberg and Paz 2014). In others there are fewer phases, indicating that the whole of the site may not have been settled at various stages within the

Figure 2.1. Map of Early Bronze Age sites mentioned in this chapter. Fortified Early Bronze III sites are marked by squares; other Early Bronze III sites in small caps; ephemeral Early Bronze III sites in brackets; major abandoned Early Bronze II sites are marked in gray

Early Bronze III (by way of comparison, the Early Bronze II is represented by one to four stratigraphic phases in different parts of the mound). The sequence begins with the arrival of Khirbet Kerak Ware producers/consumers, best understood as a mobile migrant community establishing a foothold in the abandoned spaces of a city that had recently been rocked by crisis, perhaps an earthquake (Greenberg 2007; Greenberg and Paz 2014). A later spate of construction at the site coincides with a decline in Khirbet Kerak Ware distribution. This sequence may be equated, in broad terms, with the Khirbet Kerak and post-Khirbet Kerak strata at contemporary Hazor (Greenberg 1997). Radiocarbon dates at Bet Yeraḥ date the main phase of Khirbet Kerak Ware (KKW) production to the beginning of the Early Bronze III, that is, the twenty-eighth to twenty-seventh centuries B.C. The later, KKW-poor Early Bronze III phases may be assumed to have extended into the twenty-sixth century B.C. or beyond.

With these six sites (Yarmuth, Ṣafi, Hebron, Megiddo, Bet Yeraḥ, and Hazor) anchoring the Early Bronze III sequence, we may use Getzov, Paz, and Gophna's (2001) list of Early Bronze III mounds (without necessarily accepting their subdivisions) in order to establish a relative sequence of additional excavated sites and strata. Of twenty excavated sites west of the Jordan (in addition to those noted above), nine are ephemeral or exhibit one phase of Early Bronze III occupation. These include Rosh Hanniqra (ephemeral, with KKW; Tadmor and Prausnitz 1959), Tel Gat Ḥefer (one phase, no KKW; Covello-Paran 2003), Tel Yoqneʾam (ephemeral, with KKW; Zuckerman 2005), ʿAfula (one phase, with KKW; Sukenik 1948), Tel Dothan (one phase; Master et al. 2005, p. 26), Tel Bareqet (ephemeral; S. Paz, pers. comm.), Jerusalem (one phase; Greenberg 2012), Tell Beit Mirsim (one phase; Dever and Richard 1977), and Tel ʿIra (one phase; Beit-Arieh 1999). A number of inner-valley sites exhibit village settlement associated with KKW user/producers: at Tel Qishyon (Arnon and Amiran 1993) and Tel Yaqush (Novacek 2007) there are two phases that should probably be placed in quick succession near the beginning of the Early Bronze III, while at Tel Bet Shean a longer village sequence oscillates between local-tradition (Area R, Strata R12 and R7a) and KKW (Area R, Strata R11–R7b) ceramic consumers (Mazar 2012). Another village site, lacking KKW, is Tel Qashish. It shows a brief post–Early Bronze II phase of settlement, followed, after a gap in occupation, by an ephemeral late Early Bronze or Intermediate Bronze Age settlement (Ben-Tor, Bonfil, and Zuckerman 2003).

Seven more sites are substantial, fortified towns with some stratigraphic continuity: Tel Dan (2–3 phases; Greenberg 1996) and Jericho (two strata, with subphases; Nigro 2006) in the Jordan valley, Tell Taʿanek at the edge of the Jezreel valley (two strata, with KKW; Lapp 1969), ʿAi, the sole site of the central hill region (2–3 strata; Callaway 1980), and Tell el-Hesi, Tel Halif, and Tell es-Sakan in the southern foothills and coastal plain (3–5 phases; Seger 1989; Miroschedji and Sadeq 2000). The latter site has been dated radiometrically to the earlier part of the period, whereas Jericho appears to be one of the few Early Bronze III sites with post-2500 B.C. dates (Regev et al. 2012).

The situation east of the Jordan was similar. A handful of fortified sites survived the Early Bronze II–III transition. Some of them, such as Tell el-Umeiri (Harrison 2000) and Khirbet ez-Zeraqon (Genz 2002), appear to end rather early in the period, possibly by 2700 B.C.;[4] Batrawy has a destruction layer that apparently precedes 2600 B.C. (Nigro 2010; Höflmayer 2014); Bab

[4] Relatively early radiometric dates for these two sites appear in Regev et al. 2012. Both sites have been attributed a long Early Bronze III occupation, however, I am able to distinguish only one convincing Early Bronze III assemblage at Umeiri, and probably at Zeraqon as well.

edh-Dhraᶜ (Rast and Schaub 2003) and Numayra (Chesson and Goodale 2014), which appear to have coexisted for much of the period, might have held on until about 2550 B.C. Other sites, without published radiocarbon dates at present, include the large fortified centers of Tell el-Hammam (Collins and Aljarrah 2012) and Tel Handaquq South (Chesson 2000). Tell esh-Shunah in the Jordan valley had, apparently, a single phase of Early Bronze III occupation characterized by large quantities of KKW (Leonard 1992). On the Golan plateau, most sites do not survive the Early Bronze II–III transition; a prominent exception is the massively fortified Lawieh enclosure, which was occupied in the KKW phase of the Early Bronze III (Y. Paz 2003).[5]

Table 2.1 collates the basic stratigraphic data from excavated sites in the southern Levant. While it is notoriously difficult to compare sites merely on the basis of the number of strata allotted to a given period, the disparity between sites is inescapable. Taken together with the radiometric and material culture evidence, we are faced with a relatively long Early Bronze III (3–4 centuries) that needs to be covered with a rather threadbare carpet of Early Bronze III settlement (especially when compared with the brief, intensively built-up Early Bronze II). At stratified and dated sites, KKW appears in an early stage of Early Bronze III and then gradually declines and disappears. In view of the predominance of KKW phases at many sites in the north, an uneven settlement history may be inferred, with some regions occupied in the beginning of the period, and others, such as the southern plains, perhaps showing more intensity of settlement in its latter part. It may therefore be concluded that not all the sites were settled at any given time, and that the weight of occupation (the greater proportion of sites attributed to Early Bronze III) is to be assigned to the first half of the period, before 2600 B.C.

The upshot of all this is that, at any given time in the Early Bronze III, only a portion of the fortified settlements shown on "Early Bronze II–III"–period maps would have actually been occupied (cf. Philip 2001, p. 183; Philip 2003, pp. 114–15). At times, the settled sites might have formed pairs (like Bab edh-Dhraᶜ and Numeira, Megiddo and Taᶜanek, or Yarmuth and Ṣafi), or even small clusters (such as the Hesi-Sakkan-Halif triangle),[6] but there would have been large tracts between them without permanent settlement. The south Levantine landscape would therefore have been composed of both settled and abandoned fortified settlements that could have comprised territorial landmarks (Philip 2003, p. 115), but cannot be viewed as a regionally integrated urban system.

Another point, also noted by Philip (2003, p. 115), is that even sites with several Early Bronze III settlement phases underwent periods of partial or complete abandonment, followed by rebuilding. This is attested at Tel Bet Yeraḥ by the fate of the successive fortification systems and the widespread changes in the urban layout during the Early Bronze III (Greenberg and Paz 2014). Thus, a compilation of site-wide occupation sequences shows considerable disparities between different parts of the 25–30 ha mound (table 2.2 and fig. 2.2). In the northern part of the mound, the construction of the Circles Building (or Granary) can be assigned to the Early Bronze II–III transition; it is followed by two phases of occupation, both associated with large quantities of KKW. At the southeast tip of the mound (Area BS),

[5] Descriptions of large Transjordanian Early Bronze III settlement clusters (Savage, Falconer, and Harrison 2007) are based on survey data that do not, in fact, distinguish between Early Bronze II and Early Bronze III, and cannot be taken at face value.

[6] To which Early Bronze III settlement at Tel Poran (Gophna 1992) and one or two additional sites (mentioned in Miroschedji 2006; Gophna and Gazit 2006) might be added. We have little information on the extent or depth of Early Bronze III occupation at these sites.

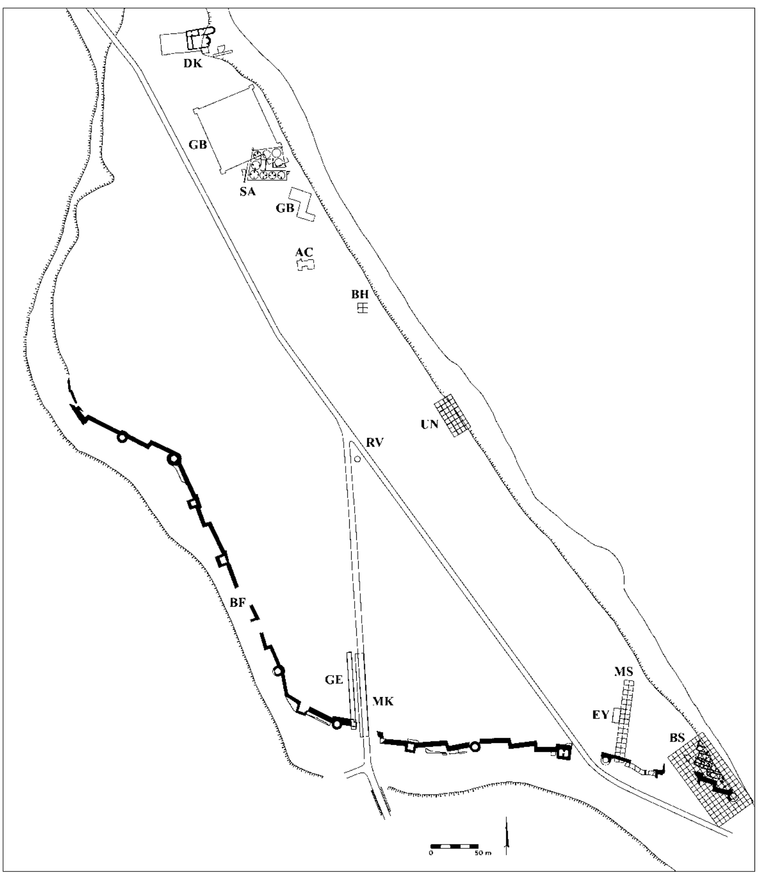
Table 2.1. Selected sites of the Early Bronze III, noting number of reported strata and latest radiocarbon determinations

Site	*Number of EB III Strata*	*Note*	*Latest C14 Date (approximate)*
Dan	2–3	—	—
Hazor	2	KKW and post-KKW phases	—
Bet Yeraḥ	2–6	KKW and post-KKW phases	2600 cal. B.C. (for KKW phase)
Bet Shean	7	Six KKW phases and one post-KKW phase	—
Tel Yaqush	2	KKW phases	—
Tel Qashish	1 (2?)	Stratum XIIA (early EB III) and Stratum XI (possibly late EB III)	—
Tel Qishyon	1–2	KKW phase(s)	—
Megiddo	4	—	2500 cal. B.C. (penultimate)
Taʿanek	2	Some KKW in both phases	—
ʿAi	2–3	—	—
Tel Yarmuth	4	—	2500 cal. B.C.
Ṣafi	4	—	2580 cal. B.C.
Jericho	2 (with subphases)	—	2400 (?) cal. B.C.
Hesi	2-3	—	—
Sakan	5	—	2500 cal. B.C.
Batrawy	2	—	2600 cal. B.C.
Umeiri	1	—	2700 cal. B.C.
Bab edh-Dhraʿ	4	—	—
Numeira	3	—	2550 cal. B.C.
Handaquq South	4	—	—

no fewer than six phases of occupation were recorded, the first three with large quantities of KKW, the following two with diminished quantities, and the final phase without KKW. At a point near the middle of the mound, in Area UN, only two phases of Early Bronze III occupation were noted, both with KKW (possibly more prominent in the earlier phase). While the three earlier consecutive building phases in houses of Areas SA and EY/MS follow the same general layout, the later phases of Areas BS, EY/MS, and UN are marked by significant changes in both street plans and individual domestic units. The fortifications of the site also have a checkered history in the Early Bronze III (Greenberg and Paz 2005). The earlier part of the period is characterized by a rather poor repair (Wall B) of the run-down Early Bronze II system. Major reconstruction occurs in late, possibly post-KKW, Early Bronze III

Table 2.2. Early Bronze III stratification in different parts of Tel Bet Yeraḥ

Area	*Number of Phases*	*Depth of Deposit (not including pits)*	*Remarks*
SA	2–3	0.60–1.20 m	One early and one late phase in the Circles Building; three phases of construction in domestic structures, all associated with KKW
UN	2	0.80 m	Two major building phases, with stone-based houses, streets; uppermost phase eroded; KKW in both phases
EY	5	1.15 m	Lower phases densely built up; later phases poorly preserved; all associated with KKW
MS	2–5	0.50–1.60 m	Fewer phases near fortification, perhaps due to clearance during construction of Wall C; densely built up to north, all phases with KKW
BF	2	—	Two Period D fortification walls: Wall B and Wall C
BS	6	2.10 m (not including fortification)	Early midden, followed by five phases of public and domestic construction, gradually diminishing KKW (none in last phase); Wall B built during second(?), and Wall C built during fifth phase
GE	3 (?)	1.10 m	Early phase "without KKW" (= Wall B fortification) followed by two more building phases (possibly associated with Wall C)



MK	N. Makhouly, 1933
MS	B. Mazar and M. Stekelis, 1944–1945
SA	M. Stekelis and M. Avi-Yonah, 1945–1946
GB	P. L. O. Guy and P. Bar-Adon, 1949–1950
RV	B. Ravani, 1950–1951
BS	P. Bar-Adon, 1951–1953
BF	P. Bar-Adon, 1952–1955
DK	P. Delougaz and H. Kantor, 1952–1953, 1963–1964
UN	D. Ussishkin, 1967
AC	R. Amiran, 1967
BH	D. Bahat, 1967–1977
EY	E. Eisenberg and O. Yogev, 1981–1982, 1985–1986
GE	N. Getzov, 1994–1995

Figure 2.2. Excavation areas of Tel Bet Yeraḥ

(Wall C). All of this adds up to a picture of non-uniform developments in various parts of the site, mirroring the regional settlement picture of the Early Bronze III: at any given point in the Early Bronze III, parts of the site itself might well have been in a state of ruin or disuse, either permanent or temporary.

In the same vein, the remarkable transformations effected in various parts of Tel Yarmuth or Megiddo, where entire domestic quarters were razed and replaced by planned structures, and entire fortification systems were superannuated, are usually attributed to the exercise of "eminent domain" by powerful elites (Herzog 1997; Miroschedji 2001; Miroschedji 2003). This may be true, yet it can also be indicative of the need to reverse processes of urban decay caused by partial/temporary abandonment. The fragility of urban agglomerations, which should be seen as a permanent trait of dry-farming regions in the Near East (Wilkinson 1994; Stein 2004), should not be obscured by the sheer size of their architectural interventions.

The Nature of Early Bronze III Towns and Elites: Strategies of Control and Collective Action

Geographic and temporal discontinuities notwithstanding, fortified Early Bronze III settlements looked alike and shared, for the most part, a similar material culture. The most tangible symbol of permanence for Early Bronze Age towns was without doubt their fortifications. The smallest towns (e.g., Numayra) had stone fortifications of at least 4 m in width, whereas at large sites, fortification systems attained a breadth of 17 m (Tel Dan) or even as much as 40 m (at Tel Yarmuth, though here, the bulk of construction had already taken place in Early Bronze II). A complete survey of the architecture of defensive installations in the Early Bronze Age has yet to be attempted.[7] However, descriptions of individual fortification systems such as Tel Dan (Greenberg 2002), ʿAi (Callaway 1980), Tel Yarmuth (Miroschdji 1990), Tel Bet Yeraḥ (Greenberg and Paz 2005), Khirbet ez-Zeraqon (Douglas 2007), Jericho (Kenyon 1979, pp. 90–94), Bab edh-Dhraʿ (Rast and Schaub 2003, pp. 280–84), Numayra (Chesson and Goodale 2014), and Khirbet el-Batrawy (Nigro 2010) paint the following picture: Whether built from scratch in the Early Bronze III or utilizing earlier systems, Early Bronze III walls were significantly more massive — broader and taller — than in the Early Bronze II (see also Kempinski 1992). They were studded with towers or large bastions and pierced with single, well-defended gates, which often underwent a process of gradual constriction and blockage (Early Bronze II posterns were invariably blocked in Early Bronze III). Often, glacis or other kinds of outworks were added to them. The massive fortifications actually comprise the most conspicuous form of public architecture, creating platforms for permanent military or civic presence, allowing surveillance of the town and its environs (see fig. 2.3).

At all sites, walls were built in segments. Sometimes the segments are carefully joined so as to present a uniform face, and sometimes — such as in Wall C at Bet Yeraḥ — the seams in construction are obvious and inelegant, suggesting a low level of coordination between the builders of each segment. The following description, of the relatively small-scale construction at Numayra, is fairly typical:

[7] Douglas 2007 is the most ambitious survey.

Figure 2.3. Early Bronze III fortifications at Tel Bet Yeraḥ (Wall C) (Bar-Adon archives)

> The fortification walls were constructed in abutting segments, each approximately 10 m long, a construction technique found at other EBA urban sites [...]. Evidence of repairs and additions to Numayra's fortification walls, tower, and gate system demonstrates that periodically some inhabitants dedicated time, labor, and resources to maintain and renovate the fortification system. We have no evidence to argue for any particular set of social and political mechanisms for maintaining and staffing the gates, towers, and walls. (Chesson and Goodale 2014, p. 127)

Chesson and Goodale appear to suggest that construction and maintenance of fortifications would have been a corporate undertaking, with the responsibility for various segments allotted to those living in the adjacent wards.

Another aspect of public construction is the construction of temples and palaces (Kempinski 1992; Miroschedji 2001; Miroschedji 2003; Sala 2010). Temples and temple complexes have been excavated at Megiddo, Khirbet ez-Zeraqon, Khirbet el-Batrawy, Bab edh-Dhraᶜ, ᶜAi, and possibly Bet Yeraḥ (the Circles Building). The structures identified as temples are usually broadrooms with entrance porticoes, set apart from domestic areas by a spatial buffer zone sometimes demarcated by a temenos wall. None of these structures has provided any evidence for the nature of the cult: there are no icons, wall paintings, favissae, or signs of specialized activity. At Megiddo, Khirbet el-Batrawy, Bab edh-Dhraᶜ, and Khirbet ez-Zeraqon, raised round outdoor platforms are interpreted as altars, with possible evidence for animal sacrifice/consumption, but neither there nor at any of the other complexes is there evidence for the intense economic activity (storage and redistribution) that is often associated with third-millennium B.C. temples in adjacent regions (for similar observations regarding North Mesopotamia and Syria, see Stein 2004; Porter 2012).

Palaces have no fixed design or style. The remarkable, well-planned, and meticulously executed palace at Tel Yarmuth comprised, in its latest form, an integrated compound with apparent domestic, economic, and administrative functions. Miroschedji (2001; 2003; 2006) has demonstrated that the palace was built to high architectural standards and has suggested that the same standards might have been applied in the Megiddo palace (which has, however, a markedly different plan). An alternate measuring system has recently been identified by H. Ashkenazi, based on an analysis of the Circles Building at Bet Yerah (Greenberg et al. forthcoming).

A third shared element in the material culture of Early Bronze III urban sites is the "supersizing" of ceramic vessels, especially those used for storage (e.g., the Yarmuth palace pithoi) and for serving — the ubiquitous oversized platters (fig. 2.4). The latter have been discussed in some detail by Bunimovitz and Greenberg (2004), who note the

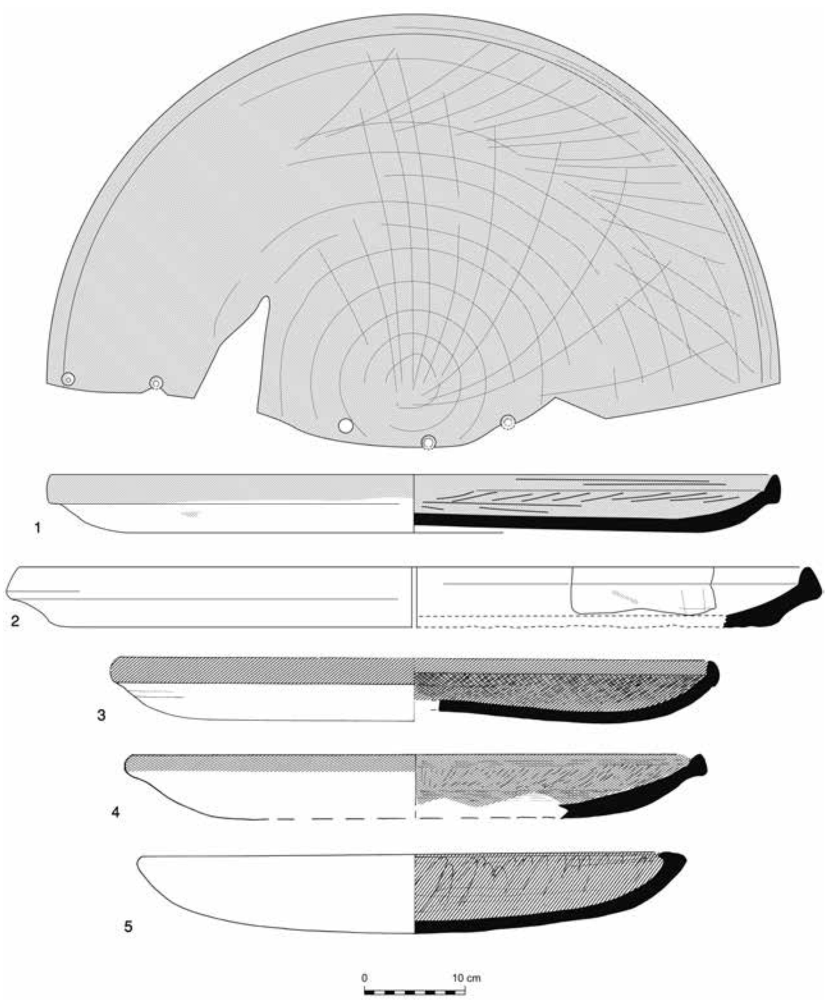


Figure 2.4. Oversized platters from Tel Bet Yeraḥ

marked increase in platter size and capacity between Early Bronze II and III, further noting that

> The construction, drying, and firing of these large platters — decorated with a complex pattern burnish that appears to emulate basketry and weighing 6–8 kg — required enormous expertise. Many artifacts show evidence of ancient repair: they were obviously highly valued. As for the context of their discovery, they are most numerous at the two palatial sites of Yarmuth and Megiddo. […] Heaped with food, large platters were more than sufficient to feed a family and could well reflect a meal-based hospitality reserved for festive occasions or for important guests. The largest platters, however, can best be imagined as centerpieces in feasts and banquets. Requiring two persons to bear them, they attest to ostentatious consumption, reflecting the owner's ability to command both the price of the artifact itself and the quantities of food placed upon it. (Bunimovitz and Greenberg 2004, p. 21)

The three commonalities of Early Bronze III urban polities can be linked together as facets of a "corporate" social and political strategy (Blanton et al. 1996; Feinman 2000). Whereas Early Bronze II polities focused on maintaining a balance between collective needs and private ambitions, instituting leveling mechanisms to prevent the dissolution of social solidarity (Greenberg 1999; Greenberg 2002), Early Bronze III towns communicate the attempt to concentrate social power in fewer hands — whether of individual aggrandizers or of kin-based units (such as the House, as suggested by Chesson in 2003). The power of these individuals or families was maintained and legitimized as a manifestation of the corporate will by means of ritual sanction and feasting (e.g., at temples), and by the recruiting of collective labor to carry out monumental construction, which in turn served as tangible evidence of the power of the city and its elites. Palaces represented the attempt of those elites to establish a permanent locus for the stockpiling and redistribution of staple products. Despite the attrition of leveling mechanisms established in the Early Bronze II (such as a uniform material culture), Early Bronze III leaders could maintain a sense of common purpose based on collective urban identity.

This strategy appears to have been sufficiently effective in creating the main components of Early Bronze III urban life, so much so, that elements usually associated with exclusionary "network" strategies practiced by aggrandizing elites or with the institutionalization of economic management typical of third-millennium B.C. polities in Syro-Mesopotamia are absent, even in south Levantine settings that appear to exhibit the highest degree of urban articulation. "Network" strategies, as formulated by Blanton and colleagues (1996, p. 4), rely to a great extent on interregional connections between elites, access to prestigious alliances, exotic goods, and specialized knowledge, fostered through trade and the manipulation of prestige goods. They are paramount in the *modus operandi* of the early Egyptian state and are also an important facet of early Mesopotamian urbanism (although Mesopotamia assuredly maintained kin-based corporate organizations in tandem with patrimonial hierarchies). If our Early Bronze III has an overriding characteristic, it is the *absence* of significant external interaction, long-distance trade (now that some long-standing assumptions about trade contacts with Old Kingdom Egypt have been put to rest: see Thalmann and Sowada 2014), and the circulation of prestige goods such as precious metals or technologically sophisticated weapons. The few exceptions — decorated bone tubes (Zarzecki-Peleg 1993), ivory bull's heads (Beck 2002), and a couple of possible Byblite ceramic imports (Greenberg 1997, p. 21;

Greenberg 2006, p. 167) — are paltry outliers that prove the rule: even in the most decidedly "palatial" sites, prestige objects are all but non-existent.

As for the technological trappings of high urbanism or early states, I have already noted the trend away from large-scale industries and attached specializations. This trend dovetails with the absence of long-distance trade: small-scale industries imply reduced commodifi-

Table 2.3. A model for the transformation of Early Bronze Age ceramic industries as part of social negotiation in the Early Bronze II–III transition (after Greenberg 2000)

Early Bronze II		→→	Early Bronze III	
Centralized production		Negotiation of contradictions	Autonomous production	
↓			↓	
Collective procurement of raw material and fuel			Individual procurement of raw material and fuel	
↓			↓	
Thin walls, smaller vessels	Standardization		Thick walls, larger vessels	Variation
↓	↓		↓	↓
Easily transported			Not easily transported	
↓	↓		↓	↓
Widespread distribution	Widespread demand		Local distribution	Local demand

cation and smaller distribution networks. Table 2.3 illustrates the ceramic aspect of this equation.

Also absent in Early Bronze III towns is evidence for any kind of administrative apparatus. Not only was the Early Bronze III pre-literate, nothing resembling an accounting system can be seen as well. Seals and seal impressions are exceedingly rare, the latter appearing rarely as decorative or branding devices on ceramic vessels rather than in contexts of goods transfer or administered storage (Greenberg 2001). The institution of metrology and architectural planning presents itself as a resolution to one of the contradictions of Early Bronze II society: the tension between a dominant urban "strategy" and the "tactics" of street walkers (after Certeau 1984), that is, between the attempt to impose order on domestic and public construction within the city walls and the everyday needs of people or the demands of important social interactions. By creating formally planned structures, often at the expense of domestic dwellings, elites exhibited their will and ability to control space, yet simultaneously they relinquished control over the remaining spaces and domestic quarters, allowing chaotic construction and private encroachment on public space away from the central institutions. Thus, the compass of urban influence was actually reduced.

Early Bronze III polities can therefore be characterized as fortified centers or citadels with unstable settlement histories, governed by leading individuals or families ("elites") who use corporate strategies to amass staple products, build monumental structures, and maintain control of limited agricultural territory. The tendency to fortify massively testifies to the fundamental insecurity of these centers, but not necessarily, or directly, to the root of that insecurity. It is difficult to gauge why fortifications would have been perceived as crucial elements of survival. Tel Yarmuth seems largely to have done without new fortifications in its latest phase of occupation, as, apparently, did Tel Halif. Few Early Bronze III towns show evidence of violent destruction that can be attributed to warfare. Indeed, absent the fortifications, there is virtually no evidence for warfare: the sole weapon type attributed to the Early Bronze III is the three-tanged battle ax, of which a grand total of three have been found (in stratified contexts) in all of the southern Levant (Sass and Sebbane 2006).[8] The insecurity may therefore have been existential, emerging from the internal contradictions that led to the dismantling of the Early Bronze II networks, or it may have been economic, related to the risks of wadi-based agriculture (Rosen 2007) and the inability of Early Bronze III polities to broaden their economic base through trade with Egypt or Syria.

The Mortuary Landscape

One of the striking characteristics of Early Bronze II urbanization in the southern Levant was the de-coupling of settlement and cemetery. The pre-urban village landscape had consisted of regular pairings of settlements and cemeteries (Ilan 2004; Ben Ari 2010). With only a few exceptions (notably, Jericho and Bab edh-Dhraᶜ), urban sites of the Early Bronze II are not associated with cemeteries. There are a few instances of continued use of Early Bronze I cemeteries in the Early Bronze II, but no new cemeteries are laid out for the use of urban dwellers. This seems to have been a deliberate strategy, intended to nullify pre-urban territorial allegiances and to establish the fortified town as the preeminent territorial marker in the landscape. Remarkably, the Early Bronze III brought no change in this strategy: the fortified hilltop remained the prime symbol of urban power and permanence. In contrast to dynastic rulers in third-millennium B.C. Syria, where necropolises were often established beneath the palace (Matthiae 1997; McClellan and Porter 1999; Schwartz 2008), south Levantine concepts of legitimate power seem to have precluded dynastic succession. The corporate basis of south Levantine urbanism was maintained.

There is, however, increasing evidence for the existence of an alternative mortuary strategy, used by non-urban populations in the Early Bronze II and III. These consist principally of fields of mortuary stone structures: tumuli in the Negev, stone circles in the Carmel mountains, and dolmens in the Jordan valley, Galilee, and Golan (Haiman 1992; Haiman 1993; Vinitzky 1992; Prag 1995; Savage 2010). While none of these structures are exclusive to the Early Bronze II–III, the coexistence of Negev tumuli and Early Bronze II seasonal settlements in the Negev seems fairly secure (Haiman 1993), the first use of the Ramat Hanadiv burial field is attributed to the Early Bronze III (Greenberg 1992), and the distribution of the Hula valley dolmens appears to dovetail quite neatly with the shift in settlement at the start of the Early Bronze III (Greenberg 2002, p. 79; see fig. 2.5). The contrast with the urban ideology (of non-burial) could hardly be more striking and should be attributed to Early Bronze Age pastoralists, whose role is considered next.

[8] Y. Paz has recently described what he views as an Early Bronze III battleground in the Lawieh (Leviʾah) gateway, strewn with scores of slingstones (Y. Paz 2011).

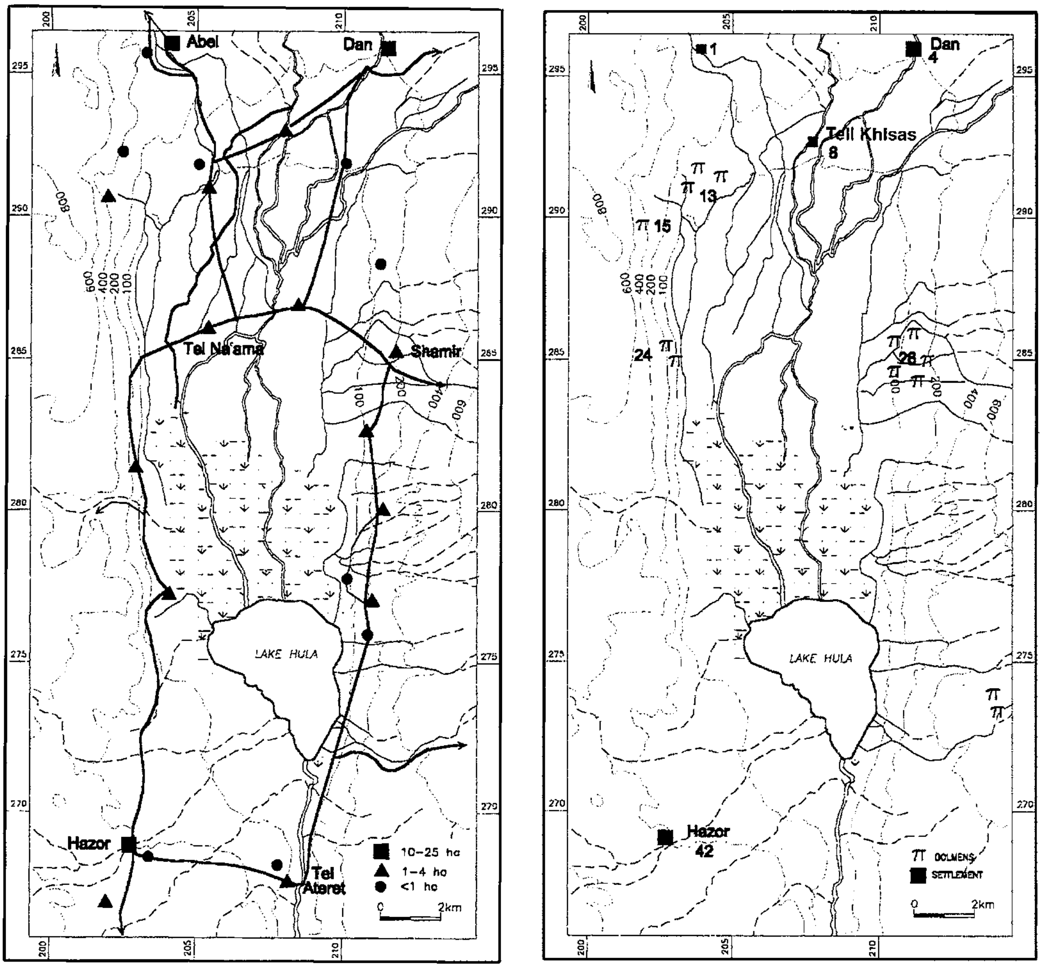


Figure 2.5. Map of settlement shifts in the Hula valley. At left, the reconstructed three-tiered system of the Early Bronze II, with 22 settled sites; at right, the settlement of the Early Bronze III, illustrating the disappearance of settled sites and the incursion of dolmen-fields

The Non-sedentary Component

It is usually assumed that in Bronze Age settings, pastoralists would have interacted — for the most part — peacefully and profitably with town dwellers, each group providing the other with specialized products necessary for their existence (Zeder 1991; Hesse and Wapnish 2001). Further emphasis on a fluid coexistence and interaction has been recently offered by Khazanov (2009), Lyonnet (2009), and Porter (2009; 2012), who suggest that pastoralists and farmers represented alternate modes of the same kin groups, societies, and cultures. Building on this observation, we should conclude that oscillation between mobile and sedentary modes — with their respective and disparate archaeological signatures — is what is actually illustrated in the checkered settlement history of the third-millennium B.C. Levant. Every agricultural society had to coexist with a pastoral one, or to have a pastoral component, including that of the highly sedentary Early Bronze II. Abandonments of (permanent) settlements and agricultural regions can be seen as augmentation of mobile, herd-based economies.

In the Early Bronze III configuration, where towns and cities were often isolated from each other, the presence, in the extensive intervening territories, of a mobile population must be assumed. This component would have left only a minor archaeological footprint in the landscape, represented by some of the "ephemeral" Early Bronze III settlements mentioned earlier (and by sherd scatters found in surveys near major sites; e.g., Dagan 2011, pp. 242–45) and by burial monuments. Within the towns, temple compounds — especially the larger ones at Megiddo and Khirbet ez-Zeraqon (both situated near the edge of town, in proximity to city gates) — might well have been devoted to the veneration of shared ancestors of town-dwelling farmers and neighboring pastoralists (cf. Porter 2012, pp. 178–89). The assumed periodical gatherings and feasts could have brought together town dwellers and herders, and the latter may even have contributed to the labor pool used for monumental construction. In fact, the occasional episodes of urban renascence within Early Bronze III could represent the influx of people from the countryside, recruited to participate on a permanent or seasonal basis in both agricultural and construction activities. But if this had been the case, and if towns did function as regional centers for mobile populations, then by the same token, the exodus of town dwellers to the countryside might have been perceived as a natural function of society, at least by some of the inhabitants. Such an exodus could have been occasioned by economic difficulty (e.g., loss of access to agricultural land through debt), social marginalization, or the wish to escape the ideological anxiety fostered by a constant sense of insecurity. Also, it could be encouraged, and reach a demographic tipping point, if an incentive were to emerge that gave a significant edge to pastoralist or other non-urban strategies (cf. Finkelstein and Perevolotsky 1990).

These incentives may well have differed regionally, according to the resources and opportunities available. For example, Haiman (1996) suggests that the significant activity attributed to the last centuries of the third millennium B.C. in the Negev and Sinai is to be seen as a corollary of the boom in copper production in the northern Arabah sites of Wadi Feinan. The peak in production at the most extensively excavated site, at Khirbet Hamrat Ifdan, falls in mid-millennium, within late Early Bronze III (Levy et al. 2002) — a period to which some of the Negev sites can easily be accommodated (especially those with red-slipped ceramics, such as parts of the extensive, "horizontally stratified" sites of Beʾer Resisim and ʿEn Ziq; Cohen 1999, figs. 154–55).

In the greater part of the southern Levant, however, a tectonic shift in the economy of Syria may have had a decisive impact. Wilkinson and colleagues (2014) offer a broad model for third-millennium B.C. changes in "zones of uncertainty" surrounding the fertile dry-farming regions of northern Syria. They intimate that the rise of cities in Syria at mid-millennium and the concomitant reorganization of textile production associated with them might have provided an extra impetus for an economic, cultural, and ideological re-orientation in the southern Levant toward the north, where aggrandizing states like Ebla were offering high reward for fuelling their expanding economies:

> The EB IV agro-pastoral communities of the southern Levant may, at least peripherally, have been involved in the resourcing or seasonal management of the vast animal herds that occupied the rangelands of the Syrian steppe in EB IV. While this may have involved the supply of young animals, or breeding stock, there may also have been a demand for significant quantities of human labour. [...] In the absence of significant southern power centres during EB IV, such a process would presumably reflect the gradual reorientation of communities in the southern Levant towards

> a northern sphere, through the opportunities offered by this new and physically distant core. (Wilkinson et al. 2014, p. 92)

With the boom of Syrian urbanism timed to the mid-twenty-fifth century B.C. (Cooper 2006, p. 15), we can see an extremely fortuitous correspondence with the last gasp of south Levantine urbanism. The economic boom of northern Syria now offered an attractive, even lucrative, alternative to the old citadel towns (see Schloen, this volume). It would also have offered new paths to prosperity and prestige, no longer linked to the old order, but to a new, physically and socially mobile one (a transformation that was to be re-enacted in Syria and the Levant, time and time again).

The Intermediate Bronze Age of the southern Levant is that new order, sporting new modes of existence, new sources of prestige and wealth, new elites, and new social strategies.

Transition to the Intermediate Bronze Age: Exodus, not Collapse

Where does this leave us with respect to collapse? If collapse is defined as the rapid disintegration of a complex system, the evidence suggests neither that the towns of the southern Levant comprised a system, nor that their decline was collectively precipitous. The Early Bronze Age–Intermediate Bronze Age transition appears rather to be the ending point of a prolonged, region-by-region exodus from Early Bronze Age towns which began much earlier, in the twenty-ninth century B.C., when the Early Bronze II experiment in state-building began to unravel. This exodus was born of the contradictions inherent in urbanization — including, among others, contradictions between new collective and old kinship-based identities, between the need for control and surveillance and the wish for personal autonomy, or between social and commercial economies — coupled with the existence of viable alternatives. In the Early Bronze II and most of the Early Bronze III, the alternatives would have been traditional mobile pastoral economies coexisting with towns in a small-scale economy, but as new opportunities and new modes of social mobility came into existence, the allure of a post-urban existence grew. It was now possible to avoid the penalties that accompany urban life without paying the price of material poverty and of marginalization. People simply walked away from town life and did not look back.

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3

Economic and Political Implications of Raising the Date for the Disappearance of Walled Towns in the Early Bronze Age Southern Levant

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Many specialists now agree that we must raise the date for the transition from the Early Bronze III to the Early Bronze IV in the southern Levant by two hundred years, from ca. 2300 to 2500 B.C. This chronological revision is supported by recent radiocarbon studies (Regev, Miroschedji, and Boaretto 2012; Regev et al. 2012; Höflmayer et al. 2014). In the new chronology, the Early Bronze II is now dated from ca. 3200 to 2900 B.C. This was the first urban culture in the southern Levant, which is not attested everywhere in the region and did not appear at every site at the same time. The subsequent Early Bronze III — the second urban phase in the southern Levant — is now dated from ca. 2900 to 2500 B.C. The Early Bronze IV is now dated from ca. 2500 to 2000 B.C., or perhaps a bit later, and lasted much longer than was previously thought. In the Early Bronze IV, walled towns disappeared from the southern Levant for at least 500 years, marking a dramatic shift in settlement pattern and land use after several centuries during which agrarian polities in the region had been centered on fortified central settlements that were characterized by monumental architecture.

It is generally agreed that the Early Bronze IV witnessed a shift toward mobile pastoralism, albeit with the continuation of sedentary subsistence agriculture in various small communities. Raising by two centuries the date of this major shift in economic and political organization has implications for our understanding of how these structural changes in the southern Levant were related to contemporary developments in the northern Levant. We must examine what was happening in Syria, not in the late third millennium B.C., but in the mid-third millennium, when agrarian city-states disappeared from the southern Levant and did not emerge again for several hundred years, according to the revised chronology.

Archaeologists long ago took note of the imports and imitations of items manufactured in the northern Levant that are found in Early Bronze IV contexts in the southern Levant (for a review of the data with a focus on ceramic evidence, see Bunimovitz and Greenberg 2004). On the basis of these items, which include sophisticated metal weapons and jewelry and distinctive ceramic drinking vessels, some kind of interaction between the two regions has long been posited, whether through trade or migration. But if we raise the starting date for Early Bronze IV in the south by two centuries, from ca. 2300 to 2500 B.C., these connections become even more significant and we can stress even more strongly the linkage between developments in the southern Levant and those in the north. Indeed, the existing ceramic and artifactual evidence fits the new chronology better than the old, because the Early Bronze IV in the northern Levant and the material culture associated with it (e.g., caliciform drinking goblets) can now be aligned quite well with the Early Bronze IV in the southern Levant. In particular, we can reassess the surprising disappearance of walled towns in the south in light of the great expansion of urban palace economies that was occurring at precisely this time in the north and is documented in thousands of cuneiform tablets found at Ebla (Tell Mardikh) in north-central Syria and is also evident in the architecture and settlement history of Ebla and many other Syrian sites.

As Raphael Greenberg has pointed out (this volume), the disappearance of walled towns in the Early Bronze IV southern Levant (the "Intermediate Bronze Age") should not be considered a "collapse" in the sense of economic disintegration because there was little economic integration to begin with during the preceding Early Bronze III. The Early Bronze III was characterized, as Greenberg says, by a "discontinuous landscape of heavily fortified polities with few sedentary villages between them" (Greenberg, this volume, citing Philip 2001; Philip 2003). Greenberg concludes that the "Early Bronze III polities [were] fortified centers or citadels with unstable settlement histories, governed by leading individuals or families ("elites") who use corporate strategies to amass staple products, build monumental structures, and maintain control of limited agricultural territory." These polities disappeared in the Early Bronze IV because there were attractive new economic opportunities that made the urban model obsolete. Greenberg concludes: "In the Early Bronze II and most of the Early Bronze III, the alternatives would have been traditional mobile pastoral economies coexisting with towns in a small-scale economy, but as new opportunities and new modes of social mobility came into existence, the allure of a post-urban existence grew. It was now possible to avoid the penalties that accompany urban life without paying the price of material poverty and of marginalization. People simply walked away from town life and did not look back." In this paper, I will explore the opportunities made available to these people by the expanding palatial economies in the northern Levant.

Greenberg has focused on the evidence from the southern Levant in the Early Bronze II and Early Bronze III. I will follow his lead but focus here on the Early Bronze IV and the extensive wool economy documented in the Ebla archives and other sources. In particular, I will discuss the relationship between the shift toward mobile pastoralism in the southern Levant and what must have been a vastly increased demand for wool in the northern Levant beginning around 2500 B.C. This is when Ebla first became a large city and its "Palace G" was built, during the stratigraphic phase labeled Tell Mardikh IIB1 by the excavators, which was contemporary with similar cultural and political developments elsewhere in Syria (Matthiae 2013). The relationship between southern pastoralism and northern urbanism is made more significant by the fact that we must now date the shift to pastoralism in the southern Levant, not to the period of the decline of the Ebla kingdom, after the destruction of its capital in the late third millennium B.C., but rather to the period of Ebla's expansion in the middle of the third millennium, as it reached the peak of its power and influence, long before the destruction of Palace G and its famous archives.

Following Greenberg and others, I here question the use of the phrase "urban collapse" to describe the transition from the Early Bronze III to Early Bronze IV in the southern Levant. It gives the wrong impression concerning the structural changes in the economy. It implies a systemic decline in overall economic integration, whereas it now appears that the disappearance of walled towns was not the result of local economic disintegration with a corresponding decline in economic specialization, but of the opposite. It was not a matter of disintegration but of increasing economic integration spanning the entire Levant, north and south. This integration entailed politically significant forms of specialized production and exchange within a larger, rapidly expanding political economy that was centered in the northern Levant but had profound systemic effects in the southern Levant.

This reverses the direction of the traditional narrative of urban collapse. The rather dramatic disappearance of walled towns after several hundred years of urbanism in the southern Levant should not be seen as evidence of decline or failure but of the opposite — as evidence of a new political and economic strategy for success by southern elites, a strategy that itself endured for the next 500 years, from 2500 to 2000 B.C., until the demise of the Early Bronze Age palace economies in Syria. The new southern strategy endured for as long as the northern wool economy survived, or until a network of new cities was founded in the south by innovative Amorite regimes during the Middle Bronze Age, which created a different set of political and economic incentives for local elites.

Climate change is not irrelevant in this new narrative. The northern urban wool economy may well have been disrupted by increasing aridification from 4.2 to 3.9 ka B.P. (2200–1900 B.C.) and consequent "habitat-tracking" migrations from northern Mesopotamia to the Orontes River region in western Syria, as proposed by Harvey Weiss (see Weiss 2014 and other works cited there). However, according to the new chronology, this climate change would have occurred three centuries after the disappearance of walled towns in the southern Levant and could not have been responsible for the original shift from agrarian city-states to mobile pastoralism. Indeed, aridification in the southern Levant at the end of the third millennium B.C. would probably have caused habitat-tracking migrations by Early Bronze IV pastoralists themselves away from the southern Levant toward the Orontes River, or toward the Mediterranean coast of Lebanon and Syria, or perhaps toward the Nile Delta, parallel to the migrations from northern Mesopotamia to western Syria that are posited by Weiss, because climate change would have affected the local agriculture in the southern Levant on which these pastoralists depended. In any case, aridification after 2200 B.C. would have prevented a return to the Early Bronze III system of agrarian polities indicated by the presence of walled towns.

Thus, we can understand why a de-urbanized landscape persisted in the southern Levant for half a millennium, from 2500 until 2000 B.C. or even later, whether we attribute this to an ongoing northern wool economy that was not seriously disrupted by climate change and maintained the incentives for specialized pastoralism that were established in the mid-third millennium B.C., or whether we attribute the continued de-urbanization of the southern Levant to aridification after 2200 B.C. that made sedentary agriculture and urbanism impossible in the south, regardless of what was happening in the north. And the fact of the matter is that city life and the palatial urban exchange network in the northern Levant did not disappear after 2200 B.C., despite the change in climate.

What the new radiocarbon chronology does not allow us to do is to blame the initial Early Bronze IV de-urbanization of the southern Levant on the usual suspects, which have been repeatedly named as culprits over the years, namely, exogenous climate change, or the disruption of interregional trade and communication networks resulting from late third-millennium B.C. Mesopotamian conquests in Syria, or from Egyptian incursions at the end of the Old Kingdom (see, e.g., Butzer 1997). These traditional explanations will no longer work if the disappearance of walled towns occurred in ca. 2500 B.C., when the Egyptian Old Kingdom and the Ebla kingdom were both at their peak and interregional trade was extensive and increasing, and when there is no evidence of disruptive foreign invasions. We can also discount the possibility that there was a local aridification that somehow affected only the southern Levant around 2500 B.C. (see Wilkinson et al. 2014, pp. 86, 90, and references cited there to the Soreq Cave data).

We should therefore consider the incentives for Early Bronze III southern elites to have abandoned their walled towns and to have converted their political and economic capital, previously localized within economically autarkic agrarian districts, into new forms of economic capital (e.g., large flocks of sheep) and new forms of political organization that suited a quite different, geographically extensive use of territory, as they became integrated into the palatial wool economy of the northern Levant. The Early Bronze Age wool economy is attested in hundreds of clay tablets found at Ebla that date to the period preceding the destruction of Palace G around 2300 B.C. (see Biga 2010; Biga 2011; Andersson et al. 2010; Porter 2012). The evidence in these cuneiform texts can be extrapolated to earlier periods of the Ebla kingdom from 2500 B.C. onward, in view of the cultural and economic continuity observed at Ebla and other sites. The scale of the palatial production and distribution of fine woolen cloth and finished garments throughout the entire region of the Levant and northern Mesopotamia should not be underestimated. The wool economy involved large numbers of attached specialists, not just in Ebla, but in many other cities. Textile workers were supervised by palace administrators and given rations so they could devote themselves to spinning, dyeing, and weaving. As in many pre-modern settings, specialized textiles and decorated garments produced by skilled workers for their political masters possessed great prestige value because they were hard to imitate and were suited to conspicuous display in order to demonstrate one's social status. The prominence of woolen textiles in the palace records of Ebla shows that they were one of the most important media by which the rulers of Ebla and other cities within its exchange network could reward and mobilize their followers and maintain political relationships. Fine cloth and finished garments were portable, high-value vehicles for the extensive system of gift exchange that fostered political integration within each kingdom as well as diplomatic alliances between political allies. Textiles were supplemented by other palace-produced items such as jewelry and ornaments made of gold, silver, and lapis lazuli; bronze weaponry and vessels; decorated wooden carriages; and fine ceramic "teapots" and drinking goblets — the chalices from which "caliciform ware" gets its name.

Bronze Age rulers in many different regions of the world have used prestige goods of this kind to integrate their political domains over long distances in a way that is not possible via the local redistribution of staple goods or local kin-based reciprocity (Earle 2002). Bulky staples were collected and stored by royal palaces so they could be distributed as rations ("staple finance") in order to mobilize local labor ("attached specialists") for the production of more portable prestige goods that could be transported over long distances and circulated in restricted social spheres as a means of mobilizing far-away political followers in a system of personalized gift exchange with countervailing obligations ("wealth finance"). The Ebla texts reveal this kind of political economy at work in the Early Bronze Age Levant. The texts document the storage of wool in special storehouses, the large-scale production of finely made textiles by attached specialists, and the distribution of woven cloth and many different kinds of finished garments to individuals near and far according to their political and social statuses (Archi 1999; Biga 2011).

This system of political economy generated a huge demand for wool, which presumably created new economic and political opportunities for the inhabitants of the southern Levant, who had hitherto been economically isolated in their small, self-subsistent agrarian city-states. According to the model of the Early Bronze III–Early Bronze IV transition espoused by Greenberg, the northern demand for wool led to an increase in mobile pastoralism in the south. The further implication is that ambitious political leaders were motivated to control extensive rangeland, watering holes, and other pastoral resources, rather than circumscribed agricultural territories. This implies a shift of economic activity eastward to encompass the steppe regions in southern Syria and Transjordan, as well as the conversion to pasture of some Early Bronze III agricultural land west of the Jordan, perhaps especially in the rocky highland regions previously used for cultivating olives and grapes. The basis of political power would have been altered in a way that caused the abandonment of walled towns, not because of an economic crisis or local warfare, but as a positive response to changing economic conditions in the Levant as a whole. A southern political leader would have obtained more prestige and thus greater ability to mobilize followers by trading wool for exotic items manufactured in northern palaces that were intended for purposes of conspicuous display as markers of social and political status. These items would have included sumptuous garments, which are not archaeologically visible, as well as metal weapons, jewelry, and fine drinking vessels of the kind that we do find in Early Bronze IV contexts in the southern Levant. Such items were not easy to imitate outside of specialized palace workshops, so “genuine” imports would have circulated in restricted ways as high-value gifts within the local political economy of the southern Levant.

We need not imagine that everyone in the Early Bronze IV southern Levant participated in wool production or became a specialized nomadic pastoralist. We need only assume that social prestige, and thus the political authority of a leader to mobilize followers, was no longer rooted primarily in control of agricultural territory. In the Early Bronze III, control of agricultural territory had been enabled by, and conspicuously symbolized by, the building of a walled town and the nucleation of the local population in and around it. In the Early Bronze IV, by contrast, we may assume that political authority came to be rooted in control of pastoral resources because of the large demand for wool in the north with the rise of Ebla and the political economy it fostered in many cities throughout Syria in the period after 2500 B.C. Southern political leaders who controlled large flocks were able to obtain exotic, palace-produced prestige goods in exchange for wool, which served to buttress their political power. The conspicuous wealth and political prestige of mobile pastoralists thus superseded that of sedentary town-based rulers and led to the disappearance of walled towns, for whose maintenance political followers could no longer be mobilized, even though a substantial part of the population may well have continued to practice subsistence agriculture and localized stock-rearing as farmers who were not directly involved in large-scale specialized pastoralism but who interacted with it, exchanging agricultural products for pastoral products and more exotic goods, in symbiosis with the powerful pastoralists.

The strong political incentives for southerners to acquire prestige goods from the north meant that, from the perspective of the northern palaces, obtaining the wool from southern suppliers could be done by trade and did not require direct political rule and taxation of the southern Levant by the king of Ebla or any other king of the northern Levant. Indeed, there is no evidence that any of them tried to conquer the south. Southern wool would have been obtained by trade, although it is not clear exactly where the exchanges took place. It is possible that there were trading posts at sites of the Early Bronze IV period located in or near the eastern steppe in southern Syria and Transjordan — for example, Al-Rawda east of Hama (Castel and Peltenburg 2007; Lyonnet 2009), Khirbet al-Umbashi southeast of Damascus (Braemer, Échallier, and Taraqji 2004), or farther south at sites like Tell Umm Hammad

(Betts 1992) and Khirbet Iskander (Richard and Long 2005). These have been interpreted as gathering places for pastoralists. Indeed, it is striking that the largest and most sophisticated settlements in the southern Levant in this period are those near the eastern steppe, which fits the picture of specialized pastoralism with various collection points for acquiring wool and other pastoral products. However, we must also reckon with the possibility that northerners did not venture into the south and that donkey caravans laden with raw wool were used by southern pastoralists themselves to transport it to northern trading locations.

A possible locus of exchange between southern pastoralists and northern wool collectors is the Bekaa valley in Lebanon, at the headwaters of the Orontes River. This would have been a convenient location for the trans-shipment of southern wool downstream along the Orontes valley to cities such as Qatna, Hama, and Tunip, and from there into inland and coastal Syria. This suggestion is supported by the observation that the Syrian pottery commonly found in tombs in the southern Levant is similar to that produced in the upper Orontes region (Hermann Genz, pers. comm.).

As an illustrative analogy for the exchange between Early Bronze IV wool collectors from the northern palaces and the culturally very different pastoralists of the south, we can consider the North American fur trade, especially in its earliest phase. Manufactured weapons, jewelry, and textiles were brought by European traders to exchange for furs, especially highly prized beaver pelts for making hats. Fur-trading posts were often established in the absence of colonization. Military interventions were needed only to prevent rival European powers from taking over the trade and not to control the producing territory. The indigenous North American economy was non-monetized and characterized by a high degree of local self-subsistence, although in many cases the "tribal" political organization was quite complex. The mobilization of labor to collect the furs was politically organized by indigenous political leaders who sought exotic prestige items to enhance and maintain their own political status. The incentives created by the external demand reshaped indigenous patterns of land use and economic activity.

Although our picture of the Early Bronze IV wool economy is based largely on texts from Ebla that describe its own palatial economy, we need not imagine that wool produced in the southern Levant for export to the north necessarily went to the city of Ebla itself. The Ebla archives and the archaeological evidence indicate that Ebla's economic system was replicated in every city in the northern Levant, whether or not the rulers of these cities were political vassals of Ebla, a circumstance which no doubt depended on the fluctuating military fortunes of the kings of Ebla. The rulers of Early Bronze IV urban centers like Qatna, Hama, Tunip, Tell Qarqur, and Tell Tayinat along the Orontes River, not to mention Byblos and other cities on the coast, no doubt imitated the king of Ebla in producing large quantities of woolen textiles for use as a primary form of wealth finance. All of the urban centers in the northern Levant and northern Mesopotamia would have participated in this system, creating a very large aggregate demand for wool.

In a recently published article, Tony Wilkinson, Graham Philip, and their colleagues have discussed the wool economy of the Levant and northern Mesopotamia in light of a detailed survey of the archaeological evidence, including zooarchaeological and archaeobotanical data (Wilkinson et al. 2014). With respect to the Early Bronze IV northern Levant, they cite a textually based estimate of 670,000 sheep (from Milano 1995, p. 1225) that were controlled at a given time by Ebla alone. A lower estimate, based on a single summary text, is on the order of 200,000 sheep (see the discussion of this text below). In any case, the maintenance of hundreds of thousands of sheep would have required a very large amount of grazing land — thousands of square kilometers — because each sheep required approximately 4.5 hectares (Wilkinson et al. 2014, p. 58). Most of the sheep recorded by palace administrators at Ebla could not have been accommodated within the immediate territory of Ebla itself, which was occupied by farming villages, each of which no doubt possessed some livestock for its own subsistence (sheep, goats, and cattle) that were not necessarily recorded by the palace and would have competed for pasture with the palace sheep. The vast flocks of wool-producing sheep mentioned in the Ebla texts must have been pastured in more remote locations, as Wilkinson and Philip have concluded. And when we take into account the additional sheep that were producing wool, not for the Ebla palace, but for other royal palaces in the northern Levant, the likelihood grows that the southern Levant became a specialized wool-production hinterland for the cities of Syria — not just Ebla in north-central Syria but the large cities known from the Ebla archives that were closer at hand in the middle and upper Orontes valley. There was no need for the sheep themselves to travel from the hinterlands into the cities because it was the wool that was of interest to the royal palaces. But the palace administrators evidently kept track of the approximate number of sheep whose wool they expected to receive, even though the flocks were dispersed geographically.

To get an idea of the total number of sheep of interest to these palaces as sources of wool for textile production, we need to consider what precisely is meant by the numbers of sheep recorded in the Ebla texts. Furthermore, we need to determine the ratios between the economic resources of Ebla itself and the resources of other cities described in the Ebla archives, which we can then use to extrapolate from the Ebla figures the approximate number of sheep used as sources of wool by palaces elsewhere. There is a text from Ebla that is an accounting summary in which a total of 118,715 sheep are mentioned (Archi 1993, pp. 8–11, 14). However, in this text and others like it, the numbers may well refer only to adult wool-bearing sheep, excluding breeding ewes and their lambs, because the purpose of the accounts was to enable the palace to calculate the amount of wool it was owed or could expect to receive to manufacture textiles necessary for the operation of the political system. There is comparative evidence from a different Bronze Age palatial context to support the idea that the Ebla accounts referred only to the wool-producing adult sheep of interest to the palace and excluded breeding ewes and their lambs. The Linear B sheep census tablets found at Knossos on Crete give tallies for 600 flocks totaling about 66,000 sheep, but these texts also indicate that the flocks consisted mostly of male sheep, with a relatively small and demographically impossible proportion of females (Halstead 1990–1991). The conclusion to be drawn from this is that the palace recorded only the wool-producing part of the sheep population, keeping in mind that the finest wool is produced by castrated adult males (wethers). A large number of breeding ewes and their lambs were not counted in the census texts nor the small number of uncastrated rams that would have been kept for breeding and not for wool production. Thus, it has been estimated that the 66,000 wool-producing sheep in the Knossos texts represent an actual sheep population of about 100,000, allowing for the missing ewes, rams, and lambs.

Linear B specialists have concluded from this that, in the words of John Bennet: "Rather than being animals directly owned by the palace […] in fact the animals were locally owned and managed and the palace merely claimed the wool on round numbers of animals. A further implication is that the palatial authorities at Knossos had taken over a pre-existing system of flock management, in order to acquire raw material (wool) for transformation into value-added finished products for redistribution and exchange" (Bennet 2007, p. 197;

cf. Halstead 2001). In other words, the purpose of the accounts was not to enumerate every sheep in the actual flocks but to know approximately how much wool was supposed to be delivered on consignment by each person mentioned in a census document in conjunction with a certain number of sheep. And it was up to that person to maintain his flock by means of additional breeding ewes and rams, which were not the palace's concern and therefore were not recorded. This interpretation makes sense because it seems unlikely that the palace of Knossos would have directly managed and cared for 100,000 sheep — just as it is unlikely that the palace of Ebla directly managed hundreds of thousands of sheep. The sheep listed in the Knossos tablets would have been managed by individual shepherds all over Crete who were part of local communities.

The Minoan palatial system of the second millennium B.C. may well have been copied from the agro-pastoral palatial system pioneered in the northern Levant in the third millennium. In any case, if we apply this interpretation of the Knossos sheep tablets to the Ebla texts, we may conclude that the tally of 118,715 sheep in a single text actually represented as many as 200,000 sheep, including the missing females, and that these sheep were not all directly owned and managed by the palace but were, in many cases, quite far from Ebla and never physically present there, although their wool was consigned to the Ebla palace. Alfonso Archi, the lead epigrapher of the Ebla tablets, notes that "some texts record flocks entrusted to 'head shepherds' ugula-mùnsub: 67,200 head in TM.75.G.1558, divided into 22 flocks in an equal number of villages [or geographical locations]" (Archi 1993, p. 15 n. 30).

Furthermore, the text in question may not record all of the sheep that were producing wool for Ebla at the time it was written because we have no way of knowing whether this was an exhaustive account. The actual number may well have been higher, in light of Lucio Milano's (1995, p. 1225) estimate of 670,000 sheep cited above. And we must reckon with a large number of additional sheep whose wool was consigned to palaces other than Ebla's. The ratio of Ebla sheep to the sheep of other palaces can be estimated based on the ratio of farmland attributed to the rulers of Ebla in comparison to farmland attributed to other cities. According to the summary account text discussed above (Archi 1993, pp. 8–11), which gives what appear to be grand totals of various categories of royal assets (including farmland as well as sheep and other livestock), the total amount of farmland controlled by the palace — divided between the crown prince and two other princes — was 498,900 land units (written GÁNA-ki). This equates to ca. 180,000 hectares or 1,800 square kilometers, if we assume that the GÁNA Sumerogram used to indicate the unit of land measurement at Ebla had the same value as the Mesopotamian *iku* (GÁNA) of 3,600 square meters (see Schloen 2001, pp. 272–76). This would amount to all the farmland in the Ebla heartland in north-central Syria, which was in turn subdivided among various royal princes and palace officials, as the texts make clear, and further divided among village communities in a quasi-feudal (i.e., "manorial") fashion. High-ranking people were granted rights to the products and services of one or more villages as overlords of the actual cultivators.

In another text (cited in Schloen 2001, p. 275), a total of 151,020 land units is attributed to the city of Tunip in the Orontes valley, possibly to be identified with modern Tell Acharneh, whose ruler was presumably a vassal of Ebla. This land area equates to ca. 54,000 hectares or 540 square kilometers of farmland, if we assume an *iku*-sized unit of land measurement. Again, this amount of land is reasonable as the cultivable area of the middle Orontes valley that would have been under the control of Tunip's ruler, again assuming that the land was subdivided among his officials and subjects in a hierarchy of land-tenure rights and obligations. Thus, Tunip had 30 percent as much farmland as Ebla (151,020 ÷ 498,900), and if we assume that a city's other resources were roughly proportional to its farmland, we can apply the land ratio to sheep and estimate that Tunip would have had an interest in 60,000 sheep if 200,000 sheep (including ewes and lambs) were involved in supplying wool to Ebla. There were several major cities west and south of Ebla that were in the same class as Tunip, so this implies a total sheep population in excess of 500,000 (based on an estimate of 200,000 at Ebla). This is a rather low estimate if Milano is correct that Ebla itself actually kept track of 670,000 sheep and not 200,000. However, what matters for our discussion is that even the lowest estimate based on the textual evidence necessarily implies the grazing of large flocks by specialized pastoralists some distance away from the territories farmed by sedentary inhabitants of the various kingdoms in the northern Levant, as Wilkinson and Philip et al. (2014) have emphasized. Furthermore, a large part of the grazing land in the Syrian steppe east of Ebla would have been claimed by cities on the middle and upper Euphrates, including Mari, Ebla's great rival, causing Ebla to look southward toward the steppe region around Al-Rawda, east of Hama (cf. Castel and Peltenburg 2007). This in turn may have caused the cities along the middle and upper Orontes to look to the southern Levant (which includes the area around Khirbet al-Umbashi, southeast of Damascus; cf. Braemer, Échallier, and Taraqji 2004). For these cities, the southern Levant would have been an accessible and less contested pastoral zone that offered suitable grazing land for seasonal migrations between the more arid regions east of the Jordan valley and the wetter regions in the west.

No doubt there were complex political and military dynamics within the Early Bronze IV southern Levant as rival polities (mobile tribes) competed for the best grazing lands and water sources, and perhaps also competed for preferential access to prestige goods supplied by northern wool collectors. If we accept the Knossos model of local ownership and management of sheep whose wool was delivered on consignment to urban wool collectors, we can envision long-term contracts for delivery of wool by southern sheep ranchers, who jockeyed for advantage with their peers both to control pastoral resources and to strike favorable bargains with the northerners. This competition can perhaps be seen in the effort invested to mark territory via dolmen fields and rock-cut tombs. Tomb assemblages and the layout of cemeteries hint at social and political hierarchies. But the politics of the pastoral tribes of the southern Levant are largely invisible to us in the absence of preserved textual and archaeological evidence, so we can only guess at this dimension of Early Bronze IV society.

What we can say is that the available evidence, when interpreted in light of the revised chronology of the Early Bronze Age Levant, is compatible with the idea that the southern Levant did not witness a systemic collapse or failure at the end of the Early Bronze III but instead experienced a systemic shift toward specialized pastoralism and integration within an expanding pan-Levantine economy. This entailed new economic and political strategies on the part of existing elites, who converted their capital into other forms — or perhaps in some cases it entailed the emergence of new elites who were not afraid to innovate and who displaced their predecessors. On this view, the Early Bronze III to Early Bronze IV transition was not a movement from economic integration to disintegration but rather the opposite, from disintegration and economic isolation toward integration within a larger, Levant-wide system. The mobile inhabitants of the Early Bronze IV southern Levant are less visible to us archaeologically than the settled folk of the Early Bronze III, but we should not assume that their political life was less complex or their economic life was less rewarding than that of their town-dwelling ancestors.

An alternative view is offered by Wilkinson and Philip et al. (2014). They emphasize the importance of the wool economy and the requirement it created for extensive grazing lands away from the core territory of the northern cities. And they argue convincingly that the rulers of Ebla and other cities of the Early Bronze IV northern Levant aggressively exploited climatically marginal areas for purposes of "opportunistic stocking" of sheep and goats. This was economically risky but yielded high rewards:

> Such a herding strategy allows the number of livestock to increase in accordance with the availability of forage so that the growing herd can then be converted into "capital" in years of good rainfall, whereas bad years can entail herd numbers being reduced as necessary. [...] In such non-equilibrium systems, pastoralists take advantage of the good times, but bear the loss during dry periods. Because episodic droughts can reduce stocking levels, or can encourage pastoralists to seek grazing elsewhere, instability can be regarded as an intrinsic part of this practice. (Wilkinson et al. 2014, p. 57)

The Early Bronze IV urban elites were willing to tolerate the risk involved in this economic strategy because their polities were of a sufficient scale to provide diversified resources with which to offset losses incurred for a period of time in the pastoral sector of their economies (and, we might add, to allow for the stockpiling of wool in case of interruptions in supply). The result was a dramatic increase in specialized pastoralism in the "zone of uncertainty" along the eastern edge of the northern Levant.

However, Wilkinson and Philip interpret the extended absence of walled towns in the Early Bronze IV southern Levant as evidence, not of a shift by local elites toward specialized pastoralism in order to participate in a pan-Levantine wool economy (as Greenberg has suggested and as I have argued here in some detail), but of an economic limitation imposed on the region due to the narrowness of its pastoral "zone of uncertainty." In their view, southern elites could not emulate the rising elites of the north, who were able to exploit the larger Syrian steppe zone to create a politically expansive agro-pastoral palatial system.

But this does not explain why the Early Bronze III cities of the southern Levant were abandoned in the first place. What caused the disappearance of a centuries-old system consisting of autarkic agrarian polities that had little involvement in regional or interregional exchange and could presumably have carried on much longer? If we are not to fall back on the dubious *deus ex machina* theory of climate change, we must find an explanation for this disappearance. Wilkinson and Philip themselves provide a glimpse of what I believe to be the correct explanation, although they present it rather tentatively as an alternative to their own preferred explanation:

> On the other hand, knowing the importance of livestock raising, and wool in particular, to Syrian centres such as Ebla, we suggest that the EB IV agro-pastoral communities of the southern Levant may, at least peripherally, have been involved in the resourcing or seasonal management of the vast animal herds that occupied the rangelands of the Syrian steppe in EB IV. While this may have involved the supply of young animals, or breeding stock, there may also have been a demand for significant quantities of human labour. In this light, the apparent contradiction between the clear derivation of the bulk of the EB IV ceramic repertoire of the southern Levant from local EB III forms and the adoption of a very specific subset of Syrian material culture by the same communities becomes comprehensible. (Wilkinson et al. 2014, p. 92)

I have argued that we should take this line of thinking much further and posit a greater involvement in the northern wool economy on the part of southern elites, who converted their erstwhile domains, both east and west of the Jordan, into a large pastoral zone for "opportunistic stocking" in response to the new opportunities created by the rise of the northern palaces. The Early Bronze III elites became mobile, dispensing with monumental architecture and replacing it with mobile capital and exotic northern prestige goods, while establishing a local economic symbiosis with the sedentary subsistence farmers who remained scattered throughout the region.

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4

The Transition from the Third to the Second Millennium B.C. in the Coastal Plain of Lebanon: Continuity or Break?

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The second half of the third millennium B.C. is generally regarded as a period of crisis in the Levant. This is particularly evident in the southern Levant, where at the end of the Early Bronze III almost all urban settlements come to an end (Palumbo 1991; Dever 1995), and urban settlements only re-emerge at the beginning of the Middle Bronze Age (Ilan 1995; Cohen 2002). The situation in Syria is more complex, with some regions such as the Euphrates valley showing evidence for a decline or even an abandonment of many sites in the last centuries of the third millennium B.C. (Cooper 2006, pp. 264–67; Genz 2012a, p. 627), whereas in western Syria urban settlements continue to flourish (Akkermanns and Schwartz 2003, pp. 233–46; Genz 2012a, p. 622).

How does Lebanon fit into this picture? Does it show a continuation of urban settlements from the Early to the Middle Bronze Age as western Syria, or does it show a decline and collapse as the southern Levant?

Lebanon at the Transition from the Early to the Middle Bronze Age: The State of Research

Unfortunately, the state of research concerning the transition from the Early to the Middle Bronze in coastal Lebanon is very uneven and fragmentary. The excavations conducted by Pierre Montet and Maurice Dunand at Byblos from 1921 to 1973 provided for a long time the only evidence for this transition (Montet 1928; Dunand 1939; Dunand 1952; Dunand 1954). While these excavations produced a number of spectacular finds for both the Early and Middle Bronze Ages, the inadequate excavation and recording strategies led to severe problems hampering our understanding of the site (see Saghieh 1983; Thalmann 2009).

Fortunately, recent excavations at several sites in the coastal plain of Lebanon have provided a wealth of information concerning the third and second millennia B.C., which enable us to reconstruct at least the broad outlines of the settlement history of the area during these periods (fig. 4.1). The excavations at Tell Arqa in northern Lebanon, which started in 1972, have provided one of the most reliable uninterrupted sequences for the third and second millennia B.C. (Thalmann 2006; Thalmann 2009; Thalmann 2010). Important results were also obtained in the excavations at College site in Sidon, which started in 1998 and are still ongoing (Doumet-Serhal 2004; Doumet-Serhal 2006; Doumet-Serhal 2009; Doumet-Serhal 2010). Tell Fadous-Kfarabida, located 12 km north of Byblos, was investigated between 2004 and 2011 (Genz 2010a; Genz 2012b).

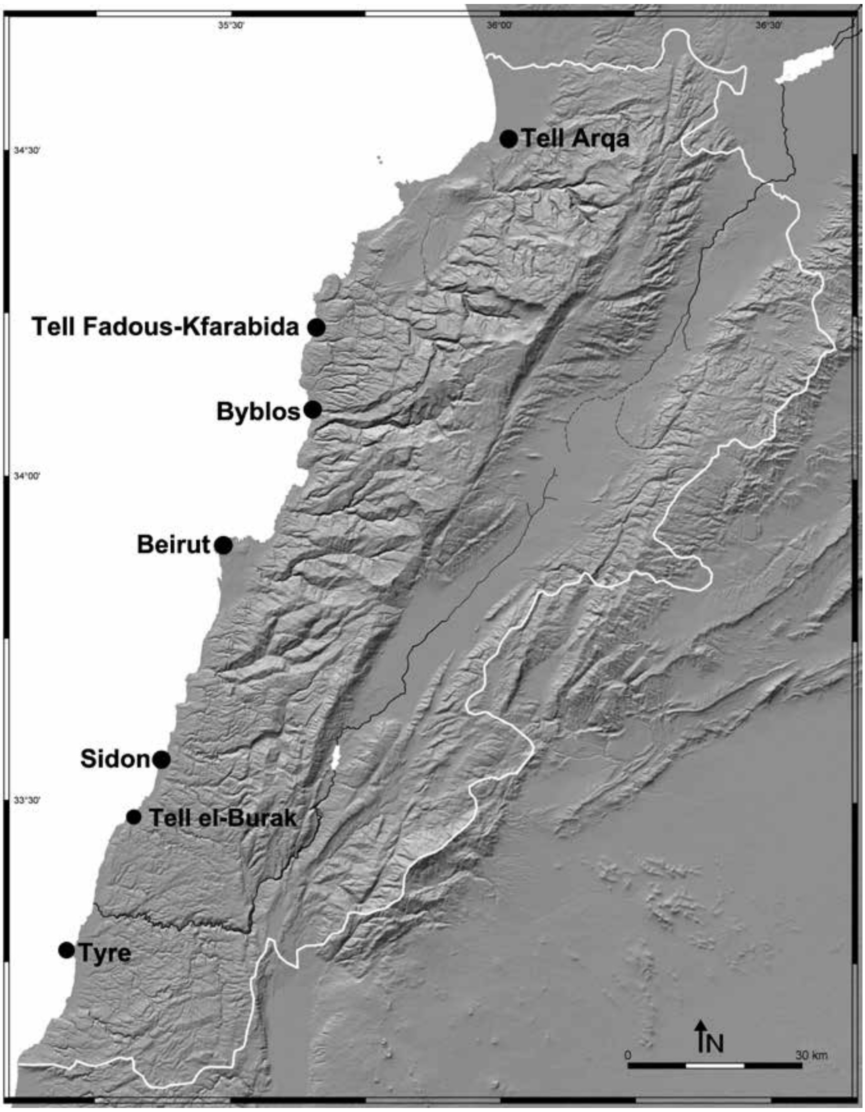

Figure 4.1. Location of the Early and Middle Bronze Age sites along the coast of Lebanon mentioned in the text

Other sites are less useful for the study of the transition from the Early to the Middle Bronze Age. The stratigraphic sounding in Tyre conducted in 1973 and 1974 by Patricia Bikai has produced evidence for the Early Bronze Age III and IV, but no Middle Bronze Age occupation is attested (Bikai 1978). Excavations on the tell of Beirut conducted by Leila Badre, Uwe Finkbeiner, Helène Sader, and others during the 1990s have produced evidence for Early and Middle Bronze Age occupation, but so far no evidence for the Early Bronze Age IV has come to light (Badre 1997; Finkbeiner and Sader 1997). Tell el-Burak, excavated since 2001, seems to represent a new foundation at the beginning of the Middle Bronze Age (Finkbeiner and Sader 2001; Kamlah and Sader 2003; Kamlah and Sader 2008; Sader and Kamlah 2010).

Survey data for the coastal plain unfortunately are almost entirely lacking. The only exception is the Akkar plain, where Karin Bartl and others have carried out a detailed survey between 1997 and 1999 (Bartl 1998–1999; Bartl 2002; Thalmann 2007).

Problems of the Periodization and Chronology

A detailed study of the transition from the Early to the Middle Bronze Age is severely hampered by the limited number of well-excavated and well-published sites. Further complications arise due to the lack of a well-defined terminological system in much of the older literature. Terms like "Early Bronze Age III" are often used quite haphazardly.

As mentioned above, the important results from Byblos are extremely problematic due to stratigraphic uncertainties and the complete absence of reliable absolute dates. Unfortunately, outdated theories continue to linger on. According to Dunand, the Early Bronze III settlement in Byblos ended in a great conflagration, which he attributes to the invading Amorites (Dunand 1952). These migration theories were greatly favored during the 1950s and 1960s to explain the marked changes discernible during the last centuries of the third millennium B.C. in the Levant (Kenyon 1966). However, since the 1980s, such theories have come more and more under attack and are now largely rejected (Ilan 1995, pp. 300–01; Akkermans and Schwartz 2003, pp. 288–90). It is therefore quite unfortunate that the Amorite invasion hypothesis continues to linger on in popular books published only recently (Jidejean 2000, p. 15).

A further problem in the past was the general absence of reliable absolute dates. While Byblos has provided a large number of inscribed Egyptian objects from the Old (Sowada 2009, pp. 128–41) and Middle Kingdoms, many of these come from unreliable contexts and therefore cannot be used to provide absolute dates.

Fortunately, in recent years excavations along the Lebanese coast have produced more reliable stratigraphic sequences. Tell Arqa (Thalmann 2006; Thalmann 2010) and Tell Fadous-Kfarabida (Genz 2010a; Genz, in press) especially have produced larger numbers of complete vessels from secure contexts, and the dating of the various levels is backed by large series of radiocarbon dates (Thalmann 2006, pp. 230–31; Höflmayer et al. 2014), thus providing a well-dated, reliable pottery sequence for the for the third and early second millennia B.C. These two sites for the time being form the backbone of a more refined periodization for coastal Lebanon, which is currently being developed in the framework of the Associated Regional Chronologies of the Ancient Near East (ARCANE) project (Mazzoni and Thalmann, forthcoming).

According to the radiocarbon dates from Tell Arqa and Tell Fadous-Kfarabida, the Early Bronze IV seems to begin around the middle of the third millennium B.C., thus making it considerably longer than hitherto thought (Höflmayer et al. 2014). This is in accordance with recent re-evaluations of radiocarbon dates from the southern Levant (Regev, Miroschedji, and Boaretto 2012; Regev et al. 2012). While precise radiocarbon dates for the transition from the Early Bronze IV to the Middle Bronze Age are still lacking, the available evidence suggests a date around 2000 B.C. for the beginning of the Middle Bronze Age (Genz 2012a, p. 621).

The evidence from Sidon unfortunately is somewhat problematic. Claude Doumet-Serhal claims that the sequence of six Early Bronze Age levels at the site spans the entire third millennium B.C. (Doumet-Serhal 2008; Doumet-Serhal 2009). However, comparisons of the pottery with assemblages from Tell Arqa and Tell Fadous-Kfarabida suggest that the latest

Phase 6 ended sometime in the Early Bronze III, around the middle of the third millennium B.C. The second half of the third millennium B.C. seems not to be attested in Sidon, and thus a hiatus has to be postulated (Genz 2014, p. 294). Radiocarbon dates to establish the absolute dating of Phase 6 and more detailed information on the range of pottery types are definitely needed to clarify the situation in Sidon during the latter half of the third millennium B.C.

The Early Bronze III

In the first half of the third millennium B.C., during the Early Bronze III, urban settlements seem to flourish along the entire coast. Although these sites are relatively limited in size, Tell Arqa with 7.5 ha and Byblos with 5 ha being the largest ones, their densely built-up interior and the presence of fortifications and public buildings in Byblos and Tell Fadous-Kfarabida clearly prove their urban character (Genz 2012a; Genz 2014).

In the absence of written documents, we know hardly anything about the political organization of the region. However, the presence of fortifications and public buildings in a small site of only 1.5 ha like Tell Fadous-Kfarabida suggests a rather complex system with larger political centers such as Byblos and smaller, administrative sub-centers such as Tell Fadous-Kfarabida (Genz 2012b, p. 25).

The Early Bronze IV

A number of changes are noticeable in the Early Bronze IV. The only Early Bronze IV site along the southern coast, Tyre, is represented only by an ephemeral campsite (Bikai 1978). This meager evidence suggests that along the southern coast settlements declined or even completely disappeared during the Early Bronze IV, following the pattern observed in the southern Levant.

Along the northern coast, on the other hand, urban settlements continued. This is particularly evident at Tell Arqa, where Strata 16 and 15 represent a densely built-up domestic quarter with multi-storied houses (fig. 4.2; Thalmann 2006; Thalmann 2010). Byblos, with a large number of temples, also witnessed the continuation of urban structures, and continuity in religious practices is furthermore suggested by the offering deposits buried under the floors of the temples, which span the entire period from the Early Bronze III to the Middle Bronze I (Thalmann 2008, pp. 72–75).

As mentioned above, according to the radiocarbon dates the Early Bronze IV must have started around 2500 B.C. While Dunand claims that Byblos was violently destroyed at the end of the Early Bronze III (Dunand 1952), it is quite interesting to note that the majority of Egyptian imports, especially from the Sixth Dynasty (Sowada 2009, pp. 128–41), clearly postdate this event. Dunand clearly states that objects dating to the Sixth Dynasty were found below the destruction layer. Absolute dates for the Sixth Dynasty still vary in detail, but general agreement places it between 2350 and 2150 B.C. (Beckerath 1997; Bronk Ramsey et al. 2010). Thus the destruction layer at Byblos should be placed within the Early Bronze IV.[1] The transition from the Early Bronze III to the Early Bronze IV therefore does not seem

[1] A destruction within the Early Bronze IV is also attested at Tell Arqa at the end of Stratum 16, dated around 2200 B.C. (Thalmann 2010, p. 91).

Figure 4.2. View of the Stratum 16 buildings at Tell Arqa (courtesy Jean-Paul Thalmann, French Archaeological Mission at Tell Arqa)

to have affected the trade relations between Egypt and Byblos (Genz, in press). It is only after the reign of Pepi II, well within the Early Bronze IV, that relations cease for some time.

Links between Byblos and Mesopotamia at the end of the third millennium B.C. are attested by the discovery of an Ur III tablet at Byblos, and furthermore by the mentioning of a ruler of Byblos in an Ur III tablet from Drehem (Sollberger 1959–1960; Lafont 2009).

The evidence from Tell Fadous-Kfarabida, however, complicates the picture. Early Bronze IV activities are only represented by pits, which seems to indicate a marked decline of the settlement. Yet this picture may be misleading. Some of the pits contain an unusually high number of fine wares, notably drinking vessels such as cups and beakers, suggesting special activities such as ritual(?) feasting at the site (Genz et al. 2010, p. 247, pl. 1). Ongoing analysis of the botanical and faunal material may help to clarify this issue.

One intriguing find from Tell Fadous-Kfarabida is a sherd of a cooking pot with a cylinder seal impression on its rim (fig. 4.3; Genz et al. 2010, pp. 256–57, pl. 7:3). Similar impressions are typical for western inner Syria during the Early Bronze IV, best known from Palace G at Ebla (Tell Mardikh) (Mazzoni 1992) and Hama, Phase J (Matthews 1996), and most likely were used in an administrative context. Despite the fact that the settlement considerably declined in importance and size, this find suggests that the remaining inhabitants were still connected to the economic or administrative sphere of western Syria during this time. Tell Arqa also produced evidence for ceramic imports from Ebla or its immediate vicinity during this period (Thalmann 2009, p. 24).

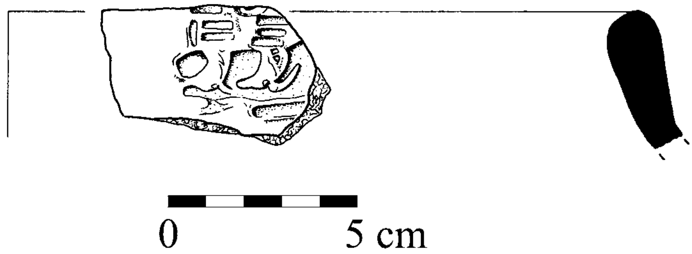

Figure 4.3. Western Syrian cylinder seal impression on the rim of a course-ware pot from Tell Fadous-Kfarabida (courtesy Tell Fadous-Kfarabida Project)

Thus along the northern coast of Lebanon, no break can be observed during the Early Bronze IV. Urban structures continue at least in Byblos and Tell Arqa, and long-distance contacts with Egypt, Syria, and Mesopotamia are still attested (Genz 2012a; Genz, in press).

The Middle Bronze Age

The Middle Bronze Age in the Levant is generally seen as a period of growing socio-political complexity (Ilan 1995; Akkermans and Schwartz 2003, pp. 288–326). Yet the evidence from the Lebanese coast does not fully support this view, at least not at the very beginning of this period.

At Tell Arqa the beginning of the Middle Bronze Age is marked by a drastic reduction of the size of the site. The northwestern part of the site, which was densely built up during the Early Bronze IV, was only used for burials and pottery production in the Middle Bronze I (Thalmann 2006, pp. 33–50; Thalmann 2010, pp. 98–99). It is only in the following Middle Bronze II period that this area was covered again by buildings, indicating that the site regained its former size (Thalmann 2006, pp. 51–67; Thalmann 2010, pp. 99–100).

A comparable situation is attested in Sidon, where an area covered by large buildings during the Early Bronze III was used for burials during the entire Middle Bronze Age (Doumet-Serhal 2004; Doumet-Serhal 2010, pp. 117–23). Only toward the end of the Middle Bronze II was a monumental building interpreted as a temple connected to funerary cult erected (Doumet-Serhal 2010, pp. 123–24).

Also at Tell Fadous-Kfarabida the Middle Bronze Age is only represented by pits and tombs, no substantial architectural remains having been encountered up to now (Genz 2010–2011). Even if the possibility that Middle Bronze Age architecture may be found in the still unexcavated parts of the tell is taken into consideration, the settlement certainly was rather small. Yet again, the presence of luxury pottery such as Tell el-Yahudiyeh juglets as well as Egyptian imports (fig. 4.4) demonstrates that the site still had connections to the outside world (Genz 2010–2011, p. 118).

Only Byblos retained its former size, as indicated by the Middle Bronze Age fortifications, which follow the line of the Early Bronze Age city walls (Burke 2008, pp. 192–97). Its importance is furthermore stressed by the spectacular discoveries in the royal tombs (Montet 1928, pp. 143–214) and rather early (early Twelfth Dynasty) contacts with Egypt (Ben-Tor 1998).

Tell el-Burak, ca. 9 km south of Sidon, seems to represent the only newly established Middle Bronze Age site (Finkbeiner and Sader 2001; Kamlah and Sader 2003; Kamlah and

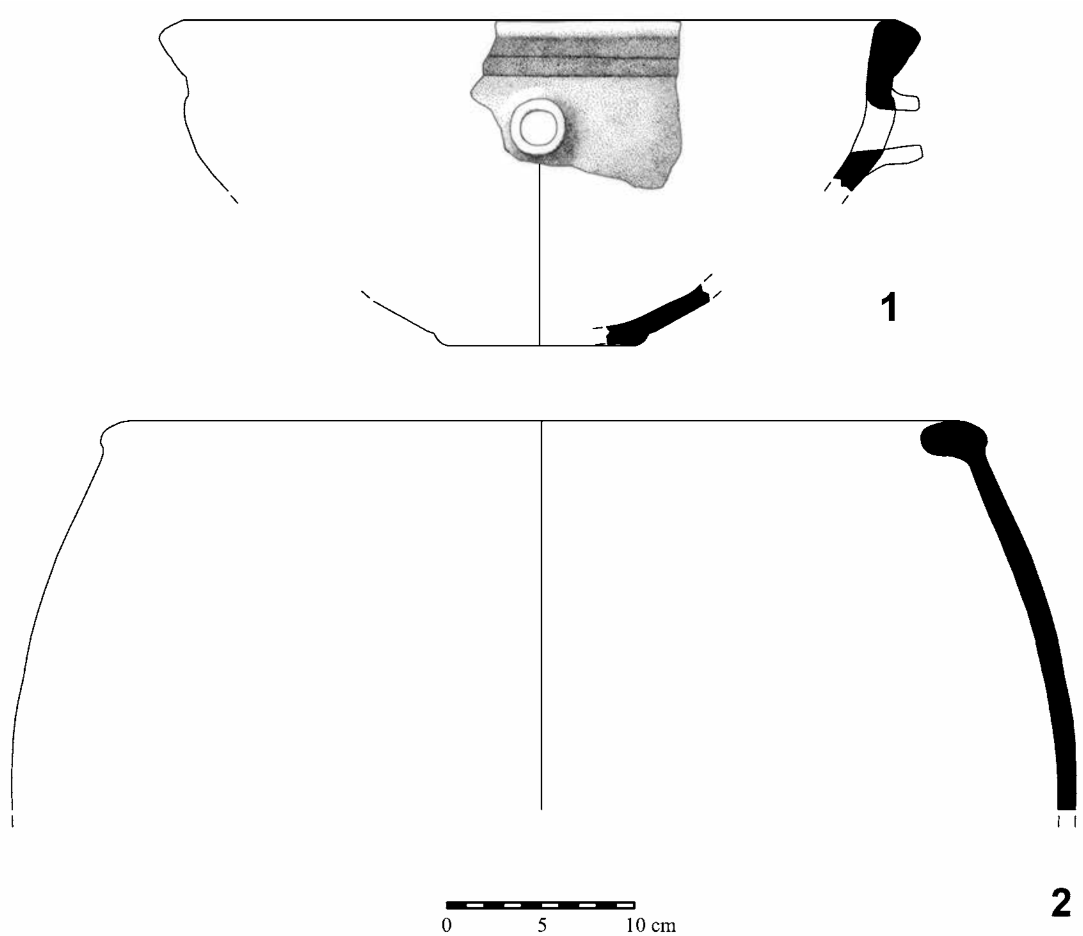

Figure 4.4. Middle Kingdom Egyptian ceramic imports from Tell Fadous-Kfarabida (courtesy Tell Fadous-Kfarabida Project)

Sader 2008; Sader and Kamlah 2010). At this site one large isolated building of 30 × 40 m is attested, erected on an artificial mound of 115 × 115 m, reaching 17 m in height (fig. 4.5). The building comprises eighteen rooms, grouped around one large rectangular courtyard. The four corner rooms slightly protrude to the outside and most likely represent towers. Two stairwells provide evidence for at least one upper story. Most intriguing is room 10, the largest room of the building, where wall paintings with good parallels in the Beni Hassan tombs, including a hunting scene, have been preserved. According to radiocarbon dates, the construction of this building started in the nineteenth century B.C. (Sader and Kamlah 2010, pp. 132–33; Badreshany and Kamlah 2010–2011, p. 82 and figs. 3–4), and is unique along the Lebanese coast. It most likely can be interpreted as a fortified palace belonging to the kingdom of Sidon (Sader and Kamlah 2010, pp. 138–40).

Remarkable are the strong connections between the Lebanese coast and Egypt from the Twelfth Dynasty onward. Egyptian commercial and even military involvement is attested in several Twelfth Dynasty inscriptions from Egypt (Allen 2008; Marcus 2007). Evidence for the re-establishment of contacts between Egypt and the Lebanese coast is provided by early

Twelfth Dynasty scarabs from the "Montet Jar" in Byblos (Ben-Tor 1998). During the later Twelfth Dynasty, these contacts intensified, as illustrated by the Egyptian luxury items from the Royal Tombs in Byblos (Montet 1928, pp. 143–204). In contrast to the coast of the southern Levant, where Egyptian ceramic imports are only rarely attested in Middle Bronze Age contexts — the exceptions being Ashkelon (Stager and Voss 2011) and Tel Ifshar (Marcus, Porath, and Paley 2008) — the Lebanese coast has provided a wealth of Twelfth to Thirteenth Dynasty Egyptian ceramic imports, for instance at Sidon, Byblos, Tell Fadous-Kfarabida, and Tell Arqa (Forstner-Müller and Kopetzky 2009; Genz 2010–2011, p. 118). Lastly, the Egyptian features of the wall paintings discovered at Tell el-Burak need to be mentioned in this connection (Sader and Kamlah 2010, pp. 136–38).

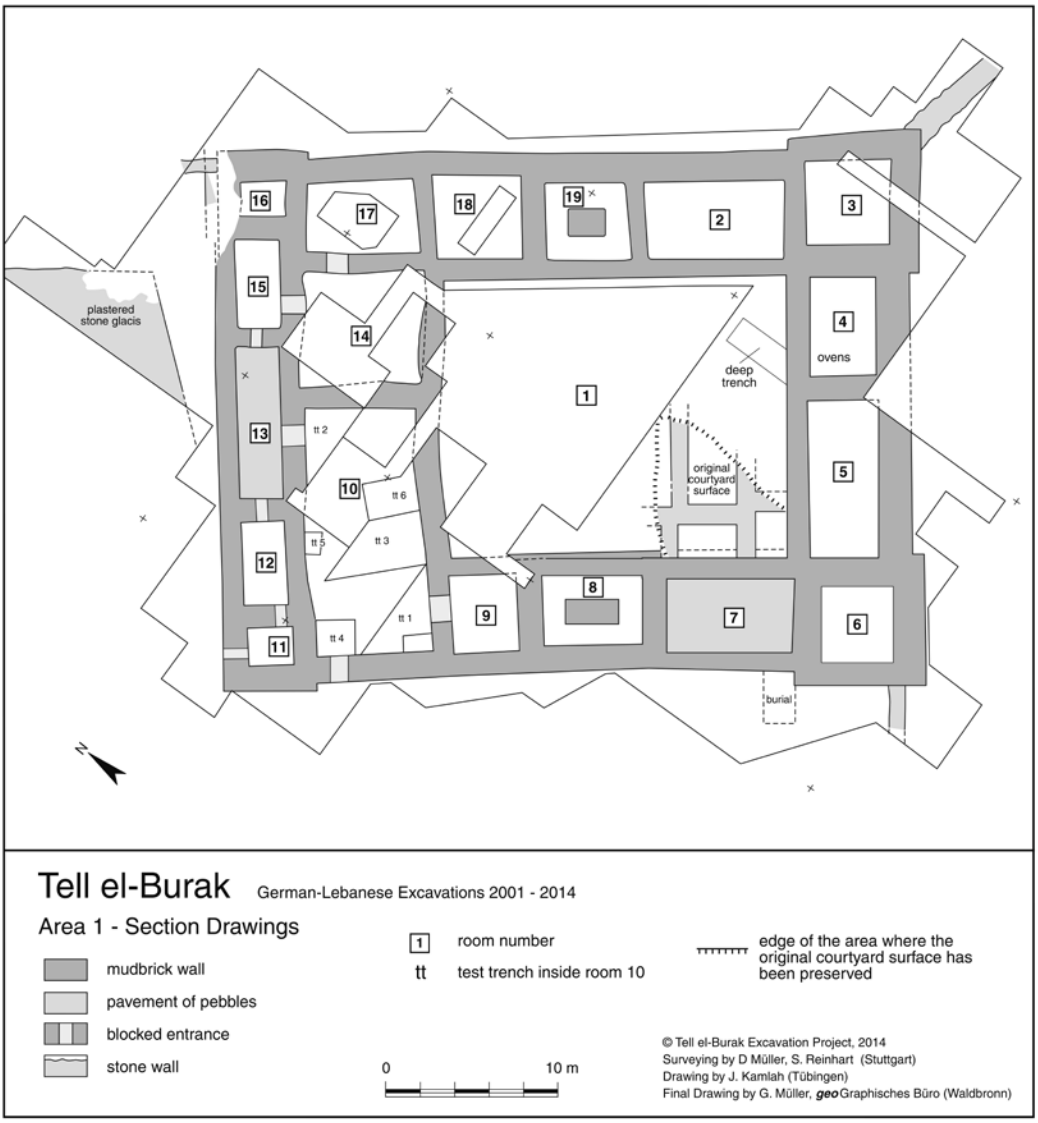

Figure 4.5. Plan of the Middle Bronze Age building from Tell el-Burak (courtesy Jens Kamlah and Helène Sader, Tell el-Burak Project)

Conclusion

While the evidence is still rather sketchy, several tentative conclusions can be drawn.

During the Early Bronze II and III, the Lebanese coast shows a relatively uniform development of urban centers. The presence of smaller sites with administrative buildings such as Tell Fadous-Kfarabida suggests a rather sophisticated political organization with sub-centers alongside the major cities, possibly reflecting incipient territorial states (Genz 2012a, pp. 614–18; Genz 2014, pp. 297–300).

Toward the middle of the third millennium B.C., in the Early Bronze IV, however, differences in the north and the south can be noted. The southern coast witnesses a marked decline of urban settlements, which either disappear completely or shrink considerably in size (Genz 2010b). The northern coast, on the other hand, provides evidence for a continuation of urban structures, as demonstrated by the discoveries in Byblos and Tell Arqa (Genz 2010b). Furthermore, the northern sites show evidence of continuing contacts with Egypt (at least until the end of the Sixth Dynasty), Syria, and Mesopotamia during this period.

The Middle Bronze I quite interestingly witnesses a general contraction of settlements along the entire coast of Lebanon (with the possible exception of Byblos). It is only in the Middle Bronze II that sites begin to expand in size again. Yet again a small site, Tell el-Burak complicates the picture, due to the discovery of an impressive building that was erected in the later part of the Middle Bronze I. The strong Egyptian connections with the Lebanese coast from the Twelfth Dynasty onward are certainly remarkable.

The collapse of the urban sites at the end of the Early Bronze III has often been attributed to environmental causes, notably the so-called 4.2 ka B.P. event (Weiss 2012). However, the new evidence from Tell Fadous-Kfarabida and other sites in the central and southern Levant clearly dates the end of the Early Bronze III much earlier, around the middle of the third millennium B.C. (Regev, Miroschedji, and Boaratto 2012; Regev et al. 2012; Höflmayer et al. 2014). Furthermore, there is clear evidence for the continuity of urban entities in to the Early Bronze IV along the northern coast of Lebanon. Thus the 4.2 ka B.P. event seems to have had little or even no impact on the central and southern Levant.

As said before, many of the observations presented here are still very preliminary, and certainly will have to be modified with future discoveries. Detailed surveys of the coastal plain are urgently needed, not only to help to reconstruct the settlement pattern, but to document archaeological sites that are severely threatened by largely uncontrolled modern building activities.

One further interesting observation is that small sites such as Tell Fadous-Kfarabida and Tell el-Burak not only have settlement histories that seem to be quite different from those of the larger centers, but even provide surprising discoveries that help to flesh out our knowledge of the settlement patterns and political organization of the coastal plain of Lebanon in the Bronze Ages.

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5

Western Syria and the Third- to Second-Millennium B.C. Transition

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In a recent publication, Daniele Morandi Bonacossi (2014, p. 428) offered the opinion that "western Syria did not suffer greatly from the phenomenon of the collapse of statehood and urban civilization … in the late third and early second millennium BC." In this paper, I propose to examine this thesis, while at the same time reviewing problems of relative and absolute chronology currently at play in the study of the Early Bronze to Middle Bronze transition

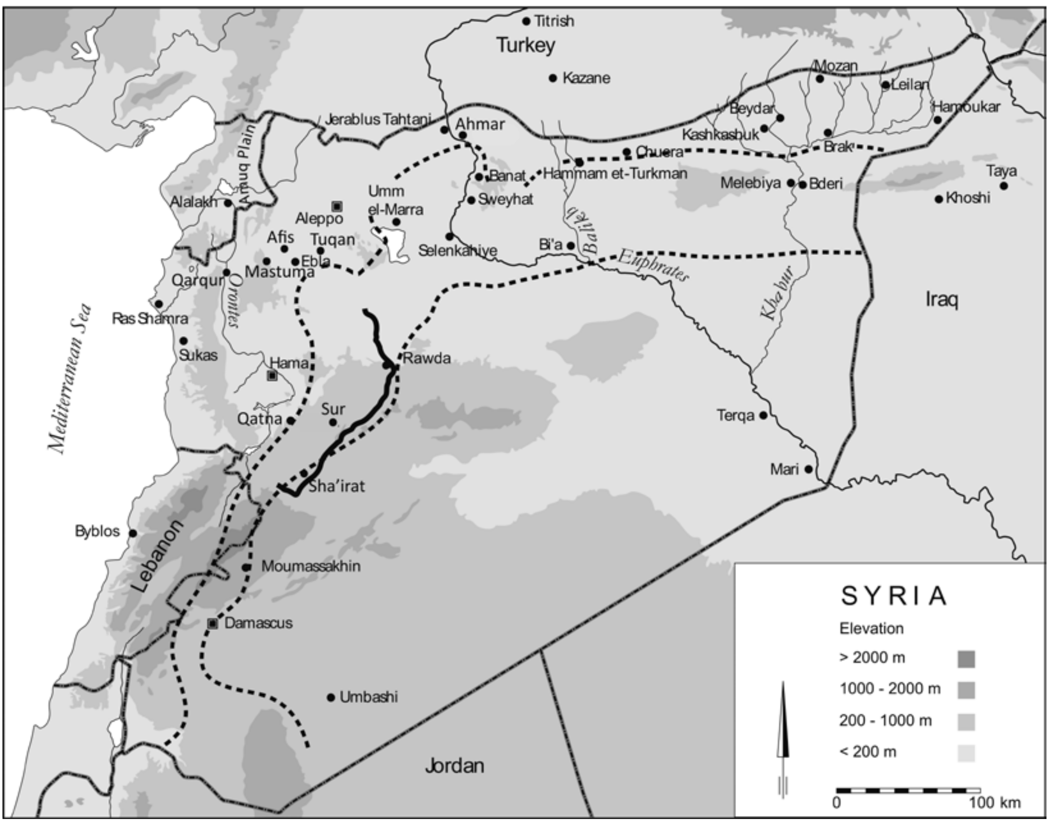

Figure 5.1. Western Syria. Dashed lines indicate "Zone of Uncertainty" (Wilkinson et al. 2014). Thick black line represents the "Très Long Mur" (Very Long Wall)

* I would like to thank Felix Höflmayer for inviting me to the Oriental Institute Postdoctoral Seminar. Anna Soifer helped prepare the original artwork for this paper, and I am also grateful for Lael Ensor's assistance.

in western Syria. I focus mainly on the region west of the Euphrates (fig. 5.1), but will also occasionally refer to the middle Euphrates valley. Chronologically and historically, western Syria is important as a linchpin between the historically documented societies in Mesopotamia and those in Anatolia and the southern Levant, while it is also significant as a heartland of urban societies with their own trajectories and character (Matthiae and Marchetti 2013).

I have tried to grapple with the subject of urban crisis or collapse in the Early Bronze to Middle Bronze transition in several earlier publications (Akkermans and Schwartz 2003, pp. 282–87; Schwartz 2006, 2007, 2012; Schwartz and Miller 2007). In this paper, I aim to synthesize some of my earlier ideas and present new data. Much new data have been collected and discussed by participants in the ARCANE (Associated Regional Chronologies of the Ancient Near East) project, especially the northern Levant group and the middle Euphrates team, and I am grateful for the information derived from them.[1] Also important have been the workshops held at Blaubeuren, Germany, organized by Uwe Finkbeiner (2007) that focused on the Early Bronze to Middle Bronze transition in the Syrian middle Euphrates region.

Relative Chronology

Traditionally, west Syrian archaeologists have used the Bronze Age periodization proposed by Paolo Matthiae and inspired by the Palestinian sequence that William F. Albright and others established (Albright 1965). In this scheme, the Early Bronze Age has four main subdivisions, Early Bronze I–IV (table 5.1). Subdividing further, Matthiae identified Early Bronze IVA as the period of Ebla Palace G and its renowned archives, with Early Bronze IVB the "second Ebla" (Dolce 2009) subsequent to the destruction of Palace G. These two sub-periods are grounded on relatively firm material-culture evidence, with distinctive pottery and other diagnostics tied to stratigraphic contexts (Mazzoni 2002; Matthiae 2013a).

Table 5.1. Relative chronology of western Syria in the Early and Middle Bronze periods

Traditional Period	*ARCANE Period*	*Ebla*	*Absolute Dates (very approximate)*
Middle Bronze II	—	IIIB	1800–1600 B.C.
Middle Bronze I	—	IIIA	2000–1800 B.C.
Early Bronze IVC (?)	ENL 6	IIB2 late	2100–2000 B.C.
Early Bronze IVB	ENL 5	IIB2	2300–2100 B.C.
Early Bronze IVA	ENL 4	IIB1	2500–2300 B.C.
Early Bronze III	ENL 3	IIA2	2700–2500 B.C.
Early Bronze I/II	ENL 1/2	—	3100–2700 B.C.

[1] Welton and Cooper 2014; Finkbeiner et al. 2015; www.arcane.uni-tuebingen.de/ (accessed 1/13/2017).

If these two periods are accepted as Early Bronze IVA and IVB, there must be an Early Bronze I–III to precede them. This poses a problem for west Syrian relative chronology, because Early Bronze I and II are very difficult to recognize and define due to a paucity of evidence.[2] Indeed, in the ARCANE system, the phase has been designated Early Northern Levant 1/2 (ENL 1/2). Presumably, Early Bronze I and II should follow the florescence of Uruk-related material culture and other contemporaneous assemblages labeled Late Chalcolithic (Rothman 2001; Schwartz 2001). If we accept a date for the end of the Late Chalcolithic period in western Syria at ca. 3100/3000 B.C. (Cooper 2014, p. 278), then Early Bronze I and II should occupy the very end of the fourth and the first third or so of the third millennium B.C.

In western Syria, relevant data primarily derive from Hama K (middle) (Fugmann 1958), Amuq periods G and H (Braidwood and Braidwood 1960), and Tell Afis post-Chalcolithic levels (Mazzoni 2002). Among the more recognizable diagnostics of the period are jars with Late Reserve Slip decoration (Jamieson 2014) and Multiple Brush Painted Ware. In the Middle Euphrates, much more evidence is available, with data originating from excavations at Jerablus Tahtani, Tell Ahmar, Shiyukh Fawqani, Shiyukh Tahtani, and Qara Quzaq in the Tishrin Dam region, and Hajji Ibrahim, Sweyhat, Halawa Tell B, and Habuba Kabira North in the Tabqa Dam region (Cooper 2006, pp. 49–50, table 3.1).[3] Presumably, the Early Bronze I/II was an era when village- and town-based societies were developing into larger-scale entities, but we know relatively little about such social changes in western Syria (Akkermans and Schwartz 2003, p. 226).

In the mid-third millennium B.C., the Early Bronze III (or ENL 3) period is increasingly better known, thanks to recently acquired evidence from sites such as Ebla (Tell Mardikh, period IIA2) (Vacca 2015) and nearby Tell Tuqan (period IC) (Baffi and Peyronel 2013; Vacca 2014), as well as Qatna (phases J44–39), Mastuma (Square 15G, layer h) (Iwasaki et al. 2009), and Umm el-Marra (period VI later) (Schwartz et al. 2006).[4] The pottery assemblage (fig. 5.2), which is rarely decorated, includes open forms with thin or thick beaded rims and jars with curving, everted necks. Pattern combed ware is found on the coast (Cooper 2014, p. 283), and Early Transcaucasian Red-Black Burnished Ware is localized in the Orontes valley (Palumbi 2003; Batiuk 2013). In the Euphrates valley and the Jabbul plain to its west, painted and/or spiral burnished thin-walled fine pottery designated Euphrates Banded Ware emerges in this period.[5] Evidence such as the large-scale architecture from Ebla preceding Palace G (e.g., Buildings G2, CC, and G5) (Dolce 2010; Matthiae 2013a; Vacca 2015), and elite tombs 5, 6, and 8 from Umm el-Marra (Schwartz et al. 2006; Schwartz 2013a) suggests that social complexity and elite-dominated hierarchy were developing at this time, and Early Bronze III may well be the take-off point for west Syrian urban society. This is a process sometimes referred to as the "second urban revolution," alluding both to the temporal priority of urbanization in

[2] Mazzoni (2002) proposed a definition for the two sub-periods, but the available evidence is too sparse at present for this definition to be accepted. Matthiae (2013a) correlates Early Bronze I with Amuq G Middle (3100–2900 B.C.) and Early Bronze II with initial Amuq H and Mardikh IIA1 (2900–2750 B.C.), but the criteria for recognizing and distinguishing these subphases are yet to be supplied.

[3] See now the ARCANE periodization of Early Middle Euphrates (EME) 1 and 2 (Sconzo 2015).

[4] Matthiae (2013a) suggests an Early Bronze IIIA equivalent to Amuq H middle and Mardikh IIA2 (2750–2600 B.C.) and Early Bronze IIIB equivalent to Amuq H final and Mardikh IIA3 (2600–2500 B.C.). Again, details on the criteria distinguishing these subphases are still to be furnished.

[5] For the middle Euphrates, see now EME phase 3 (Sconzo 2015). Porter (2007) provides a comprehensive discussion of regional synchronisms and their difficulties.

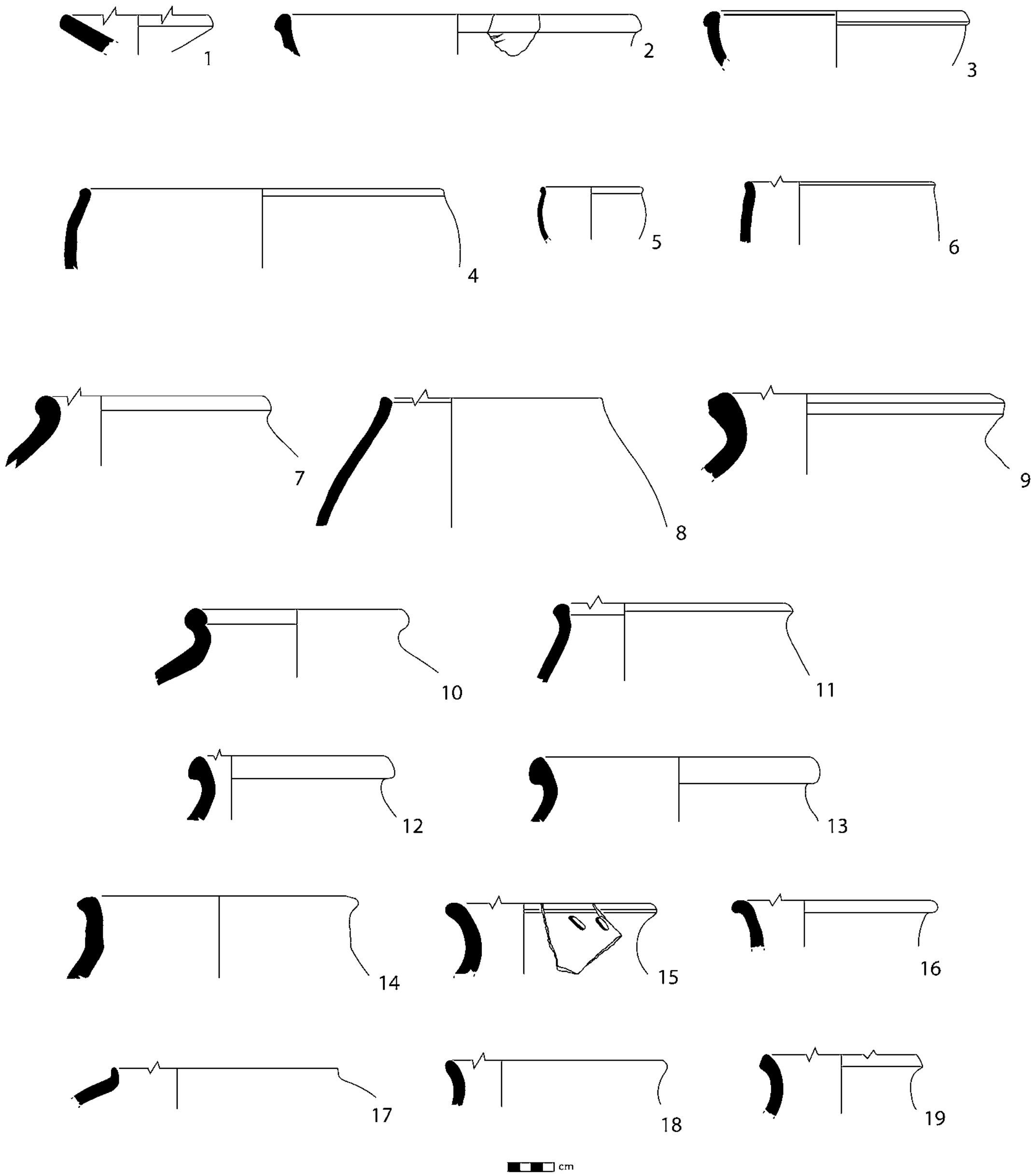

Figure 5.2. Early Bronze III ceramics from Umm el-Marra, Acropolis Center. (*1*) 1280/3902-700, Gray-brown, fine sand, rough surface. (*2*) 1280/3916-104, Light yellow exterior/interior, core pink-brown, fine sand, incised notches. (*3*) 1282/3914-105, Light yellow/brown, no visible inclusions. (*4*) 1284/3918-100, Dark brown, fine white sand. (*5*) 1291/3906-128, Light brown-gray, fine sand. (*6*) 1280/3898-701, Light brown, fine sand, exterior smooth, interior rough. (*7*) 1280/3890-701, Brown/yellow exterior, core/interior pink/brown, fine sand. (*8*) 1286/3903-508, Brown, fine sand. (*9*) 1280/3918-103, Light yellow, medium vegetal inclusions. (*10*) 1278/3916-100, Red-brown, no visible inclusions. (*11*) 1291/3906-128, Brown, fine sand. (*12*) 1284/3918-105, Yellow-brown, fine sand. (*13*) 1278/3916-101, Light brown/yellow, fine sand. (*14*) 1282/3916-104, Exterior light yellow (slip), core/interior light brown, fine sand. (*15*) 1278/3908-708, Light yellow, fine sand, incised notches. (*16*) 1278/3908-708, Gray/brown, fine and coarse white sand. (*17*) 1274/3894-700, Dark brown to black, fine white sand (Cooking Ware). (*18*) 1278/3894-702, Gray-brown, fine white sand (Cooking Ware). (*19*) 1274/3894-700, Dark brown to black, medium white sand (Cooking Ware)

southern Mesopotamia and to Syria's early but somewhat aborted phase of urbanization in the fourth millennium B.C. (Mazzoni 1991; Akkermans and Schwartz 2003, pp. 233–87).

Particularly well known among the Early Bronze Age periods is Early Bronze IVA (or ENL 4), the era of Ebla Palace G (Mardikh IIB1), constituting the apogee of Syrian Early Bronze Age urban civilization. Other comparable assemblages derive from Tuqan period IIA, Qatna phases J38–28, Qarqur Area A stratum 14, Amuq I, Hama J8-5, Umm el-Marra period V, and Ras Shamra IIIA2–IIIA3. Ceramically, the Early Bronze IVA is associated with the so-called caliciform corrugated goblets (figs. 5.3–5.4) (Welton and Cooper 2014) and other types such as gray spiral-burnished "Syrian bottles" and wavy-line jugs.[6] Mazzoni's proposal (2002) to subdivide the period into Early Bronze IVA1 and Early Bronze IVA2 on the basis of the Ebla results requires further examination and verification from other sites (Vacca 2015). The floruit of Syrian urban civilization in the Early Bronze IVA is effectively illustrated by the textual and material culture results from Palace G at Ebla and from other nucleated sites with evidence of elite institutions.[7]

Also of note is the great proliferation of new sedentary communities in this period, a development that includes expansion into the drier "steppe fringe" to the east of Ebla, Qatna, and Umm el-Marra (Geyer et al. 2007; Yukich 2013). Particularly striking is the appearance of a set of circular urban type settlements (e.g., al-Rawda, es-Sur, Shaʾirat) in the vicinity of a 220 km long stone wall one meter wide, the so-called Très Long Mur (Geyer et al. 2010). The reasons for this expansion are not yet conclusively demonstrated, but it is likely that urban-based powers in the wetter agricultural heartlands like Ebla chose to exploit the drier zones for such activities as sheep/goat pastoralism, long-distance trade, and agricultural maximization (Castel and Peltenburg 2007; Mazzoni 2013; Wilkinson et al. 2014).

The Early Bronze IVB (or ENL 5) corresponds to the period after the destruction of Ebla Palace G and prior to the rebuilding of the city on a grand scale in the Middle Bronze I (Mardikh IIIA). At Ebla (period Mardikh IIB2), layers deposited above the destruction have a new ceramic assemblage whose most conspicuous type consists of painted and incised goblets (see fig. 5.5 for examples from Tell Tuqan). Other Early Bronze IVB characteristics include cooking ware trays with pitted bottoms, Smeared Wash Ware, and wide goblets with collared rims (Akkermans and Schwartz 2003, fig. 8.10a; Finkbeiner 2007, fig. 1, type 18). Vertical rim bowls, or bowls with a collared rim, are very common in the Early Bronze IVB as well, although they are introduced in the Early Bronze IVA (Akkermans and Schwartz 2003, fig. 8.10e). In addition to Mardikh IIB2, occupations with the Early Bronze IVB ceramic assemblage include Tuqan period IIB, Mastuma IX–VI (Iwasaki et al. 2009), al-Rawda (main occupation period/ville neuve), Qatna J27–19, Amuq J (Welton 2014), Hama J4–1, and Umm el-Marra IV.[8] Despite the Ebla Palace G destruction, evidence of urbanism and social complexity are still apparent in western Syria — indeed, Mazzoni (2013, p. 39) designates the Early Bronze IVB as a "flourishing phase in Central and Northern Syria."

In a recent development, some authorities have proposed the detachment of the latter part of the Early Bronze IVB and its identification as a separate period, Early Bronze IVC or

[6] Jugs with painted wavy lines undulating down the side of the vessel (Akkermans and Schwartz 2003, fig. 8.8i).

[7] In the middle Euphrates, this phase is approximately equivalent to the ARCANE period EME 4 (Sconzo 2015).

[8] See the EME 5 phase in the middle Euphrates (Sconzo 2015).

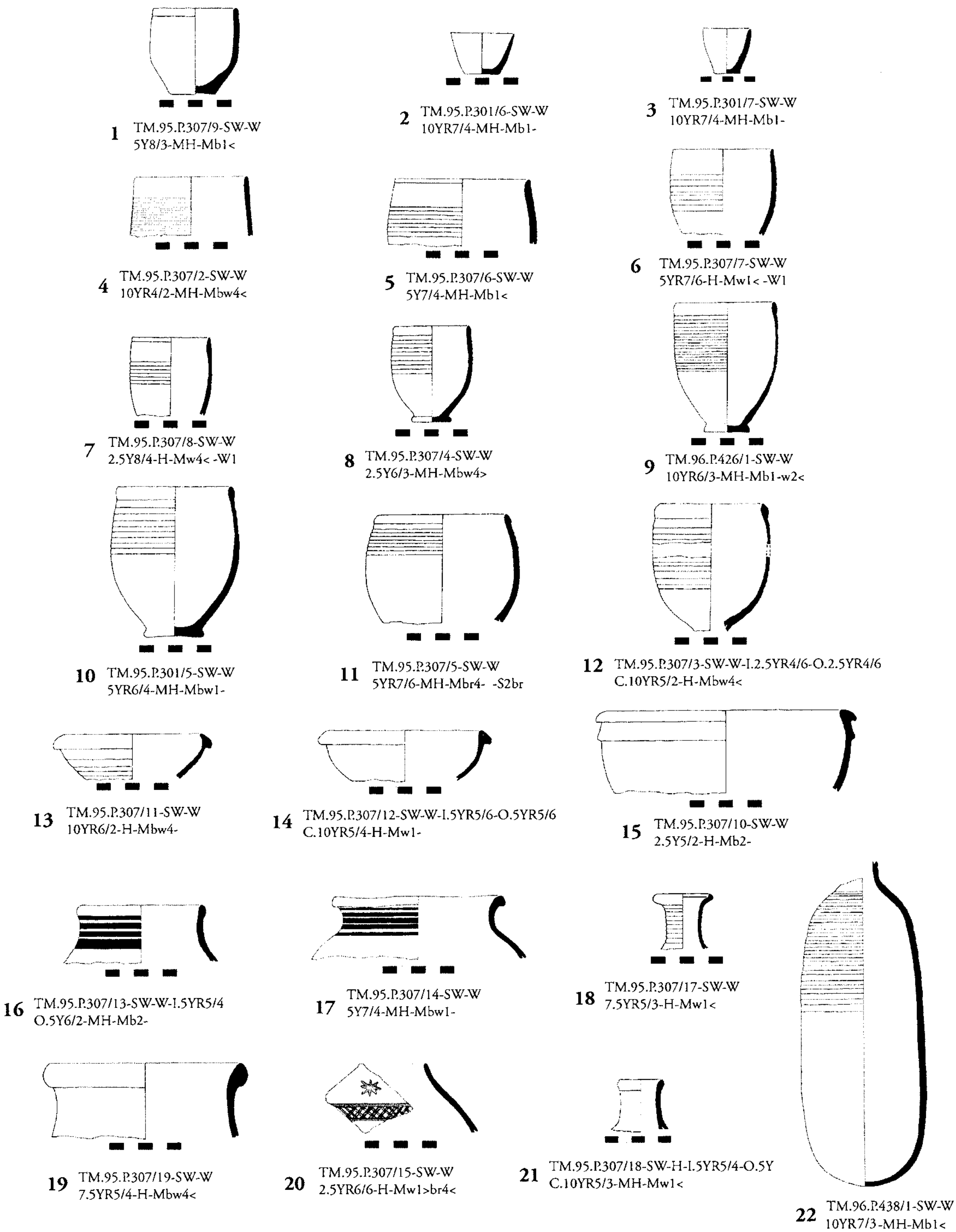

Figure 5.3. Early Bronze IVA ceramics from Ebla, Building P4, room L.6298 (after Marchetti 2013, fig. 7.30)

Figure 5.4. Early Bronze IV corrugated goblets from Umm el-Marra, tomb 1

ENL 6 (Dornemann 2008, fig. 5:18–32, fig. 6, fig. 7:1–11). Among the ceramic diagnostics of this latest Early Bronze Age phase, particularly salient are bowls with vertical grooved rims (fig 4.6: TT.78.A.26/24) (Akkermans and Schwartz 2003, fig. 8.8a–b; Finkbeiner 2007, fig. 1, type 19). These are attested, for example, at Ebla, Qarqur, and Tuqan Areas A and G (Baffi and Peyronel 2013).

In the middle Euphrates region, of particular interest is the identification of a ceramic period displaying a mixture of Early Bronze Age and Middle Bronze Age traits. This "Transitional" phase is present at Tell Kabir near Tell Banat (fig. 5.7) (Porter 2007), Sweyhat, and Hadidi (Cooper 1998, 2006; Porter 2007).[9] An important question is: If these sites demonstrate a gradual shift from Early Bronze to Middle Bronze types, should the same smooth continuity be expected elsewhere? And, if there is no such Transitional phase at a site, does that mean there is an occupational hiatus? At present, the answers to both questions are uncertain.

With the advent of the second millennium B.C., we enter the Middle Bronze Age, which demonstrates a significant change in material culture styles, urban organization, and political entities, which are now dominated by Amorite rulers (Jahn 2009; Schwartz 2013b; Burke 2014 and in this volume). In the Middle Bronze Age, we can observe an increased focus on ceramic mass manufacture, with pottery tending to be thicker-walled and coarser than in the Early Bronze Age and with fewer ware categories and less effort devoted to decoration. Typical shapes in the Middle Bronze Age assemblage include shallow carinated bowls with everted rims, goblets with a biconical shape and everted bead rim, and open or closed shapes with flat or ledge rims that have multiple grooves on top. For this period, Matthiae's recognition of two subdivisions is generally accepted, Middle Bronze I and Middle Bronze II, which correspond to Mardikh IIIA and IIIB (ca. 2000–1800 B.C. and 1800–1600 B.C., respectively).

[9] This phase is designated as EME 6 in the new ARCANE periodization (Sconzo 2015).

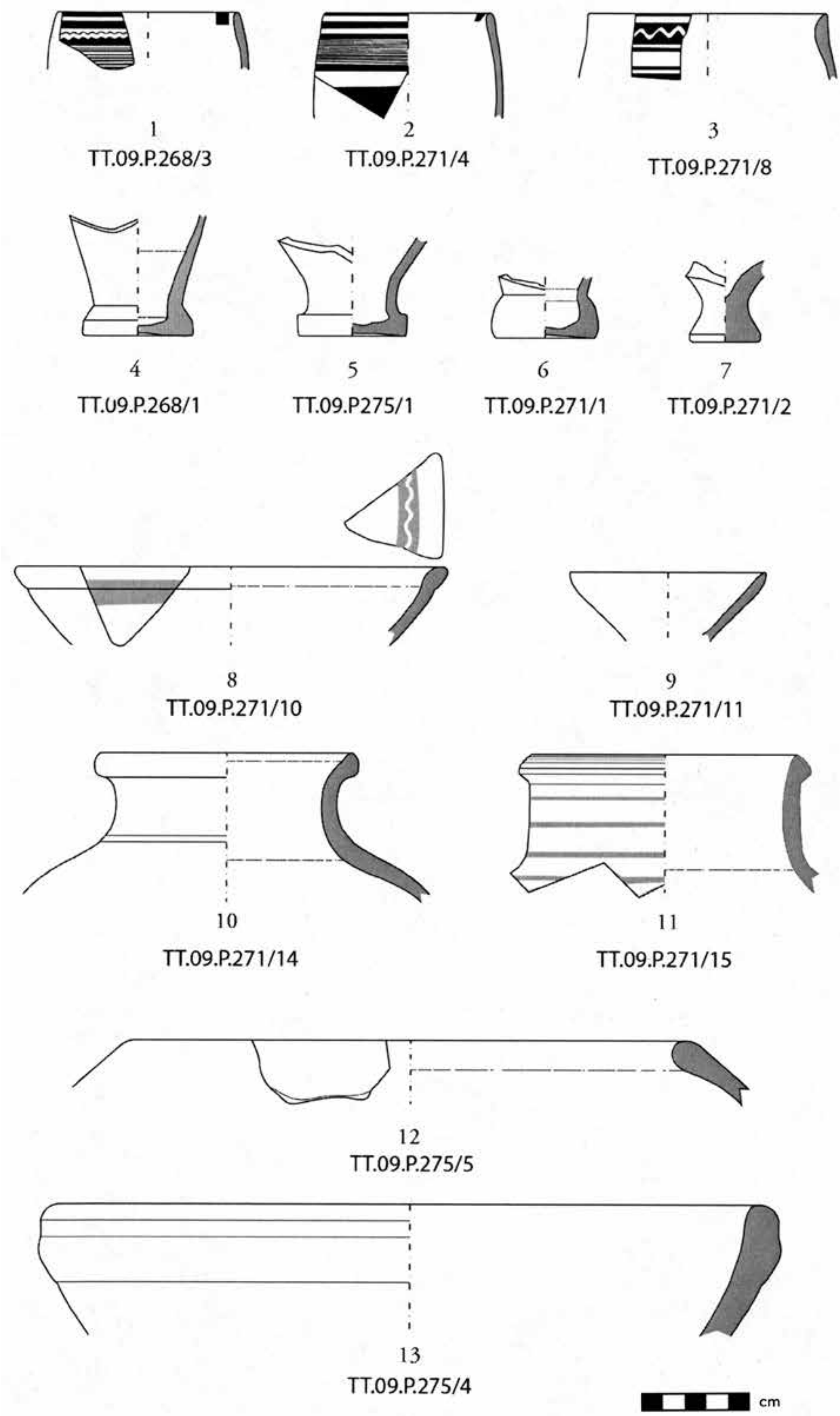

Figure 5.5. Early Bronze IVB ceramics from Tell Tuqan, Area P, phase 4 (after Baffi and Peyronel 2013, fig. 9.3)

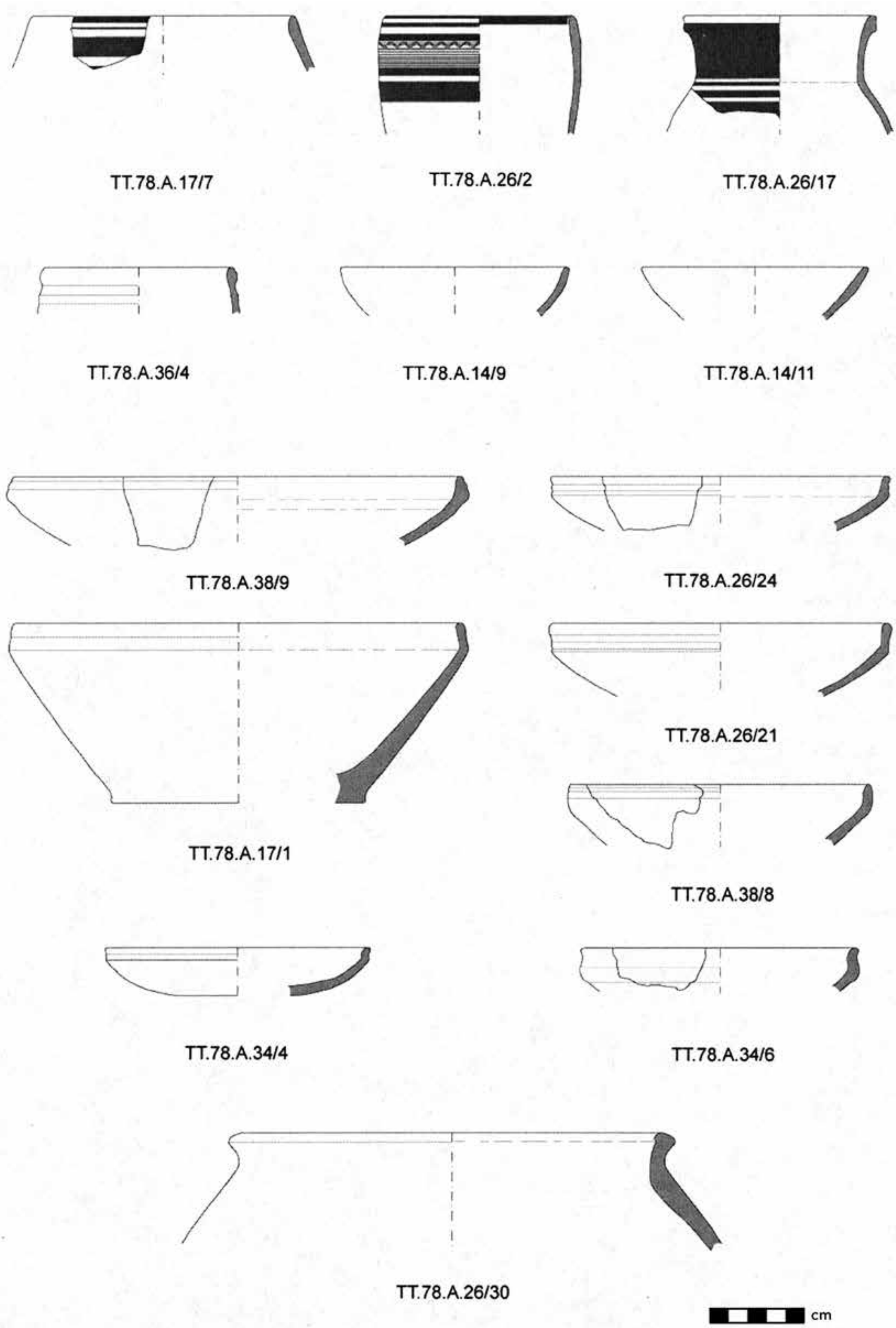

Figure 5.6. Late Early Bronze IVB ("EB IVC") ceramics from Tell Tuqan, Area A (after Baffi and Peyronel 2013, fig. 9.13)

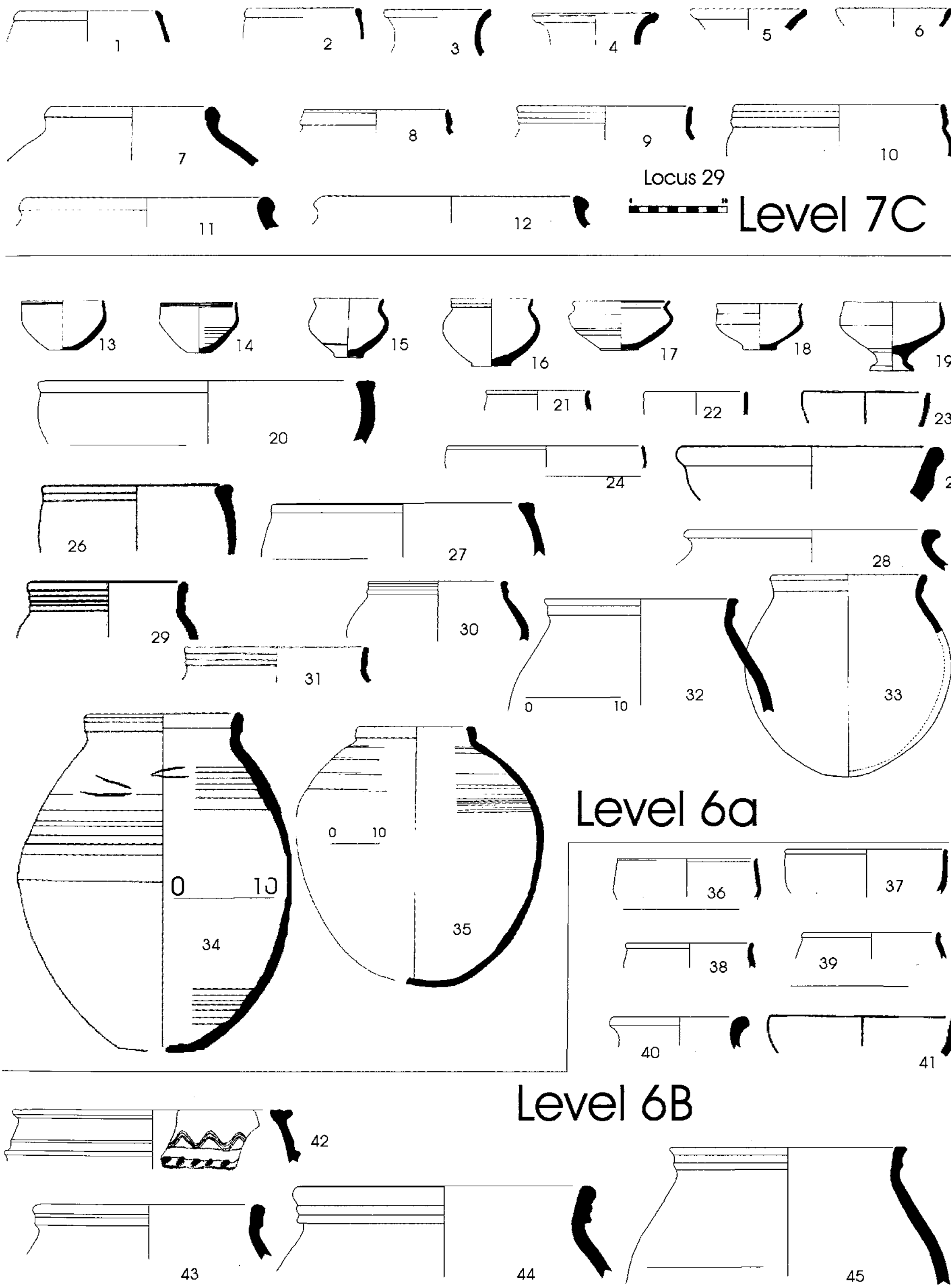

Figure 5.7. "Transitional" Early Bronze–Middle Bronze ceramics from Tell Kabir (after Porter 2007, fig. 2)

Absolute Chronology and the Ebla Destruction

In order to connect this west Syrian material-culture periodization to an absolute chronology, there are two tools at our disposal: text-based historical linkages and radiometric dating. With respect to historical tie-ins, the Ebla texts and their link to Mesopotamian chronology should be pivotal. However, this link is tenuous; both Sargon and Naram-Sin of Akkad claimed to have subjugated Ebla, so one must determine whether Sargon or Naram-Sin — or some other agent — was responsible for the destruction of Ebla Palace G and its archives. Most scholars favor Sargon or a contemporaneous entity, since the material culture of Ebla, including the paleography of its cuneiform texts, has its closest parallels to Mesopotamian Early Dynastic III (Matthiae 2009, p. 60 n. 52). Instead of Sargon, Archi and Biga (2003) have proposed that Ebla was destroyed by its rival Mari shortly before Sargon's appearance on the upper Mesopotamian scene.

A literary text from Mari recently published by Jean-Marie Durand (2012) is relevant to Sargon's campaigns in the region and supports the contention that he was the first to subjugate Ebla and Mari. The text states that Idida, servant of Sargon, marched against Mari and Terqa; Idida is likely to be identical to Ididiš, the first ruler of Mari's šakkanaku dynasty, believed to be installed by the Sargonic occupiers. Later, the text refers to Mari's allies, the people of the house of the god of Aleppo, understood by Durand to mean the Eblaites. In Durand's interpretation, first Mari was subjugated by Sargon's troops, then Ebla was conquered. While Durand's interpretation of this text, whose context remains to be fully discussed, is by no means conclusive, the document adds intriguing new information.

If Sargon or a contemporary was responsible for the destruction of Early Bronze IVA Ebla, we may then consider the absolute date that this would imply. Given the equivocal nature of Mesopotamian chronology, there are several candidates for the dates of Sargon's reign, depending on whether one prefers the High, Middle, Low, or Ultra-Low Chronology. According to Walther Sallaberger (2011), a Middle Chronology date for Sargon's reign would be 2353–2314 B.C. if the Gutian period is assigned a maximum of 100 years, or 2313–2274 B.C. if the Gutian period is assigned a minimum of sixty years. The observation of a solar eclipse at Mari mentioning the birth of Shamshi-Adad has been taken as evidence in favor of a "reduced" Middle Chronology (Michel and Rocher 2000; Michel 2002), which would place Sargon's reign in the early to mid-twenty-third century B.C., according to Sallaberger (2303–2264 B.C. if the Gutian period lasts 100 years, 2263–2224 B.C. if the Gutian period lasts sixty years). Therefore, we have estimates extending from the mid-twenty-fourth to the mid-twenty-third century B.C. for Sargon and, by extension, the destruction of Ebla Palace G. If one prefers a Low or Ultra-Low Chronology, these dates would have to be moved down into the twenty-second century B.C. (see also Charpin 2005; Matthiae 2009, p. 43 n. 3; Lebeau 2012; and Marchesi and Marchetti 2011, pp. 138–40 on dating the Ebla Palace G destruction).

A complement to text-based assessments of Ebla Palace G absolute chronology is now available from sixteen radiocarbon dates derived from carbonized seeds found in the debris of the Palace G destruction and the contemporaneous destruction in nearby Building P4 (table 5.2; figs. 5.8 and 5.9) (Calcagnile, Quarta, and D'Elia 2013).[10] Their calibrated range is

[10] Calibration of all radiocarbon dates referred to in the text was done using OxCal 4.2.4 (Bronk Ramsey 1995, 2001, 2009) against the INTAL13 calibration curve (Reimer et al. 2013) interpolated to yearly intervals (Resolution = 1).

Table 5.2. Radiocarbon dates from Early Bronze IVA Ebla (Calcagnile, Quarta, and D'Elia 2013)

Context	*Lab Code*	*Uncalibrated* B.P. *Date*	*Material*
Palace G	LTL-12319A	3927 ± 35	seeds
Palace G	LTL-12320A	3855 ± 45	seeds
Palace G	LTL-12322A	3809 ± 45	seeds
Palace G	LTL-12323A	3942 ± 40	seeds
Palace G	LTL-12324A	3857 ± 45	seeds
Palace G	LTL-12326A	3833 ± 45	olive pit
Palace G	LTL-12327A	3918 ± 35	seeds
Palace G	LTL-12328A	3885 ± 40	seeds
Building P4	LTL-12329A	3872 ± 35	seeds
Building P4	LTL-12330A	3800 ± 35	olive pit
Building P4	LTL-12331A	3798 ± 40	seeds
Building P4	LTL-12332A	3819 ± 35	olive pit
Building P4	LTL-12333A	3858 ± 35	seeds
Building P4	LTL-12334A	3863 ± 45	seeds
Building P4	LTL-12335A	3840 ± 35	seeds
Building P4	LTL-12336A	3893 ± 35	seeds

Table 5.3. Radiocarbon dates from al-Rawda (Brochier and Castel, in press)

Sample	*Uncalibrated* B.P. *Date*	*Material*
Latest Occupation Phase		
LY-4853 SacA	3860 ± 35	charcoal
LY-3471 OxA	3860 ± 35	charcoal
LY-12511	3785 ± 40	seeds
LY-3475 OxA	3820 ± 50	charcoal
Intermediate Phase		
LY-12508	3990 ± 40	seeds
First Fortification Phase		
LY-12507	4090 ± 35	seeds
LY-3474 OxA	3880 ± 35	charcoal
LY-3472 OxA	3935 ± 35	charcoal
LY-3473	3940 ± 40	charcoal
Below the First Fortification Phase		
LY-12509	3990 ± 40	seeds
LY-12510	4020 ± 40	seeds

Table 5.4. Radiocarbon dates from Qatna (Morandi Bonacossi 2008, tables 1–2)

Context	*Number*	*Uncalibrated* B.P. *Date*	*Material*
Middle Bronze I, J18–17			
J17	GX-28917	3540 ± 70	charcoal
J18	GX-28922	3630 ± 40	charcoal
Early Bronze IVB, J27–19			
J19	GX-28918	3550 ± 100	charcoal
J20	GX-28919	3510 ± 80	charcoal
J22	GX-28920	3820 ± 40	seeds
J23	GX-28921	3680 ± 80	charcoal
J25	GX-28924	3600 ± 130	charcoal
J27	LTL-2035A	3844 ± 90	seeds
Early Bronze IVA, J38–29			
J28b	LTL-2460A	—	seeds
Early Bronze III, J44–39			
J34	LTL-2040A	—	seeds
J39	LTL-2041A	—	charcoal
J40	LTL-2042A	—	seeds
J44a	LTL-2044A	—	seeds

Table 5.5. Radiocarbon dates from Umm el-Marra.
All samples are from seeds or other short-lived plant components

Area	*Context*	*Number*	*Uncalibrated B.P. Date*	*Material*
Late Bronze (Destruction Level)				
West Area A	South Room, northeast corner	UCIAMS 126326	3075 ± 20	seeds
West Area A	1068/3854-004	UCIAMS 126327	3105 ± 20	seeds
Southeast Area	1361/3760 Room 2-001	Beta-151641	3050 ± 40	seeds
Southeast Area	1361/3748 Room 2	Beta-151642	3000 ± 70	seeds
Southeast Area	1371/3742-013	Beta-151643	3100 ± 50	seeds
Southeast Area	1373/3748 Room 1-006	Beta-151644	3050 ± 60	seeds
Southeast Area	1373/3748 Room 1-007	Beta-151645	3050 ± 80	seeds
Middle Bronze II Late				
Northwest Area A	1000/4014 Room 6-005	UCIAMS 126329	3340 ± 15	seeds
Northwest Area A	1000/4014 Room 4-012	UCIAMS 126336	3345 ± 20	seeds
Middle Bronze I				
Acropolis Northwest	1238/3906-101	Beta-267128	3400 ± 40	seeds
Acropolis South	1272/3852-198	AA82484	3467 ± 41	seeds
Acropolis Northwest	1238/3906-099	AA82486	3488 ± 40	seeds
Acropolis West	1232/3856-208	UCIAMS 126330	3540 ± 20	seeds
Acropolis West	1232/3856-206	UCIAMS 126337	3560 ± 20	seeds
Early Bronze IVB				
Acropolis Northwest	1238/3906-100	Beta-267127	3720 ± 40	seeds
Acropolis South	1274/3852-124	AA82483	3884 ± 45	seeds
Acropolis Northwest	1238/3906-098	AA82485	3792 ± 41	seeds
Acropolis East	1316/3864-112	UCIAMS 126328	3790 ± 15	seeds
Acropolis Center	1276/3920 Room 1-100	UCIAMS 126325	3835 ± 20	plant material
Acropolis Center	1284/3900-205/206	UCIAMS 126338	3935 ± 20	seeds
Early Bronze Early				
Acropolis North	1270/3936-500	AA82487	4034 ± 41	seeds
Acropolis Center	1278/3920-300	AA82488	4394 ± 42	seeds
Acropolis North	1270/3936-500	UCIAMS 126324	4030 ± 20	plant material
Acropolis East	1316/3870-314	UCIAMS 126331	4475 ± 20	seeds
Acropolis North	1276/3928-304	UCIAMS 126332	4085 ± 20	seeds

disappointingly broad, ranging from the twenty-fifth to the twenty-third centuries B.C. at one standard deviation. Calcagnile, Quarta, and D'Elia calculated the weighted average to be 3870 ± 8 B.P. and report that its most probable calibrated range is 2367–2293 B.C., with 53.6 percent probability. If this is acceptable, the calibrated dates suggest a time in the later twenty-fourth century B.C. for the destruction of Early Bronze IVA Ebla. Such a date accords with a destruction in the time of Sargon, according to the Middle Chronology. However, the wide range of radiocarbon dates from the Ebla destruction level gives pause.[11]

If we accept a late twenty-fourth-century B.C. date for the destruction of Ebla Palace G, the Early Bronze IVA should terminate at the same time. Such a date is supported by the more abundant radiocarbon dates available from Early Bronze IVB contexts at al-Rawda[12] (table 5.3; figs. 5.10 and 5.11), Qatna (table 5.4; figs. 5.12 and 5.13), Umm el-Marra (table 5.5; figs. 5.14 and 5.15),[13] and Sweyhat (Danti and Zettler 2007, fig. 11.3, Sweyhat phase 4), which indicate a late third millennium B.C. date for the Early Bronze IVB. Any absolute date suggested for the starting point of Early Bronze IVA, not to mention Early Bronze I/II and Early Bronze III, will be extremely approximate and uncertain, given the scarcity of relevant radiocarbon dates.

The traditional absolute date for the beginning of the Middle Bronze Age in western Syria, as posited by Matthiae, is 2000 B.C. (Matthiae 2009, p. 43 n. 3; Morandi Bonacossi 2014, table 28.1). Such a date is not contradicted by the Early Bronze IVB radiocarbon evidence, but some difficulties have been identified. Certain characteristics of Middle Bronze I pottery in western Syria, like combed decoration, are typical of late third-millennium B.C. pottery in upper Mesopotamia. Pruß (2007), Porter (2007), and most recently Pfälzner (this volume) have therefore asked whether the beginning of the Middle Bronze I in western Syria — and the end of Early Bronze IV — should be assigned to 2100 B.C., not 2000 B.C. Were that the case, Middle Bronze I would be contemporaneous with the Ur III period in southern Mesopotamia, according to the Middle Chronology. It must be noted, however, that combed pottery is not restricted to the late third millennium B.C. in northern Mesopotamia but is also characteristic of early second millennium B.C. assemblages, as noted at Tell Rijim in the upper Tigris region (Koliński 2000) and recently in the excavations at Kurd Qaburstan southwest of Erbil directed by the author.

A proposal of chronological equivalency between Syrian Middle Bronze I and Mesopotamian Ur III has also been made on the basis of similarities between the pottery from Middle Bronze I Ebla and contexts at Tell Mozan in the upper Khabur that are dated to the Ur III period by epigraphic evidence (Schmidt 2012, 2013; Pfälzner, this volume). Carinated bowls with everted rims and concave upper bodies, for example, are found in both assemblages. Such similarities might be coincidental, since evidence of comparable types from regions between Ebla and Mozan remains to be identified. But if the similarities are related, it is also

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[11] Casana (2014) suggests that the earlier dates may be from residual materials and therefore the later dates (converging on the twenty-second century B.C.) should be given greater credibility, but it is unlikely that carbonized seeds from the destruction level derived from earlier contexts.

[12] I am extremely grateful to Corinne Castel and Jacques Brochier for permission to include the radiocarbon dates from al-Rawda, which will appear in Brochier and Castel, in press.

[13] I am grateful to Felix Höflmayer and Aaron Burke for their help in processing the Umm el-Marra UCIAMS-dates as part of the CINEMA project (Chronometric Investigation of Near Eastern and Mediterranean Antiquity), co-directed by Felix Höflmayer and Aaron A. Burke and funded by the Fritz Thyssen-Foundation (2011–2013) and the University of California, Los Angeles (2012–2013).

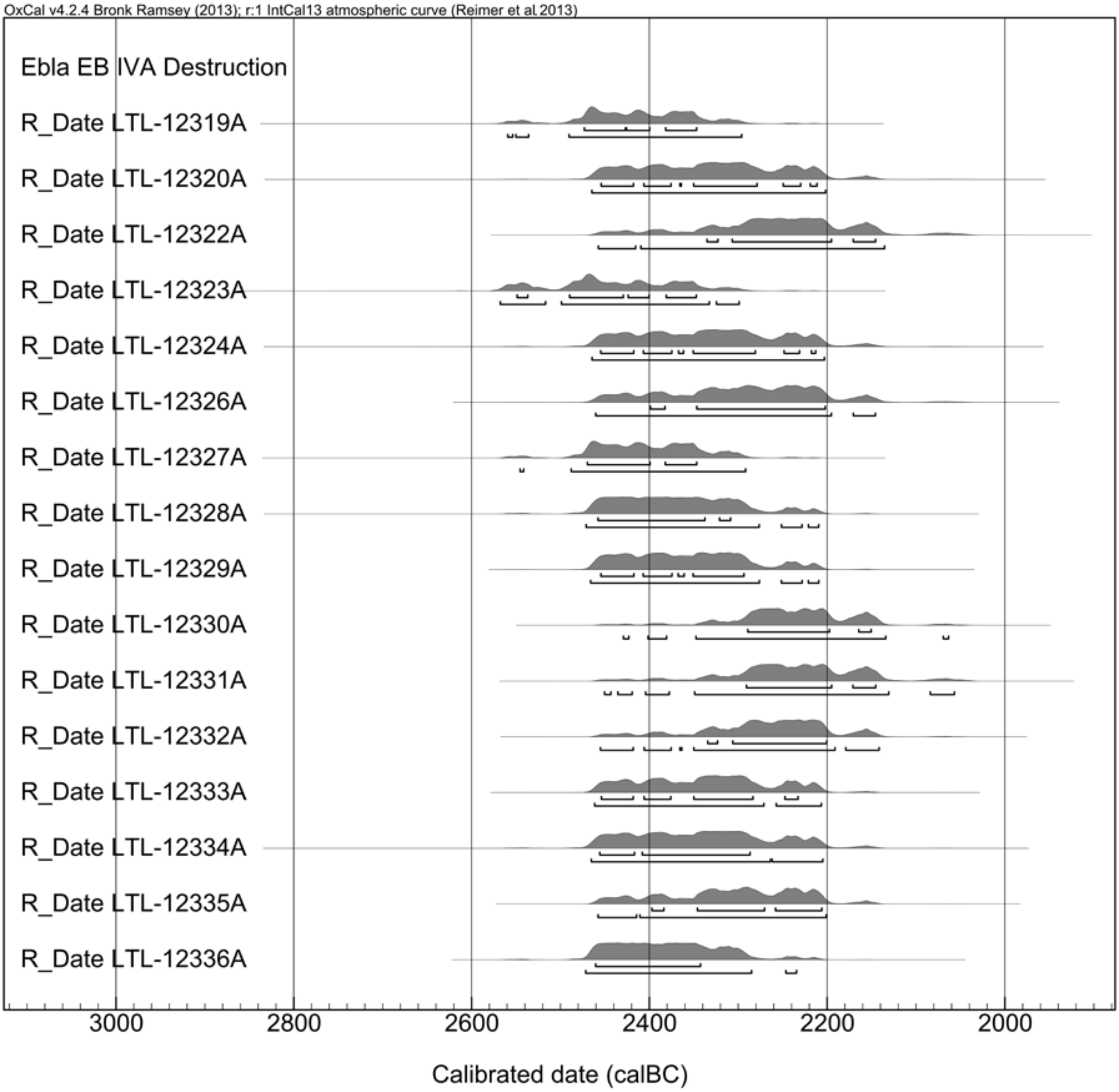

Figure 5.8. Radiocarbon dates from Ebla Early Bronze IVA (after Bronk Ramsey 2013 and Reimer et al. 2013)

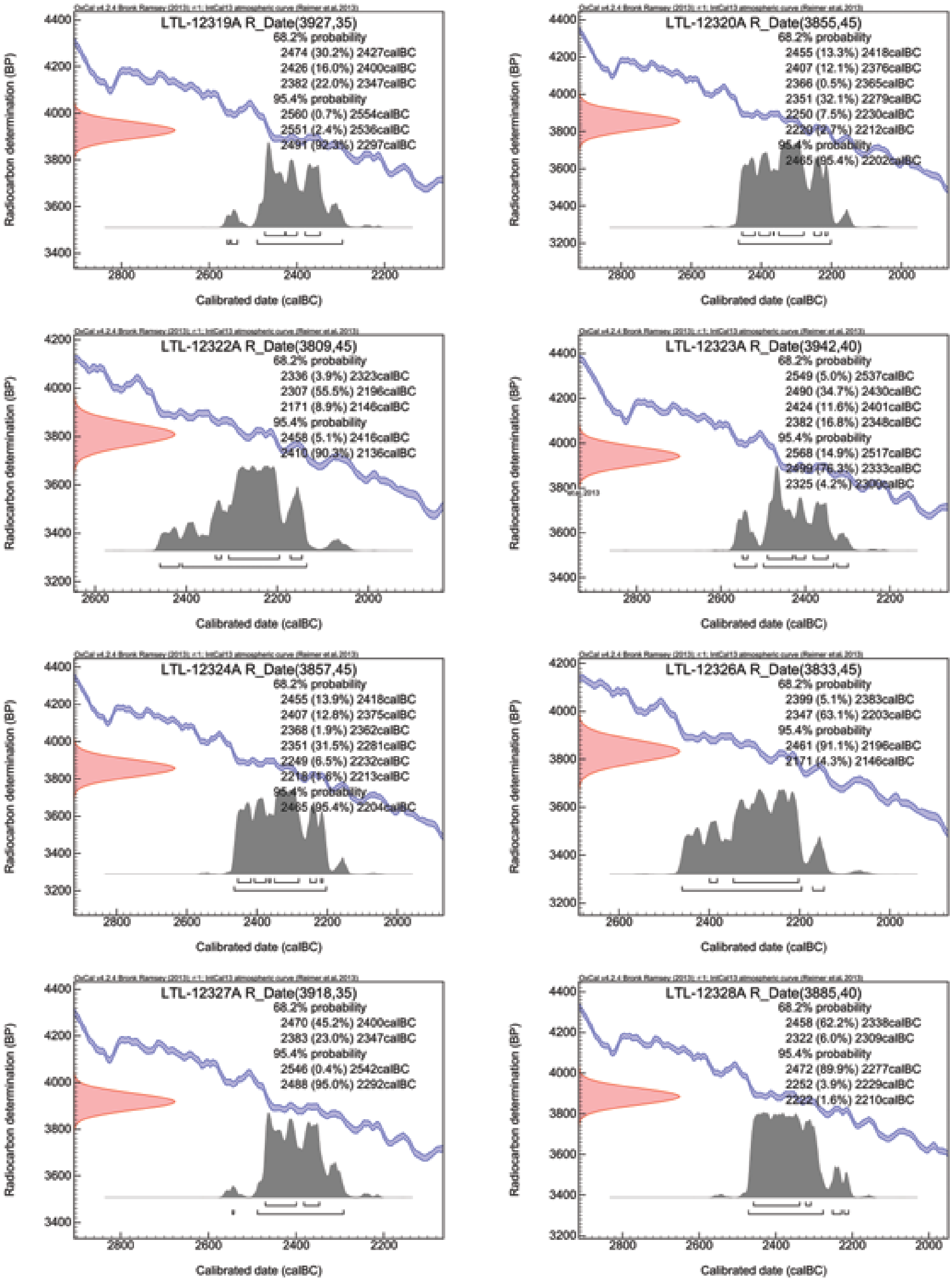

Figure 5.9. Radiocarbon dates from Ebla Early Bronze IVA. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

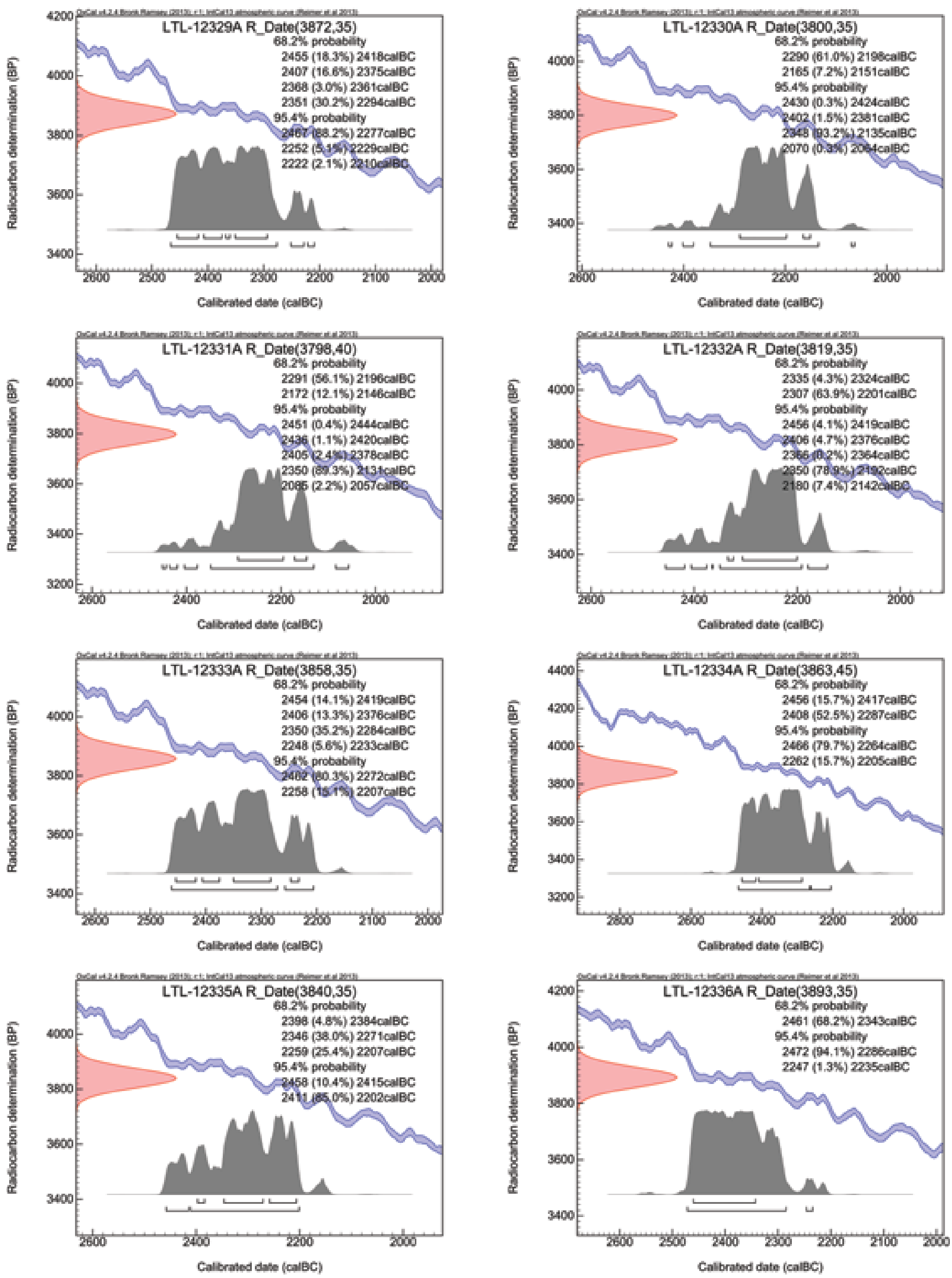

Figure 5.9 (*cont.*). Radiocarbon dates from Ebla Early Bronze IVA. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

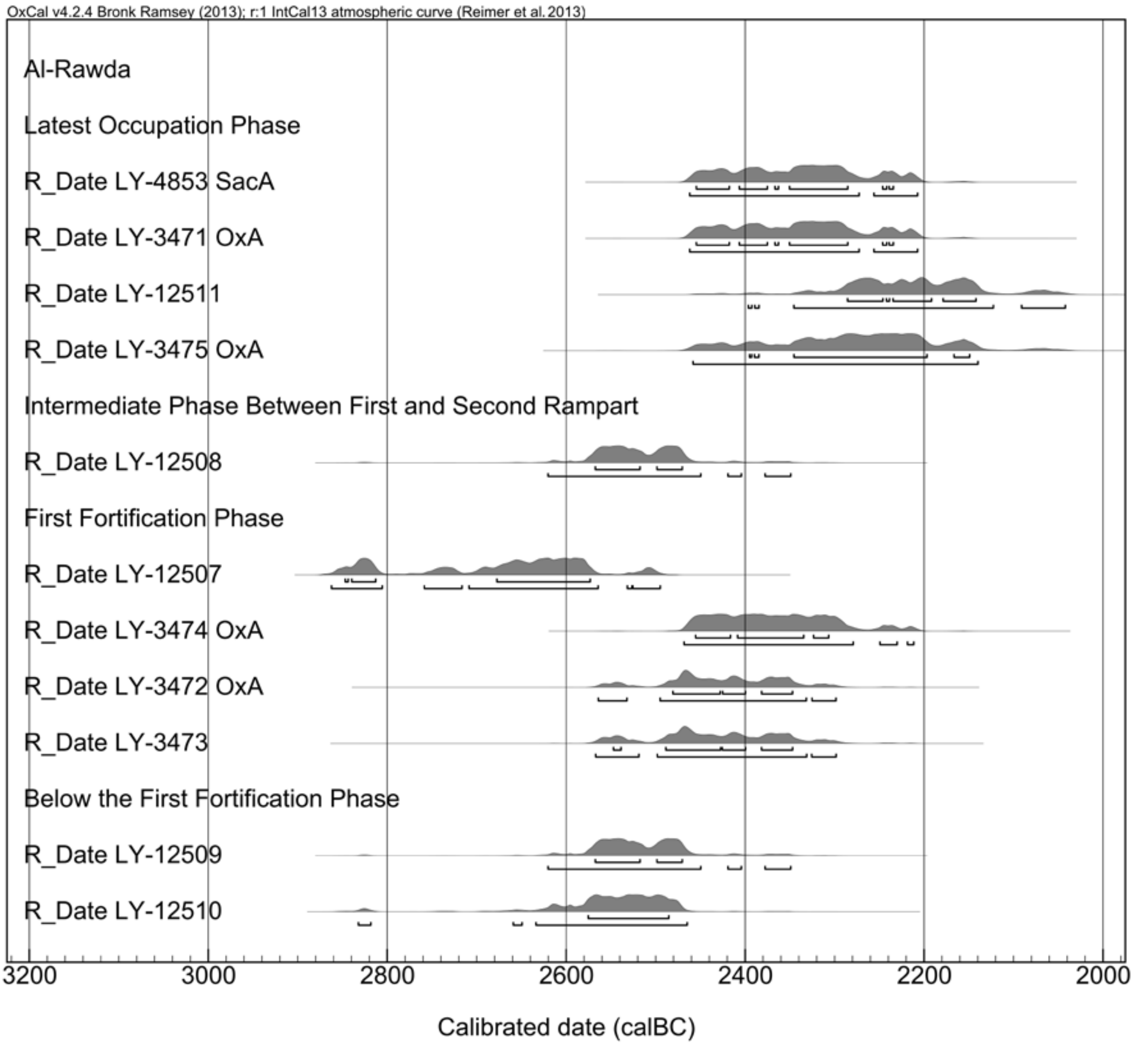

Figure 5.10. Radiocarbon dates from al-Rawda (after Bronk Ramsey 2013 and Reimer et al. 2013)

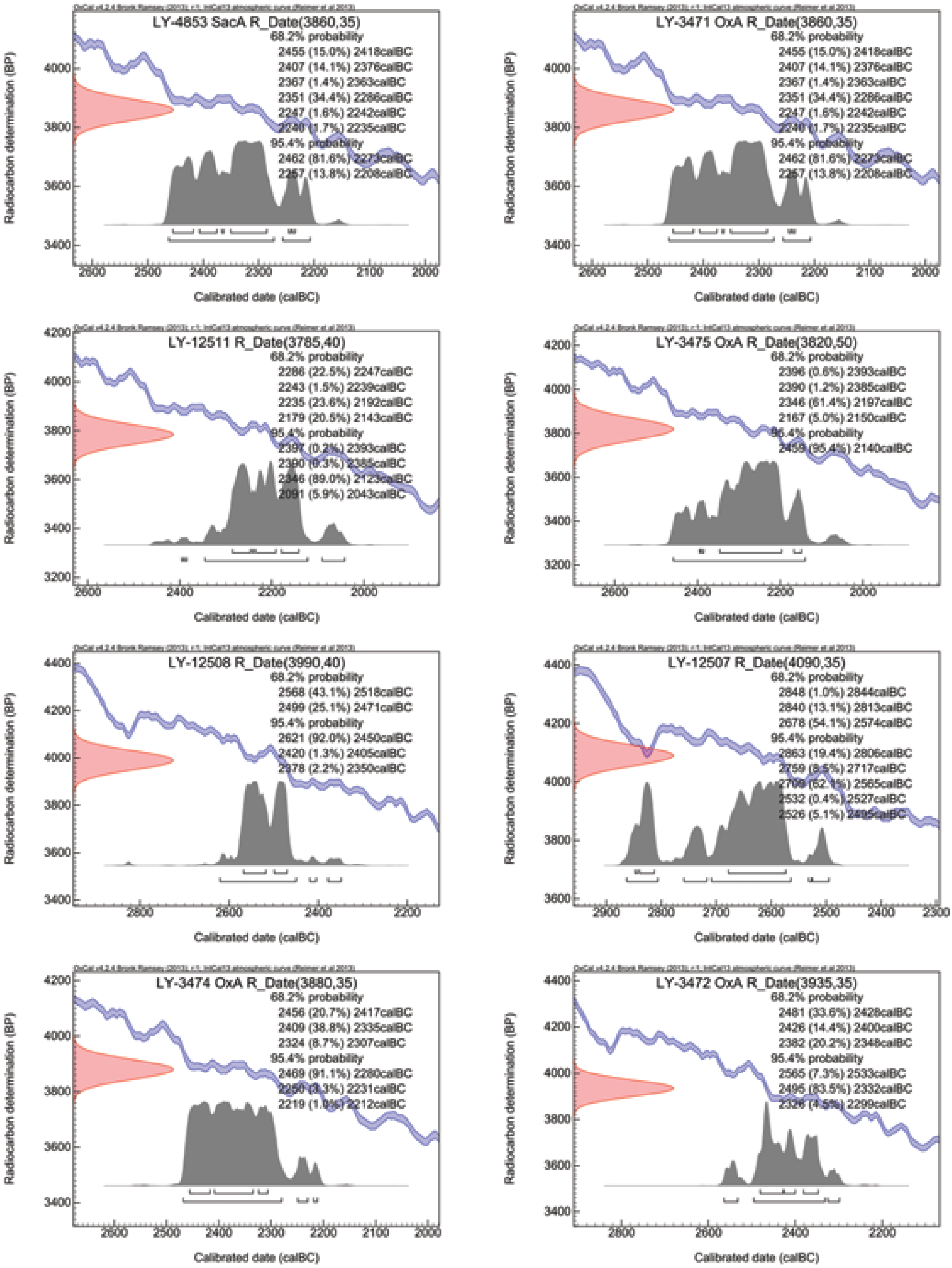

Figure 5.11. Radiocarbon dates from al-Rawda. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

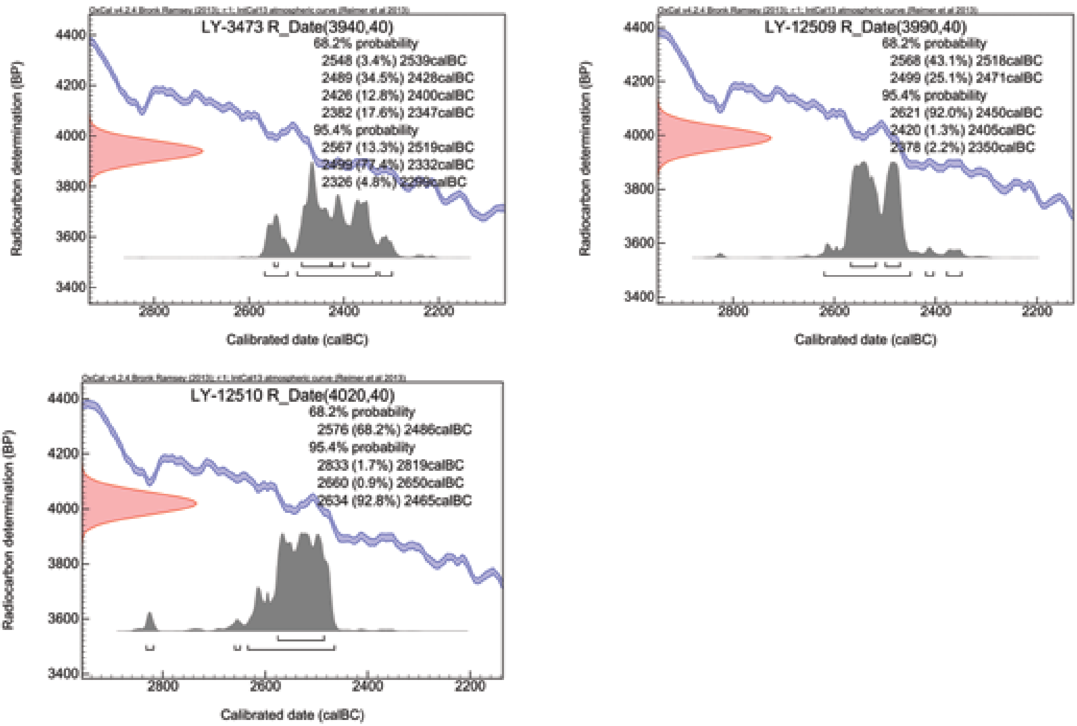

Figure 5.11 (*cont.*). Radiocarbon dates from al-Rawda. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

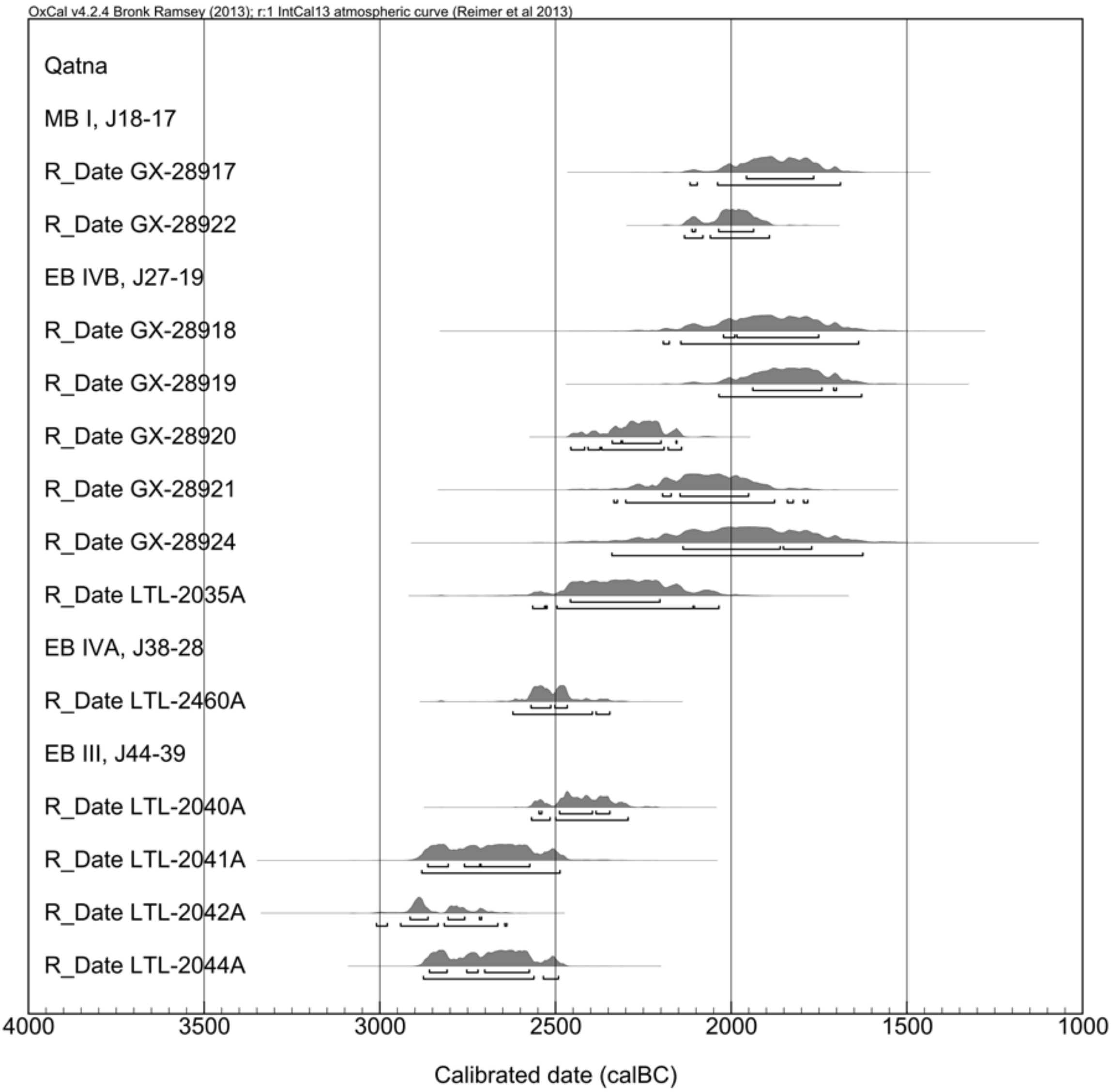

Figure 5.12. Radiocarbon dates from Qatna (after Bronk Ramsey 2013 and Reimer et al. 2013)

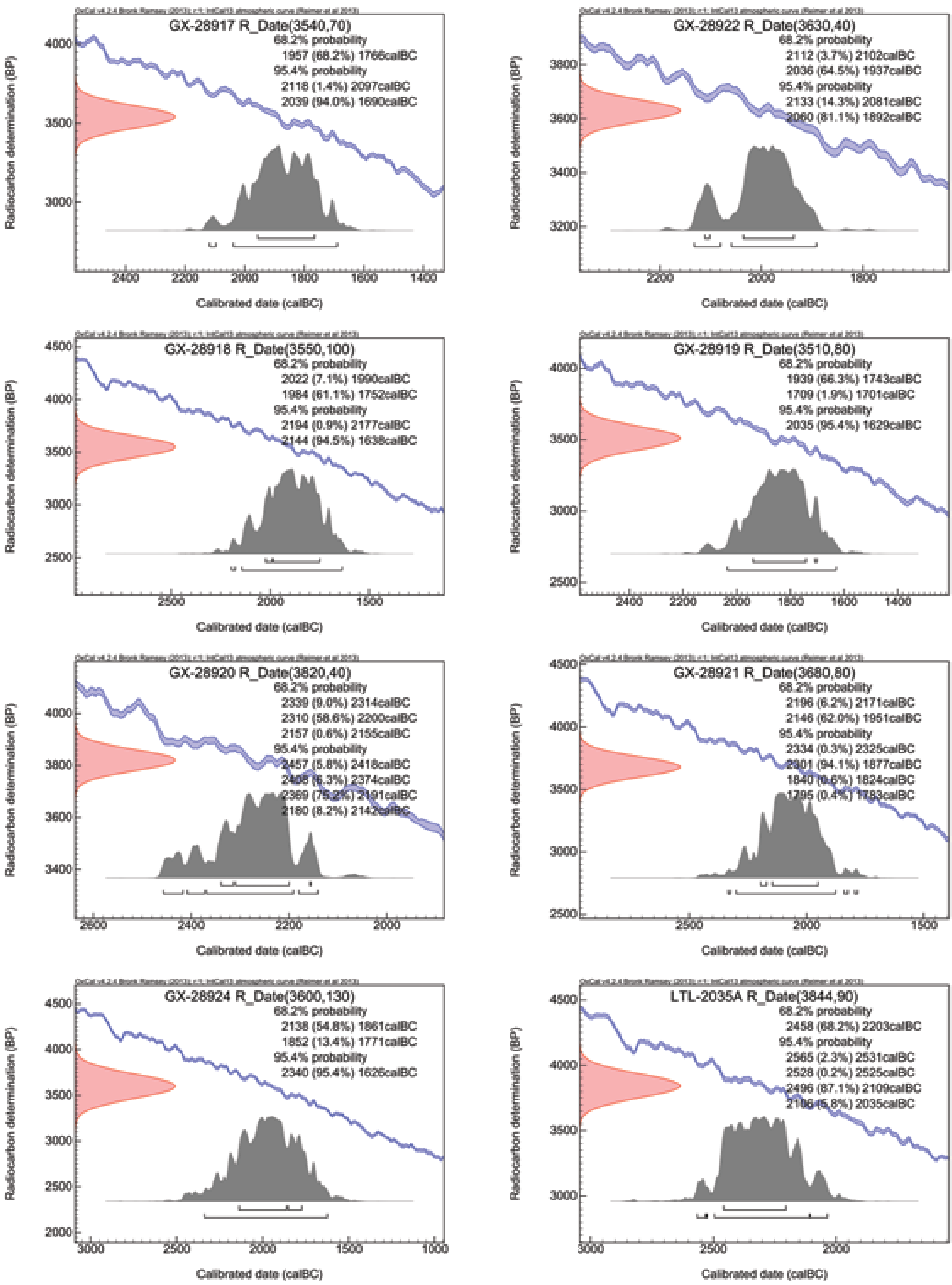

Figure 5.13. Radiocarbon dates from Qatna. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

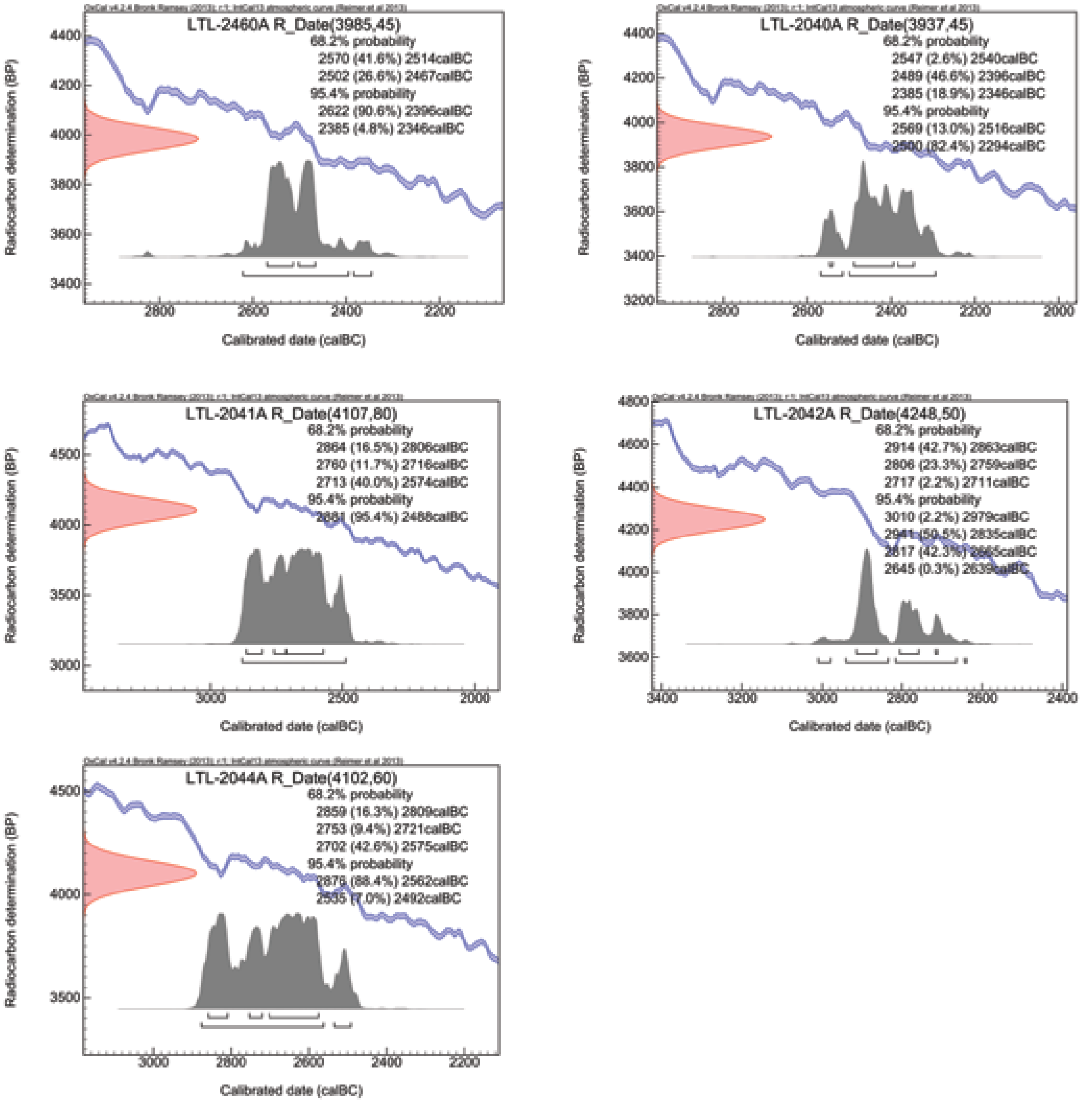

Figure 5.13 (*cont.*). Radiocarbon dates from Qatna. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

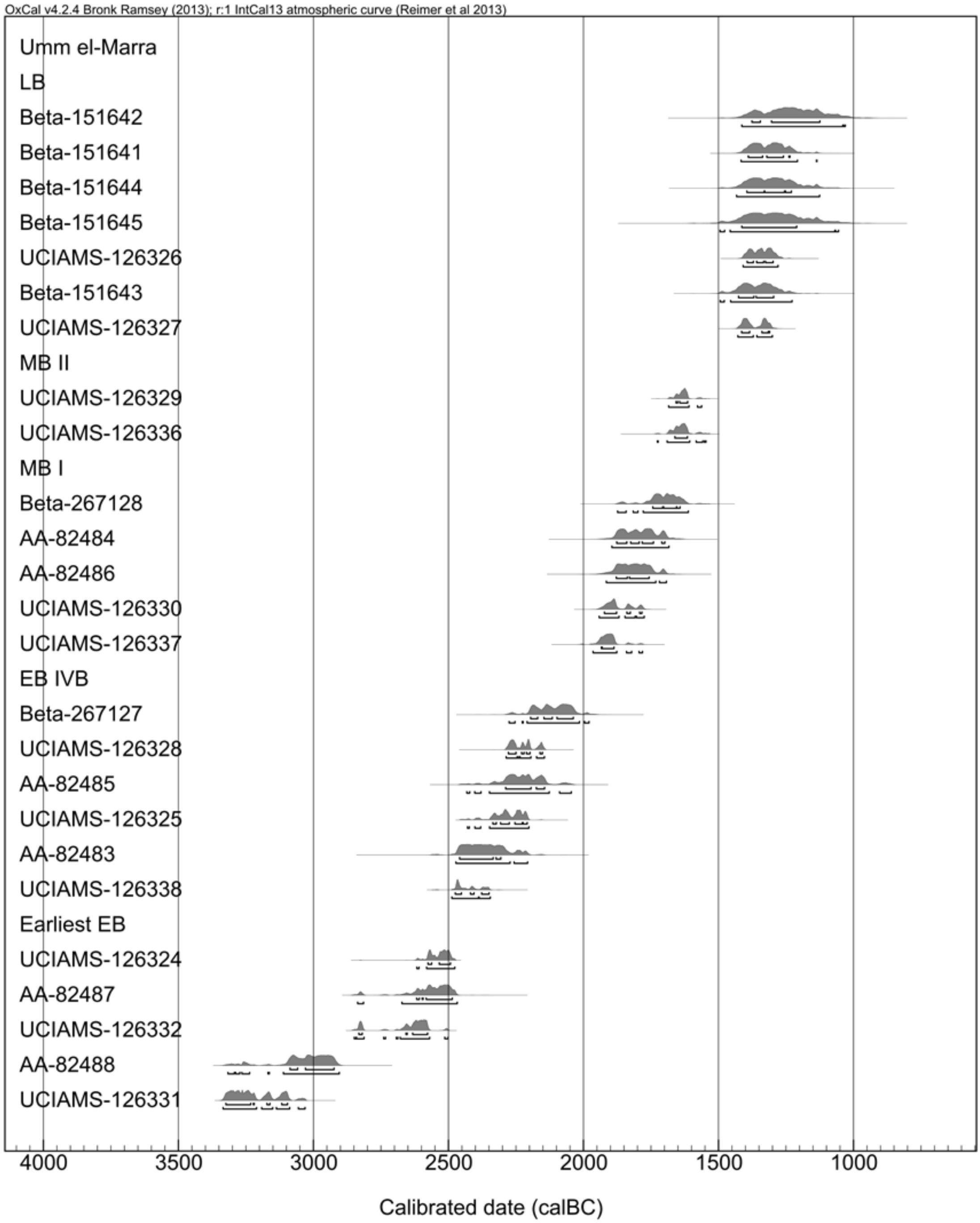

Figure 5.14. Radiocarbon dates from Umm el-Marra (after Bronk Ramsey 2013 and Reimer et al. 2013)

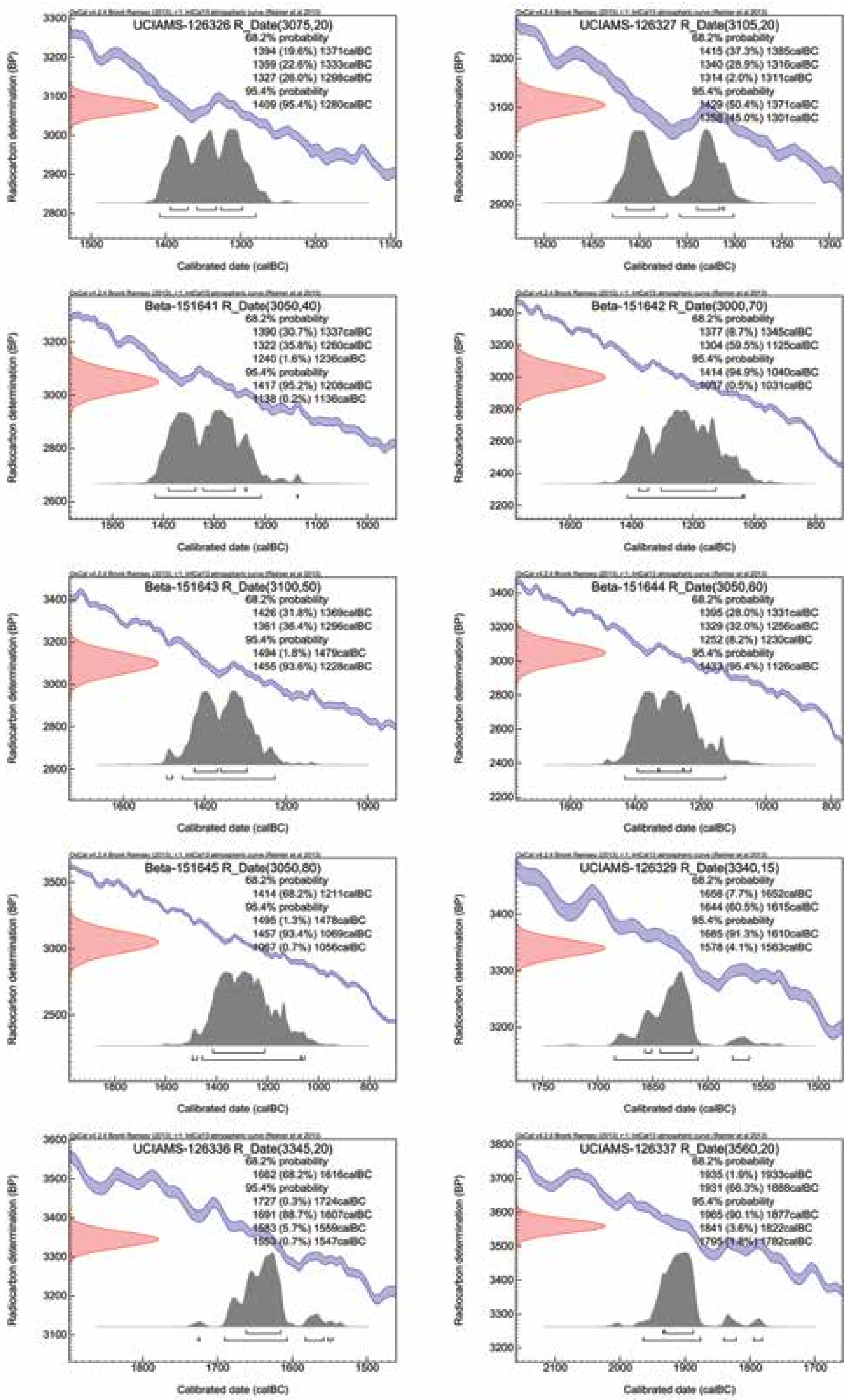

Figure 5.15. Radiocarbon dates from Umm el-Marra. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

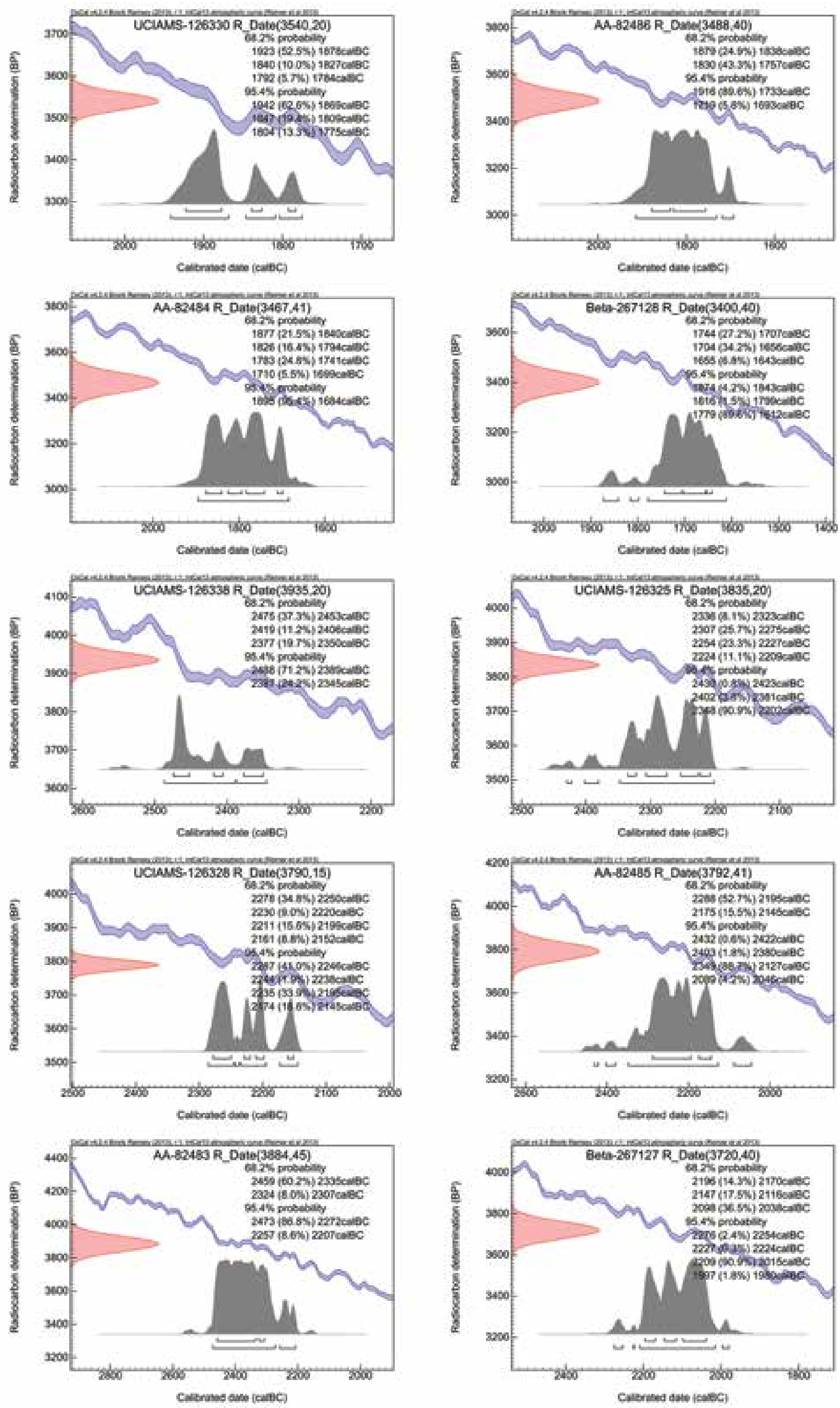

Figure 5.15 (*cont.*). Radiocarbon dates from Umm el-Marra. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

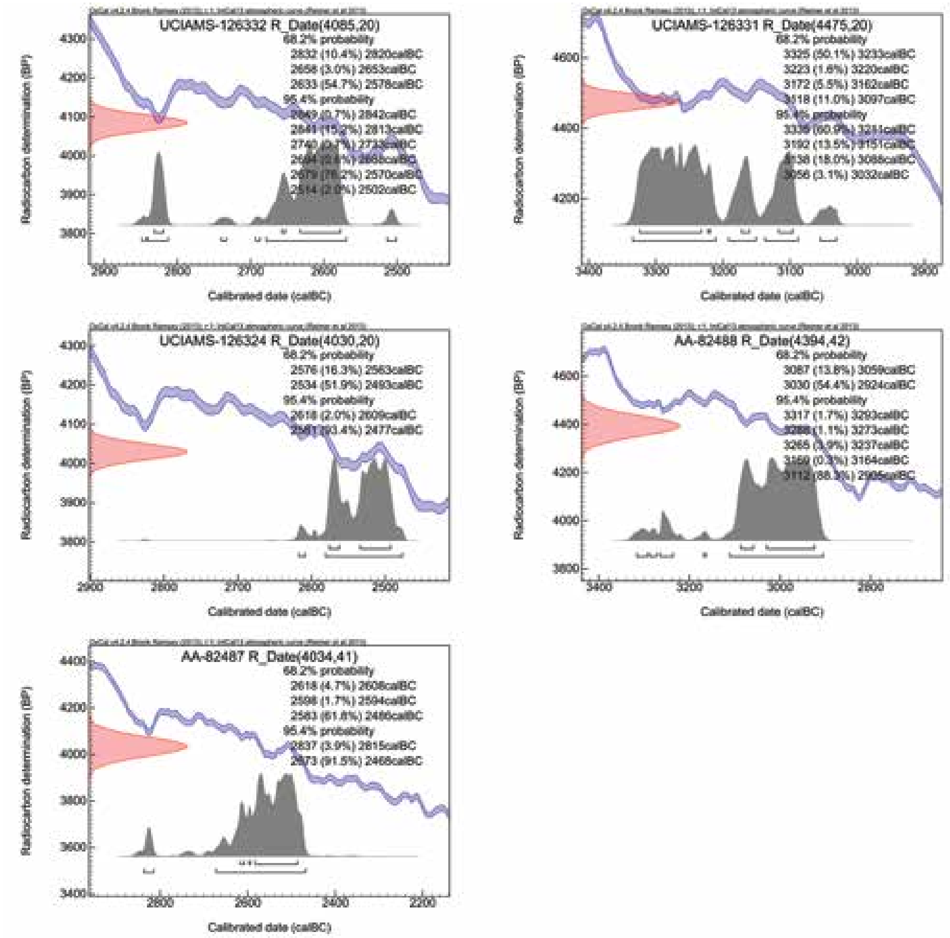

Figure 5.15 (*cont.*). Radiocarbon dates from Umm el-Marra. Uncalibrated B.P. date is listed at top, to right of sample number (after Bronk Ramsey 2013 and Reimer et al. 2013)

possible that the pottery styles in question were adopted gradually from east to west and appeared in upper Mesopotamia a century or more before their adoption in western Syria.

Concurrent Socio-Political Changes

Over the past two decades, archaeologists working in Syria and upper Mesopotamia have debated the character of socio-political developments in the transition from Early to Middle Bronze Age (Kuzucuoğlu and Marro 2007; Laneri, Pfälzner, and Valentini 2012). Stimulated by the provocative ideas of Harvey Weiss (Weiss et al. 1993) on the causal relationship between climate change and societal crisis, scholars have considered the issue with much vigor and not a little rancor. Some maintain that the late third millennium B.C. was a period in which the newly developed Syrian urban civilization experienced significant problems and even a collapse.[14] This phenomenon is largely observable from the abandonment or diminution of urban centers and smaller sedentary communities. One may infer political decentralization and economic downsizing as well. It is important to emphasize that these "problems" were particularly associated with elites and elite institutions, and it is possible that non-elite individuals profited from the phenomena in question (Schwartz 2007).

Archaeologists who interpret the data in terms of disruption, de-urbanization, and collapse have sought for causal variables, among which the most prominent (if the most controversial) is climatic aridification, in addition to factors such as human-induced environmental degradation and the effects of warfare. But on the other side of the issue, many scholars downplay or deny the existence of significant crises or collapse in the Early Bronze–Middle Bronze transition period.

At the conference organized by Catherine Kuzucuoğlu and Catherine Marro held in Lyon in 2005, I argued in favor of a *longue durée* approach and attempted to discern whether episodes of abandonment, site reduction, or political fragmentation were common ca. 3000–1600 B.C. in Syria, were limited to specific time spans, or were rare (Schwartz 2007). After reviewing the extant evidence, the results indicated that symptoms of collapse enumerated above were not "normal" but occurred in distinct clusters, primarily in the late third millennium and mid-second millennium B.C. Within those general time spans, however, the attestations of crisis were not perfectly synchronized but occurred in different times and places over a period of several centuries.

Data that have accumulated since that publication tend to be consistent with this argument. Here I briefly review some of the relevant information from western Syria, beginning with the abundant material from Ebla. At Ebla, there are major changes from the Early Bronze Age to the Middle Bronze Age, but no wholesale abandonment. After the burning of the site at the end of Early Bronze IVA, there is evidence for a reduction in site size and in the scale of public architecture. At the same time, energetic new building activities take place, including the construction of the Archaic Palace on the lower town north and new cultic buildings (Temples HH4 and HH5) above the ruins of the Early Bronze IVA Temple of the Rock. These and other new building projects (e.g., Temple D3 built above the Red Temple of Early Bronze IVA) indicate a large-scale institutional presence and a continuity in religious architecture in the Early Bronze IVB (Dolce 2009; Matthiae 2013a, 2013b).

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[14] See McAnany and Yoffee 2010 and Middleton 2012 for recent discussion and critique on archaeological uses of the concept of collapse.

A destruction at the end of the Early Bronze IVB at Ebla has been deduced from large quantities of ash associated with Early Bronze IVB sherds found in the core of the town's rampart, which was constructed in the Middle Bronze period (Matthiae 2009).[15] The ash and its ceramic contents were presumably recycled from in situ Early Bronze IVB contexts within the site.

The shift from the Early Bronze IVB to the Middle Bronze Age at Ebla sees a dramatic intensification and reorganization of urban activity, with a major program of temple, palace, and city wall construction. Alongside these major changes, evidence of cultural continuity between the Early and Middle Bronze at Ebla has been cited, including the replication of the size and fortified nature of the site, construction of new temples atop the remains of Early Bronze IVB cultic structures, common artistic representations of royalty in the Early and Middle Bronze, and employment of Middle Bronze royal names referencing those of the Early Bronze (Pinnock 2009). It should be noted that the latter phenomena could indeed signal continuity, but this may not contradict the possibility of disruption and crisis between Early and Middle Bronze. For example, Lauren Ristvet (2012, 2015) has proposed that rulers of new Middle Bronze polities in the Syrian Jezireh, presiding after an episode of decentralization and deurbanization at the end of the Early Bronze, deliberately attempted to communicate their ties to the earlier "golden age" of the Early Bronze Age through titular and material culture references.

At Ebla, the ceramic assemblage changes abruptly from the Early to Middle Bronze, without any transitional period mixing types from both periods. If we expect the evolution from Early to Middle Bronze to include a transitional phase, as in the middle Euphrates, the abrupt Early to Middle Bronze shift at Ebla could signal a brief hiatus. The same phenomenon has been inferred at Hama in the Orontes region south of Ebla in the transition from period J to period H (Nigro 2002, table 7, p. 101).

A transitional assemblage *is* said to be evident at Tell Afis, in the environs of Ebla to its northwest, in the E3 workshop area containing vessels in situ that combine Early and Middle Bronze traits (Felli and Mazzoni 2007; Mazzoni 2013). The excavators interpret this result to signify occupational continuity from the Early to Middle Bronze. Such continuity is also inferred at Tell Tuqan, although from less substantial evidence, where extensive occupation in Early Bronze IVB is followed by an Middle Bronze I settlement. The Middle Bronze I occupation at Tuqan includes the recycling of much Early Bronze IVB material in a newly constructed city wall, as was the case at nearby Ebla (Baffi and Peyronel 2013).

Occupational and cultural continuity is also inferred at Qatna (Tell Mishrifeh), south of Hama, with no evidence for a break in occupation. But, like Ebla, Qatna saw a major period of urban change with the shift from Early to Middle Bronze. In Early Bronze IV, the northern acropolis was occupied by a domestic quarter, while the acropolis summit was the locus of a sequence of large-scale grain storage and processing facilities (Morandi Bonacossi 2009). In the Middle Bronze Age, the site expanded dramatically from a 25 ha circular town to a 100 ha square metropolis demarcated by massive earthen ramparts. Atop the previous grain storage emplacements, a large-scale pottery workshop including multiple kilns was installed, with a new monumental construction (Building 8) to its west. In the northern acropolis, the former domestic quarter was replaced by a large cemetery.

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[15] But see Mazzoni 2013, p. 47, for an interpretation of gradual decline rather than a single catastrophic event — and note also that neither the Archaic Palace nor Temples HH4 and HH5 suffered burning.

As was the case with Ebla, Qatna did not experience long-term abandonment in the transition from Early to Middle Bronze, but evidence from early Middle Bronze at both sites reveals that very substantial changes in the organization of urban life coincided with the change from the Early to Middle Bronze. As Frances Pinnock notes (2009, p. 79), the continuities between the Early and Middle Bronze Ages should not obscure the distinct differences between the two periods.

Survey results in the Orontes and Ebla regions generally lack conspicuous evidence for any dramatic decline in sedentary occupation in the late Early Bronze or early Middle Bronze (Mazzoni 2013; Morandi Bonacossi 2014, p. 417). However, it must be acknowledged that an occupational hiatus of relatively brief duration (e.g., one or two centuries) may not be discernible from survey, which is typically restricted to grossly defined material culture periods such as the Early Bronze IV and Middle Bronze.

Reviewing the data presented thus far for Early–Middle Bronze western Syria, we can observe that Morandi Bonacossi's assertion of continuity and lack of crisis in western Syria is more or less upheld by the evidence, although possibilities of small-scale occupational gaps may exist. But when we proceed to more easterly zones in our region, the situation changes. For example, the "arid margins" on the fringe of the settled area east of Ebla and Hama that had seen a marked proliferation of towns and villages in the Early Bronze IV are bereft of sedentary occupation in the Middle Bronze I (Geyer et al. 2007). The distinctive round settlements in the vicinity of the "Très Long Mur" such as Tell al-Rawda, Tell es-Sur, and Tell Shaʾirat are abandoned prior to the end of the Early Bronze IVB, that is, before "EB IVC" (Castel and Peltenburg 2007; al-Maqdissi 2010; al-Maqdissi and Ishaq 2012).

A similar desertion of eastern, dry steppe zones might also be noted from archaeological survey in the Qatna region. In the Qatna survey area, the Early Bronze IV sees the first major dispersion of settlements across the region (Morandi Bonacossi 2007), but there is a significant depopulation of the drier Wadi Mydan region east of Qatna with the onset of the Middle Bronze Age (cf. Wilkinson et al. 2014, fig. 3a).

To the north, a comparable pattern can be recognized in the Jabbul plain between Aleppo and the Euphrates valley. At Umm el-Marra, the largest Bronze Age site of the area, occupation began in the earlier third millennium B.C. and soon included the establishment of a large and unusual elite mortuary complex on the site acropolis, in use from Early Bronze III to IVB (Schwartz 2013a). But after the Early Bronze IVB layers there is strong evidence of a gap in occupation until later Middle Bronze I (Schwartz and Miller 2007). Ceramically, the earliest Middle Bronze material at Umm el-Marra resembles that of Ebla IIIA2 (Middle Bronze IB), with little evidence of Middle Bronze IA or an Early-Middle Bronze "transitional" assemblage (Schwartz and Miller 2007). Similarly, a set of radiocarbon dates (table 5.5) taken from the latest Early Bronze and earliest Middle Bronze levels on the Umm el-Marra acropolis indicate an occupational hiatus.[16] In these samples, the late Early Bronze dates are well within the last few centuries of the third millennium B.C., while those of early Middle Bronze range from ca. 1900 to 1700 B.C., and the 2σ-ranges of the two sets of dates show no overlap. Thus a significant break between Early and Middle Bronze at the site is indicated.[17]

[16] In table 5.5, the latest Early Bronze IVB samples are Beta-267127, AA-82483, and AA-82485; the earliest Middle Bronze samples are Beta-267128, AA-82484, and AA-82486.

[17] Table 5.5 and figs. 5.14 and 5.15 provide additional dates from the different periods at Umm el-Marra, including newly processed samples from the Late Bronze destruction level in West Area A and from late Middle Bronze II in Northwest Area A.

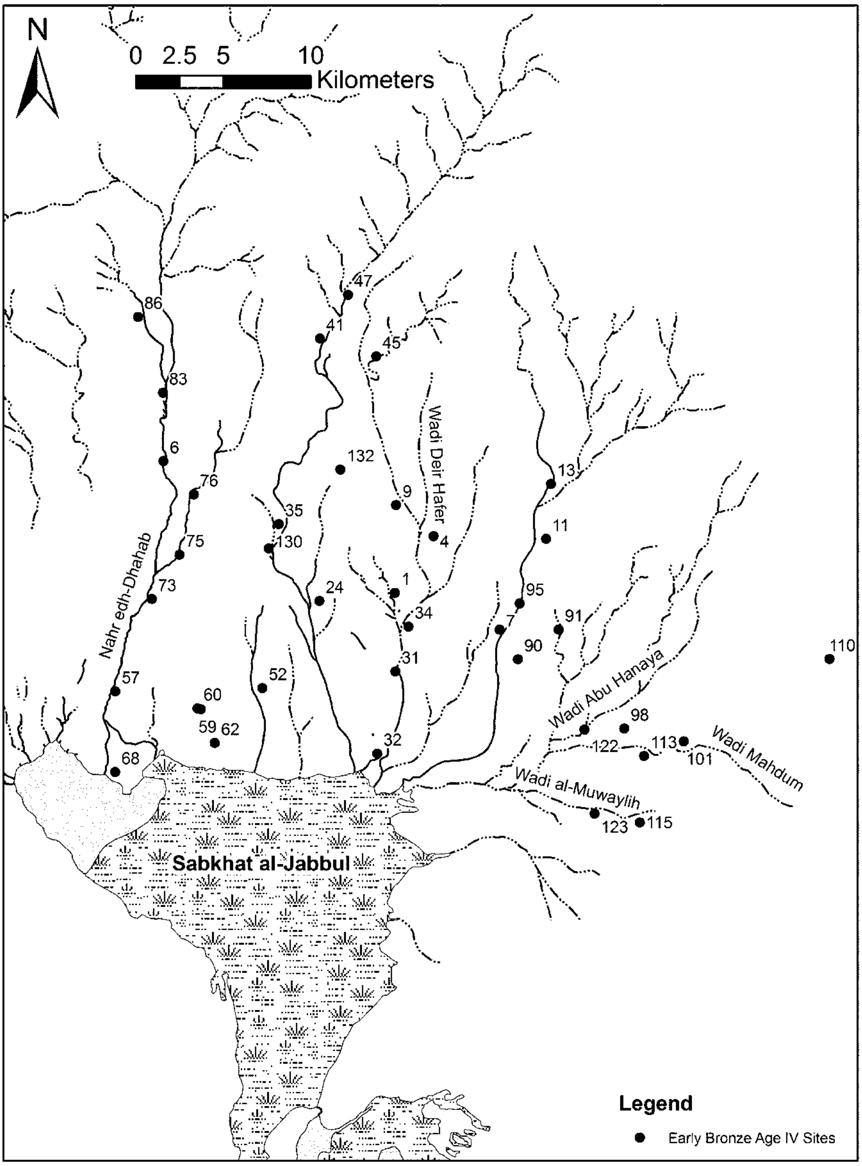

Figure 5.16. Settlement distribution in the Early Bronze IV, Jabbul plain (after Yukich 2013, fig. 5.7)

Similar indications of site abandonment are observable from the results of the survey of the Jabbul plain conducted in 1996 (Schwartz et al. 2000), with modifications and analyses provided by Sarah Yukich (2013). A decrease in the number of sites from Early Bronze IV to the Middle Bronze, from thirty-eight in the Early Bronze (fig. 5.16) to twenty-seven in the Middle Bronze (fig. 5.17) is noted,[18] and, more significantly, a major change in the spatial distribution of sites. In the Early Bronze, all areas of the survey region were occupied, including

[18] The initial report (Schwartz et al. 2000) stated that the apogee of settlement in the Early Bronze was followed by a crash with very few Middle Bronze I sites, but Yukich (2013) identified many more Middle Bronze I sites than previously documented.

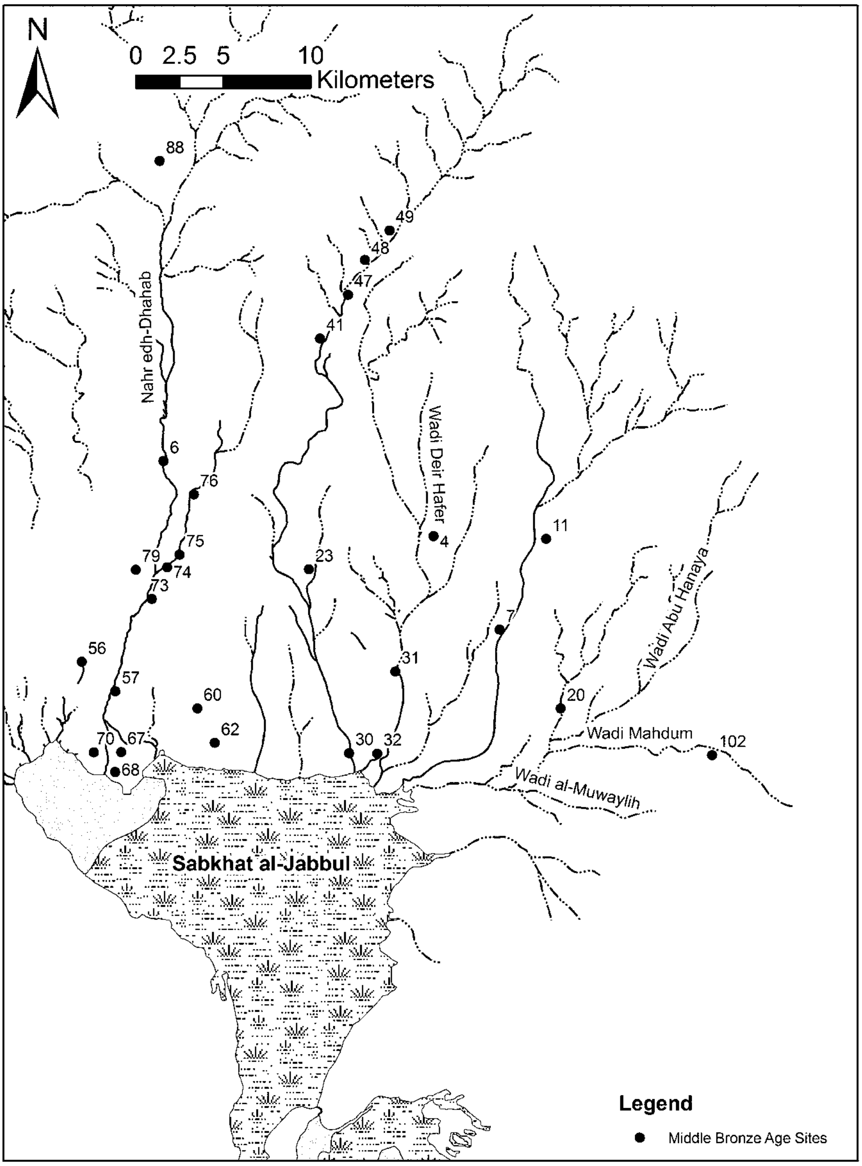

Figure 5.17. Settlement distribution in the Middle Bronze Age, Jabbul plain (after Yukich 2013, fig. 5.14)

the drier zones to the east. In the Middle Bronze, the eastern drier areas were mostly abandoned. Since the aggregate occupied site area remained more or less constant, it is likely that the population of the eastern communities migrated to the wetter western zones.[19]

[19] Presumably, when Umm el-Marra was reoccupied in later Middle Bronze I, the population originated in those wetter regions of the western Jabbul. See Finkelstein and Langgut 2014 for the proposal that a dry climate episode in the early second millennium B.C. Levant resulted in population movement from drier to wetter regions.

In the Syrian middle Euphrates area, the general pattern that can be observed is of a set of abandonments in the late Early Bronze and early Middle Bronze Age, along with some sites evincing varying degrees of continuity (Cooper 2012). In the Tishrin Dam region south of the Turkish border, occupation at Jerablus Tahtani ends by Early Bronze IVB, and Shiukh Tahtani and Qara Quzaq appear to have a hiatus between Early Bronze IV and Middle Bronze I. Banat, a wealthy and presumably powerful center perhaps to be identified as ancient Armi, is abandoned by the Early Bronze IVB except for its clifftop citadel (Porter 2007; Otto and Biga 2010).[20] While nearby Tell Kabir survives longer into the second millennium B.C., it is abandoned in the Middle Bronze Age (Porter 2007).[21]

South of the Tishrin area is the Tabqa Dam salvage region, situated around the great bend of the Euphrates. In this region, Selenkahiye was abandoned in Early Bronze IVB (van Loon 2001), Tell Sweyhat was reduced in size and then abandoned in the early Middle Bronze (Danti and Zettler 2007), and Tell al-ᶜAbd was also deserted by the early Middle Bronze (Finkbeiner 1995). Other sites have possible settlement breaks or reductions between the Early and Middle Bronze Age.[22]

Conclusions

Returning to Morandi Bonacossi's comments on the relatively minimal evidence for collapse in western Syria, I find that his observations are correct — but with a significant exception. It is indeed the case that sites like Ebla, Qatna, Afis, and Tuqan in wetter, agriculturally prosperous regions in western Syria display relatively little evidence for existential crises. However, loci in the marginal, drier zones, like the steppe fringe where Rawda and other circular settlements are located, Umm el-Marra and the eastern Jabbul plain, and the middle Euphrates valley, exhibit substantial evidence for the abandonment of sedentary communities in the Early to Middle Bronze transition.

The marginal, dry area in question is comparable to the "Zone of Uncertainty" discussed by Tony Wilkinson and his colleagues in the Fragile Crescent Project (Wilkinson et al. 2014) (see fig. 5.1). This area, receiving 180/200–300 mm rainfall per year, was first settled substantially in the mid-third millennium B.C., probably under the auspices of elites willing to take the risks inherent in cereal agriculture or sheep/goat pastoralism in return for a sizeable profit in the good years. For example, one can imagine that Ebla and its urban peers would have been especially interested in the sheep-herding opportunities of the steppe fringe, given their economic focus on wool production (Castel and Peltenburg 2007). The settlements in the region may also have served as farming villages and trade nodes.

But these newly exploited zones experienced significant degrees of abandonment during the Early to Middle Bronze transition. Many sites — or entire regions — were deserted or were

[20] The latter suffered several destructions and a change of character in the Early to Middle Bronze transition (Otto and Biga 2010).

[21] There is no evidence yet presented for a gap in occupation between Early and Middle Bronze layers at Tell Amarna and Tell Ahmar, although details on the relevant ceramic subphases have yet to be presented.

[22] Hadidi is reduced in size from the Early to the Middle Bronze, and Munbaqa might have been abandoned at the end of Early Bronze IVB and has a diminished size in the Middle Bronze. It is not clear if Halawa A suffered abandonment between the Early and Middle Bronze, but there are major changes in the layout and character of the town. Continuous occupation might be inferred at Habuba Kabira North and Emar on the basis of evidence thus far presented (Cooper 2006; Porter 2007; Schwartz 2007).

substantially reduced in size. The abandonments were not perfectly synchronized; rather, they show a variable temporal pattern from region to region, both within western Syria and beyond.[23] These results suggest that the chronology and character of the changes in settlement patterns differed in each location and were dependent on local political, economic, and environmental processes. Similar observations have been made about the Classic Maya "collapse," with James Aimers (2007, p. 330) noting that the phenomenon "varied regionally and sometimes by site."

Whether the abandonments in the drier zones were the result of climatic or environmental change remains to be elucidated.[24] As Wilkinson et al. (2014) note, the high-risk enterprises in the marginal locations would have been more vulnerable to vagaries in climate, trade, and politics than economic activities taking place in the wetter regions.[25] If the drier areas experienced declining rainfall in the late Early Bronze Age, they would have been less amenable to agricultural exploitation than in the preceding wetter period. But if the central institutions changed for reasons other than environmental stress, such as political retrenchment or military defeat, the associated settlements in the drier zones could have likewise been destabilized or abandoned due to a lack of resources or will to sustain them.

When considering the possible reasons for site abandonments and other phenomena understood as symptoms of urban crisis or collapse, it would be useful to consider the dauntingly long list of possible proximate causes supplied by Aimers for the Classic Maya collapse (Aimers 2007, table 1). In Early to Middle Bronze west Asia, it may be necessary to explore a similar diversity of factors before reaching consensus.

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[23] See, in this volume, Manning's apt observation that drought would have differential effects in different parts of the region and would occur in different zones at different times, as opposed to a single event across all of western Asia.

[24] For recent discussions of this problem, see Danti 2010; Matney 2012; McMahon 2012; Ur 2014; Weiss 2014.

[25] Along similar lines, Mazzoni (2013) suggests a shift from a palatial economy in the Early Bronze IV to an economy dominated by private households in the early Middle Bronze, and the consequent abandonment of the high-risk dry steppe zone.

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Part II

Mesopotamia

6

"Seventeen Kings Who Lived in Tents"

Harvey Weiss, Yale University

"The formula of the Naturalistic narrative is simple; it is one-way traffic: the description determines the action." (Ibisch 1982, p. 102)

The 4.2–3.9 ka B.P. Abrupt Climate Change Event

Annual precipitation in the Mediterranean and west Asia is guided by the North Atlantic Oscillation (Kushnir and Stein 2010; Cullen et al. 2002) and delivered by the Mediterranean westerlies that pass through the Mediterranean trough to west Asia (Lionello, Malanotte-Rizzoli, and Boscolo 2013). Century-scale megadrought interruptions of the westerlies, at unexplained millennial periodicities — 8.2, 5.2, 4.2, 3.2 ka B.P. —reduced cultivable dry-farming areas in the eastern Mediterranean and west Asia and forced adaptive social responses among varied polities, economies, and agricultural regimes. During the 4.2–3.9 ka B.P. (ca. 2200–1900 B.C.) megadrought, which reduced precipitation in west Asia 30–50 percent, these adaptations — political collapse and regional desertion, habitat tracking, nomadization — are evident archaeologically and epigraphically (Weiss 2014; Weiss 2015). Many social-process details within these transitions, however, remain obscured by absent or low-resolution archaeological and epigraphic data, the targets for a new generation of researchers.

The frame of the 4.2 ka B.P. event's North Atlantic chronology and magnitude is now available within the records of Icelandic lakes (Geirsdóttir et al. 2013) and the sequence of North Atlantic Oscillation anomalies (Olsen, Anderson, and Knudsen 2012). The high-resolution chronological boundaries of these records are reflected in the synchronous Mediterranean westerlies paleoclimate proxies that are distributed across seven regions:

Coastal Spain, France, and North Africa

Doñana National Park (Jiménez-Moreno et al. 2015), Sierra de Gador (Carrión et al. 2003), Cova da Arcola (Railsback et al. 2011), Borreguiles de la Virgen (Jiménez-Moreno and Anderson 2012), Lake Montcortès (Scussolini et al. 2011), Puerto de Mazzarón (Navarro-Hervás et al. 2014), Cueva de Asiul (Smith et al. 2016), Lake Estanya (Morellón et al. 2009), Ojo Guraena Karst Complex (Cruz et al. 2015), Lac Petit (Brisset et al. 2013), Lake Sidi Ali (Zielhofer 2017), Gueldaman Cave (Ruan et al. 2015).

Central Mediterranean Italian Lakes

Lago di Pergusa (Sadori et al. 2013; Peyron et al. 2013), Bucca della Renella (Drysdale et al. 2006; Zanchetta et al. 2016). Lago Alimini Piccolo (Di Rita and Magri 2009), Maar lakes (Magri and Parra 2002; Magri and Sadori 1999), Lake Accessa (Magny et al. 2007; Peyron et al. 2013; Magny et al. 2013), Lago Preolo (Magny et al. 2011), Corchia Cave (Regattieri et al. 2014; Zanchetta et al. 2016).

Greece and Albania

Lake Lerna (Jahns 1993), Osmananga Lagoon, Pylos (Zangger et al. 1997), Lake Vrana (Schmidt et al. 2000), Lake Prespa (Leng et al. 2010), Lake Shkodra (Zanchetta et al. 2012; Mazzini et al. 2015; Sadori et al. 2014), Lake Ohrid (Wagner et al. 2009), Lake Dojran (Francke et al. 2013), Lake Vrana (Schmidt et al. 2000), Aegean Sea (Ehrmann et al. 2007; Kuhnt et al. 2008; Triantaphyllou et al. 2014), Kotychi Lagoon (Haenssler et al. 2014), Alepotrypa Cave (Boyd 2015).

Levant and Red Sea

Acre (Kaniewski et al. 2014), Tweini (Kaniewski et al. 2008), Dead Sea (Migowski et al. 2006), Zeelim, Dead Sea (Langgut et al. 2014), Sedom, Dead Sea (Frumkin 2009), Soreq Cave (Bar-Matthews and Ayalon 2011), Shaban Deep (Arz, Lamy, and Pätzold 2006), central Red Sea (Edelman-Furstenberg, Almogi-Labin, and Hemleben 2009), Lake Hula (Baruch and Bottema 1999), Lake Tiberias (Finkelstein and Langgut 2014), Jeita Cave (Cheng et al. 2015; Verheyden et al. 2008), Tell Sukas (Sorrel and Mathis 2016).

Anatolia

Konya lakes (Roberts et al. 1999; Leng et al. 1999; Reed, Roberts, and Leng 1999), Göl Hissar Gölü (Eastwood et al. 1999; Eastwood et al. 2007; Leng et al. 2010), Eski Açigöl (Roberts et al. 2001), Koçain Cave (Göktürk 2011), Abant Gölü (Bottema 1997), Yeniçağa Gölü (Bottema 1997), Söğütlü Marsh (Bottema 1997), Lake Iznik (Ülgen et al. 2012), Yenişehir (Bottema, Woldring, and Kayan 2001), Arslan Tepe (Masi et al. 2013), Göbekli (Pustovoytov, Schmidt, and Taubald 2007), Lake Van (Lemcke and Sturm 1997; Wick, Lemcke, and Sturm 2003), Lake Tecer (Kuzucuoğlu et al. 2011), Nar Lake (Dean et al. 2015), Sofular (Göktürk et al. 2011; Fleitmann et al. 2009; Jones, Fleitmann, and Black 2016).

Persian Gulf

Gulf of Oman (Cullen et al. 2000), Awafi (Parker et al. 2006; Parker and Goudie 2008), Qunf Cave (Fleitmann et al. 2003).

Black Sea, Caspian Sea, Iranian Plateau

Lake Zeribar (Stevens, Wright, and Ito 2001), Lake Mirabad (Stevens et al. 2006; Schmidt et al. 2011), Lake Maharlu (Djamali et al. 2009), Black Sea (Cordova and Lehman 2005), Caspian Sea (Leroy et al. 2007; Leroy et al. 2014), Iranian plateau (Carolin et al. 2016).

Significant as well are the synchronous African and Indus proxy records that measure Nile flow and Indus precipitation, functions of the Indian summer monsoon as it passes across the Arabian Sea between the subcontinent and the Horn of Africa. The 4.2 ka B.P. event not only disrupted the Indian summer monsoon (Berkelhammer et al. 2012; Dixit, Hoddell, and Petrie 2014), northeast African precipitation (Marshall et al. 2011; Revel et al. 2014), and consequent Nile flow (Hassan and Tassie 2006), but also Saharan precipitation, as at Lakes Yoa (Kröpelin et al. 2008; Lamb et al. 2000) and Jikariya (Wang et al. 2008), where the aridification and dust event created the likely sources of African dust in Tuscany (Magri and Parra 2002). From Lakes Yoa and Jikariya, the westernmost proxy evidence for the event in central Africa is the Gulf of Guinea (Weldeab et al. 2005). In southern Africa the event is documented to the 30° latitude (Chase et al. 2010; Schefuss et al. 2011).

Some proxy data suffer from lengthy sampling intervals that preclude observation of century-scale events or source events — for example, Jeita Cave (Verheyden et al. 2008; Cheng et al. 2016) and Tell Sukas (Sorrel and Mathis 2016) with poor dating, confusion of wild and domesticated Olea, and misassignment of Olea, a component of dry-shrub steppe. So, too, some proxies are situated in regions where the Intertropical Convergence Zone or Black Sea orography may obscure signal clarity (Fleitmann et al. 2003; Jones, Fleitmann, and Black 2016), and some anomalies, such as Lake Bosumtwi, occur without obvious explanation but are surrounded by other robust proxies. The cumulative evidence now, however, revises prior uncertainties (Finné et al. 2011), including those from low-resolution Anatolian lake dating (e.g., Roberts et al. 2011), and indicates the event's synchronicity across the Mediterranean (fig. 6.1) (Zanchetta et al. 2012; Zanchetta et al. 2016; Carozza et al. 2015).

The range of temporal resolution of the proxy excursions at 4.2–3.9 ka B.P. is provided by linear interpolation across uranium/thorium- (U/Th) or radiocarbon- (^{14}C) dated points for measured quantities of stable isotopes, arboreal and other

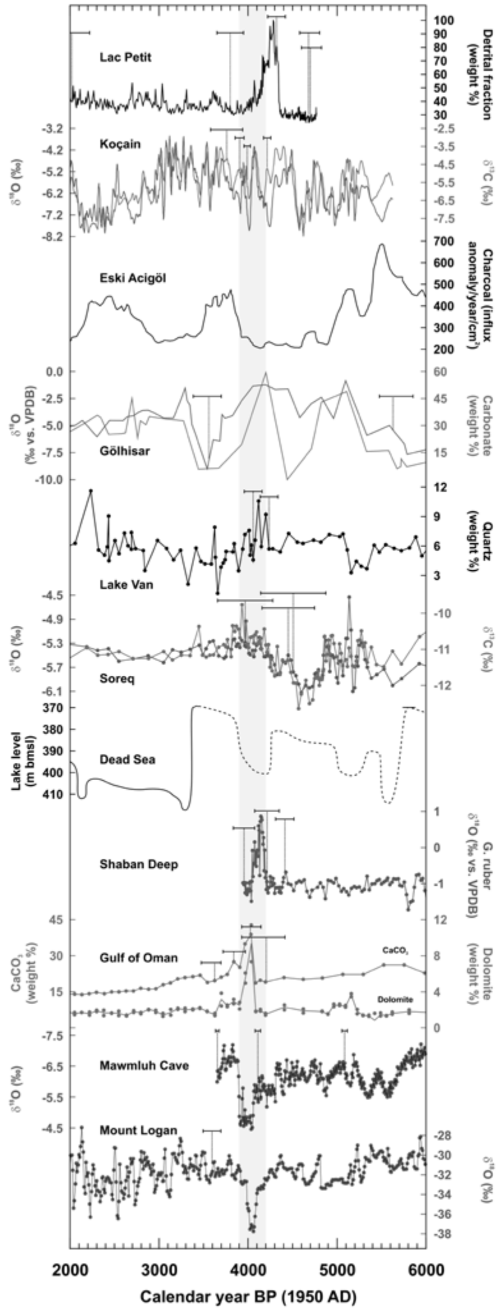


Figure 6.1. Multi-proxy stack, Mediterranean westerlies, illustrating varied temporal resolution for 4.2–3.9 ka B.P. abrupt climate change event (Weiss et al. 2012; Walker et al. 2012). The Mount Logan, Yukon, glacial core and the Mawmluh Cave, India, speleothem are high-resolution examples of the global distribution of synchronous paleoclimate proxies that document the megadrought (Harvey Weiss and Mark Besonen)

pollen, diatoms, carbonates, lake levels, magnetic susceptibility, or other climate proxies. The Mediterranean westerlies multi-proxy stack (Weiss et al. 2012; Weiss 2015) illustrates the ranges of chronological resolution with two-standard deviations around 4.2–3.9 ka B.P. and, as well, the coincident 4.2 ka B.P. event high-resolution chronologies at Mawmluh Cave, India (Berkelhammer et al. 2012), and Mount Logan, Yukon (Fisher 2011), which illustrate global synchronicity already suggested (Walker et al. 2012) and increasingly well documented (Weiss 2015; Weiss 2016).

At Lac Petit, France, an abrupt detrital pulse triggered by more intense or more frequent rainfall in Alpine regions (Magny et al. 2013) marks a major shift in diatom assemblages framed around 4300–4100 B.P. by radiocarbon dates (Brisset et al. 2013). The Koçain Cave, Turkey, speleothem (Göktürk 2011) provides high-resolution U/Th dates that constrain abrupt decreases and increases of $\delta^{18}O$. The Eski Açigöl, Turkey, lake core (Roberts et al. 2001) has no radiocarbon dates during a decline in lake-core charcoal interpreted as anthropogenic deforestation (Turner, Roberts, and Jones 2008), while the Göl Hissar, Turkey, lake core (Eastwood et al. 2007) carbonate spike and rise in $\delta^{18}O$ are framed by radiocarbon dates 2,000 years apart. The Lake Van, Turkey, core (Lemcke and Sturm 1997) displays a quartz spike understood as a dust proxy dated by varve counts with slight errors (see Kuzucuoğlu et al. 2011). The dense sampling intervals for the Soreq Cave, Israel, speleothem $\delta^{18}O$ and $\delta^{13}C$ values are linked to U/Th dates (Bar-Matthews and Ayalon 2011), but with large standard deviations that provide a labile chronology. The Dead Sea (Migowski et al. 2006; Kagan et al. 2015) lake levels are estimated to have dropped 45 meters (see Frumkin 2009) during this period. At the Red Sea Shaban deep core (Arz, Lamy, and Pätzold 2006) fifteen-year diatom sampling intervals are constrained by high-resolution radiocarbon dates with a marine reservoir correction (see Edelman-Furstenberg, Almogi-Leben, and Hemleben 2009).

The Gulf of Oman marine core (Cullen et al. 2000) has dolomite and calcium carbonate (dust) spikes framed by radiocarbon dates and is tephra-linked to Tell Leilan chronostratigraphy (Weiss et al. 1993). The Mawmluh Cave, India, speleothem (Berkelhammer et al. 2012) provides six-year $\delta^{18}O$ sampling intervals constrained with U/Th dates and links the Nile flow reductions (see Hassan and Tassie 2006), east African lake level reductions (see Gasse 2000), and the Indian summer monsoon deflection (see Dixit, Hodell, and Petrie 2014). The Mount Logan, Yukon, glacial core (Fisher 2011) is cross-dated with the NorthGRIP-core and exemplifies the event's North American expression (e.g., annual resolution Great Basin tree rings; Salzer et al. 2014), second in magnitude to the 8.2 ka B.P. event. These dates correspond to other recent Mediterranean core dates, such as at Lake Shkodra (Zanchetta et al. 2012; Mazzini et al. 2015; Sadori et al. 2013; Sadori et al. 2014), Lake Accessa (Magny et al. 2009; Zanchetta et al. 2012), and Acre (Kaniewski et al. 2014), that is, about 4.2–3.9 ka B.P. (Zanchetta et al. 2016).

Akkadian Imperialization

The adaptive abandonment of dry-farming plains across west Asia and habitat tracking to sustainable riparian, paludal, and karstic refugia were synchronous social responses at the 4.2 ka B.P. onset, alongside the likely, if problematic, nomadization of formerly sedentary populations (Alizadeh 2009). At this moment, the most intensively studied locus for the social effects of the 4.2–3.9 ka B.P. megadrought in west Asia is the Khabur plains of northeastern

Syria that were then under about 100 years of Akkadian imperialization, as determined from the Tell Leilan Acropolis radiocarbon-dated occupational sequence (Weiss et al. 2012).

Imperial Akkadian production and distribution in both southern and northern Mesopotamia were controlled by local palaces and the imperial *šabra* officials, acting as the bridges between imperial Akkad and its imperialized domains (Brumfield 2013). The documentation for the extraction of provincial surplus production, reprised often by modern epigraphers, included animals, oils, finished products, and grain, the latter usually measured in Akkadian imperial *gur* (Powell 1987–1990; Glassner 1986). In central Mesopotamia, these Akkadian extractions are documented at Ešnunna, Awal, Gasur, and Aššur (Brumfield 2013; Visicato 1999) (fig. 6.2).

To the limits of efficient transport, apparently, the extractive success was unconstrained. The extortion of land and estates from local southern rulers; the murder of thousands of insurgents (e.g., the Rimush incident); the conquest and rebuild of distant cities like Mari, Leilan/Shekhna, Brak/Nagar, Nurrugum, and Ninua; crushing military defeat of "The Great Rebellion" and the deification of Naram-Sin suggest large Akkadian military forces and effective intimidation and terror.

The Akkadian extractions are certain, but their conveyance remains unclear. For example, how were imperial revenues collected and then delivered from Gasur/Yorgan Tepe to Akkad? Were the revenues collected at Aššur disposed there or removed to Akkad? Large grain shipments from NAGAR^{ki}, likely Tell Brak (Na-gàr^{ki}, Ebla; Na-ga-ar^{ki}, elsewhere; Gelb 1961, p. 191), were removed from the Khabur plains and collected at imperial Sippar (CT 1: 1b, 2,7; 1c, 12). By which waterborne route were these tons of cereal harvest dispatched to

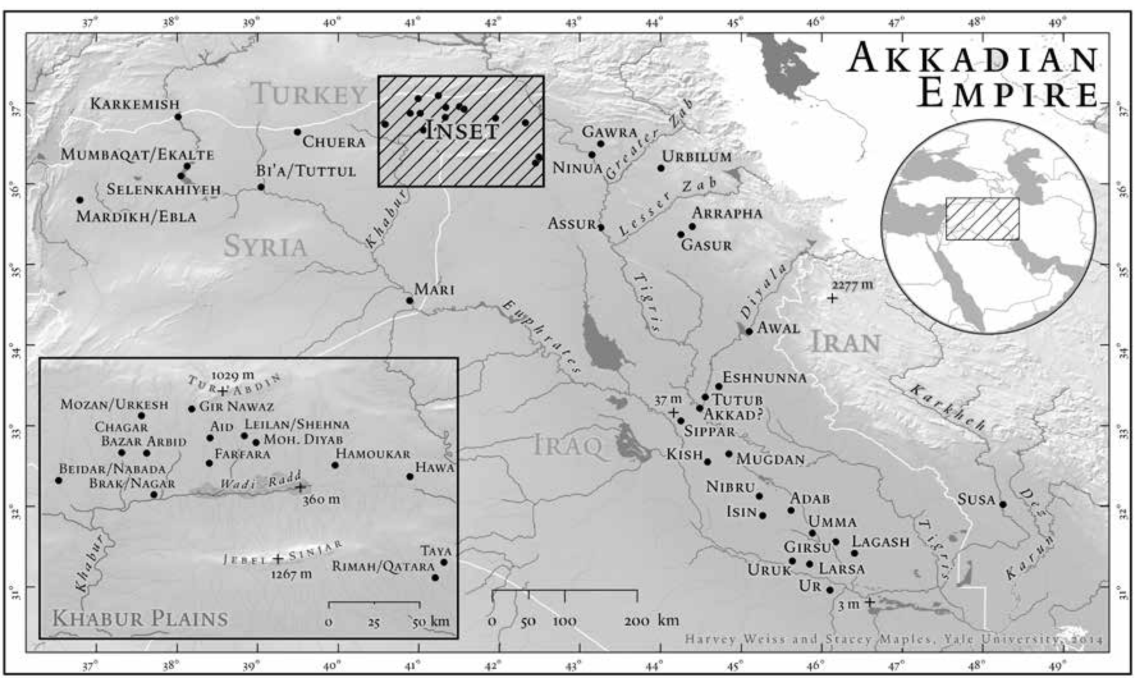


Figure 6.2. Akkadian empire, ca. 2350–2200 B.C. Akkadian imperial control documented archaeologically and epigraphically across both dry-farming and irrigation agriculture Mesopotamia collapsed at ca. 2200 B.C. (Harvey Weiss and Stace Maples)

Sippar, and who controlled their measurement (Sommerfeld, Archi, and Weiss 2004)? Also on the Khabur plains, the 379 tons of river-transported emmer probably received at the 5-hectare small town at Chagar Bazar (Chagar Bazar A.391; CDLI P212515) were destined for which storehouses? The divide between state and private interests in such imperial extractions was likely porous, as in empires to this day.

Abandonment and Collapse

Abrupt termination of Akkadian imperial control and abrupt regional abandonment by the foreign and indigenous population have been exposed at the Khabur plains' equidistant urban centers Brak, Leilan, and Mozan, and across the villages and towns of the surrounding countryside (figs. 6.3–6.4). Ritual closure of Akkadian public buildings sealed Tell Brak in dramatic fashion while the city's Naram-Sin fortress walls and floors were left unfinished (Weiss 2012). The Akkadian Administrative Building at Tell Leilan was vacated during preparation of its terminal cuneiform records, while "The Unfinished Building" (TUB), across the Leilan Acropolis

Chronostratigraphy Late Third Millennium BC Khabur Plains

BC	Leilan	Moh Diyab	Brak	Chagar Bazar	Arbid	Barri	Mozan	Hamoukar
	LTE/N Palaces					34A		
	I Acrop NE-				IIa, b	34B		
	Temples	VIII cemetery	P HH, HN	Khabur houses	IIc	O 34C	houses 5	
1950	Early Khabur	IX pisé bldgs / fdtns			III kilns, pits	34D cemetery	C4 burials	
2000							C5	
2050								
							C6	
2100								
						P 35A *abandoned*		
2150						35B kiln 1016	C7	
2200		pits		I pits	IV pits			pits
		XIc	FS1_SS1/TC PB		Vb-a Main Bldg		houses 4	
	IIc pA 4-rm	XIb	N FS2 SS2	II Chant. D, Bât. 1	VI pA houses		erosion 3	?
	abandoned	*abandoned*	*abandoned*	*abandoned*	*abandoned*	*abandoned*	*abandoned*	*abandoned*
2250	IIb1 AAB, TUB	TUB (6a-4, 5a-12)	FS3_SS3 NSP			36	C8 Palace 2	
	CG, Lower Town		Lower Town				Lower Town	
	Op 4, Op 7, Op 8						C9	
2300	IIb2 AAB	XIa	M FS4_SS4		VII houses	Q 37 small rms	C10	3
							C11	
2350	IIb3 Scribal Room		FS5 SS5					
	IIa late	XII	L		VIII	R	C12 phase 1	2

BC is Leilan ^{14}C (Weiss et al this volume):
start early Khabur 1995 - 1896 (95.4%), 1969 - 1919 (68.2%)
end IIc 2253 - 2156 (95.4%), 2233 - 2196 (68.2%)
end IIb1 2266 - 2211 (95.4%), 2254 - 2220 (68.2%)

Figure 6.3. Chronostratigraphy late third–early second-millennium B.C. Khabur plains reveals a 250-year occupational hiatus, ca. 2200–1950 B.C., coincident with the ca. 4.2–3.9 ka B.P. megadrought (Weiss 2012)

Street, was deserted alongside a semicircle of basalt blocks that were being dressed for wall placement. Brick walls set upon mudpack sherds were left uncompleted, although sub-floor drains had been installed under unfinished working floors (Weiss et al. 2012). "Hayabum, šabra," an early Amorite (Gelb 1980; Bauer 1926, p. 18), walked out on the TUB construction, but left his finger- and rope-impressed sealing on its floor (McCarthy 2012). Minor pieces of two similar and aborted Akkadian TUB constructions were observed at adjacent Tell Mohammed Diyab (Nicolle 2012), while at Tell Mozan the similar basalt block-base palace was abandoned, and upon its collapse and erosion surfaces irregular private houses were eventually constructed (Buccellati and Buccellati 2000). At Tell Taya, adjacent to Tell Afar, another high-yield cereal production center, the same curious Akkadian construction technique was deployed, perhaps for structures of similar function (Reade 1968).

Famously, the Lower Towns of Brak, Mozan, Leilan, the residences of the imperialized agricultural workers, were deserted alongside their central acropolises. At Tell Mozan/Urkesh, the "continuous occupation" of a post-Akkadian–Ur III-period wealthy city was, in fact, the 80-percent-abandoned Akkadian city, with a fraction of the former acropolis inhabited after desertion of the possibly 90-hectare lower town (Pfälzner 2012). Similarly, the purported high precipitation and dry-farming at Tell Mozan during this period (Riehl 2010)

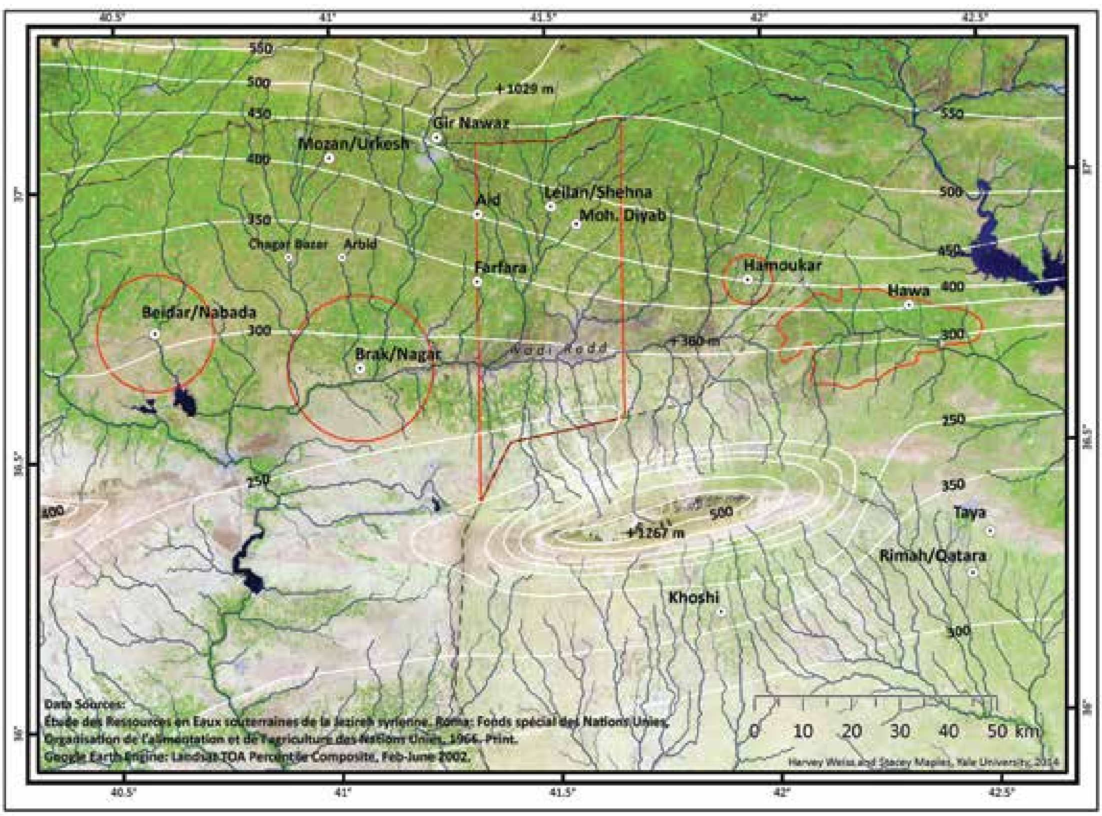
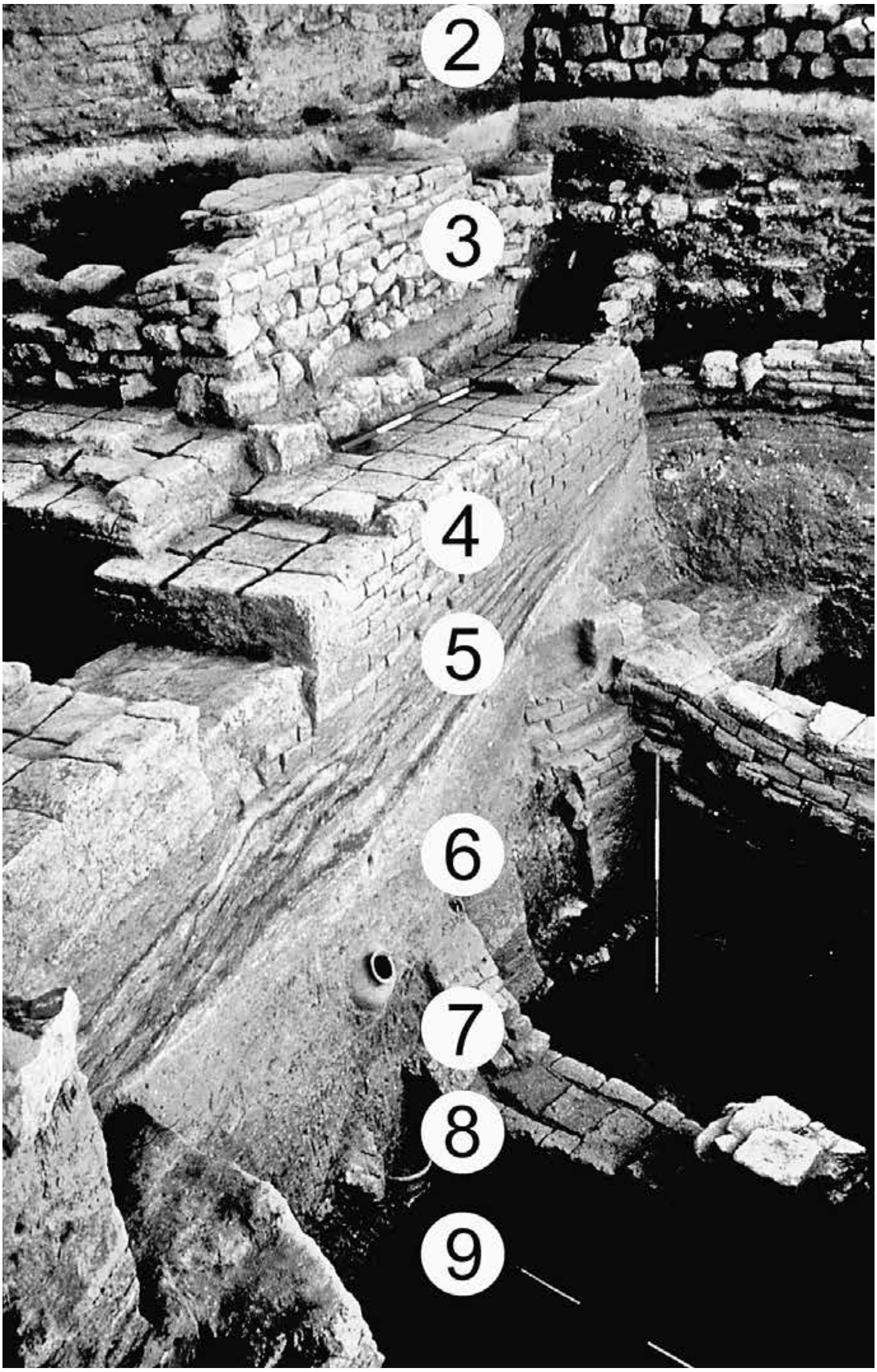


Figure 6.4. Khabur plains archaeological surveys. Beidar 450 sq. km (Ur and Wilkinson 2008), Brak 1,256 sq. km (Colantoni 2012), Leilan 1,650 sq. km (Arrivabeni 2012; Ristvet 2012), Hamoukar 78 sq. km (Ur 2010), Hawa 455 sq. km (Wilkinson and Tucker 1995). Beidar, Hamoukar, and Hawa survey analyses lumped pre-Akkadian and Akkadian settlement; Hawa survey did not distinguish post-Akkadian settlement; Brak survey is mostly unpublished (Harvey Weiss and Stace Maples)



Phase 4: Ḫabur

Phase 5: "… a single streaked layer represents all that is left of level V … chiefly black and grey, consisting respectively of carbonized sheep-dung and friable gypsous flooring … the whole deposit was clearly produced by a pastoralist population"

Phase 6: "Ur III", "… did not last much more than half a century. The population either died in the destruction, though no skeletons were found, or deserted the site."

Phase 7: "post-Akkadian"

Phase 8: Akkadian (ca. 2300–2200 B.C.)

(descriptions from Reade 1968)

Figure 6.5. Tell Taya, Sinjar plains, northwestern Iraq, Acropolis stratigraphic section, excavated by Julian Reade, British School of Archaeology in Iraq, 1967–1973 (photograph by Julian Reade)

have evaporated with notice of overlooked and unique *Phalaris* (canary grass) components of botanical samples that indicate stream-side cultivation only 8 kilometers from the Tur Abdin debouchement (Weiss 2012). Nawar, Urkesh's remnant urban complement, the "large Hurrian city" importunely sought for decades at Tell Brak, was probably located similarly along the edge of the Tur Abdin, even perhaps at homonymous Gir Nawaz. By the time of the ca. 1950 B.C. resettlement, Mozan was a small village rest stop on the famous road west from Tell Leilan/Shubat Enlil.

Elsewhere on the Khabur plains, the same process was operative. Hamoukar, about 100 hectares at the eastern edge of the Khabur plains, was possibly occupied briefly in the post-Akkadian period, but was certainly abandoned before that period ended as the low-density site is capped by "early post-Akkadian pits" (Gibson 2001) that cannot extend beyond 2200 B.C. (fig. 6.3). Adjacent Tell al-Hawa, 66 hectares, was littered with Akkadian *sila*-bowls (Senior and Weiss 1992), but had no occupation thereafter until the Khabur ware resettlement (Wilkinson and Tucker 1995). Farther southeast, at Tell Afar, the Tell Taya acropolis excavation has illustrated the abandonment with its famously transparent stratigraphic section (Reade 1968) (fig. 6.5).

Region-wide, not only large cities but also their surrounding countrysides were deserted. In the Leilan Region Survey (1,650 sq. km; figs. 6.6a–d, 6.7), some 87 percent of dependent villages and towns were abandoned at the end of Leilan IIb1, 2254–2220 B.C. (68.2%), with the remainder disappearing completely less than 50 years later at the end of Leilan IIc, 2233–2196 B.C. (68.2%). That is, Bayesian-modeled short-lived radiocarbon dates provide a chronology that defines small village or household occupations for three to five decades after the major urban collapse (Emberling et al. 2012; Koliński 2012; Weiss et al. 2012). Significantly, these short-lived post-Akkadian remnants were five times more numerous (n=18, 0.01/km^2) in the high-precipitation Leilan Region Survey (Arrivabeni 2012) than in the marginal-precipitation Brak survey area (Colantoni 2012) (table 6.1).

Table 6.1. Site size (ha) reductions, late third–early second millennium B.C. Khabur plains (Weiss 2012)

Site	*Akkadian Period (ca. 2350–2250 B.C.)*	*post-Akkadian/EJZ 4c (ca. 2250–2200 B.C.)*		*post-pA/EJZ 5 (ca. 2200–1950 B.C.)*	*Khabur (ca. 1950–1700 B.C.)*
Leilan	90	0.002	(-99%)	0	90
Mozan	120	20	(-83%)	<20	<20
Brak	70	<35	(-50%)	0	10
Moh Diyab	50	14	(-72%)	0	35
Chagar Bazar	10	1	(-90%)	0	9
Hamoukar	100	0*	(-100%)	0	0
Arbid	4	3.2	(-20%)	0	1.75
Barri	<6	0	(-100%)	0**	6
Leilan Region Survey	397	69	(-87%)	0	767

* Chronology uncertain; unlikely but possible partial occupation this period.
** Isolated stratum 35 kiln within this period.

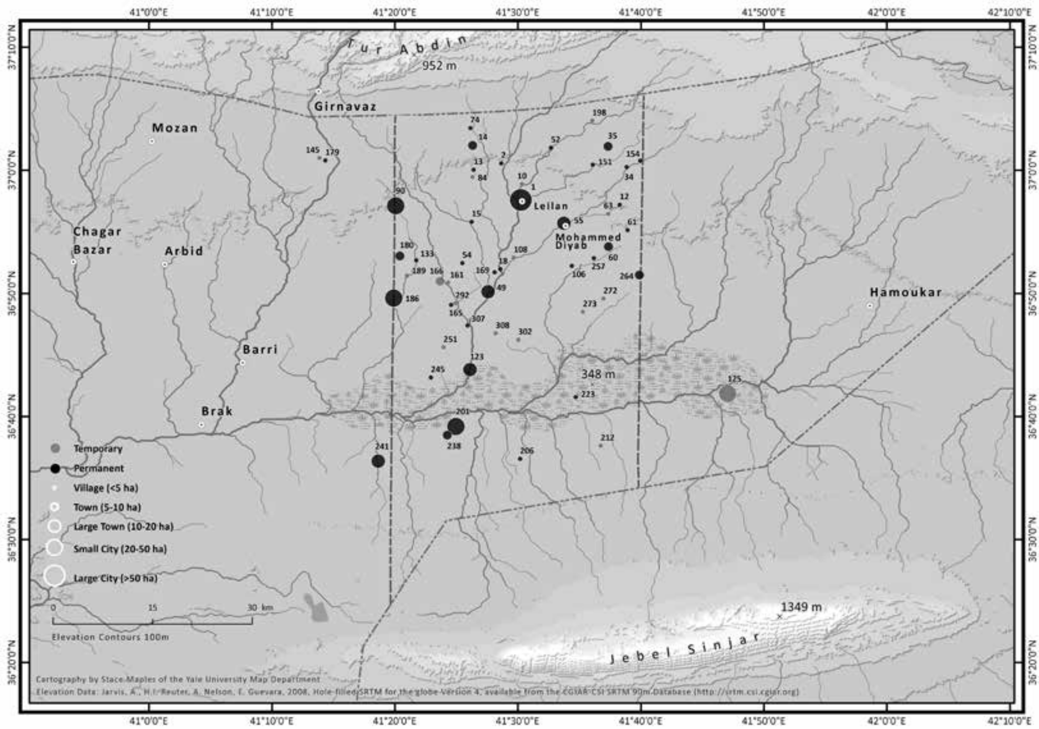


Figure 6.6a. Leilan Region Survey, Leilan IIb settlement, ca. 2350–2250 B.C. (Ristvet 2012)

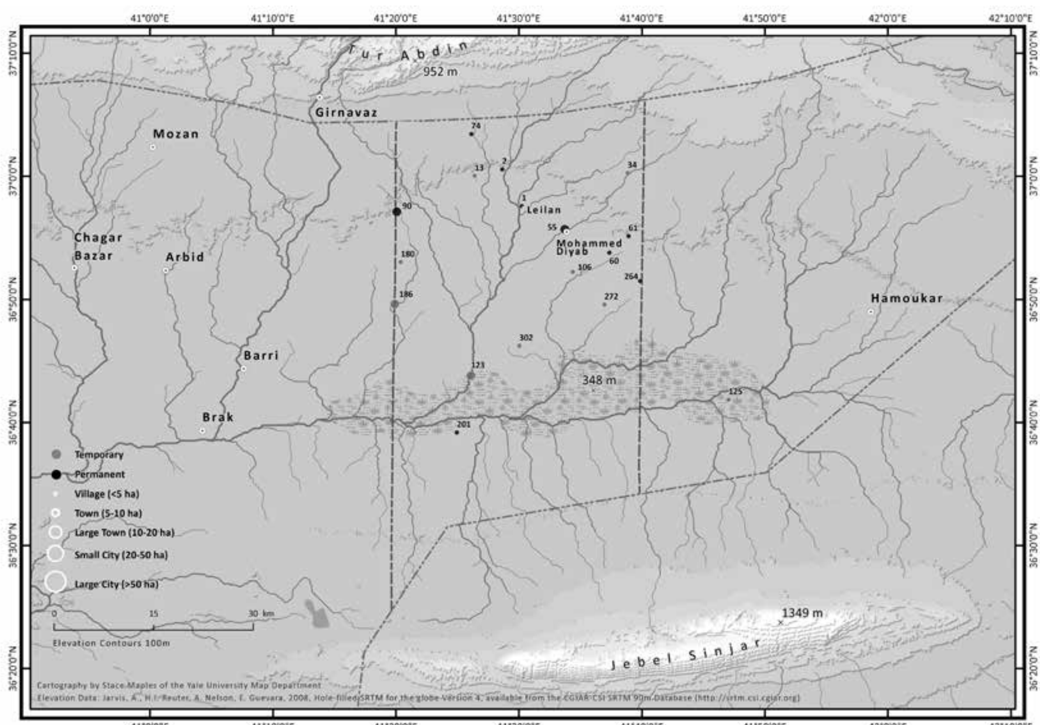


Figure 6.6b. Leilan Region Survey, Leilan IIc settlement, ca. 2250–2200 B.C. (Arrivabeni 2012)

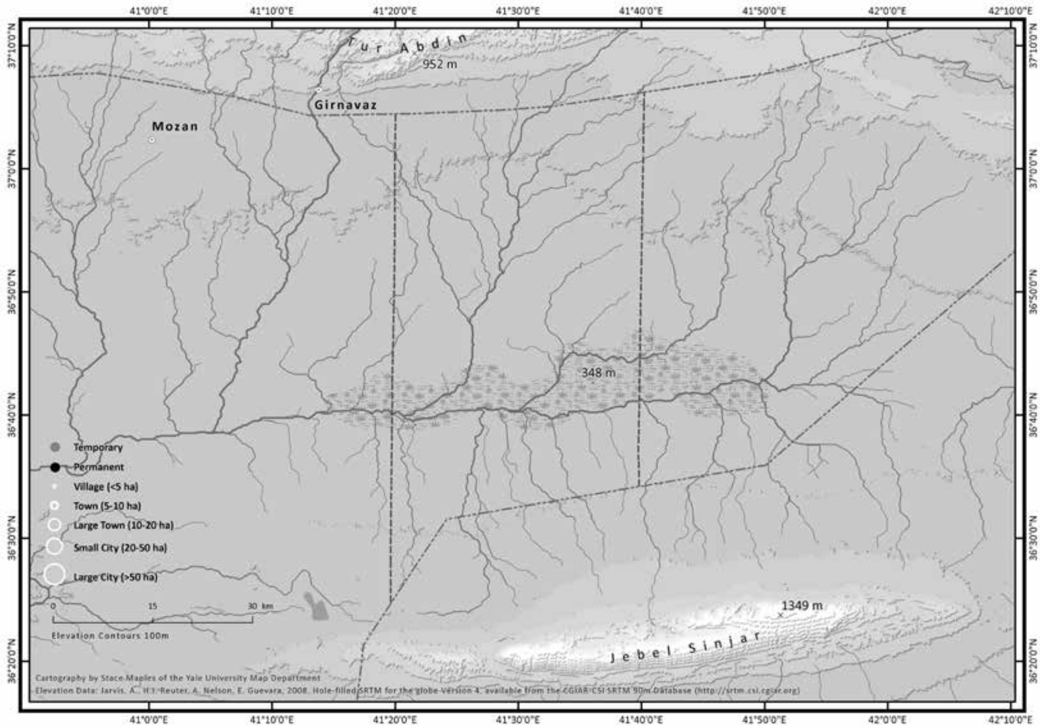


Figure 6.6c. Leilan Region Survey, Leilan IId settlement, ca. 2200–1950 B.C. (Weiss 2012)

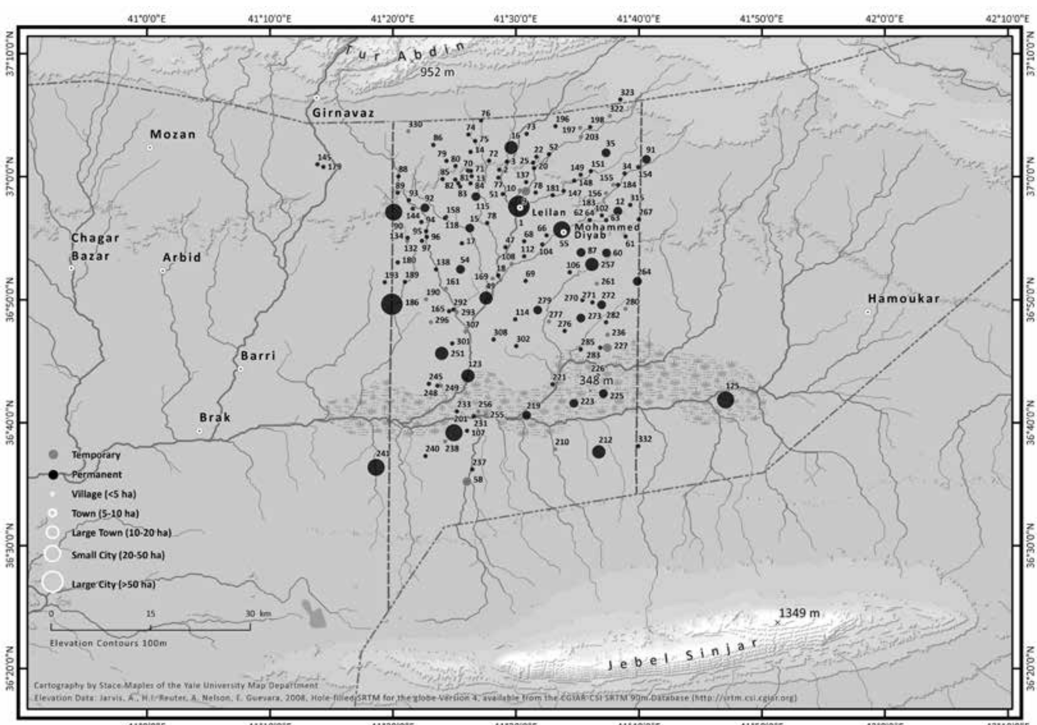


Figure 6.6d. Leilan Region Survey, Leilan I settlement, ca. 1950–1750 B.C. (Ristvet and Weiss 2013)

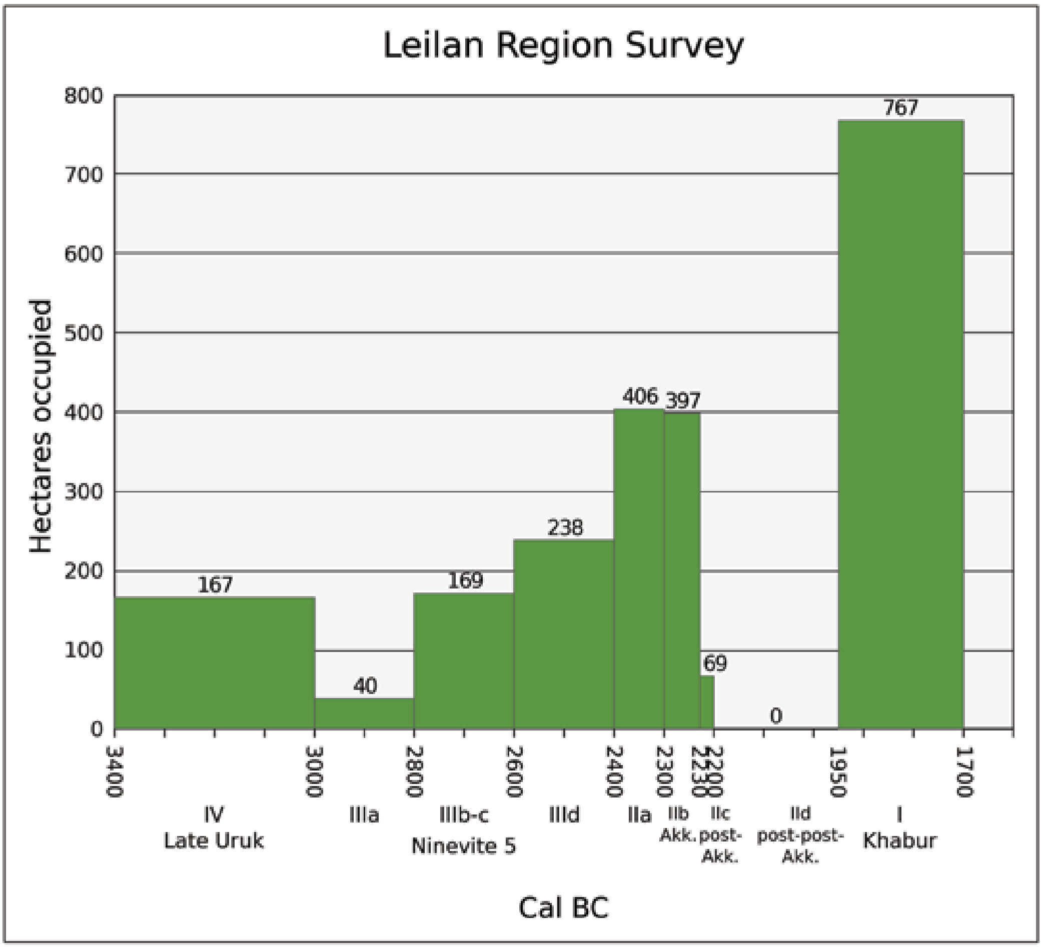


Figure 6.7. Leilan Region Survey (1,650 sq. km) histogram of total hectares occupied / radiocarbon-dated occupation periods (Weiss 2012)

At Tell Leilan, the collapsed mudbrick walls of the pre-Akkadian palace and its rebuilt Akkadian Administrative Building were used as bases for the construction of a Leilan IIc period post-Akkadian four-room house and courtyard, the only post-Akkadian structure yet uncovered there (fig. 6.8; Weiss et al. 2012). The voluminous Tell Leilan radiocarbon-dating program defines as well the synchronous short-lived and ramshackle post-Akkadian–period structures at Tell Brak (Emberling 2012), the "communal" house at Chagar Bazar (Tunça, McMahon, and Baghdo 2007), and domestic structures at Tell Arbid (Koliński 2012).

The chronological definition of Leilan IIc is also useful, where comparable radiocarbon dating is available, for understanding the coincident inter-regional effects of the 4.2–3.9 ka B.P. event. The First Intermediate Period in Egypt began synchronously with Leilan IIc (Bronk Ramsey et al. 2010) and underscores the region-specific habitat-tracking variability and systemic similarities among and between societal megadrought responses (see Macklin et al. 2013; Weninger and Easton, this volume).

Figure 6.8. Tell Leilan 2002, Acropolis Northwest, Leilan IIc, 2233–2196 B.C. (68.2%), four-room house and courtyard, the only post-Akkadian-period occupation retrieved at Tell Leilan (Weiss et al. 2012)

Megadrought and Leilan IId

Following the brief post-Akkadian interval, sedentary settlement within the Leilan Survey Region, and most of the Khabur plains, abandoned the region for about 250 years, the Leilan IId period, until the sudden return of pre-megadrought precipitation levels and Khabur-period resettlement at around 1950 B.C., earlier than a presumed Middle Chronology vanguard sedentarization led by Šamši-Adad (Weiss et al. 2012; Manning et al. 2016). The northern Mesopotamian post-megadrought soil landscape, perhaps altered analogously as that analyzed in post-megadrought south Alpine France (Brisset et al. 2013), may reveal some of the forces behind Khabur-period resettlement, possibly similar to the convenient social and climatic convergences at the termination of the Little Ice Age four thousand years later (Kaniewski, Van Campo, and Weiss 2012).

This same pattern of regional abandonment occurred across dry-farming western Syria (Weiss 2012; Weiss 2014), the Levant (Harrison 2012), Anatolia (Boyer, Roberts, and Baird 2006; Massa and Şahoğlu 2015), the Aegean (Weiss 2000; Weiberg and Finné 2013; Davis 2013), and in the western Mediterranean with the abandonment of the Late Neolithic and Bell Beaker settlements in the Languedoc and Rhône valleys (Carozza et al. 2015). However, low-resolution ceramic periodizations, survey intensity, and quantification still obscure some significant details and hinder comparative studies, as in western Syria (D'Andrea 2016). The extensive data for EB IV Ebla and its environs (Matthiae and Marchetti, eds. 2013) do not yet permit discrimination of demographic changes during this period. Re-dating the end of the Early Bronze III period in the southern Levant, for example, has encouraged re-dating of the succeeding Early Bronze IV abandonments and collapse (Regev et al. 2012). Lowering the beginning of the southern Levant Early Bronze IV period, however, alters neither the radiocarbon-dated Early Bronze IV settlements here, some number of the around 2,000 central Negev Early Bronze IV pastoral sites (Haiman 1996; Adams 2000; Regev et al. 2012), nor the famous Hauran pastoralist settlements (Braemer, Échallier, and Taraqji 2004), nor the synchronous abandonments and collapses in western Syria (e.g., Rawda: Barge, Castel, and Brochier 2014; Brochier in press; Umm el-Marra: Schwartz et al. 2012) and across northern Mesopotamia (Weiss 2014). The limited and low-resolution chronology and simple quantification of Early Bronze III and Early Bronze IV settlement in small highland areas of Israel (Langgut et al. 2014; 2016) do not allow observation of abandonments, but emphasize the need for radiometric and relative chronology Early Bronze IV subdivisions (table 6.2) and, of course, quantified regional surveys (D'Andrea 2012; 2016).

Table 6.2. Late third-millennium abrupt climate change chronology (after Weiss 2000, fig. 29) with Early Bronze IVx

Date B.C.	*Aegean*	*Egypt*	*Syria/Palestine*	*N. Mesopotamia*	*S. Mesopotamia*	*Indus*
1700						
	Middle					
1800	Helladic	Middle	Middle	Leilan I	Old Babylonian	Harappa 4
	II	Kingdom	Bronze I			
1900						
	Middle					
2000	Helladic I	First	Early	**"17 kings who lived in tents"**	Isin-Larsa	
2100	Early	Intermediate	Bronze IVx	Leilan IId	Third Dynasty of Ur	Harappa 3C
	Helladic III					
2200		Period		Leilan IIc		
2300	Late					
			Early	Leilan IIb	Akkadian	Harappa 3B
2400	Early	Old	Bronze IVa			
	Helladic	Kingdom		Leilan IIa	Early Dynastic III	
2500	II		Early			
			Bronze III			
2600	Early			Leilan IIId	Early Dynastic II/III	Harappa 3A

Habitat Tracking

The regional populations that left the Khabur and adjacent dry-farming plains beginning at the end of Leilan IIb1 and during Leilan IIc (ca. 2250–2200 B.C.) were forced by their megadrought-altered landscapes to move abruptly to alternate sustainable habitats. The down-cut channels of the Euphrates and Tigris precluded innovative irrigation agriculture in northern Mesopotamia as, of course, did the topography and hydrography of the Levant. The habitat tracking (Coope 1979) that ensued was to sustainable riparian, paludal, and karstic refugia in adjacent regions. These refugia included the close-to-sea-level irrigation agriculture of Tigris-Euphrates regions of southern Mesopotamia, soon filled with hypertrophic Ur III cities; the central Euphrates valley dotted with irrigation agriculture cities at Mari, Tuttul and Terqa, the Madekh, Ghab, Amuq, and Radd swamps; the cities of the karst-fed Orontes River; the riverside towns of coastal Syria and Lebanon; and the karst-spring towns of the southern Levant (Weiss 2014). Similar movements to sustainable agricultural regions are observed synchronously in the megadrought-afflicted western Mediterranean (Carozza et al. 2015). Coincident abandonments likely occurred across desiccated dry-farming northern and northeastern Iraq, surrounded by the plateaus' megadrought proxies (e.g., Sea of Marmara: Felikci et al. 2016; Göbekli: Pustovoytov, Schmidt, and Taubald 2007; Lake Tecer: Kuzucuoğlu et al. 2011; Lake Van: Lemcke and Sturm 1997; Black Sea: Cordova and Lehman 2005; Caspian Sea: Leroy et al. 2014; Iranian plateau: Carolin et al. 2015).

The estimated scale of this region-wide population transfer awaits refinement with regional surveys of sufficient chronological resolution to observe decadal and century-scale alterations. An early conservative estimate assumed that approximately five times the population of the Khabur plains abandoned the plains from western Syria to northeastern Iraq during the interval between about 2200 and 1950 B.C. (Weiss et al. 1993). A trickle of persons per year could accommodate this figure, but larger groups likely left periodically at junctures that remain to be identified (see Burke, this volume).

Opportunistic Resettlement and Sedentarization

The Amorite intrusions, wars, and eventual presence in riverine central and southern Mesopotamia during the Ur III, Isin-Larsa, and early Old Babylonian periods (Edzard 1957; Garfinkle 2014) — that is, during the 4.2–3.9 ka B.P. megadrought — remain to be understood within this paleoclimate and demographic frame. In particular, the normative conceptualization of Ur III dynasty southern Mesopotamia awaits reconsideration. By the early nineteenth century B.C., two confederations of Hanaean pastoralist transhumant tribes, Yaminites and Simʾalites, already ranged between northern Mesopotamia, western Syria, and the central Euphrates (Rowton 1974; Heimpel 2003), where some controlled Mari, settling opportunistically the abandoned tracts within tribe-legitimized states and territories previously ignored and unidentified epigraphically, but now called Ida-Maraṣ, Apum, and Subartu (Heimpel 2003; Ristvet 2008). This resettlement across dry-farming west Asia now seems a major archaeological research frontier.

The return of precipitation is evidenced by the abrupt 3.9 ka B.P. spikes within the paleoclimate proxies from Iceland to Iran, from the Mediterranean Sea to Mount Kilimanjaro, and from Lake Tilo to Mawmluh Cave. Geographic variability of drought stress was claimed for minor alterations of $\delta^{13}C$ values of Middle Bronze Age (1900–1600 B.C.) barley grains from

Tell Mozan (Riehl et al. 2014), but the isotope analysis has been discredited (Maxwell, Silva, and Horwath 2014). Additionally, grain stable isotopes do not reflect climate but cultivation, including possible manuring (Styring et al. in press). Hence, robust transfer functions for the megadrought's paleoclimate proxies, in addition to the 30–50-percent precipitation reductions already measured by Frumkin (2009), Bar-Matthews et al. (1997), and Kaniewski et al. (2012), remain a desideratum for observation and calculation of megadrought spatial variability across the Mediterranean and west Asia, and globally. Within current levels of resolution, however, the abrupt alterations of climate and settlement in the east Mediterranean/west Asia and the west Mediterranean at 4.2 and 3.9 ka B.P. are synchronous and extend to Central Asia, South Asia, East Asia, Australia, East Pacific, North America, South America, and the Antarctic as well (Weiss 2016).

A full appreciation and explanation of the societal forces released or propelled at about 3.9 ka B.P. awaits additional quantification of the return of pre-megadrought precipitation. In the Mesopotamian domains of the Mediterranean westerlies, this juncture is marked by the sedentarization of Amorite pastoralists and resettlement of previously desiccated and abandoned dry-farming territories. However, pre-Akkadian Amorite precursors of the nineteenth- and eighteenth-century B.C. Euphrates-Khabur pastoralist transhumants are not observed in the personal names of the Beydar archives (Talon 1996), while the MAR.DÚ of the Ebla archives are not described as pastoralist transhumants (Archi 1985) and do not extend in time to the pre–Lim dynasty period at Mari (Butterlin 2007). Hence the megadrought "enforced sedentism" of Khabur pastoralist transhumants, along and down the Euphrates (Weiss et al. 1993), beginning at Leilan IIc and extending through Leilan IId, a potential correlate of "enclosed nomadism" (Rowton 1974; Klengel 1972), remains elusive but for records from the ethnographic present (de Boucheman 1934). This period, however, is likely that designated in the Assyrian King List as the reigns of the "seventeen kings who lived in tents" (Finkelstein 1966). Subsequent sedentarization, resettlement, and state formation across northern Mesopotamia and western Syria, idealized in Shamshi-Adad's Amorite genealogy in the Assyrian King List, nevertheless remain enigmatically unexplained. Assyriological documentation assumes, however, that "there will always be some further more concrete description that the causing consists in" (Cartwright 1999, p. 120). Within central Asian Mongol history, a similar process of sedentary state formation at the return of pre-drought precipitation has been documented recently (Pederson et al. 2014). Here too, beyond the sudden availability of rain-fed domains, the forces for pastoralists' opportunistic sedentarization and state formation await exploration.

Acknowledgments

The Directorate-General of Antiquities and Museums, Syrian Arab Republic, provided the essential administrative support for the Yale University Tell Leilan Project research that is reviewed here. Research funding was provided by the National Science Foundation, National Endowment for the Humanities, Yale University, Malcolm Wiener, Roger and Barbara Brown, Raymond and Beverly Sackler Foundation, and the late Leon Levy. I also thank Mark Besonen (Texas A&M University, Corpus Christi) and Stace Maples (Stanford University) for their essential technical assistance and cartography.

Portions of this paper appeared in Harvey Weiss, "Megadrought, Collapse and Resilience in Late 3rd Millennium BC Mesopotamia," in *2200 B.C. — A Climatic Breakdown as a Cause for the*

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Abbreviations

CT	Cuneiform Texts from Babylonian Tablets in the British Museum
CDLI	Cuneiform Digital Library Initiative. cdli.ucla.edu

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7

Ḫabur Ware and Social Continuity: The Chronology of the Early to Middle Bronze Age Transition in the Syrian Jezireh

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Archaeological investigations in the Syrian Jezireh during the last two decades created a large bulk of new data concerning the Early Bronze to Middle Bronze transition. They also pertain to the often debated events around 2200 B.C. and the following period between 2200 and 1900 B.C., also labeled the "Intermediate Bronze Age" (Weiss 2014). The new data also allow us to re-evaluate the question of the so-called urban collapse of the late third millennium B.C. to the Syrian Jezireh (for the theory of the urban collapse, see Weiss 1997; Weiss 2000; Weiss 2012; Weiss et al. 1993; Weiss and Bradley 2001; Weiss and Courty 1993; Ristvet and Weiss 2013). A clear picture, meanwhile, has evolved for the Syrian Jezireh, indicating that there was not a general "collapse" of urban society in this region, but a process of decline and transformation in manifold ways (Pfälzner 2010; Pfälzner 2012a; Pfälzner 2012b; Koliński 2007; Koliński 2012a; Koliński 2012b; Orsi 2012; Schwartz 2012). It seems to be more appropriate — instead of using the term "urban collapse" — to talk about a period of "urban crisis" at the end of the third millennium B.C. This crisis did not result in the disappearance of urban culture, but in a contraction of it (Pfälzner 2010, pp. 8–10, table 2; Pfälzner 2012, pp. 72–77). Each urban center could react in a different way to this crisis, some through dissolution of urban structures and abandonment, some others through adaptation and gradual social or economic change.

Apart from the question of social processes — and in accordance with the topic of the Chicago seminar organized by Felix Höflmayer — this paper intends to discuss the chronology of the Early to Middle Bronze Age transition in the Syrian Jezireh and the development of pottery types between the two periods. Stratigraphic sequences, radiocarbon (^{14}C) dates, and comparative pottery typologies are considered in this discussion. Finally, the emerging chronological picture will help to better understand the socio-political processes at the turn of the third to the second millennium B.C. Transformations on the internal socio-political level are regarded as a decisive factor in cultural change between the Early and Middle Bronze Age, probably even having a stronger impact than environmental change (see also Pfälzner 2010; Pfälzner 2012a).

Both socio-political and environmental changes have the potential to influence each other. From a theoretical point of view, the reciprocal effects of environmental and social change are best illustrated by a systems theory approach, as has been convincingly demonstrated in a model by Fred Plog (see Plog 1974, pp. 55–73, tables 6.1 and 6.2; adapted for the third millennium B.C. Syrian Jezireh by Pfälzner 2012a, pp. 76–77, fig. 19). It needs to be pointed out that change is neither predictable nor happening in a unimodal way within one region. There are always multiple alternative ways in which a social system can respond to new external or internal conditions. Therefore, there are always manifold solutions for a crisis situation, as is demonstrated in the following discussion.

A Chronological Benchmark for the Beginning of the Middle Bronze Age

A valuable chronological benchmark for the beginning of the Middle Bronze Age in the Syrian Jezireh has been identified at the important third-to-second millennium B.C. urban center of Tell Mozan. This benchmark comes from Phase C7 of the Central Upper City, excavated between 1998 and 2001 (for a full account on Tell Mozan Phase C7, see Bianchi et al. 2014, pp. 203–67). Phase C7 dates to the Early Jezireh V period, which is the last phase of the third millennium B.C. The most important architectural feature of this phase is the so-called House of Puššam. This designation refers to the hundreds of impressions of the seal of Puššam found in this building. According to the inscription on his seal he was a trader and employee of an interregional trading enterprise (Pfälzner and Dohmann-Pfälzner 2014, pp. 68–70).

The absolute dating of Phase C7 is based on a set of different chronological indicators:

Ceramic Chronology

A comparison of the pottery of Phase C7 to late third-millennium B.C. ceramic repertories from southern Mesopotamia reveals that many of the types from Mozan find clear parallels in pottery from Ur III levels in the south. The Mozan C7 pottery inventory shows striking similarities to Ur III pottery contexts from Uruk, Tell Asmar/Ešnunna, and even Susa (Schmidt 2012, pp. 170–73, table 3; Schmidt 2013, pp. 107–09). Particularly significant are sharply carinated bowls, as well as narrow-necked jars with a globular body, best known as libation jars from the Gudea and Ur III reliefs and statues (figs. 7.1–7.2). It can be unambiguously concluded that the Phase C7 pottery from Tell Mozan is contemporary with the Ur III period. This fact not only points to a synchronism between Mozan C7 and the Third Dynasty of Ur, but is also proof of the existence of close cultural ties between the Syrian Jezireh and the south during the final stage of the third millennium B.C.

Sealings

Another important set of artifacts for dating Mozan Phase C7 are seal impressions. Stylistically, they have close connections to the Ur III style group from the south. This is particularly obvious with regard to the seal of Puššam itself, which finds good parallels in the Ur III glyptic (fig. 7.3) (Dohmann-Pfälzner and Pfälzner 2001, pp. 122–25, pls. 18–19). The seal, furthermore, is contemporary with the Puššam House, which means it was actually used within this building, as is shown by the fact that its impressions have been deposited as primary refuse in numerous examples on the floors of the building.

Textual Sources

There are two cuneiform inscriptions from Tell Mozan Phase C7: the inscription on the Puššam seal (see above and fig. 7.3a) and a small cuneiform tablet found in the Puššam House

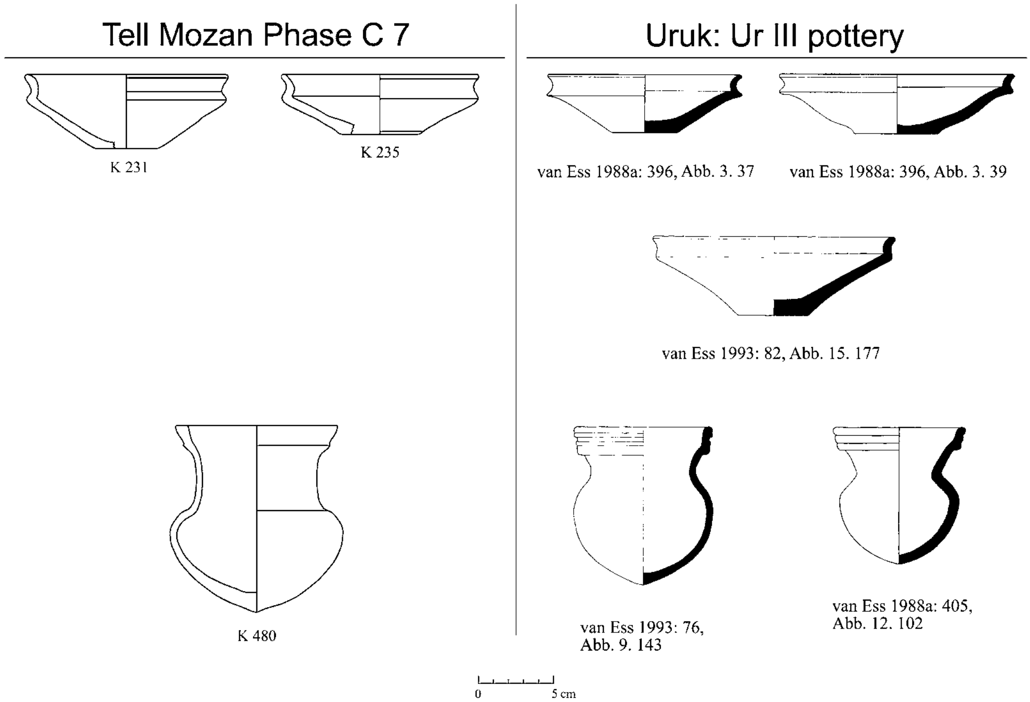
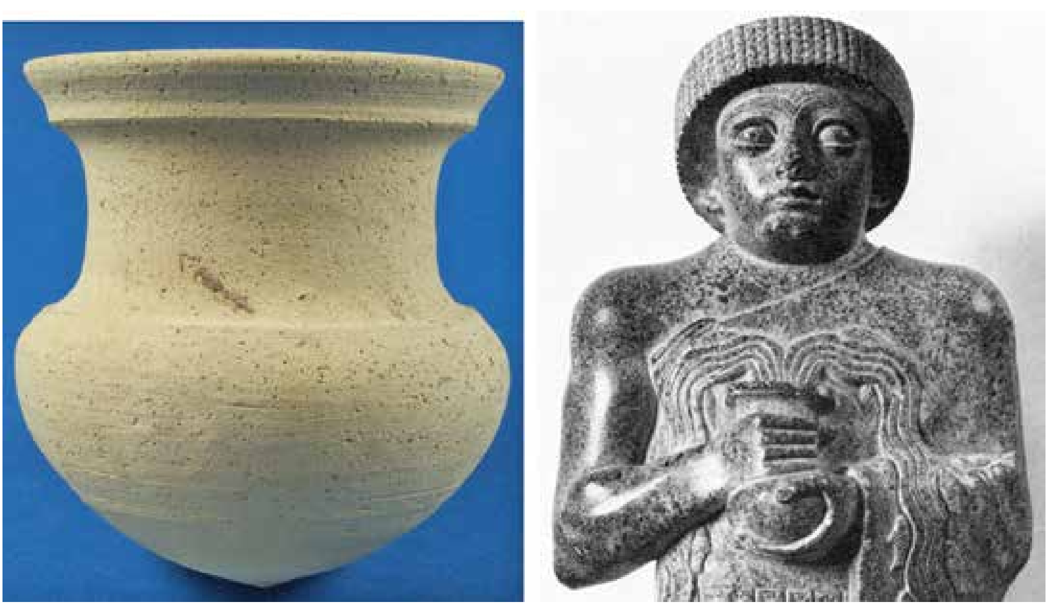
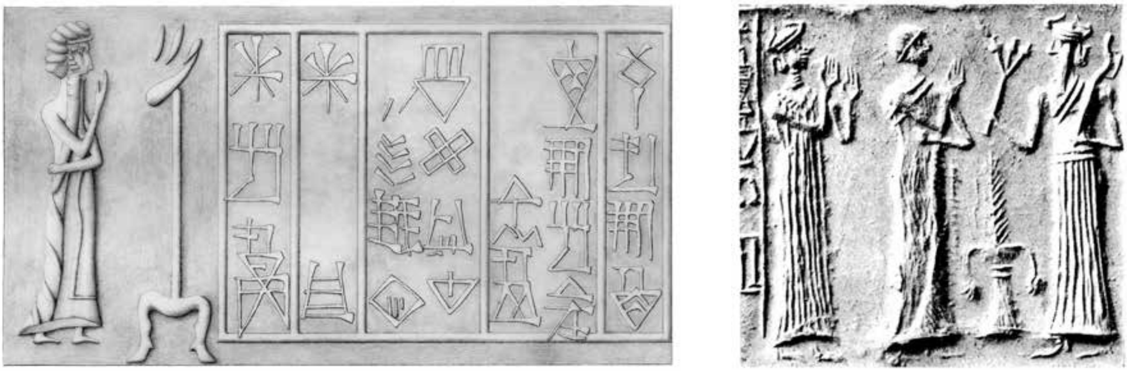


Figure 7.1. Comparison of pottery types from Tell Mozan Phase C7 and from Ur III contexts at Uruk (illustration from Schmidt 2012, fig. 10; for indicated references, see bibliography)



a b

Figure 7.2. Comparison of late third-millennium B.C. pottery from Tell Mozan and southern Mesopotamia: (*a*) globular jar from Tell Mozan Phase C7; (*b*) globular jar as depicted on a statue of Gudea of Lagaš



a b

Figure 7.3. Comparison of late third-millennium B.C. seals from Tell Mozan and southern Mesopotamia: (*a*) impression of seal of Puššam from Tell Mozan Phase C7; (*b*) Ur III seal from Mesopotamia (Frankfort 1939, pl. 25c)

(Pfälzner 2012a, pp. 55–56; Dohmann-Pfälzner and Pfälzner 2001, pp. 125–27, figs. 18–19, 21). On the basis of philological, particularly orthographic and paleographic, analysis, Sumerologist Konrad Volk determined that the writing can be dated between the late Sargonic and the early Ur III period (Volk 2004, pp. 93, 97–98). This observation reinforces the dating of Phase C7.

Radiocarbon Dates

Finally, another powerful chronological indicator for the date of Phase C7 can be added: radiocarbon dates from short-lived plants deposited in Phase C7 accumulations.[1] These have produced interesting results: out of the four samples analyzed, three lie in a narrow chronological frame between 2200 and 2000 cal. B.C. (fig. 7.4). This hints at a date for Phase C7 somewhere during the last two centuries of the third millennium B.C. The twenty-second century B.C. seems generally improbable for the Early Jezireh V period, because this time largely corresponds to the final part of the Early Jezireh IV period. Therefore, the twenty-first century B.C. should be the proper time frame for the Early Jezireh V period. Only one ^{14}C sample from Phase C7 provided an older date, lying between 2450 and 2300 cal. B.C., probably representing an older ecofact deposited in this level. In conclusion, the radiocarbon dates offer an excellent support for a date of Phase C7, derived from a typological dating of archaeological objects and inscriptions, to the Ur III period or even slightly earlier.

In conclusion, Phase C7, which defines the Early Jezireh V period at Tell Mozan, can be dated to the last phase of the third millennium B.C., mainly between 2100 and 2000 B.C. Earlier assumptions that the Early Jezireh V period might have extended from the twenty-first

[1] Radiocarbon dates have been obtained in the framework of the CINEMA project (Chronometric Investigations in Near Eastern and Mediterranean Antiquity), directed by Felix Höflmayer and Aaron A. Burke, and analyzed drawing on a Transdisciplinary Seed Grant by the University of California, Los Angeles. Radiocarbon dates were measured in 2013 by the W. M. Keck Carbon Cycle Accelerator Mass Spectrometry Laboratory of the University of California, Irvine. A final report on the radiocarbon dates for Tell Mozan will be published in the near future.

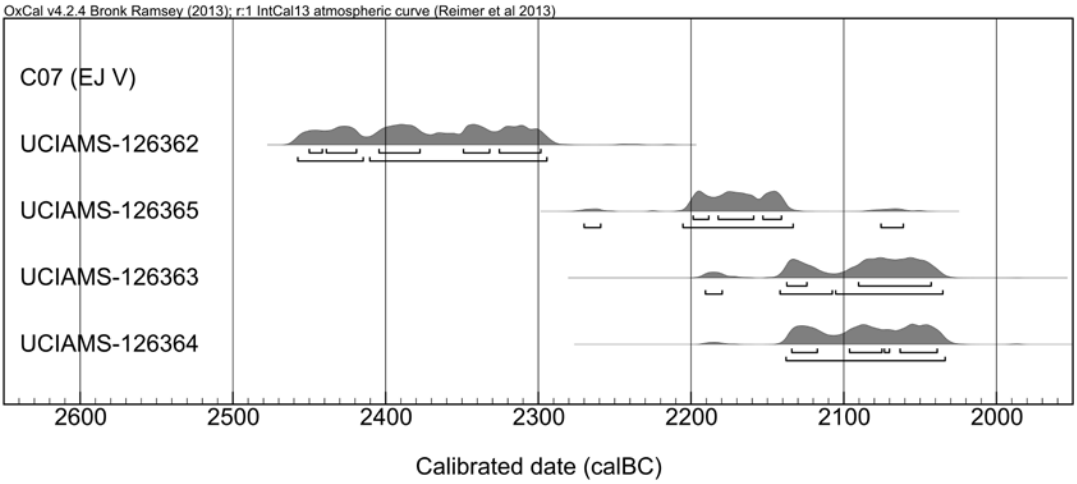


Figure 7.4. Radiocarbon dates from Tell Mozan Phase C7 (courtesy of Felix Höflmayer)

century B.C. well into the beginning of the second millennium B.C. (twentieth century B.C.) (see Pfälzner 2012a, p. 56 n. 29, table 2), are unlikely on the basis of the new radiocarbon data from Tell Mozan. Thus, backed by the new radiocarbon dates, the Early Jezireh V cultural complex at Mozan (Phase C7) can serve as an important chronological benchmark for the chronology of the late third millennium B.C. in the Syrian Jezireh. This cultural complex consists of a characteristic, time-specific set of cultural features, including distinctive types of architecture, ceramics, glyptic, and inscriptions. The identification of this benchmark has far-reaching implications for the chronology of the Syrian Jezireh and even beyond, as is demonstrated below.

Implications for the Regional Chronology of the Syrian Jezireh in the Late Third/Early Second Millennium B.C.

The Tell Mozan Phase C7 chronological benchmark has considerable implications for the regional chronology of the Syrian Jezireh in the late third and early second millennium B.C. This is all the more important as the interior chronology of the Syrian Jezireh has been controversially debated in recent years. It is especially relevant for the material culture at the turn of the third to the second millennium B.C., which covers the last phase of the Early Bronze Age, labeled the Early Jezireh V period, and the first phase of the Middle Bronze Age, labeled the Old Jezireh I period in the region of the Syrian Jezireh. Sites of the Old Jezireh I period, which is contemporary to the Isin-Larsa period of southern Mesopotamia, have rarely been recognized in the Syrian Jezireh (Koliński 2007, pp. 353–54). Tell Arbid (Koliński 2012a, b), Tell Barri (Orsi 2011, pp. 413–25; Orsi 2012, pp. 99–100), and Tell Mozan (Pfälzner and Dohmann-Pfälzner 2014, pp. 66–74, tables 3–4) are the only remarkable exceptions to this. The rarity of attestations of this period in the Syrian Jezireh, however, needs not necessarily be a result of a lack of occupation during this time. Rather, it could simply be a consequence of our lack of knowledge of the material culture of this period, and the resulting difficulty of identifying respective layers as such.

This difficulty is closely connected to the question of the origin and chronological development of the so-called Ḫabur Ware. Generally, it is assumed by scholars that Ḫabur Ware started to appear during the first half of the nineteenth century B.C. (Koliński 2007, table 1; Faivre and Nicolle 2007, pp. 181–83; Nicolle 2000, p. 1173 [at 1900 B.C.]; Rova 2011, p. 64; Orsi 2012, p. 93; Baccelli and Manuelli 2008, p. 189).[2] This pre-assumption is often even employed as a *terminus post quem* for dating layers in which Ḫabur Ware is attested. When Ḫabur Ware appears, the respective layers are generally assumed to date to the Old Jezireh II period (1850–1650 B.C.).

Recently, Koliński has argued for the existence of a so-called "Early Khabur Ware," to be dated to the Old Jezireh I period (2000–1850 B.C.) (Koliński 2014, pp. 21–31). He defined it on the basis of pottery specimens from Tell Arbid and Tell Barri. He argues that the Early Khabur Ware would be a primary indicator for Old Jezireh I sites in the Syrian Jezireh (table 7.1).

Table 7.1. Comparative chronological classification of Ḫabur Ware by different authors: Faivre and Nicolle 2007, p. 183; Oguchi 2006, fig. 2; Baccelli and Manuelli 2007, pl. 8; Kolińksi 2014, table 1, and Pfälzner, this paper

Periodization			*Faivre and Nicolle 2007*	*Oguchi 2006*	*Baccelli and Manuelli 2008*	*Koliński 2014*	*Pfälzner*
Middle Bronze	Old Jezireh II	1850–1650 B.C.	Khabur recente (MB II)	Khabur 3	Khabur IIB	Classical Khabur Ware	**Ḫabur IIb Period**
				Khabur 2	Khabur IIA		**Ḫabur IIa Period**
	Old Jezireh I	2000–1850 B.C.	Khabur ancienne	Khabur 1	Khabur I	Early Khabur Ware	**Ḫabur Ib Period**
Early Bronze	Early Jezireh V	2100–2000 B.C.					**Ḫabur Ia Period**

Against this assumption, it can be stated that Ḫabur Ware is already present in layers of the Early Jezireh V period. There is clear evidence for this at Tell Mozan Phase C7, dated to the Early Jezireh V period in the twenty-first century B.C. (see above). The Ḫabur Ware sherds come from numerous well-stratified loci of Phase C7, both in the Puššam House and in surrounding areas, particularly Court DA and Rooms B, AM, AL, AI, BH, and BY (Schmidt 2013, pp. 102–05, table 4 4.[3] There are altogether 149 specimens of Ḫabur Ware from Phase C7,

[2] For a slightly different approach, see Oguchi, who thinks that Ḫabur Ware started with "Ḫabur Ware Period 1 (1900–1814 B.C.)" at around 1900 B.C. (Oguchi 1997, p. 198; Oguchi 1998, p. 119; Oguchi 2001, p. 84; Oguchi 2006, fig. 2).

[3] For the architectural and depositional contexts, compare Bianchi et al. 2014, pp. 203–66.

deriving from thirty-nine different loci, covering Sub-Phases C7c to C7a (see Schmidt 2013, table 44). Therefore, the evidence cannot be related to a few misplaced or intrusive sherds, but definitively reflects an original occurrence of Ḫabur Ware in this period.

In general, the Ḫabur Ware sherds from Phase C7 carry mainly horizontal bands attached in close proximity to the rim as painted decoration (fig. 7.5). A hatched pattern on top of the rim also appears (fig. 7.5, K 1131), as well as simple triangular patterns on the rim (fig.

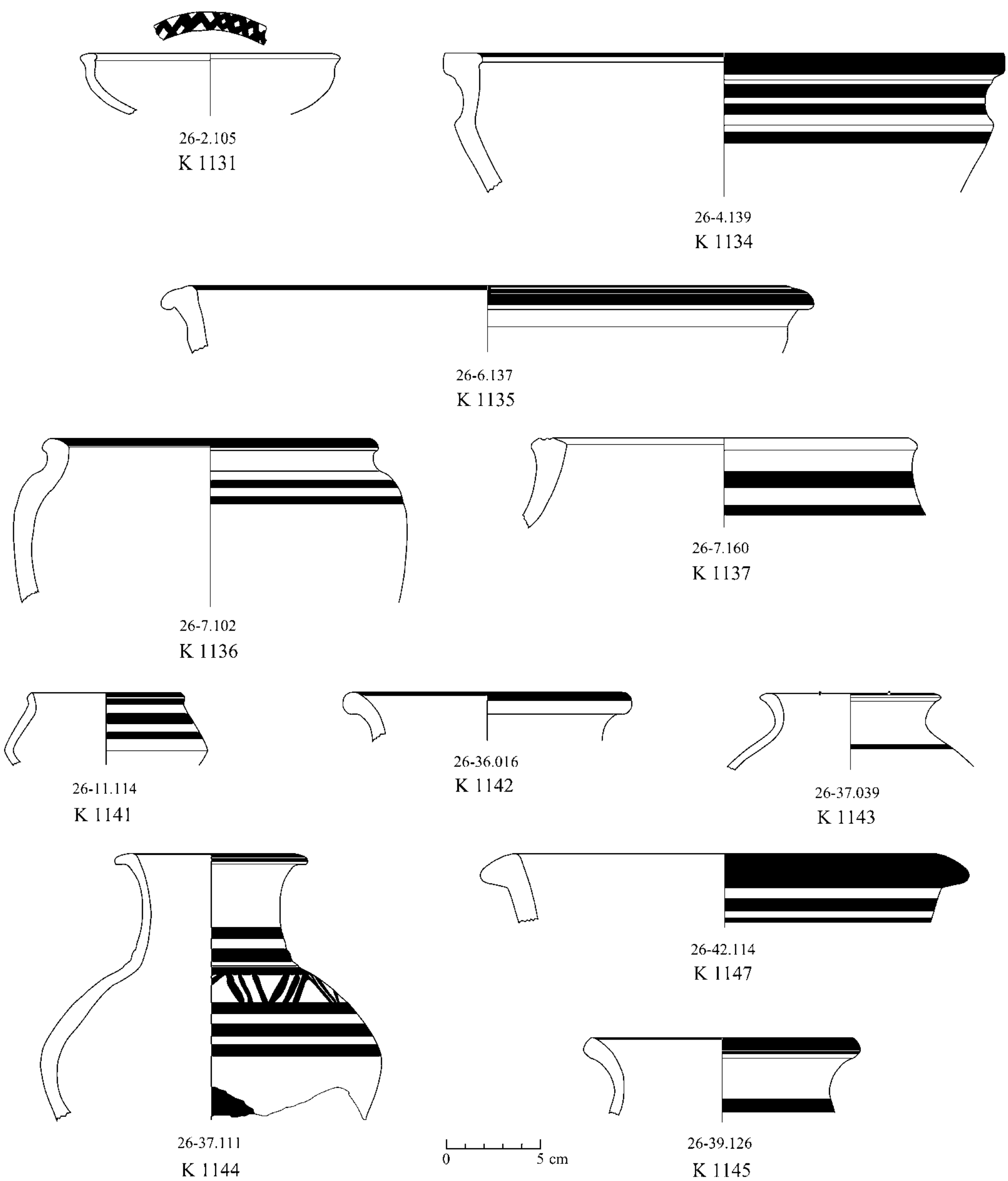


Figure 7.5. Selection of sherds of Ḫabur Ware from Phase C7 at Tell Mozan, pottery period Ḫabur Ia (Early Jezireh V period, ca. 2100–2000 B.C.) (illustration from Schmidt 2012, fig. 4, extended by author; for sherd descriptions, see Schmidt 2013)

7.5, K 1144). More complex patterns, as in later phases of Ḫabur Ware, are still missing. The Ḫabur Ware sherds from Phase C7 reveal some more typological peculiarities, which seem to be characteristic for this early stage of the ware: the paint, while in most cases having the usual brown color, is sometimes of a peculiar orange-red color (fig. 7.6a).[4] The painting style is sometimes cursory and slightly transparent, giving a careless impression (fig. 7.6b). Among the shapes, a number of small bowls with a sharp carination and strongly inverted shoulder are remarkable (fig. 7.6c). Furthermore, deep bowls with soft carination are characteristic of the Ḫabur Ware of this phase (fig 7.6d). These characteristics define the pottery period Ḫabur Ia, datable to the Early Jezireh V period (ca. 2100–2000 B.C.).

It needs to be pointed out that, despite the large absolute number of Ḫabur Ware sherds, the ware makes up only 0.43 percent of all sherds in Phase C7 (see fig. 7.14). This is a rather low proportion, which might actually hint at the start of this new kind of pottery at this time. The first examples at Tell Mozan appear, with only nine specimens, in the eldest Sub-Phase 7c of Phase C7, representing the oldest so far attested occurrence of Ḫabur Ware in the Syrian Jezireh. Thus, we have a clear sign of innovation in this period.

Area C at Tell Mozan offers the clearest, but not the only, evidence of a very early occurrence of Ḫabur Ware at the end of the third millennium B.C. It is also attested in Palace Area A of Tell Mozan, in Phase 4b,[5] dated by Bianchi to the Early Jezireh V period (Bianchi 2012, pp. 188–90, table 9). This convincingly demonstrates that Ḫabur Ware existed already during the Early Jezireh V period, at the end of the third millennium B.C., that is, during the twenty-first century B.C. The northern part of the Syrian Jezireh around Tell Mozan can be seen as one of the core regions of Ḫabur Ware.

This means that Ḫabur Ware can no longer be regarded as a chronological indicator for the Old Jezireh II period, and especially for the time of Šamši-Addu, as has been believed for many decades.[6] Consequently, the attribution of sites to the Middle Bronze Age on the basis of the occurrence of Ḫabur Ware needs to be critically revised. Furthermore, Ḫabur Ware can be seen as a clear link between the material culture of the Early and the Middle Bronze Age, as the ware emanated already in the final phase of the Early Bronze Age and was continuously produced during the Middle Bronze Age. Thus, the transition from the Early to Middle Bronze Age does not reflect a complete break in pottery production. It hints at a continuity of production units and, therefore, of social institutions. In conclusion, the Early to Middle Bronze Age transition was characterized — at least partially — by continuity.

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[4] For a description, see Schmidt 2013, p. 104; for a color photo of this piece, see the free-access Tell Mozan Central Upper City pottery webpage (www.keramik-mozan.uni-tuebingen.de/index.php/ker-bearbeitung/viewfotos/MZ01C2-i1532 [accessed 1/13/2017]). On this webpage, also most other specimens of Ḫabur Ware from Tell Mozan can be seen on color photos; to access, check sherd number in Schmidt 2013 (catalog) and type sherd number into search field (for Phases C7 to C4) of www.keramik-mozan.uni-tuebingen.de (accessed 1/13/2017).

[5] Bianchi 2012, p. 140 (Shape 322), p. 144 (Shape 443.3), pp. 148, 159, fig. 7 (Ware H), fig. 289, 308, pl. 62: nos. 817, 818, 819, 745.

[6] This idea goes back to Max Mallowan's excavations at Tell Chagar Bazar, where cuneiform tablets of the time of Šamši-Addu were found besides Ḫabur Ware (Mallowan 1947, pp. 82–83). But already in 1937 Mallowan had very correctly pointed out that the overall production period of Ḫabur Ware is to be situated between 2000 and 1600 B.C. (Mallowan 1937, pp. 102–04). He later reduced this time period for Ḫabur Ware and wrote: "The significant fact which emerges from this evidence is that the painted Ḫabur ware was most extensively used between about 1800 and 1600 B.C." (Mallowan 1947, p. 84). Also this assessment is not incorrect in view of our modern knowledge on the ware — as exposed in this paper — when one takes his expression "most extensively used" into account.

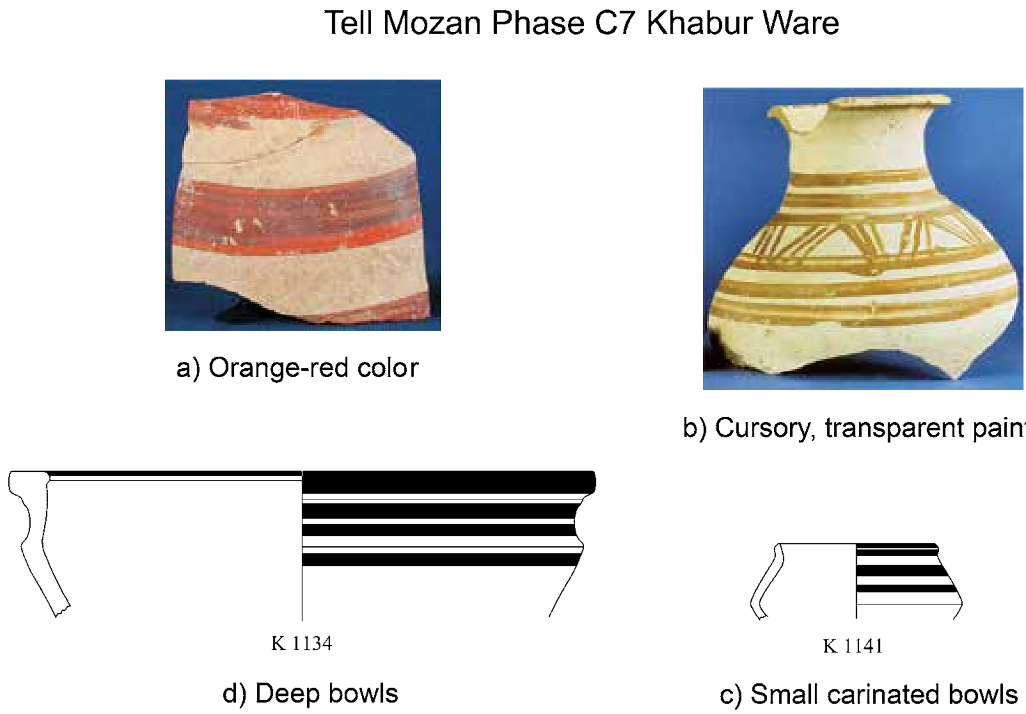

Figure 7.6. Characteristics of early specimens of Ḫabur Ware from Phase C7 at Tell Mozan, pottery period Ḫabur Ia (Early Jezireh V period, ca. 2100–2000 B.C.) (illustrations from Schmidt 2013, figs. 73–74, pls. 137–38)

This new understanding of the chronological value of Ḫabur Ware has significant effects on the conventional dating of sites in the Syrian Jezireh, as shown below for the case of Tell Barri. However, we can even go one step further and question the conventional starting point of the Middle Bronze Age, usually anchored around the year 2000 B.C. What basis with regard to the development of material culture does it have? This critical question is further discussed below.

Implications for the Chronological Synchronization between the Syrian Jezireh and Southern Mesopotamia

The Tell Mozan Phase C7 chronological benchmark supported by radiocarbon dates also has implications for the synchronization of cultures between the Syrian Jezireh and southern Mesopotamia. As has been shown above, the Early Jezireh V culture of northeastern Syria has close links with the Ur III culture of the south. This can be observed on the level of the architecture, in which the baked brick pavement and the terra-cotta water pipes of the Puššam House show parallels with the south (Pfälzner and Dohmann-Pfälzner 2014, pp. 66–70). It can also be demonstrated on the basis of the pottery, with a repertoire closely reminiscent of that in the south (see fig. 7.1) (Schmidt 2012, pp. 172–73; Schmidt 2013, pp. 107–09). Even the seals of the Early Jezireh V period show close parallels to the Ur III seal style of southern Mesopotamia (Dohmann-Pfälzner and Pfälzner 2001, pp. 122–25). Finally, the adoption of the

Late Sargonic/early Ur III writing system in the Syrian Jezireh is another hint at this close contact (Volk 2004; Steinkeller 1998).

The basis for this intensive cultural exchange seems to have been close trade relations between the Ur III region and the Syrian Jezireh in the twenty-first century B.C. Clear evidence for this is the presence of an interregional trading agency at the Puššam House of Tell Mozan (Schmidt 2005; Volk 2004; Pfälzner and Dohmann-Pfälzner 2014, pp. 66–70).

However, the chronology of the Ur III period in southern Mesopotamia is as yet highly controversial. There is a strong disagreement on the absolute date of the Ur III period on philological grounds, which refers to the unsolved dispute over the Middle, Low, and Ultralow Chronologies (Gasche et al. 1998).[7] This results in three divergent possible dates (leaving aside the Long Chronology) for the Ur III period: according to the Middle Chronology, the Ur III period dates from 2110 to 2003 B.C., according to the Short Chronology it dates from 2050 to 1943 B.C., and the Ultra-Short chronology sets it from 2018 to 1911 B.C. There are hardly any radiocarbon dates from the south to evaluate these conflicting assumptions and to narrow down the plausible absolute dating range of the Ur III period.

As a consequence of the chronology system used, the Ur III period shifts its placement within the framework of the archaeological periodization system. On the basis of the Middle Chronology, the Ur III period falls within the final phase of the Early Bronze Age; with the Short Chronology applied, it would extend over the transition from the Early to the Middle Bronze Age; and the application of the Ultra-Short Chronology would put the Ur III period well into the Middle Bronze Age, when the usual date of 2000 B.C. is applied for the turn of the Early to the Middle Bronze Age. This demonstrates, as argued above, that the temporal placement of the Early to Middle Bronze Age transition is highly arbitrary.

However, on the basis of the chronological benchmark from Tell Mozan Phase C7, supported by radiocarbon dates clearly pointing to the twenty-second and twenty-first centuries cal. B.C. for the Early Jezireh V period, the open question of the absolute chronology of the Ur III period can be brought closer to a solution from an external perspective. With the Ur III period being undoubtedly contemporary to the Early Jezireh V period in the north, the twenty-first-century B.C. date of the latter period can be conferred to the Ur III period. Consequently, a twenty-first-century B.C. date for the Ur III period correlates with the chronological framework of the Middle Chronology, setting the Third Dynasty of Ur between 2110 and 2003 B.C., and thus attributes strong plausibility to the latter. In conclusion, the Tell Mozan Phase C7 chronological benchmark strongly supports the validity of the Mesopotamian Middle Chronology.

Implications for the Chronological Synchronization between the Syrian Jezireh and the Northern Levant

The Syrian Jezireh also maintained close cultural contacts with the regions of western Syria at the turn of the third to the second millennium B.C. This is demonstrated by strong pottery resemblances between the Early Jezireh culture and sites to the west of the Euphrates, as discussed below. Therefore, the Tell Mozan Phase C7 chronological benchmark also

[7] On this chronological controversy, see recently Mebert 2010; Nahm 2013.

has implications for the chronological synchronization between the Syrian Jezireh and the northern Levant.

Correlations between Tell Mozan and western Syria are not based on the occurrence of the Ḫabur Ware,[8] but on other elements of the shape repertoire of the Early Jezireh V pottery assemblage. A comparison to the pottery assemblages from Ebla results in the interesting observation that there are particularly close parallels between Tell Mozan Phase C7 and Mardikh Phase IIIA (figs. 7.7–7.9) (Schmidt 2012, pp. 170–72, figs. 11–13, table 3; Schmidt 2013, pp. 111–12, table 45). The strongest resemblances can be seen for the following types: flat bowls with a sharp carination (fig. 7.7), deep bowls with grooves on top of the rim (fig. 7.7), small jars with a short neck and a slight carination (fig. 7.8), potstands (fig. 7.8), and necked jars with a concave rim (fig. 7.9).

These manifold similarities make a chronological correlation of Phase Mardikh IIIA with the Early Jezireh V period very compelling, all the more as the mentioned types are very distinctive for the latter period. Conventionally, a Middle Bronze Age I date is assigned to the Mardikh IIIA horizon at Ebla, which would correspond to a time span from 2000 to 1800 B.C. (Nigro 2009, p. 60, table 1:1; Matthiae 2013, p. 285). In view of the Mozan Phase C7 benchmark and its assured date to the twenty-first century B.C., the dates for Ebla need to be raised. The Mardikh IIIA horizon has to be placed into the twenty-first century B.C., as well. Whether it continued from there into the second millennium B.C. or ended — as the Early Jezireh V period did — at around 2000 B.C. is a different question, which cannot be decided from a Syrian Jezireh perspective. Beyond doubt, however, the beginning of the Middle Bronze Age in the northern Levant, as reflected by Mardikh IIIA, has to be dated at around 2100 B.C.[9]

A synchronism with the Early Jezireh V period can even be demonstrated for Middle Bronze Age I contexts at Qaṭna in central western Syria. A well-defined context was retrieved from a silo attributed to Phase G10 below the Royal Palace of Qaṭna (for the find context, see Geith, forthcoming). This installation was covered and partially cut by the foundations of the Royal Palace of Phase G9, dated to the Middle Bronze Age IIA period. The silo was filled with a large amount of botanical material and pottery. The pottery repertoire, astonishingly, shows many parallels both to Ebla Phase Mardikh IIIA and to Tell Mozan Phase C7 (figs. 7.10–7.11). This again refers to flat bowls with sharp carination, deep bowls with grooves on top of the rim, short-necked jars with a slight carination, and jars with a concave rim.[10]

Thus, even in view of the large geographic distance of the two regions, the Middle Bronze I pottery of central western Syria is typologically closely related to the Early Jezireh V repertoire of the Syrian Jezireh. Again, this speaks for a contemporaneity or, at least, a temporal overlapping of the mentioned phases. Also the Qatna Phase G10 silo produced radiocarbon dates, measured in the frame of the CINEMA project of Felix Höflmayer and Aaron Burke (fig. 7.12). Interestingly, they offer a time range between 2100 and 1900 cal. B.C. for Phase G10, and concentrate especially before and after 2000 cal. B.C. Thus, they are only

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[8] However, Ḫabur Ware, or at least a ware very similar to it (at Ebla labeled "Simple Painted Ware"), is well attested in Mardikh IIB2 contexts at Ebla (see Sala 2012, pp. 65–72, figs. 7, 13) dated to the Early Bronze IVB (2300–2250 B.C.), an interesting phenomenon that is currently investigated in the dissertation thesis of Tulip Abd el-Hay at Tübingen University. This evidence hints at a Western origin of Ḫabur Ware.

[9] This result is perfectly in agreement with the idea of Glenn Schwartz (this volume) of a beginning of Ebla Middle Bronze Age I at around 2100 B.C.

[10] The pottery was studied by Tulip Abd el-Hay in the frame of her M.A. thesis; see Abd el-Hay in Geith, forthcoming.

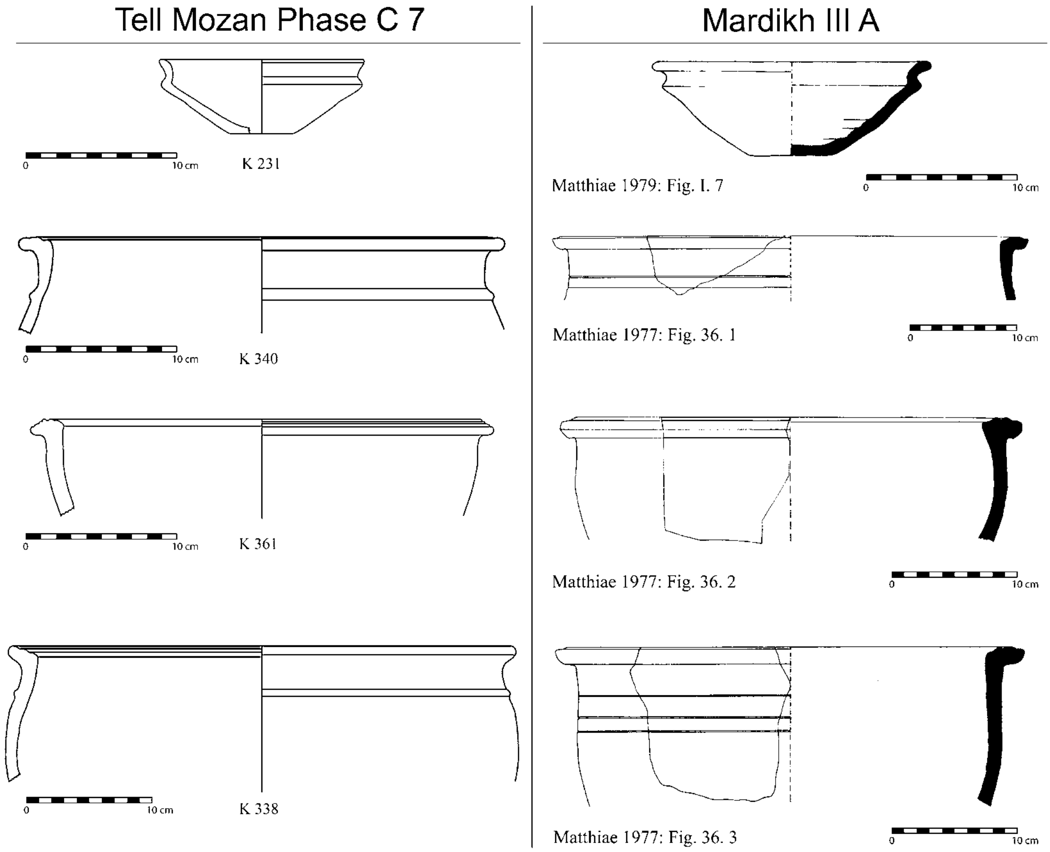

Figure 7.7. Comparison of flat and deep bowls from Tell Mozan Phase C7 (*left*) and Ebla Phase Mardikh IIIA (*right*) (illustration from Schmidt 2012, fig. 11)

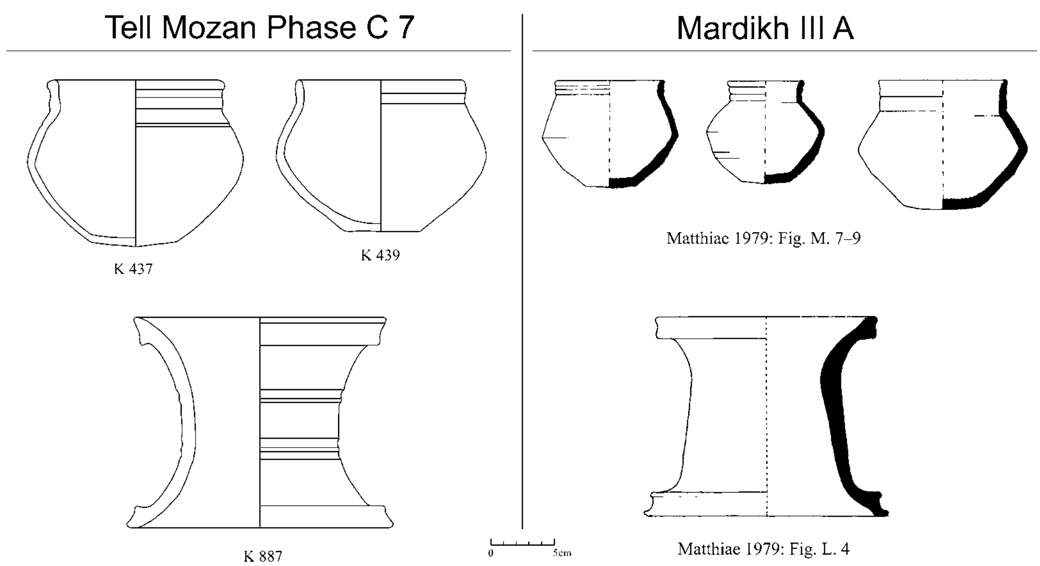

Figure 7.8. Comparison of small jars and potstands from Tell Mozan Phase C7 (*left*) and Ebla Phase Mardikh IIIA (*right*) (illustration from Schmidt 2012, fig. 12)

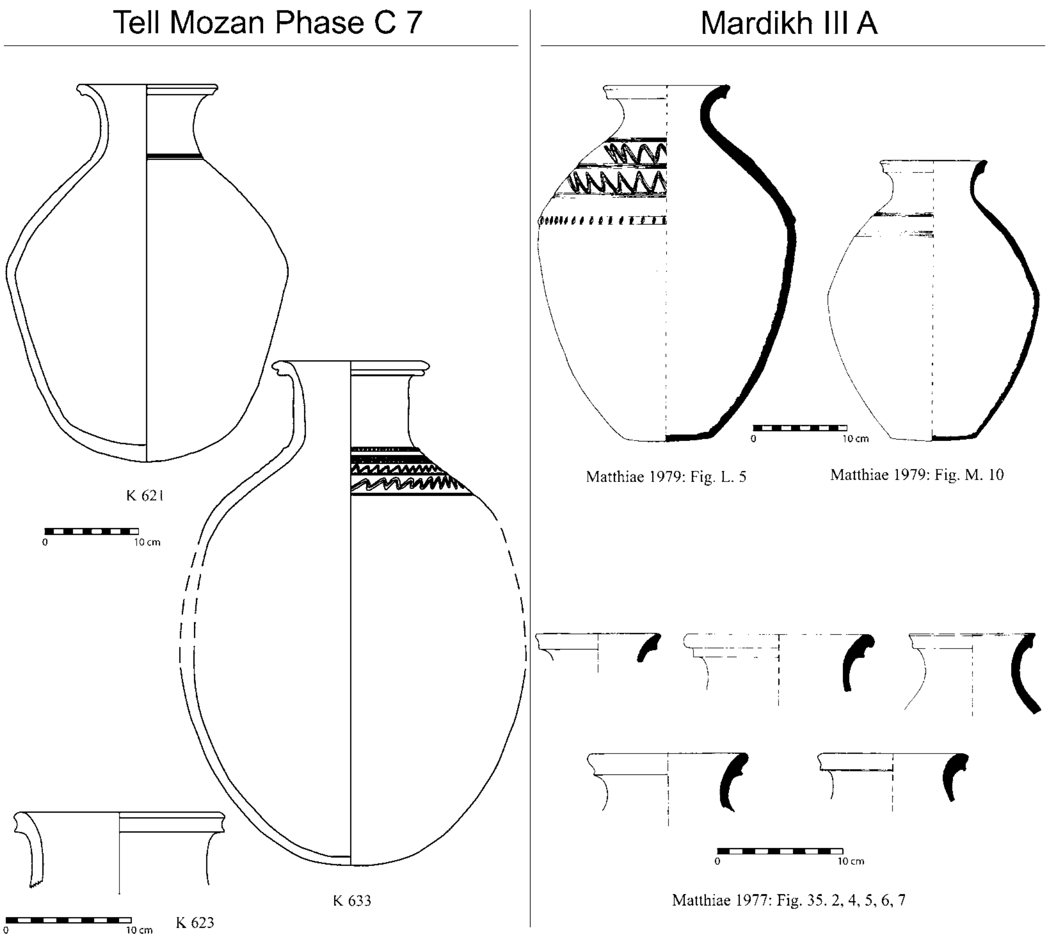

Figure 7.9. Comparison of large jars from Tell Mozan Phase C7 (*left*) and Ebla Phase Mardikh IIIA (*right*) (illustration from Schmidt 2012, fig. 13, modified by author)

slightly later than the Mozan dates for Phase C7 (see fig. 7.4). This, again, supports the idea of an early start of the Middle Bronze Age I period in western Syria, during the twenty-first century B.C., at least partly contemporary to the Early Jezireh V period of the Syrian Jezireh.

In conclusion, the twenty-first century B.C. Tell Mozan Phase C7 chronological benchmark helps to establish an interconnected late third-millennium B.C. horizon throughout Mesopotamia, Syria, and the northern Levant (table 7.2). It throws a particular light on the beginning of the Middle Bronze Age, which needs to be pushed back in time beyond the 2000 B.C. time line for approximately one century. For the sake of a comparative chronology, it makes perfect sense to define in general terms the start of the Middle Bronze Age at around 2100 B.C. in the three mentioned regions, and beyond. Thus, not only is the Syrian Middle Bronze I concerned, but also the Early Jezireh V period in northeastern Syria and the Ur III period in southern Mesopotamia which, being contemporary to each other, would all mark the initial stage of the Middle Bronze Age. Furthermore, this increases our understanding of the Early to Middle Bronze Age as a continuous process.

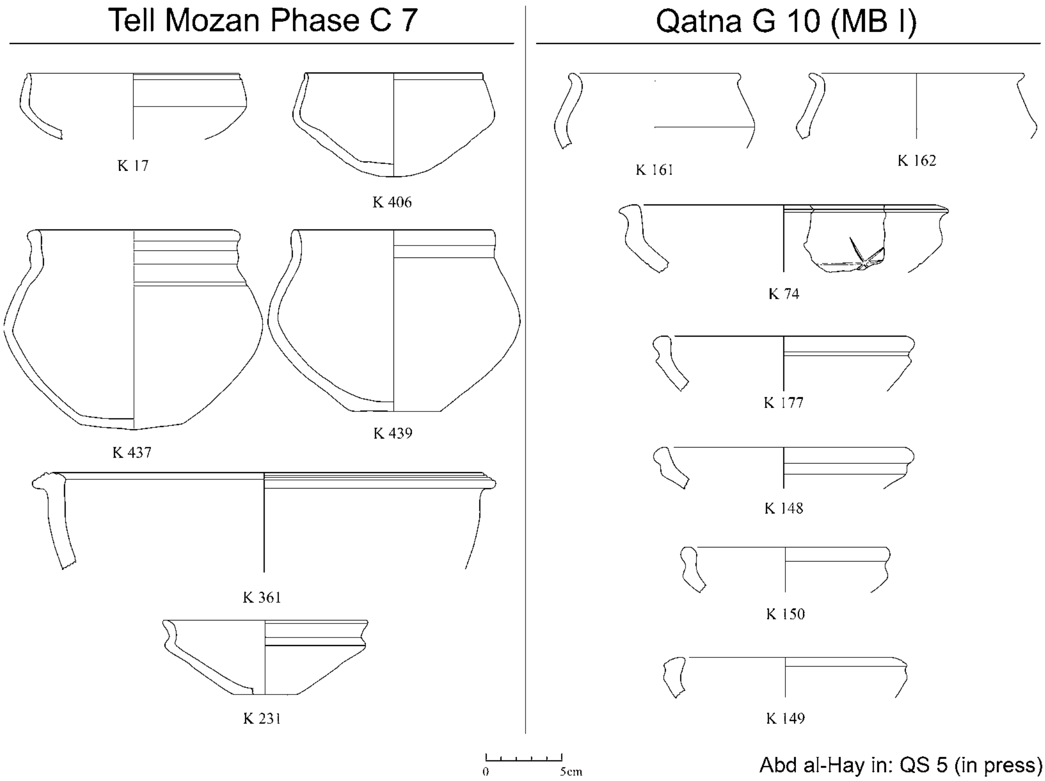

Figure 7.10. Comparison of bowls from Tell Mozan Phase C7 (*left*) and Qaṭna Phase G10 (*right*) (for Mozan specimens, see Schmidt 2013; for Qaṭna specimens, see Geith, forthcoming)

Table 7.2. Proposal for a new periodization of the Early to Middle Bronze Age transition in Mesopotamia, the Syrian Jezireh and the northern Levant

Period		*Southern Mesopotamia*	*Syrian Jezireh*		*Northern Levant*	
Middle Bronze II	1850–2650 B.C.	Old-Babylonian	Old Jezireh II	Mozan C4	Mardikh III B	Qaṭna G 9
Middle Bronze IB	2000–1850 B.C.	Isin-Larsa Period	Old Jezireh I	Mozan C5 C6	↑	↑
Middle Bronze IA **2100 B.C.**	2100–2000 B.C.	Ur III	Early Jezireh V	Mozan C7	Mardikh III A	Qaṭna G 10
2100 B.C. **Early Bronze IV**	2400–2100 B.C.	Akkad	Early Jezireh IV	Mozan C8	Mardikh II B1–II B2	Qaṭna G 11–12

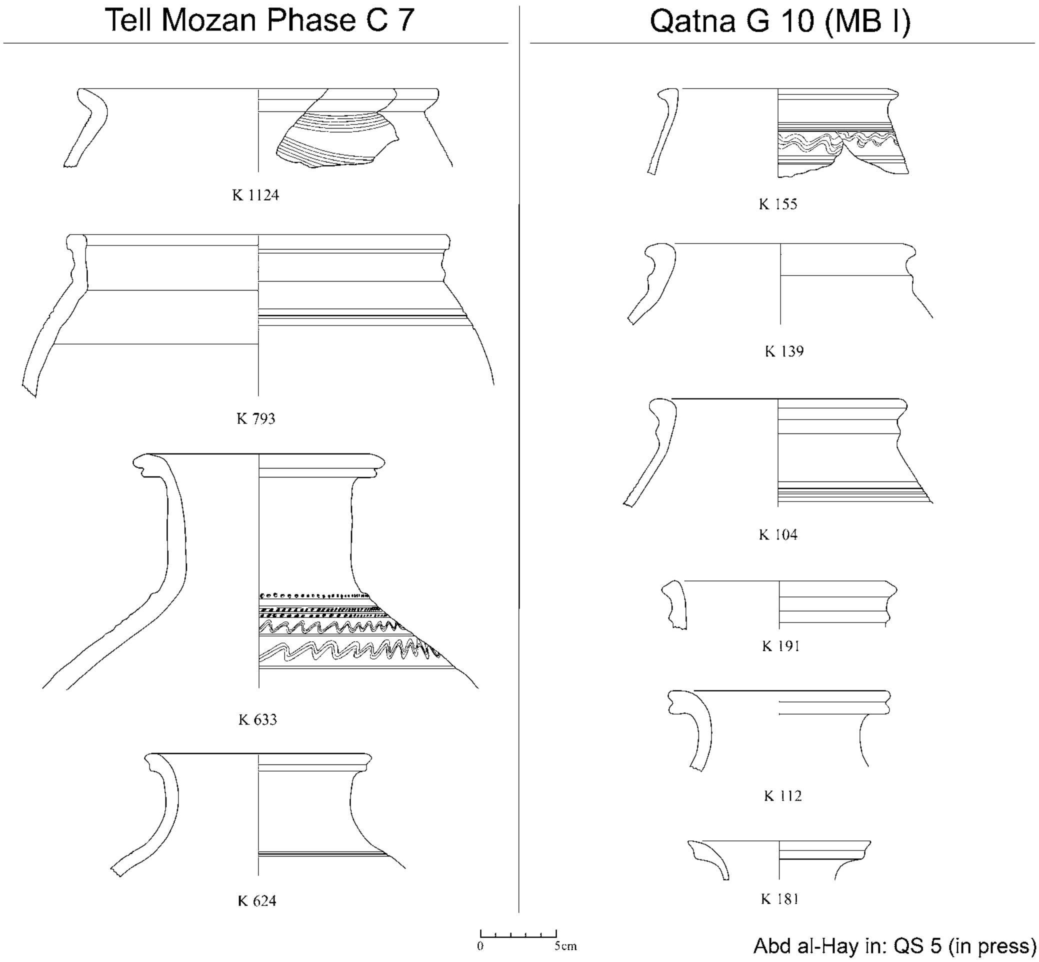

Figure 7.11. Comparison of jars from Tell Mozan Phase C7 (*left*) and Qaṭna Phase G10 (*right*) (for Mozan specimens, see Schmidt 2013; for Qaṭna specimens, see Geith, forthcoming)

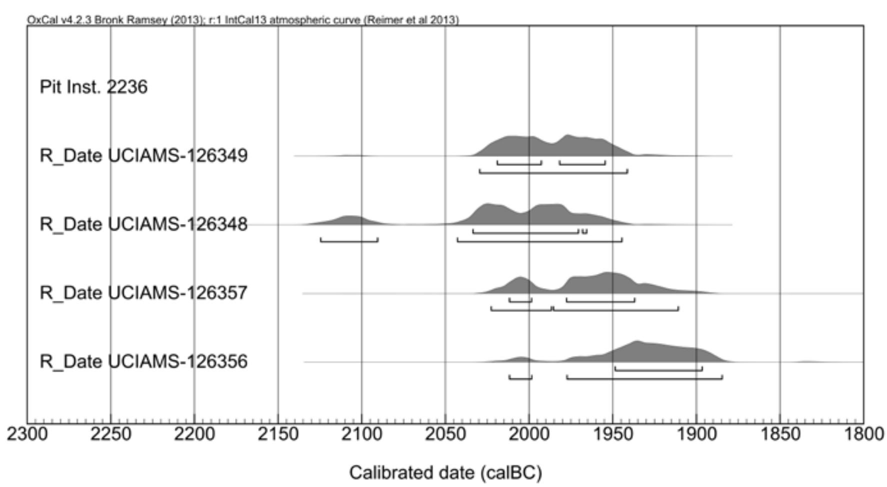

Figure 7.12. Radiocarbon dates from Qaṭna, Phase G10 (courtesy of Felix Höflmayer)

Innovation and Change during the Early to Middle Bronze Age Transition in the Syrian Jezireh: The Case of the Ḫabur Ware

In the last section of this paper, I want to discuss the chronological and stratigraphic evidence of the Early to Middle Bronze Age transition at select sites in the Syrian Jezireh against the background of the Mozan Phase C7 benchmark. A special focus is devoted to the development of Ḫabur Ware and its implications for chronology.

Based on new archaeological data, the transition from the Early to the Middle Bronze Age can be observed at a number of sites in the Syrian Jezireh. Besides Tell Mozan, these are Tell Arbid (Koliński 2012a, 2012b, 2014), Tell Barri (Orsi 2010, 2011, 2012), Tell Mohammed Diyab (Nicolle 2012, pp. 140–41, fig. 13), Chager Bazar (Tunca and Miftāḥ 2007, pp. 13–14, fig. 2.18; McMahon 2012, p. 30).[11] and possibly Tell Brak.[12] Three of these stratigraphic sequences, those of Tell Mozan, Tell Barri, and Tell Arbid, are discussed and compared in detail in the following analysis. The goal is to synchronize these three continuous and well-defined sequences and to work out the development of Ḫabur Ware as one of the main and best visible indicators of cultural innovation during the Early to Middle Bronze Age transition. The comparative discussion refers to two aspects: changes in pottery production and changes in architecture and urban layout. Both of these aspects are relevant for the chronological assessment of the Early to Middle Bronze Age transition and for understanding the processes of socio-political change during this period.

The Stratigraphic Evidence at Tell Mozan

For Tell Mozan, we have an uninterrupted sequence from the late third to the early second millennium B.C., extending from Phase C7 to Phases C6, C5, and C4.

The Early Jezireh V Period

As shown above, the twenty-first-century B.C. chronological benchmark at Tell Mozan is related to Phase C7 (Early Jezireh V period), for which the House of Puššam has been excavated on a large scale.

The Old Jezireh I Period

Interestingly, in Phase C6, dated to the Old Jezireh I period (2000–1850 B.C.), the House of Puššam stays in use. This is a very important observation as it proves a direct continuity from Phase C7 to C6, that is, from the end of the third to the beginning of the second millennium B.C.

There are some architectural modifications of the Puššam House in Phase C6, with new walls being inserted, while the old northern outer wall was still in use (fig. 7.13) (see Pfälzner 2012a, pp. 56–58, figs. 4 and 6; Bianchi, Geith, and Wissing 2014, pp. 323–39). As Phase C6

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[11] For the dating of Chagar Bazar Phase IIa to Early Jezireh 4c/5, see Quenet 2011.

[12] The stratigraphic evidence of the third- to second-millennium B.C. transition at Tell Brak is not completely clear, especially with regard to the Old Jezireh I period, for which a gap seems to exist; for a recent discussion, see McMahon 2012, esp. pp. 27–28, 32, fig. 5, table 1; Colantoni 2012, esp. pp. 57–61, table 1; Emberling et al. 2012.

Figure 7.13. Architectural continuity of the Puššam House at Tell Mozan in Phases C7 and C6

floors connected the new with the old walls, their stratigraphic connection is proven beyond doubt.[13] Because walls of sun-dried mudbricks do not remain intact over a long time, especially when a building would be abandoned and exposed to erosion, we can conclude that there could not have been any longer time gap between Phases C7 and C6, apart from probably a very short phase of decay and rebuilding activity (see Bianchi, Geith, and Wissing 2014, pp. 323, 328, 339). We assume a time distance between the two phases of not more than fifty years. Thus, Phases C7 and C6 offer a perfect link between the third and the second millennia B.C., hardly attested at any other site with such a clear stratigraphic situation.

What is particularly interesting is the fact that despite the continuity in architecture between Phases C7 and C6 there is a change in pottery. In Phase C6, new shapes appear that are typical for the Middle Bronze Age throughout northern Mesopotamia (see Schmidt 2013, pp. 114–16, fig. 79). Furthermore, Ḫabur Ware, which first appeared in Phase C7 (see above), is far more frequent in Phase C6. It now holds a proportion of approximately 7 percent of the whole pottery repertoire, while its percentage for the previous Phase C7 was only at 0.4 percent (fig. 7.14). This is a substantial relative increase in Ḫabur Ware, which now comprises a considerable, clearly noticeable part in the entire pottery corpus of the time. Additionally, the full repertoire of decorative patterns known to exist for Ḫabur Ware can be already observed at

[13] See particularly Bianchi et al. 2014, Beilage 20 (floor Inst. 413), Beilage 21 (floors Inst. 363 and 1022), pl. 50 (floor Inst. 745), pl. 51 (floor Inst. 413), pl. 52 (floor Inst. 385), and pl. 53 (floor Inst. 389).

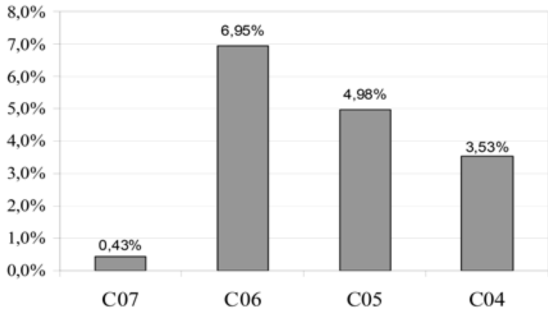

Figure 7.14: Percentages of Ḫabur Ware from Phases C7 to C4 at Tell Mozan (from Schmidt 2013, fig. 72)

this point (figs. 7.15–7.16).[14] Among them are types that have been regarded by Koliński as examples of his so-called Early Khabur Ware at Tell Arbid (Koliński 2014, pp. 27–30, figs. 4–6). These vessels are low carinated beakers with a painted decoration on the upper half of the body consisting of triangles carried out in a slightly careless manner (fig. 7.17). Unlike other examples of Ḫabur Ware decoration, the band of triangles is here not framed by a horizontal line above and below which would have inserted them into a clearly delineated decorative band. However, it is evident that this decorative scheme is not a particularly early type, because at Tell Mozan (Phase C6) it appears in the second phase of the Ḫabur Ware development (pottery period Ḫabur Ib). Therefore, the term "Early Khabur Ware" seems to be inappropriate for this type.

The dating of Phase C6 to the very beginning of the second millennium B.C., shortly after 2000 B.C., based on the above-mentioned stratigraphic argument of a the re-use of the Phase C7 architecture in Phase C6 indicating only a short time span between the two phases, can be compared to new radiocarbon dates from Tell Mozan. Two samples from Mozan Phase C6 have been analyzed in the framework of the CINEMA project (fig. 7.18). Although they do not fall in the twentieth century B.C., as would have been expected, they are older than this and thus, at least, do not contradict the proposed absolute date of Phase C6. One sample dates to the twenty-fourth/twenty-third century cal. B.C., while the other provides a date in the twenty-second/twenty-first century cal. B.C. Thus, both samples, although of short-lived plants, seem to belong to older, residual biofacts deposited in Phase C6. Interestingly, the results match those of the dated sample from Phase C7 (see fig. 7.4), thus underlining the close relatedness of Phases C7 and C6, which can also be observed on the basis of the architecture.

In the following level, Phase C5 at Tell Mozan, there exists a number of houses in a densely occupied habitation quarter (Pfälzner and Dohmann-Pfälzner 2014, pp. 70–75; Bianchi, Geith, and Wissing 2014, pp. 343–94). They have been built directly upon the foundations of Phase C6 and thus re-use these foundations. Again, this is a clear evidence of a direct continuity of the settlement. Furthermore, Phase C5 is characterized by exactly the same kind of pottery as Phase C6, with hardly any typological development being visible between the two phases (see Schmidt 2013, pp. 116–18, fig. 80). This is also true for Ḫabur Ware, which shows similar shapes and motifs as in Phase C6 (figs. 7.19–7.20).[15] Even the quantitative occurrence of Ḫabur Ware at 5.0 percent of the total pottery of Phase C5 is very similar to that of the previous Phase C6 (see fig. 7.14).

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[14] All specimens of Ḫabur Ware depicted in figs. 7.15 and 7.16 can be seen in color photos on the free-access Tell Mozan Central Upper City pottery webpage (www.keramik-mozan.uni-tuebingen.de [accessed 1/13/2017]). To access photos, check the sherd number in Schmidt 2013 (catalog) and type the sherd number into the search field (for Phases C7 to C4).

[15] On the social processes, transformations, and socio-economic "turns" within this period, see Pfälzner 2010, pp. 8–10, table 2; Pfälzner 2012a, pp. 72–77; Pfälzner 2012b, pp. 157–58).

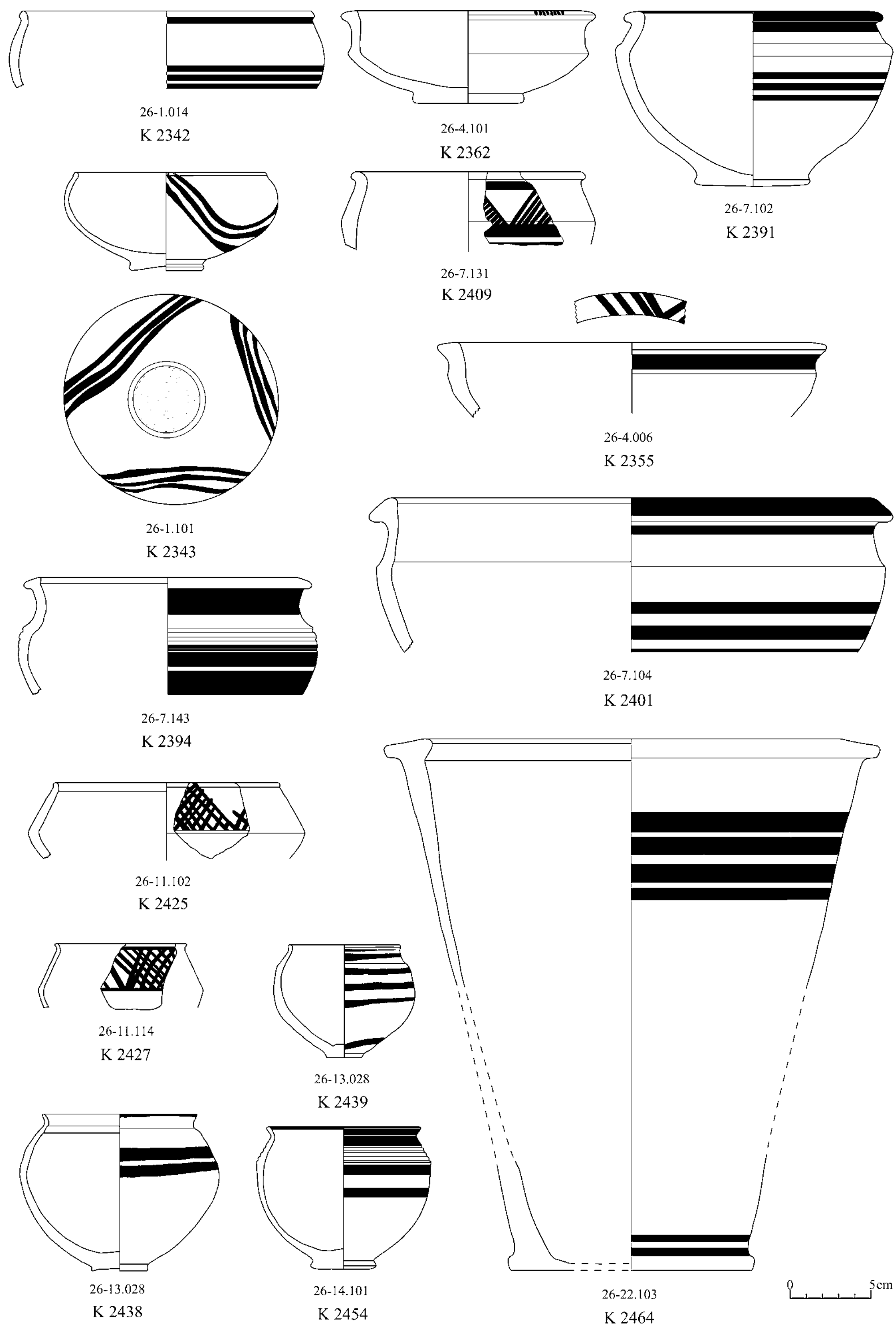


Figure 7.15. Selection of sherds of Ḫabur Ware from Phase C6 at Tell Mozan, pottery period Ḫabur Ib (Old Jezireh I period, ca. 2000–1850 B.C.) (illustrations from Schmidt 2013, pls. 246–74; for sherd descriptions, see Schmidt 2013, catalog)

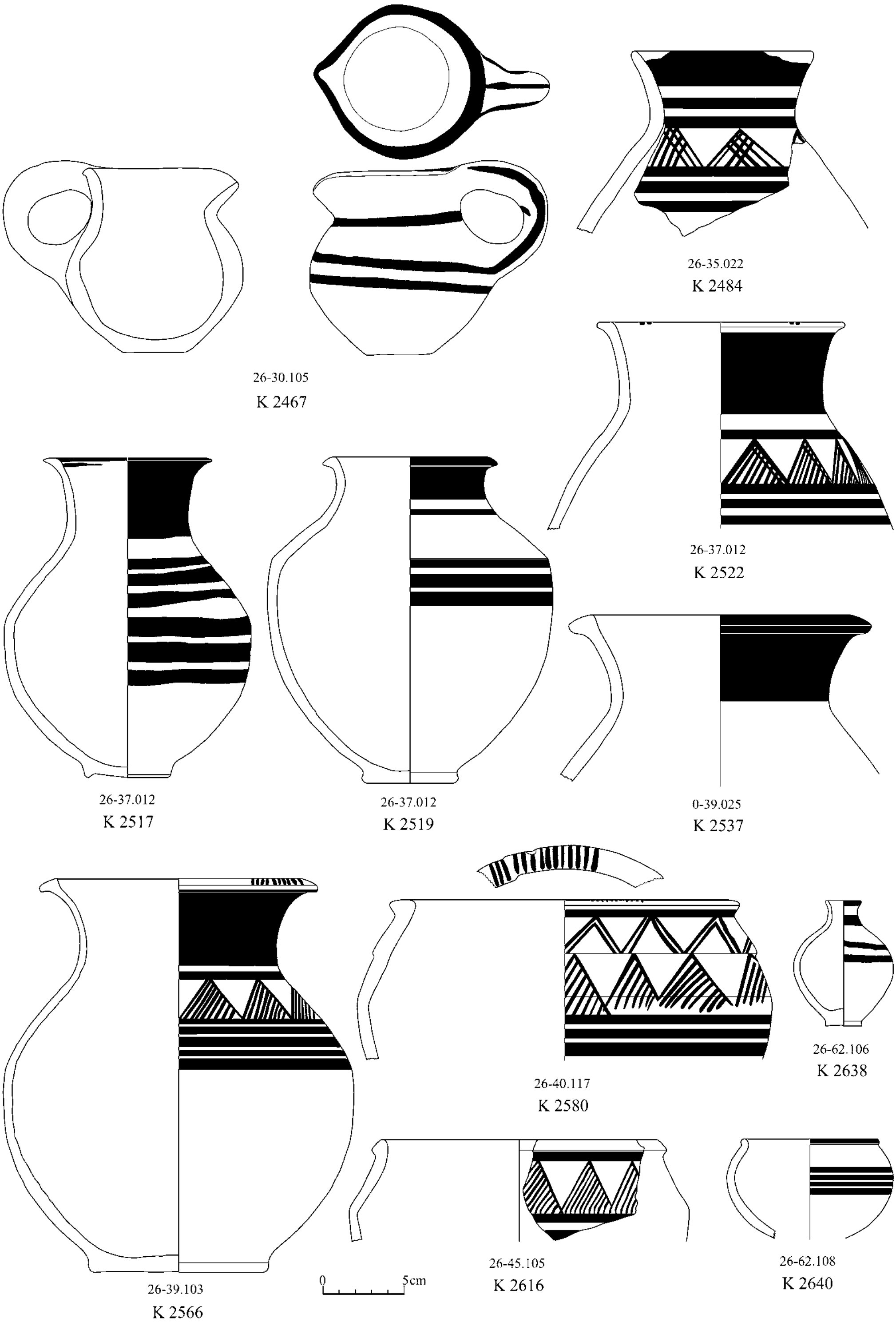
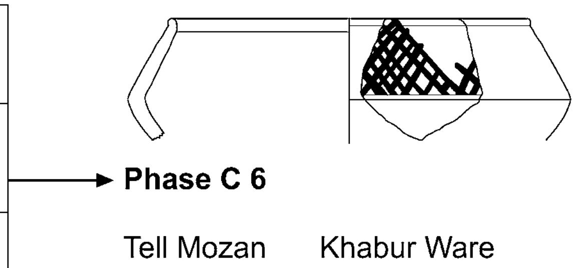


Figure 7.16. Selection of sherds of Ḫabur Ware from Phase C6 at Tell Mozan, pottery period Ḫabur Ib (Old Jezireh I period, ca. 2000–1850 B.C.) (illustrations from Schmidt 2013, pls. 246–74; for sherd descriptions, see Schmidt 2013, catalog)

OJ II	1850 – 1650 BC	Mozan C 4
OJ I	2000 – 1850 BC	Mozan C 5 Mozan C 6
EJ V	2100 – 2000 BC	Mozan C 7



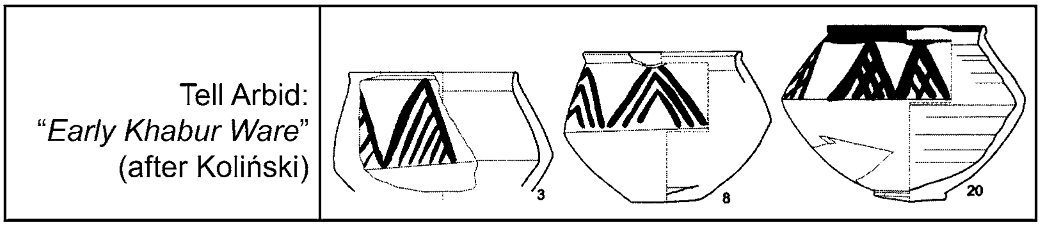


Figure 7.17. Comparisons of carinated Ḫabur Ware beakers from Tell Mozan Phase C6 and Tell Arbid (illustrations for Mozan from Schmidt 2013, pl. 256, K 2425; for Arbid from Koliński 2014, fig. 4)

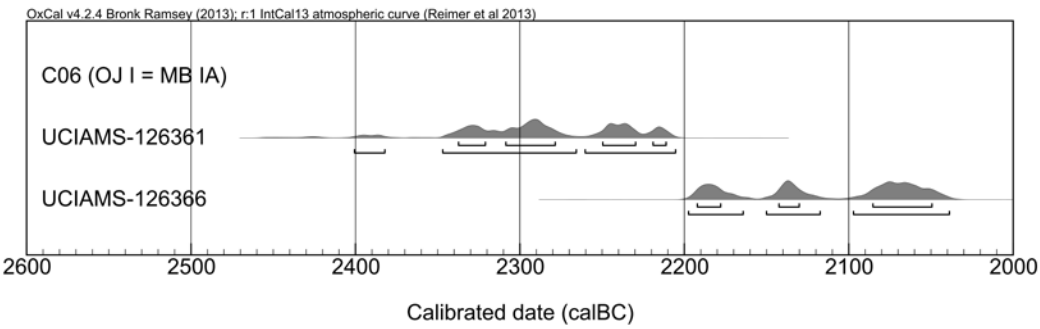


Figure 7.18. Radiocarbon dates from Tell Mozan Phase C6 (courtesy of Felix Höflmayer)

With regard to absolute chronology, we again have two lines of argumentation. On the basis of the architecture, three sub-phases (Phases 5b, 5a2, and 5a1) can be distinguished for Phase C5. In connection with seven attested sub-phases for Phase C6 (Phases 6b1, 6b2, 6a5, 6a4, 6a3, 6a2, and 6a1), both levels together must have covered an extended length of time. The ten sub-phases together reflect a continuous, long-lasting occupation of the domestic quarter in the Central Upper City of Tell Mozan/Urkeš, for which an overall time range between 2000 and 1850 B.C. can be easily assumed.

Three samples of short-lived plants from Phase C5 have been radiocarbon dated. Unfortunately, two of them, again, are too high (twenty-sixth and twenty-third centuries cal. B.C.), thus obviously reflecting older, residual ecofacts. The third date lies in the eighteenth century cal. B.C., with a weaker possibility in the nineteenth century B.C. This date corresponds to the Old Jezireh II, or probably to the very end of the Old Jezireh I period. It supports the idea of a long-lasting, continuous development of the settlement at Tell Mozan

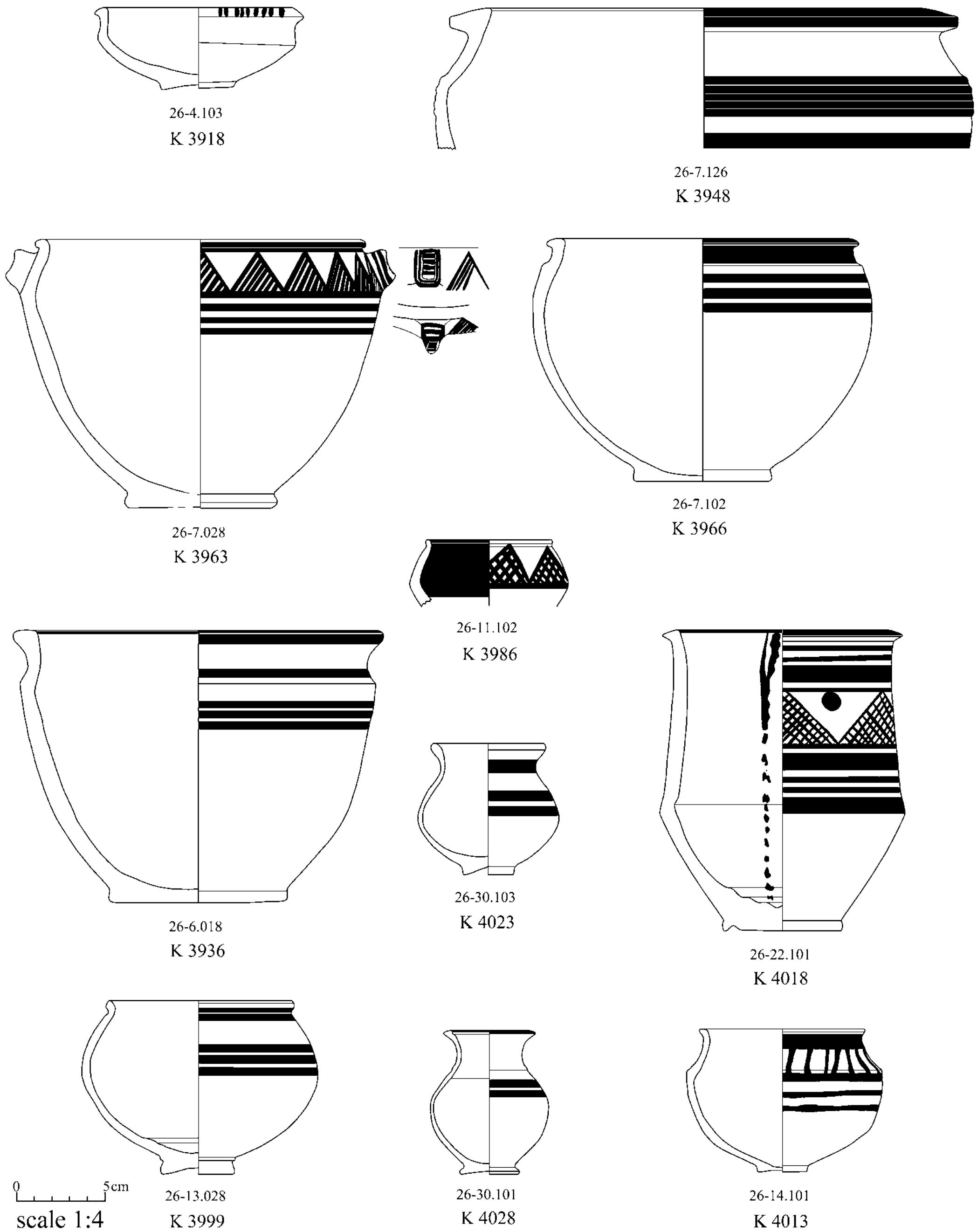


Figure 7.19. Selection of sherds of Ḫabur Ware from Phase C5 at Tell Mozan, pottery period Ḫabur Ib (Old Jezireh I period, ca. 2000–1850 B.C.) (illustrations from Schmidt 2013, pls. 398–433; for sherd descriptions, see Schmidt 2013, catalog)

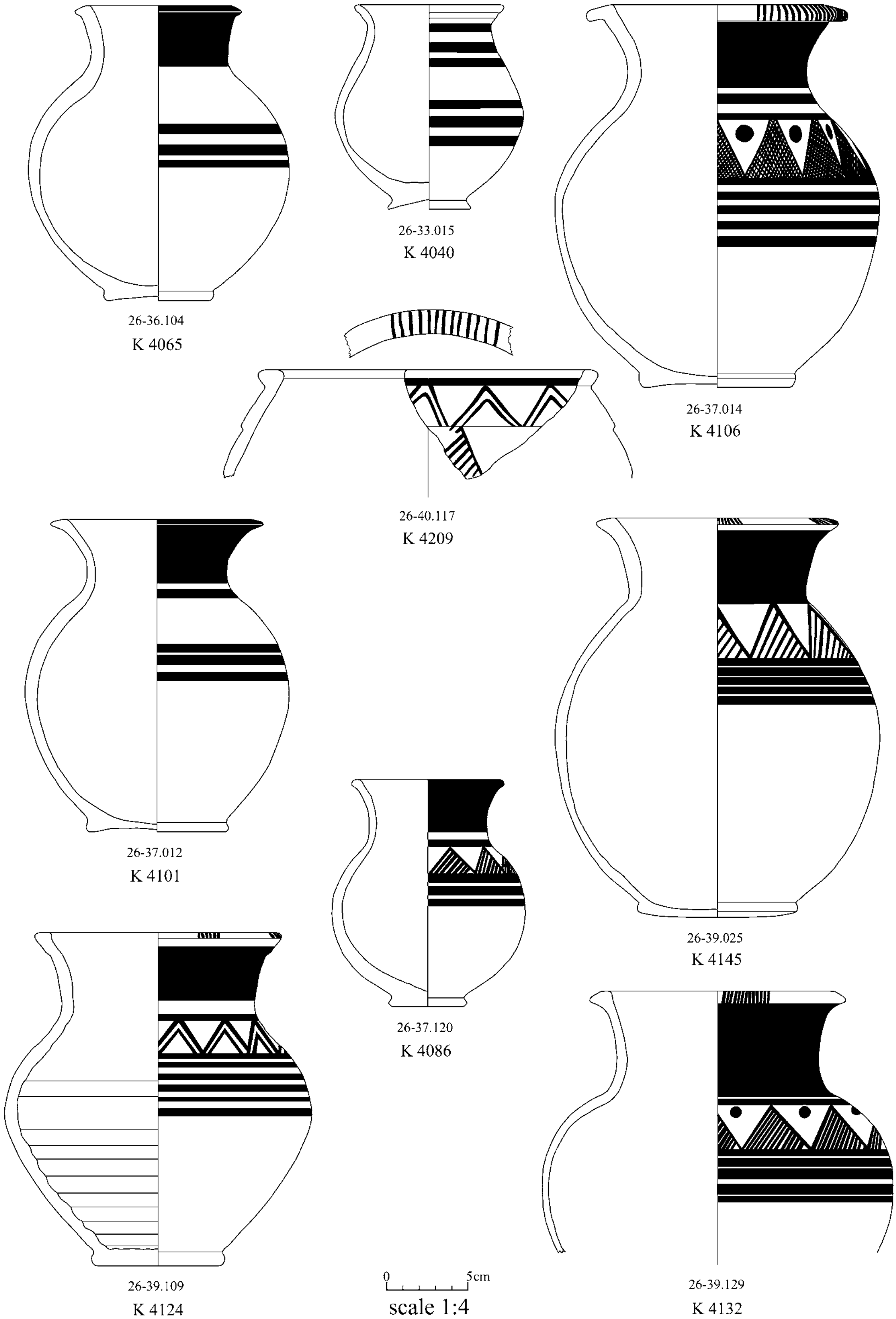


Figure 7.20. Selection of sherds of Ḫabur Ware from Phase C5 at Tell Mozan, pottery period Ḫabur Ib (Old Jezireh I period, ca. 2000–1850 B.C.) (illustrations from Schmidt 2013, pls. 398–433; for sherd descriptions, see Schmidt 2013, catalog)

throughout Phases C7, C6, and C5, from the twenty-first to at least the late nineteenth or eighteenth century B.C.

The Old Jezireh II Period

The last phase of occupation in the domestic quarter of the Central Upper City of Tell Mozan is defined as Phase C4. This period witnesses the gradual, but definitive, abandonment of the dwelling quarter. On the basis of some minor changes in pottery, it can be ascribed to the beginning of a new period, the Old Jezireh II period (see Schmidt 2013, pp. 118–19, fig. 81, table 46). However, there is no occupation at the site during most part of the Old Jezireh II period. Ḫabur Ware comprises 3.5 percent of the total pottery of Phase C4, a value similar to that of the previous Phase C5. In addition, the shapes and decorative patterns of Ḫabur Ware are largely unchanged (fig. 7.21) (Schmidt 2013, pp. 54–62, 75–78, 118–19). This phase must be dated to the very beginning of the pottery period Ḫabur IIa (see below).

In conclusion, Tell Mozan shows an un-interrupted cultural sequence from the Early to the Middle Bronze Age, covering the Early Jezireh V, the Old Jezireh I, and the beginning of the Old Jezireh II period. This corresponds to an approximate time range from 2100 to 1800 B.C. The beginning of this long time range, the Early Jezireh V period, is characterized by the

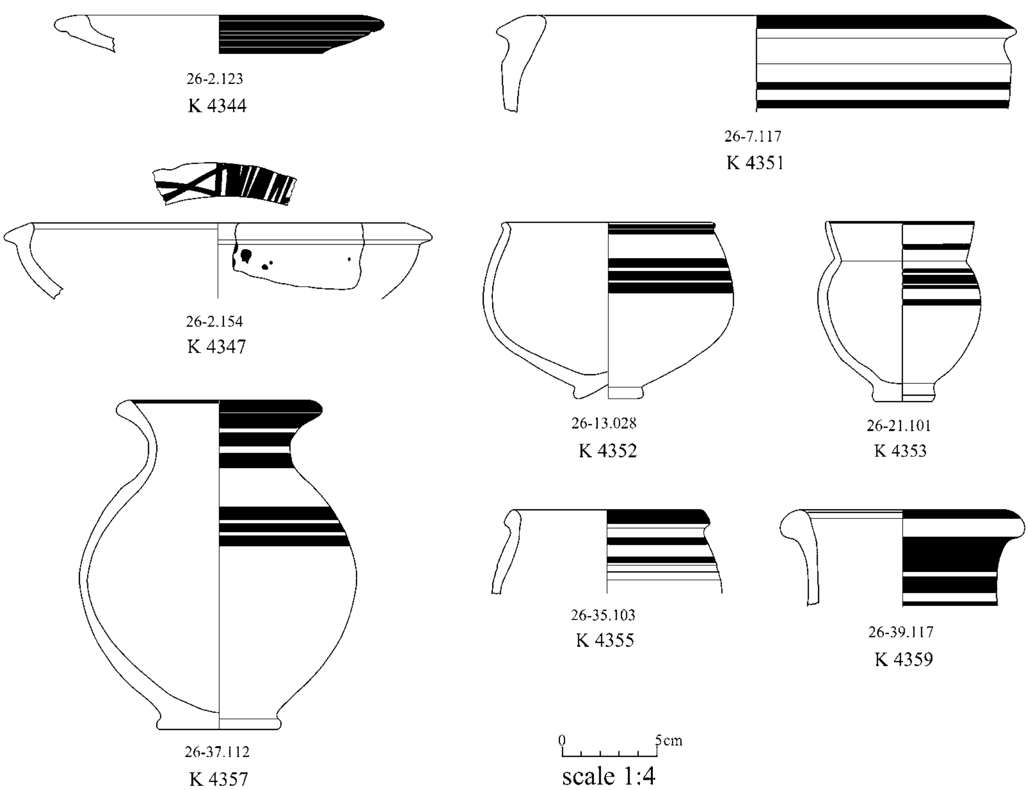


Figure 7.21. Selection of sherds of Ḫabur Ware from Phase C4 at Tell Mozan, pottery period Ḫabur IIa (Old Jezireh II period, ca. 1850–1650 B.C.) (illustrations from Schmidt 2013, pls. 442–44; for sherd descriptions, see Schmidt 2013, catalog)

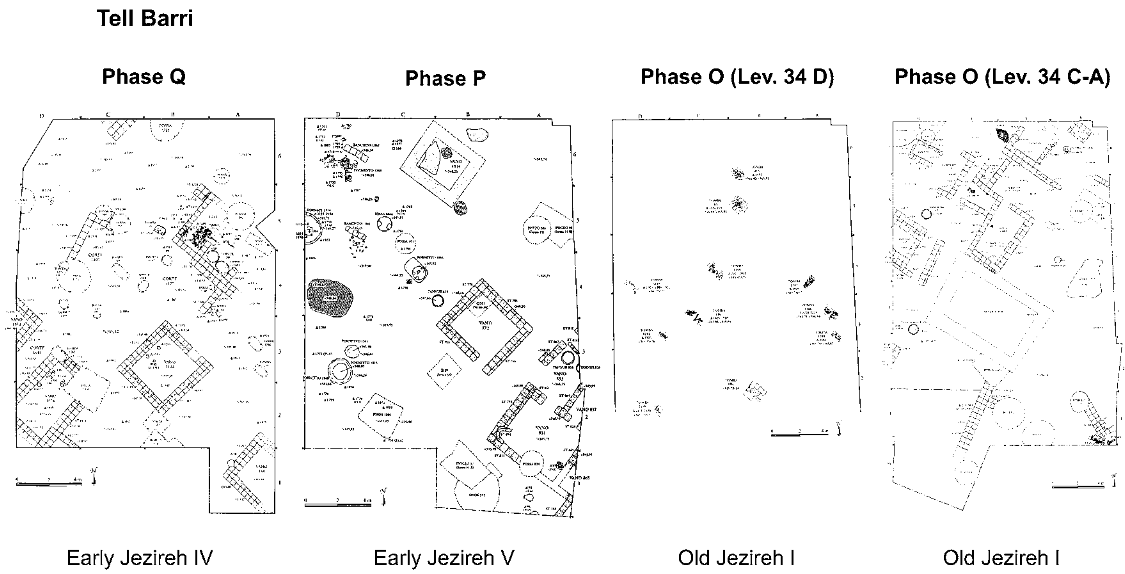


Figure 7.22. Architectural sequence at Tell Barri from the Early Jezireh IV to the Old Jezireh I period (illustrations from Orsi 2011, pls. 162, 164–66)

introduction, at around 2100 B.C., of a new kind of pottery, Ḫabur Ware, which constitutes one of the constant elements within the following social developments. Furthermore, this characteristic ware forms a link between the late third and the early second millennium B.C. Thus, its introduction marks an important cultural innovation. What for a long time has been believed to be a poorly documented "transitional phase" needs to be regarded as a period of continuity, with gradual, long-term social processes.[16]

The Stratigraphic Evidence at Tell Barri

The Early to Middle Bronze Age transition can be observed at Tell Barri through Phases Q, P, and O (fig. 7.19).

The Early Jezireh IV Period

Phase Q, covering Levels 37 to 36, is characterized by typical "Akkadian" pottery, closely comparable to the Early Jezireh IV ceramics of Tell Beydar (Orsi 2011, pp. 308–41, pls. 168–79; Orsi 2012, p. 91). During the Early Jezireh IV period, the settlement at Tell Barri is characterized by small-scale and single-room houses with thin walls representing households of a relatively low economic status (fig. 7.22) (Orsi 2011, pls. 162–63). This is a social situation very much similar to the contemporary small houses of the Early Jezireh IV Phases C11 to C8 in the Central Upper City of Tell Mozan (see Pfälzner 2012a, p. 63; Pfälzner 2012b, pp. 145–47; Pfälzner and Dohmann-Pfälzner 2014, pp. 64–66; Bianchi, Geith, and Wissing 2014, pp. 139–202).

[16] On the social precesses, transformations, and socio-economic "turns" within this period, see Pfälzner 2010, pp. 8–10, table 2; Pfälzner 2012a, pp. 72–77; Pfälzner 2012b, pp. 157–58.

The Early Jezireh V Period

Phase P, which covers Levels 35B and 35A at Tell Barri, is considered by Orsi to have extended over two centuries (ca. 2125–1925 B.C.), including the final Early Jezireh IV, the Early Jezireh V, and the Old Jezireh I ("Isin-Larsa") period (Orsi 2010; Orsi 2011, p. 420 schema 20, p. 426 schema 22.[17] In view of the fact that it covers only two sub-phases, this time frame appears to be too long. Furthermore, the pottery of Phase P (Orsi 2011, pp. 341–60, pls. 180–90) is typologically closely comparable to that of Phase A4 in the palace area at Tell Mozan, as has been ascertained in a careful comparative analysis by Orsi (Orsi 2010; Orsi 2011, pp. 381–413). Thus, Tell Barri Phase P has to be regarded as contemporary to Mozan Phases A4a and A4b. The latter two phases have been convincingly dated to the Early Jezireh V period in a recent study by Bianchi, on the basis of a clear correlation with the Tell Mozan Phase C7 assemblage (Bianchi 2012, pp. 188–90, table 9). Thus, Tell Barri Phase P dates to the Early Jezireh V period, as well. Accordingly, its temporal range has to be limited to ca. 2100 to 2000 B.C.

Astonishingly, there are no Ḫabur Ware sherds in the Phase P Early Jezireh V levels at Tell Barri. This clearly contrasts with the contemporary evidence of Ḫabur Ware at Mozan, both in Phases A4b and C7 (see above). Thus, we observe a later start of Ḫabur Ware at Barri than at Mozan. Probably, however, this observation is only accidental, due to the small area uncovered at Barri and the resulting limited amount of pottery available.[18] The 149 Ḫabur Ware sherds in Phase C7 at Tell Mozan are high in absolute numbers but low in percentage (0.4%). Thus, applying the same statistical ratio to contemporary Barri Phase P on the total of diagnostic sherds recovered from Phase P would result in a theoretical amount of only 2.7 sherds to be statistically expected. These two or three sherds might easily be missing in the pottery assemblage due to an accidental find situation.

There is a second difference between Tell Mozan and Tell Barri during the Early Jezireh V period: the architecture at Barri Phase P consists of only small-scale houses in a dispersed arrangement (see fig. 7.22) (Orsi 2011, pl. 164; Orsi 2012, pp. 98–99). Thus, the habitation zone has roughly the same character as before in Phase Q of the Early Jezireh IV period. This reflects the continuous occupation of the quarter by households of relative low socio-economic status. This is in contrast to the large household at Tell Mozan, the Puššam House, connected to inter-regional trading activities. The different scope of activities might be a reason for the lack of innovative elements at Tell Barri, while the introduction of Ḫabur Ware can be witnessed at the same time in the households of Tell Mozan. Of course, this observation does not necessarily need to have been true for the whole settlement, but the mentioned effect could also have been only locally present within a site, depending on the area or quarter which was exposed by the excavations.

Another detail of the stratigraphy of Tell Barri might be of interest here. The houses of Level 35 (Phase P) have a different location and layout than the previous ones of Phase Q (cf. Orsi 2011, pls. 162–64, and this paper, fig. 7.19). Thus, they seem to have been newly installed households. This means that there was no direct household continuity between the Early Jezireh IV and V periods at Tell Barri. Orsi even takes a "brief period of disruption" into consideration (Orsi 2012, p. 98). The observable discontinuity around 2100 B.C.

[17] Including the Isin-Larsa period. Orsi advocates a shorter time period, covering only the post-Akkadian and Ur III periods (Early Jezireh IVC and V), in Orsi 2012, p. 91.

[18] There are only 668 diagnostic sherds from Phase P (Levels 35B and 35A together) at Tell Barri; see Orsi 2012, chart 1.

might be regarded as another reason why a lesser degree of innovation can be seen at Early Jezireh V Tell Barri.

The Old Jezireh I Period

Phase O at Tell Barri has been dated by Orsi to the late Old Jezireh I and the early Old Jezireh II period (ca. 1925–1850 B.C.) (Orsi 2011, p. 426 schema 22; Orsi 2012, pp. 93–94).[19] During the first stage of this phase, Level 34D, no architecture or habitation activities could be detected on the excavated surface of Area G, but only burials (fig. 7.22) (Orsi 2011, pl. 165; Orsi 2012, p. 100). This indicates a clear reduction of the settlement intensity signaling a disruption of the settlement between the Early Jezireh V and the Old Jezireh I period. This represents a second process of social discontinuity in the development at Tell Barri. Starting from Level 34C and continuing up to Level 34A, there is a fundamentally new kind of occupation at Barri, which contains large house complexes leaving fewer open spaces in between them (fig. 7.22) (Orsi 2011, pl. 166; Orsi 2012, p. 100). The new households introduced an important innovation: the first appearance of Ḫabur Ware at Barri is from Level 34C (fig. 7.23) (Baccelli and Manuelli 2008, pp. 192, 194, pl. 8; Orsi 2012, p. 93, chart 1). The quantities of Ḫabur Ware during this period are still rather low: there are only eight rim-sherds of this ware in Levels 34C to 34A together. This amounts to approximately 2 percent of the total pottery in Levels 34C and 34B, while in Level 34A the percentage of Ḫabur Ware rises to about 4 percent (Orsi 2012, chart 1). Compared to the occurrence of Ḫabur Ware at Tell Mozan, there is the closest correlation in frequencies between Barri Level 34A and Mozan Phases C6 to C4, dating to the Old Jezireh I period (table 7.3).

Table 7.3. Comparison of frequencies of Ḫabur Ware at Tell Mozan and Tell Barri (based on Schmidt 2013, fig. 72; Orsi 2012, chart 1; Baccelli and Manuelli 2008, pl. 8)

Period		*Ḫabur Ware Frequencies*				
		Tell Mozan		*Tell Barri*		
Old Jezireh II	1850–1650 B.C.			Barri Phase N	Levels 31–29	***41%***
					Levels 33–32	***36%***
		Mozan C4	***3.5%***			
Old Jezireh I	2000–1850 B.C.	Mozan C5	***5.0%***	Barri Phase O	Level 34A	***3.9%***
					Level 34B	***1.9%***
					Level 34C	***1.6%***
		Mozan C6	***7.0%***			
					Level 34D	0%
Early Jezireh V	2100–2000 B.C.	Mozan C7	***0.4%***	Barri Phase P	Level 35	0%

[19] It has to be pointed out that the late start of Tell Barri Period O within the twentieth century B.C. in the chronological model of Orsi has been mainly derived from the assumed appearance of Ḫabur Ware not before the nineteenth century B.C. (Orsi 2012, p. 93).

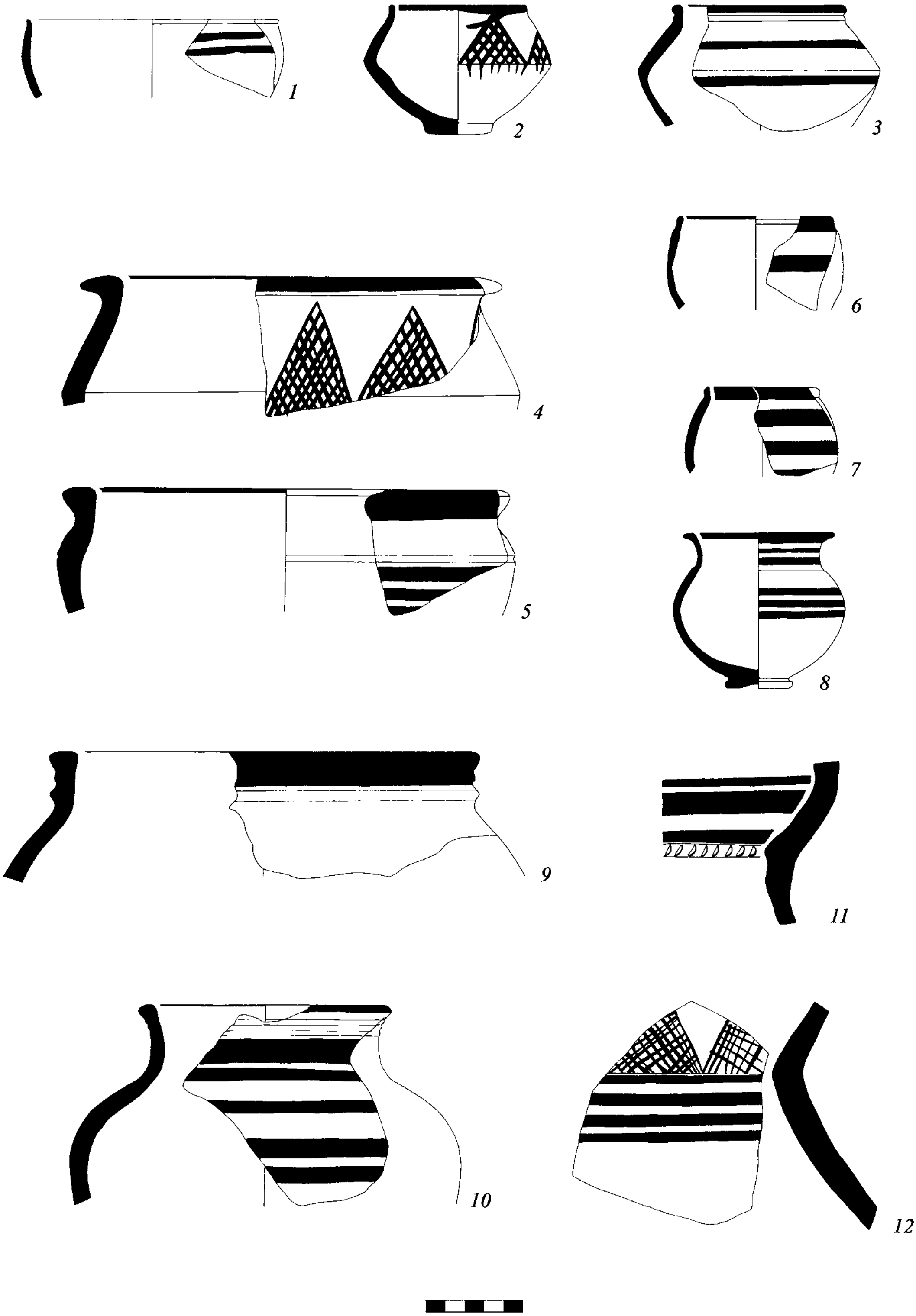


Figure 7.23. Selection of Ḫabur Ware specimens from pottery period Ḫabur Ib at Tell Barri Phase O, Levels 34CA (illustration from Baccelli and Manuelli 2008, pl. 1)

The Old Jezireh II Period

The relative frequencies of Ḫabur Ware seem to be quite indicative for chronology. This becomes obvious when looking at the further quantitative development of Ḫabur Ware at Tell Barri (see fig. 7.23). There is a considerable increase in quantities, starting with Level 33–32, which correspond to Barri Phase N, dated to the Middle Bronze Age IIA (Baccelli and Manuelli 2008, pl. 8), that is, the Old Jezireh II period. They even reach a frequency of 41 percent during Levels 31 to 29, corresponding to the Middle Bronze IIB period (Baccelli and Manuelli 2008, pl. 8). This means that over one-third of the recorded sherds of these levels belong to Ḫabur Ware during the Old Jezireh II period at Tell Barri.

The far smaller quantities at Tell Mozan can be explained by the fact that the major Ḫabur Ware Phases C6 and C5 date to the Old Jezireh I period, and Phase C4, with still limited frequencies of Ḫabur Ware, might date to the very beginning of the Old Jezireh II period.[20] Thus, the mentioned Mozan phases are definitely earlier than Levels 33–32 at Tell Barri. At Tell Mozan there is, at least in Area C of the Central Upper City, no occupation during most part of the Old Jezireh II period, at the time when Ḫabur Ware witnessed its dramatic increase in quantity.

A Proposal for a New Periodization of the Ḫabur Ware Sequence

Consequently, a new sequence of the development of Ḫabur Ware can be proposed (table 7.4). The initial period of Ḫabur Ware, attested at Tell Mozan Phase C7, is labeled Ḫabur Ia. It is characterized by the first appearance of Ḫabur Ware in low quantities (0.4% frequency) and can be dated to the Early Jezireh V period. The period of a substantially increased occurrence of Ḫabur Ware, with its full repertoire of shapes and decorative patterns developed, is labeled Ḫabur Ib. Now, frequencies of Ḫabur Ware range between 2 and 7 percent. This phase dates to the Old Jezireh I period. Finally, Ḫabur II is characterized by a dramatic increase in quantity, reaching 35 to 40 percent of the total pottery inventory. This stage dates to the Old Jezireh II period and includes the time of Šamši-Addu and his Old Assyrian Kingdom of Upper Mesopotamia. As Baccelli and Manuelli point out, this phase can again be divided into sub-periods Ḫabur IIa and IIb on the basis of a typological development of Ḫabur Ware observable at Tell Barri (Baccelli and Manuelli 2008, pp. 192–97, pls. 6.1, 6.2, 7.1, 7.3, 8). This is, for example, reflected by the occurrence of more mineral temper, a greater care in painting, the increase in shouldered beakers with everted rim (Baccelli and Manuelli 2008, pl. 7.3), and the new shape of the "grain measures" with purely geometric painted decoration (Baccelli and Manuelli 2008, pls. 4.1, 5.11) in Phase IIb as compared to Phase IIa at Tell Barri.[21]

[20] This would even be a good argument to place Tell Mozan Phase C4 still at the end of the Old Jezireh I period, an idea not reflected in the published stratigraphical charts for Tell Mozan Area C2 (Pfälzner 2010, table 1; Pfälzner 2012a, table 2; Schmidt 2013, table 1; Pfälzner and Dohmann-Pfälzner 2014, table 3).

[21] However, it has to be pointed out that a "grain measure" with geometric painted Ḫabur Ware decoration was already found at Tell Mozan in Phase C5, dating to the Old Jezireh I period, i.e., the pottery period Ḫabur Ib (see Schmidt 2013, pl. 403, no. K 4018, and here fig. 7.19). The type, consequently, is older than previously thought.

Table 7.4. Periodization of the Ḫabur Ware, with a comparative chronology of the Early Bronze to Middle Bronze transition at Tell Mozan and Tell Barri

Tell Barri					*Tell Mozan*		*Periodization*	
Level	*Phase*	*Dating Orsi*	*Dating Pfälzner*	*Dating Baccelli/ Manuelli*	*Palace (Area A)*	*Habitation (Area C)*	*Period*	*Pottery Phase*
29								
30				Khabur IIb				**Ḫabur IIb**
31	Phase N	—	Old Jezireh II				Old Jezireh II	
32				Khabur IIa				**Ḫabur IIa**
33					A 5c	C4		
34A					A 5b	C5		
34B	Phase O	Old Jezireh I–II	Old Jezireh I	Khabur I			Old Jezireh I	**Ḫabur Ib**
34C								
34D					A 5a	C6		
35A	Phase P	Early Jezireh V–Old Jezireh I	Early Jezireh V	—	A 4b A 4a	C7	Early Jezireh V	**Ḫabur Ia**
35B								
36	Phase Q	Early Jezireh IV	Early Jezireh IV	—	A 3 A 2	C8–C12	Early Jezireh IV	—
37								

Figure 7.24. Carinated beaker from Tell Barri, Level 34A, Phase O (Old Jezireh I period), a specific feature of the pottery period Ḫabur Ib (illustration from Orsi 2012, fig. 2:21a–b)

In conclusion, it is important to notice that the quantitative occurrence of Ḫabur Ware is a much more significant chronological indicator than changes in style, decoration, or vessel shape. Nevertheless, chronological trends of decoration and vessel shape are observable in some specific instances. The above-mentioned carinated beakers with painted triangles above the carination, present at Tell Arbid and at Tell Mozan Phase C6, are also to be found at Tell Barri Phase O (Old Jezireh I period) (fig. 7.24; cf. fig. 7.17) (Orsi 2012, fig. 2:21a–b; and

Baccelli and Manuelli 2008, pl. 1:2).[22] Thus, they seem to be a typical feature of the pottery period Ḫabur Ib (Old Jezireh I).

The Stratigraphic Evidence at Tell Arbid

The chronological and architectural development of the Early to Middle Bronze Age transition was carefully excavated and studied in Sector P of Tell Arbid by Rafał Koliński (Koliński 2012a, 2012b, 2013, 2014). The site provides a continuous sequence from the Early Jezireh IV through the Early Jezireh V up to the Old Jezireh I and II periods.

The Early Jezireh IV Period

The settlement of Level VII, dated to the Early Jezireh IV period, was characterized by small-scale houses (Koliński 2012a, pp. 111–12, fig. 2), very similar to those at contemporary Tell Mozan and Tell Barri (fig. 7.25). These kind of households are generally very vulnerable to crisis, and thus it is unsurprising that they were abandoned in the following phase. A hiatus

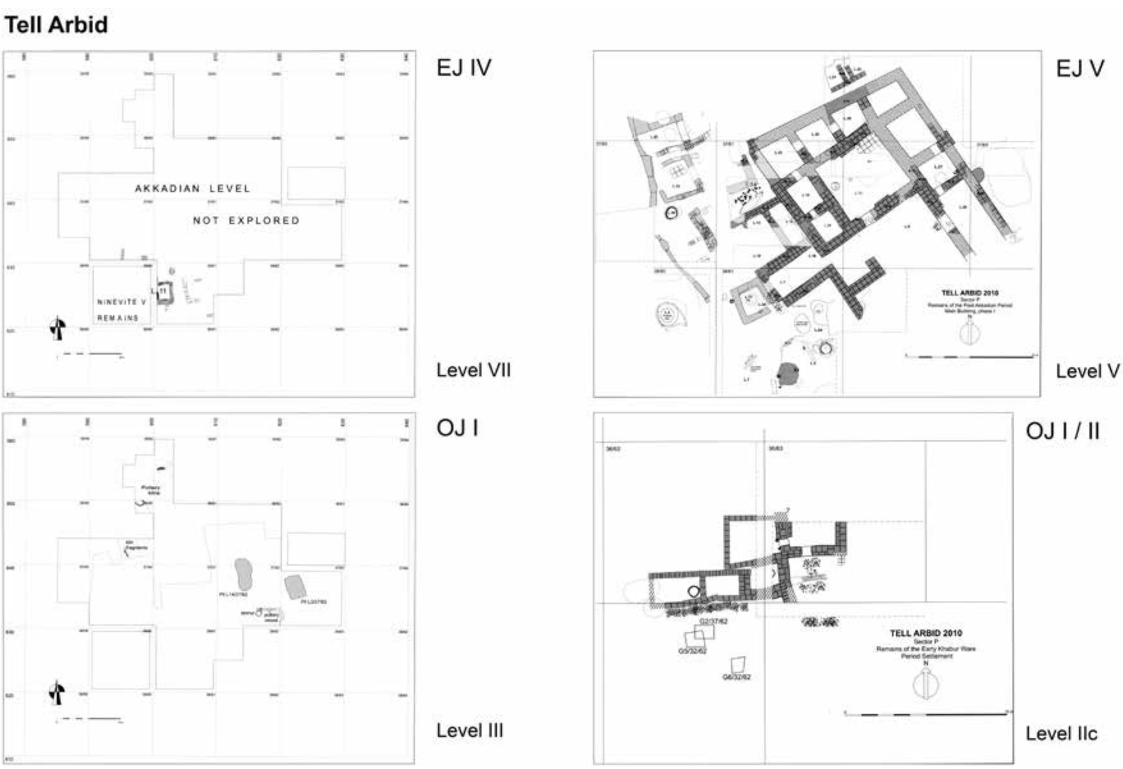


Figure 7.25. Tell Arbid, architectural sequence from the Early Jezireh IV to the Old Jezireh II period (illustrations from Koliński 2012b, figs. 2, 4, 78)

[22] The same type, however, also exists in the pottery period Ḫabur II, as examples from Tell Barri demonstrate; see Baccelli and Manuelli 2008, pl. 3:14.

of one generation is assumed by Koliński (2012a, p. 112). In conclusion, the breaking up of social relations at the end of the Early Jezireh IV period resulted in an interruption of occupation at Tell Arbid, as opposed to Tell Mozan, where it led to new initiatives visible in the foundation of the Puššam House (see above).

The Early Jezireh V Period

Level VI, dated to the Early Jezireh V period, witnessed a restart of occupation at Tell Arbid. Simple domestic structures were constructed, with a different orientation compared to that of the houses of the previous late Akkadian period. The lack of a stratigraphic and architectural link between the Level VII and the Level VI occupation is a clear indication of the disruption of social structures.

In the succeeding Levels Va and Vb, a large building was erected, 14 × 14 m in size, organized around a courtyard, with well-constructed, thick walls and special installations, such as a baked-brick pavement in the courtyard and terra-cotta pipe water channels (fig. 7.25) (Koliński 2012a, pp. 113–18, figs. 45; Koliński 2013, pp. 464–71). This arrangement is very similar to the Puššam House at Tell Mozan, and, therefore, Koliński thinks, with some justification, that the building at Tell Arbid might also have been kind of a caravanserai (Koliński 2012a, p. 123; Koliński 2013, pp. 474–76). With a wealthy household now occupying a formerly low-level social habitation area at Tell Arbid, the same general social process as at Tell Mozan can be observed here during the Early Jezireh V period.

The pottery of Level Va includes a jar in the form of the "Gudea and Ur III libation jars" (Koliński 2013, fig. 9a), a typical pottery shape of the Ur III period, which is similarly attested at Tell Mozan in Phase C7 (Early Jezireh V period) (see above, and fig. 7.2). This type is a very significant chronological indicator for the twenty-first century B.C. Unlike Tell Mozan, the Early Jezireh V deposits at Tell Arbid did not yield Ḫabur Ware. This might be due to find circumstances, as the expected percentages of Ḫabur Ware in this phase are rather low (0.4%), so that it only has a realistic chance to appear in very large pottery collections.

There is an important radiocarbon evidence from Level Va at Tell Arbid, which provides a date of ca. 2200 to 2040 cal. B.C. with a 68 percent probability (Koliński 2013, table 2). This fits well to the Ur III period and to the radiocarbon dates from Tell Mozan Phase C7 (see above). Two other radiocarbon dates come from Level Vb, one ranging from ca. 2280 to 2130 cal. B.C. and the other from ca. 2430 to 2200 cal. B.C., each with a 68 percent probability (Koliński 2013, table 2). Thus, they are earlier than the Ur III and Early Jezireh V period and, therefore, might represent residual ecofacts.

The Old Jezireh I Period

At the end of Level V, the large building was deliberately abandoned, so that again a process of settlement disruption can be observed. It is followed by a pit horizon in Level IV. After another abandonment phase, the Old Jezireh I occupation started at Tell Arbid with Level III. Thus, the Early to Middle Bronze Age transition at Tell Arbid was a very discontinuous process. This appears in strong contrast to the neighboring site of Tell Mozan, where the Early to Middle Bronze Age transition is characterized by a high degree of continuity (see above).

The Old Jezireh I period at Tell Arbid starts with another pit horizon in Level III, containing a number of pottery kilns (fig. 7.25). Here were found the first specimens of Ḫabur Ware at Tell Arbid (Koliński 2012a, pp. 119–20; Koliński 2014, p. 28). Therefore, Level III and the Old Jezireh I period were designated at the "Early Khabur Ware horizon" at Tell Arbid by

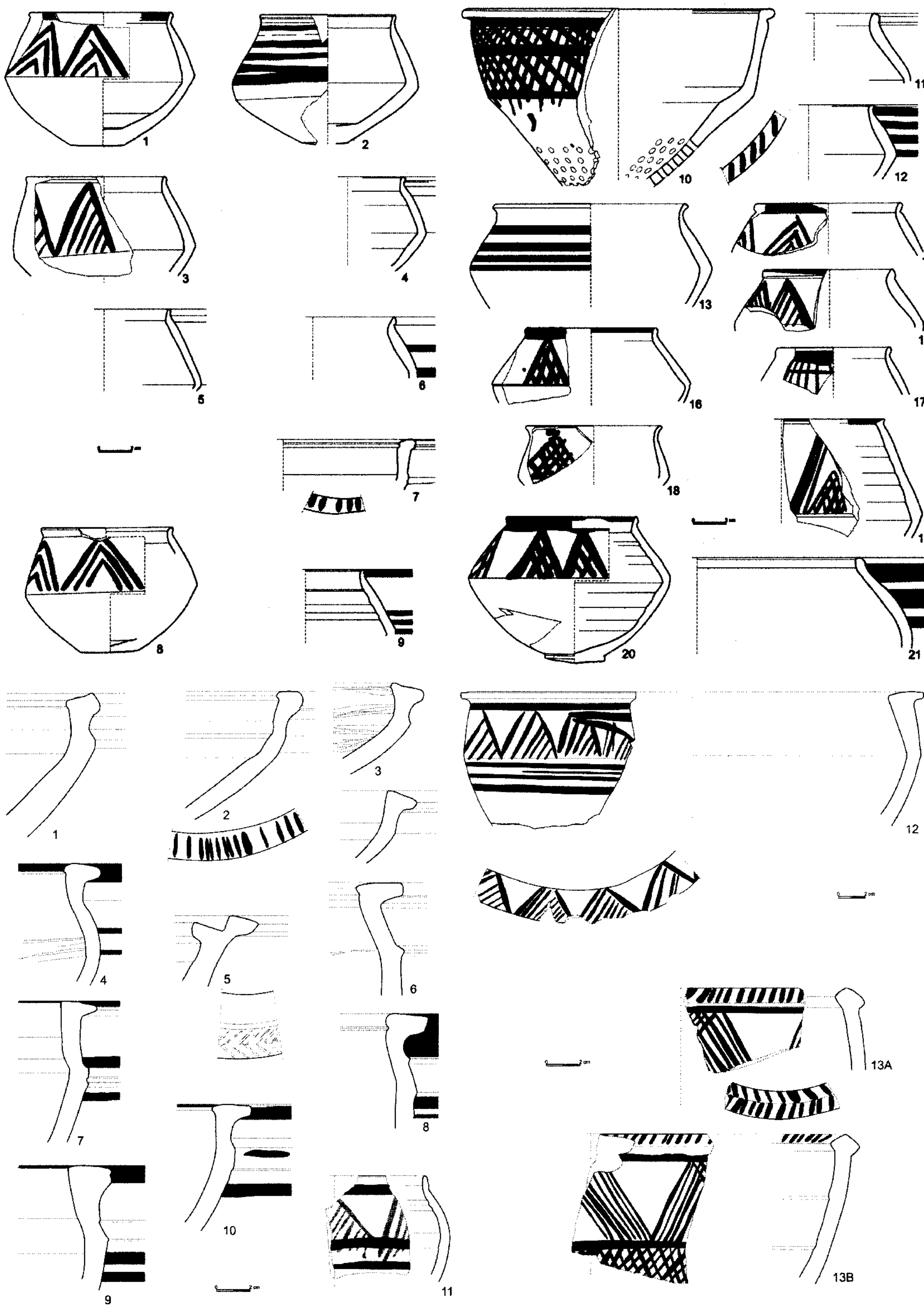


Figure 7.26. So-called Early Khabur Ware from Tell Arbid, mostly from Levels III to IIc, Old Jezireh I and I/II, pottery period Ḫabur Ib (illustration from Koliński 2014, fig. 5)

Figure 7.27. Two miniature vessels of the so-called Early Khabur Ware of Tell Arbid, Level III (Old Jezireh I period), pottery period Ḫabur Ib (photo from Koliński 2013, fig. 4)

Koliński (fig. 7.26). The examples of the so-called Early Khabur Ware from this level comprise two miniature jars with Ḫabur Ware decoration (fig. 7.27) (Koliński 2012a, p. 120, fig. 10d; Koliński 2013, fig. 4). They show clear similarities to Ḫabur Ware miniature jars from Tell Mozan Phases C6 and C5 (Schmidt 2013, pl. 274: nos. 2629, 2631, 2634–39 [Phase C6], pl. 433: nos. 4259–62, 4266–67 [Phase C5]). Their contexts are accordingly dated to the Old Jezireh I period. Typical decorative features of the "Early Khabur Ware" at Tell Arbid, as suggested by Koliński, are the following (Koliński 2014, pp. 28, 30–31): horizontal bands, hatched and cross-hatched triangles, often without horizontal border lines below and above the triangles. Among the typical shapes are cups with sharp carination and flat shoulders, deep carinated bowls with wide rims and bead rims (fig. 7.26). These decorative patterns and shapes actually all appear also on the Old Jezireh I pottery from Phases C6 and C5 at Tell Mozan (see figs. 7.15–7.16 and 7.19–7.20) (Schmidt 2013, figs. 79–80 and pls. 246–74 [Phase C6], pls. 389–433 [Phase C5]). This offers a perfect synchronism of Level III at Tell Arbid with Phases C6 and C5 at Tell Mozan, both dated independently from each other to the Old Jezireh I period.[23] This correlation constitutes a valuable chronological link.

However, the Old Jezireh I phase is not the oldest phase with Ḫabur Ware at Tell Mozan, as has been shown above. At Tell Mozan the ware appears considerably earlier, during the Early Jezireh V period (see above). Therefore, it is unjustified, or at least misleading, to label the Old Jezireh I specimens from Tell Arbid as "Early Khabur Ware." Instead, they perfectly fit into the Ḫabur Ib stage, that is, an advanced phase of the Ḫabur Ware development (table 7.5).

[23] This observation of an strong and un-questionable parallelism between the Tell Mozan C6 and C5 Ḫabur Ware and the so-called "Early Khabur Ware" from Tell Arbid clearly contradicts and rules out — at least for the case of Tell Mozan — the following erroneous assumption of Koliński (2014, p. 31): "On the other hand, the absence of sherds showing features similar to Early Khabur Ware as defined above at sites such as Tell Chagar Bazar, Tell Mozan (Area C) and Tell Jigan suggests very strongly that those sites/sectors were not occupied during the earliest part of the second millennium B.C."

Table 7.5. Comparative stratigraphy and chronology of the sequences at Tell Mozan and Tell Arbid during the Early Bronze to Middle Bronze transition

Tell Arbid		*Tell Mozan*		*Periodization*	
Level	*Pottery Periodisation Koliński*	*Palace (Area A)*	*Habitation (Area C)*	*Period*	*Pottery Phase*
IIa IIb IIc	Classical Khabur	A 5c	C4	Old Jezireh II	**Ḫabur IIb** **Ḫabur IIa**
III	"Early Khabur"	A 5b A 5a	C5 C6	Old Jezireh I	**Ḫabur Ib**
IV V VI	—	A 4b A 4a	C7	Early Jezireh V	**Ḫabur Ia**
VII		A 3 A 2	C8–C12	Early Jezireh IV	—

The Old Jezireh II Period

Levels IIc to IIa at Tell Arbid are believed to date from the end of the Old Jezireh I to the Old Jezireh II period. This time is regarded as the "Classical Khabur Ware period" at Tell Arbid (Koliński 2012a, pp. 121–22, fig. 8; Koliński 2014, p. 28). New houses were constructed, showing irregular plans and including graves that yielded a large amount of Ḫabur Ware pottery. While there is "Classical Khabur" pottery from Levels IIa–b, dating to the Old Jezireh II period, the earliest Level IIc is regarded to have been a transitional period from the Old Jezireh I to II period (fig. 7.25) (Koliński 2012a, p. 121). In this level are graves which still contain the so-called Early Khabur Ware in Koliński's terminology, as, for example, a double vessel with triangular decoration from Grave G8-37/62 (fig. 7.28) (Koliński 2012a, n. 13; Koliński 2012b, fig. 9; Koliński 2014, fig. 6.1). The vessel shape is very exceptional, definitely a unique piece from the hand of an innovative potter, who could have fabricated this specimen — in the present author's view — at any time during the Ḫabur Ware tradition. It combines a jar with a carinated bowl, the latter being a typical shape of the Old Jezireh I period. Also, the

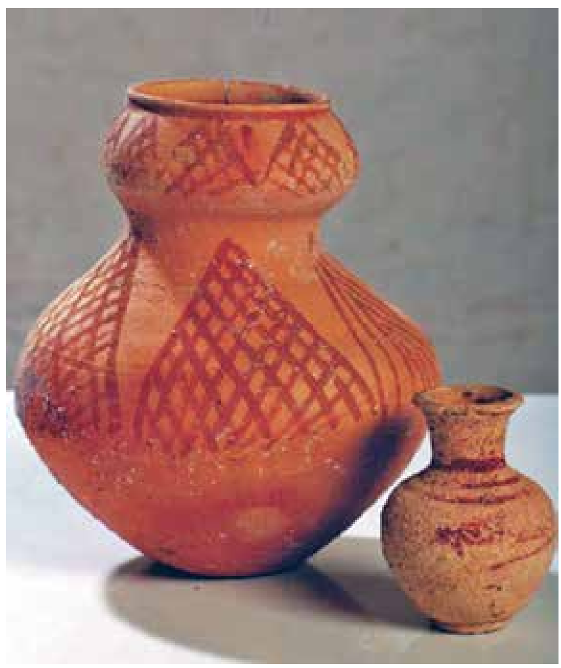


Figure 7.28. Tell Arbid, so-called Early Khabur Ware from Grave G8-37/62; double-vessel and juglet (photo from Koliński 2012b, fig. 9)

painted decoration on both the upper and lower part of the vessel, consisting of hatched triangles without border lines above and below, is typical for the Old Jezireh I period, that is, the Ḫabur Ib phase (see above). From the same grave comes a small juglet with horizontal bands (fig. 7.28, right) (Koliński 2012b, fig. 9), also very typical for the Old Jezireh I repertory of the Ḫabur Ware, as Mozan Phase C5 examples show (Schmidt 2013, pl. 403, nos. 4023, 4028; pl. 433, nos. 4259, 4261–62). Consequently, the present author does not think that it is justified to label these pieces "Early Khabur Ware" because they represent typical examples of the Ḫabur Ib phase of the Old Jezireh I period, which represents an advanced stage of the Ḫabur Ware development (see above).

Conclusions

Three major conclusions can be derived from the above discussions:

1. The Tell Mozan Phase C7 assemblage, precisely dated by multiple cross-related pieces of evidence, offers an important chronological benchmark for the twenty-first century B.C. in the Syrian Jezireh and beyond. It helps to correlate the regional chronologies at the transition from the Early to the Middle Bronze Age from southern Mesopotamia to the Syrian Jezireh and to the northern Levant. The resulting chronological considerations strongly advocate setting the start of the Middle Bronze Age at around 2100 B.C.

2. Of particular importance for the study of the Early to Middle Bronze Age transition in the Syrian Jezireh is the development of Ḫabur Ware. It proves the existence of a strong connection and continuity between the Early and the Old Jezireh periods, that is, between the third and the second millennia B.C. On the basis of the evidence of Ḫabur Ware from Tell Mozan and inter-connected with the appearances of Ḫabur Ware at Tell Barri and Tell Arbid, a four-step development of Ḫabur Ware could be proposed. It covers the stages Ḫabur Ia (Early Jezireh V period), Ḫabur Ib (Old Jezireh I period), and Ḫabur IIa and IIb (both Old Jezireh II period). This sequence is characterized by constantly growing quantities of Ḫabur Ware, which at the end of this development, in the Old Jezireh II period, makes up more than one-third of total pottery inventories.

3. The transition from the Early to the Middle Bronze Age needs to be understood as a bundle of multi-modal processes, happening in diverging manners from site to site. There are processes of continuity and discontinuity, observable differently at nearby sites. And there are innovations that played an influential role in processes of cultural change. They accompanied and possibly sometimes even stimulated gradual changes in the social organization of the cultures in the Syrian Jezireh and other regions. The introduction of Ḫabur Ware was one of these innovations at the turn of the Early to the Middle Bronze Age in the Syrian Jezireh.

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8

Bioclimatic and Agroecological Properties of Crop Taxa: A Survey of the Cuneiform Evidence Concerning Climatic Change and the Early/Middle Bronze Age Transition

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1. Introduction

It has been suggested that after 4000 B.C. the climate in the eastern Mediterranean was dominated by a climate regime of a series of downward-trending wet-to-dry oscillations (e.g., Roberts et al. 2011). In this context it has been a matter of debate to what extent the dynamics of human settlement patterns during the Bronze Age were influenced by environmental change. According to Weiss et al. (1993), a global drought event around 2200 B.C.[1] may have resulted in dramatic economic and political changes on a regional scale (see also Weiss 2012). Recently, the thesis of Harvey Weiss was criticized by most of the archaeologists who are familiar with this subject. Such a period of increased aridity should have led to considerable crop failure due to enormous water stress on economic plants. Some paleobotanists reject that there was any fundamental climate change over the past 6,000 years in Upper Mesopotamia.

Since the paleobotanical data may be biased (Miller 1984; Charles 1984; Wallace and Charles 2013), it would be helpful to evaluate the cuneiform evidence. Thus, this paper[2] deals with the question of whether cuneiform evidence can prove or disprove the hypothesis that a global drought event around 2250 B.C. has had its impact on climate in Upper Mesopotamia and if such an event was followed by a downward-trending second- and first-millennium B.C. aridity.

[1] Usually archaeologists and paleoclimatologists prefer the terms "4.2k cal." or "4200 B.P. event." I will use the B.C. terminology. In the third and the first half of the second millennium B.C., I refer to a reduced Middle Chronology (rMC).

[2] This paper is based primarily on research I have done from 2010 to 2013 working as researcher in the project "Klima, Landwirtschaft und Gesellschaft — Zur Nachhaltigkeit früher landwirtschaftlicher Systeme im Vorderen Orient." Funding was provided by the German Research Foundation (DFG) and by Freiburg University. My research benefited from comments by S. Riehl, K. Pustovoytov, B. van Geel, H. Reculeau, W. Sallaberger, M. Doll, K. Egerer, and H. Brunke. Special thanks go to R. Pruzsinszky and F. Höflmayer, who made this paper possible.

2. Method and Model

The transition from the Early to the Middle Bronze Age is characterized by a lack of written sources from greater Upper Mesopotamia.[3] Thus, the textual evidence will be viewed in a long-term chronological perspective including data from third-, second-, and first-millennium B.C. Upper Mesopotamia as well as data from Middle and Lower Mesopotamia, insofar as it is necessary and appropriate.

I tried to exclude evidence concerning very low or high precipitation of an isolated single year, since this may reflect an inter-annual climatic fluctuation. Therefore, I only evaluated data that stems from a sequence of years, since only such sequences are well suited to identify long-term climatic trends. The cuneiform sources are evaluated against the background of the recent archaeological, paleoclimatological, and paleobotanical research.

Simone Riehl (2009) presents a theory showing how the natural environment determined agricultural decision-making and correspondingly the crop assemblages. In semi-arid Upper Mesopotamia, water availability is the main stress factor on crop vegetation. Therefore, changing proportions and extents of drought-susceptible crops like grape, field pea, flax, and einkorn reflect the amount of humidity. Thus, in rainfed agriculture the proportions and extent of drought-susceptible crops indicate levels of precipitation. This socio-ecological model is premised on the assumption that social agents act rationally. Agricultural decision-making, however, is not always rationally based (Cappers and Neef 2012). Even most social and economic scientists deny that decisions are based on pure rational choice. They have developed models based on the idea that agents are limited by the information they possess to make a decision (Simon 1959). Considering that ancient farmers had more or less all information concerning input, output, and climate variables, I think it is plausible to expect *idealtypisch* rational decision-making. This seems to be confirmed by the paleozoological *and* geomorphological *and* paleobotanical research on Early Bronze Age Tell Mozan (Doll 2010; Riehl 2009; Riehl 2010b). Since the paleobotanical evidence may be biased (Miller 1984; Charles 1984; Wallace and Charles 2013), it would be helpful to compare it with data from cuneiform archives.

Therefore, I will present some philological research of phenomena that are considered here to be indicative of climate humidity and agricultural productivity from the third to the first millennium B.C.: variations in yield rates (see below, §4.1), changing harvest dates (§4.2), and fluctuations in the number of family members (§4.3). The main focus concerns the evolution of proportions of drought-susceptible cereals before and after 2200 B.C. (§4.4). Thus, I have counted and analyzed references to the relevant crops in the cuneiform archives of the Early Bronze Age sites of Ebla/Tell Mardikh, Nabada/Tell Beydar, and Gasur/Yorgan Tepe, along with those of the Middle Bronze Age sites of Mari/Tell Hariri, Tuttul/Tell Biʿa, Qaṭarra/Tell al-Rimah, Šeḫna/Leilan, Chagar Bazar, and Alalaḫ/Tell Atchana, as well as the Late Bronze Age sites of Nuzi/Yorgan Tepe, Emar/Tell Meskene, and Dūr-Katlimmu/Tell Sheikh Hamad. In order to investigate the validity of the textual evidence, I focused on texts that explicitly count the proportions of seed, harvest yields, and the surface area of fields that are designated to specific crops. I concentrated my research on cereals, since the terminology of other crops like legumes and flax is not well understood and since the administration in Upper

[3] Greater Upper Mesopotamia means the Jezirah plain including Assyria east of the Tigris including the region of Nuzi/Yorgan Tepe and west of the Euphrates as far as Ebla/Tell Mardikh.

Mesopotamia primarily registered products of agriculture and not of horticulture. For the reason that some of the proposed ancient cereals may also be identified with legumes or flax, it is impossible to exclude the analysis of these crops. This analysis is based on a discussion of the specific agroecological and ecotrophological properties of the species (§5.1). In closing, I discuss to what extent the presented data indicate climate change (§6).

3. References

3.1. *The Modern Environment*

Greater Upper Mesopotamia lies in the subtropics along the 250 mm isohyet. North Atlantic Oscillation, the Siberian High, and the eastern Mediterranean climatic pattern lead to precipitation accumulation in the Levant and Upper Mesopotamia between the months of October and April (Almohamad 2009). The remaining part of the year is very hot and without any significant precipitation. In inter-annual drought years, precipitation accumulation is 100–200 mm less than the long-term mean (Wirth 1962). Inter-annual yield variability in Middle Assyrian yield texts and dendrochronological research on growth rings of Anatolian trees corroborate that inter-annual drought years were among the constraints on ancient Upper Mesopotamian agriculture (Reculeau 2011; Touchan et al. 2003; Touchan et al. 2005).

The harvest of winter cereals starts after the rainy season around mid-May in present-day Iraq and Syria. Threshing occurred from July to October in traditional southern Iraqi husbandry (Charles 1990, p. 55).[4] The beginning of the harvest tends to lag with latitude (see fig. 8.3). The barley harvest in Raqqa and Deir ez-Zor, for instance, starts around mid-May (Bishaw 2004), whereas the barley harvest of the Baghdad area begins around the 10th–15th of April (Fotheringham 1928), even occurring even as late as the end of April (Adams 1965). The barley harvest of the Basra area is usually about fifteen days earlier than that of the Baghdad area.

3.2. *The Ancient Environment*

Bottema and van Zeist (1980) proposed that global humidity increased following the Pleniglacial period until about 4000 B.C., followed by a global trend of decreasing temperatures and precipitation levels. Between 3000 and 1000 B.C., lake isotope data from Anatolia and western Iran indicate a series of downward-trending wet-to-dry oscillations, with greatest aridity around 3300–3000, 2500–1950, and 1200–850 B.C., and a moister episode at 1950–1250 B.C. (Roberts et al. 2011, pp. 149, 151). This general trend had its regional differences. For example, research on sequences of isotopic values in pedogenic carbonates and on $\delta^{13}C$ values of charred plant macro remains indicates moister conditions in Upper Mesopotamia around 3000–2000 B.C. (Riehl et al. 2009). Research on climate development in western Iran reflects small-scale, regional differences (cf. Stevens et al. 2006; Staubwasser and Weiss 2006). Records from Lake Van indicate a moist peak between 2200 B.C. and 2000 B.C. (Wick, Lemcke, and

[4] Cuneiform evidence regarding the agricultural cycle during pre-Sargonic twenty-fourth-century B.C. Girsu (cf. LaPlaca and Powell 1990) shows no significant changes in the basic cycle of cereal cultivation and processing. Thus, the Early Bronze IVa cycle of seasons was the same as today in Lower Mesopotamia.

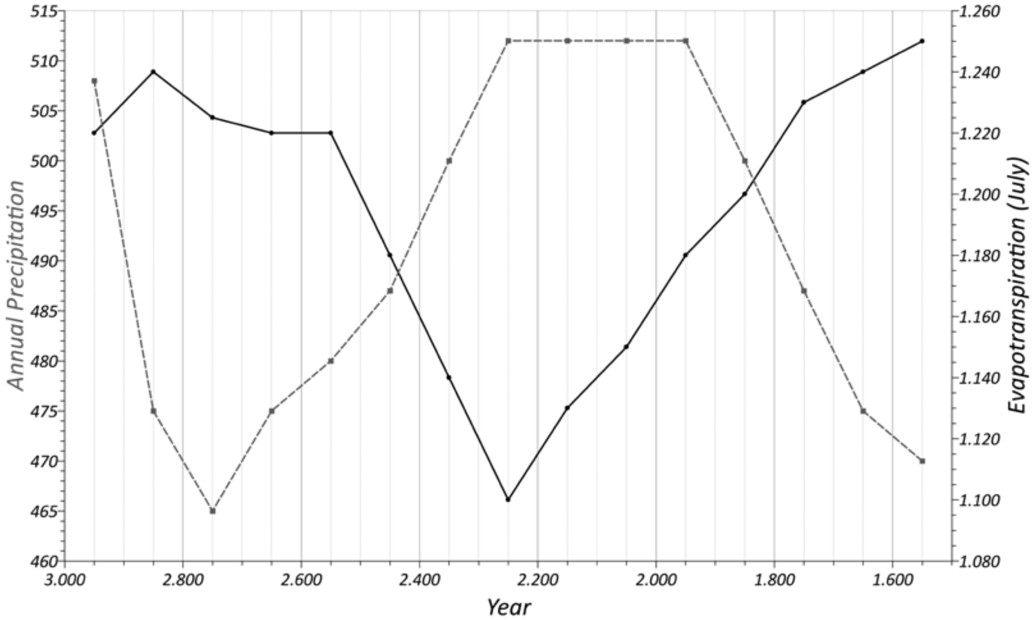

Figure 8.1. Precipitation and evaporation levels at ancient Qamishli (using data from Riehl 2010b, p. 17, table 1; both diagrams were generated using QtiPlot 0.9.8.9 svn 2288, © 2004–2011 Ion Vasilief)

Sturm 2003). For the second and first millennia B.C., shifts in Babylonian harvest times may indicate a warmer and more arid seventeenth and sixteenth century B.C. and a cooler and wetter sixth century B.C. (Neumann and Sigrist 1978). Seventeenth- and sixteenth-century B.C. aridity is supported by the paleoclimate model of precipitation and evaporation levels at ancient Qamishli (fig. 8.1).

Several assumed global drought events around 6200, 4200, 2200, and 1200 B.C. seem to correlate with increasing summer monsoons in southern India and decreasing summer monsoons in northern India induced by increased solar irradiance (Staubwasser and Weiss 2006; Dixit, Hodell, and Petrie 2014; Kaniewski et al. 2010), whereas a global humidity around 850 B.C. coincides with decreasing solar irradiance (van Geel et al. 1999; van Geel, Renssen, and van der Plicht 2001). According to Weiss et al. (1993), the drought event around 2200 B.C. reduced productivity of Upper Mesopotamian rainfed agriculture, forced abandonment of settlements, disrupted Akkadian imperial revenues, caused the collapse of the Akkadian empire, and led to the rise of Amorite nomadism. Archaeological research seems to prove the partial collapse of former vital Upper Mesopotamian urbanism around 2300 B.C. Relatively humid conditions returned around 1900 B.C. (Weiss 2012).

Recently, many Assyriologists and archaeologists have held the opinion that not the climate impact but socio-economic reasons forced the crisis of Upper Mesopotamian urbanism.[5] Indeed, there was no total abandonment but rather reduced settlement continuity

[5] Wilkinson (1994) stressed that the collapse of Upper Mesopotamian urbanism was the consequence of overexploitation of natural resources. According to Sallaberger (2007), the partial collapse of Upper Mesopotamian urbanism was forced by Akkadian imperialism; according to Pfälzner (2012), the reason for the crisis was the erosion of the former local socio-political and economic systems.

after a short-term abandonment such as at the Upper Mesopotamian sites of Tell Arbid or Mozan (Koliński 2007). Research on the vegetation of Tell Sheikh-Hamad and Bderi, on the very rare pollen sequences from Upper Mesopotamia, and on the sediment history of Wadi Chuera does not indicate any fundamental climate change over the past 6,000 years in Upper Mesopotamia (Bottema and Gremmen 1991; Bottema 1997, p. 490; Kürschner 2008; van Zeist 2008; Krätschell 2010). There is no evidence for a sudden desiccation and deterioration of the natural environment around 2200 B.C. (Riehl 2010b).

On the other hand, the research on the northward shift of the Pistacia-woodland steppe (Deckers and Pessin 2010) and the fact that drought-susceptible crops considerably decreased over the course of the end of the Early to Late Bronze Age is very likely a result of second-millennium B.C. aridity in Upper Mesopotamia (Riehl 2009). Evaluation on sequences of isotopic values in pedogenic carbonates and on $\delta^{13}C$ values of charred plant macro remains from Upper Mesopotamia indicates an increase in moisture availability in Upper Mesopotamia around 3000–2000 B.C. and a sudden decrease of humidity with higher evaporation than precipitation levels around 2000 B.C. (Riehl et al. 2009, p. 261). Research on the isotopic signature of Eblaite plant macro remains done by Caracuta and Fiorentino (2013) and the existence of drought-susceptible garden pea, flax, einkorn, club wheat, and rye (Wachter-Sarkady 2013) may indicate moister conditions in Early Bronze IIIb–IVa than in Middle Bronze I–II Ebla. According to Biga (2010), very drought-susceptible flax was cultivated in Ebla to support the local Eblaite linen industry. Only one flax capsule of linseed, however, was found at Ebla (Wachter-Sarkady 2013).

The paleobotanical research on Early Bronze Age Tell Mardikh, Arbid, Brak, and Bderi proves that einkorn and emmer are the second most attested cereals with almost an equal number of attestations (table 8.1). Whereas emmer is an aridity-tolerant crop, einkorn seems to be a drought- *and* very heat-susceptible cereal that is absent in Egypt and southern Mesopotamia (Oleinikova 1976; Perrino et al. 1996; Hajnalová and Dreslerová 2009). According to Wasylikowa and Koliński (2013), a shift from hulled wheat to naked wheat may indicate dry conditions in post-Akkadian and moister conditions in Middle Bronze Age Tell Arbid. Nonetheless, a recognizable part of hulled wheat around 2100–2025 B.C. and 1900–1800 B.C. is einkorn, which is indicative of a moister period. Only one sample of einkorn comes from period IIc (1800–1750 B.C.). On the contrary, there is no evidence for einkorn from periods VI (2150–2100 B.C.), IV (2025–2000 B.C.), IIb–a (1750–1700 B.C.), and I (1700–1500 B.C.). In Tell Leilan IIc, proportions of einkorn around 2200 B.C. decreased, whereas proportions of drought-tolerant hard wheat/*Triticum turgidum* ssp. *durum* increased (table 8.1).

Paleobotanical research on Tell Leilan, Brak, Mozan, and Arbid seems to prove that quite drought-resistant hard wheat and not drought-susceptible bread wheat/*Triticum aestivum* ssp. *aestivum* was the common ancient Mesopotamian naked wheat (Wetterstrom 2003; Wasylikowa and Koliński 2013). Increasing proportions of naked wheat and research on faunal remains from Tell Mozan around 2100–2000 B.C. may indicate a moister period (Doll 2010; Riehl 2010b). But, drought-susceptible hard wheat dominates wheat assemblages around 2100–1950 B.C. (table 8.1). Post-Akkadian evidence from Tell Leilan is very inconsistent. At the same time it shows an increase of proportions of drought-tolerant hard wheat *and* drought-susceptible bread wheat as well as a decrease of drought-tolerant barley and emmer *and* on the other hand drought-susceptible einkorn (table 8.1).

The paleobotanical research on Tell Mozan confirms a shift back to barley, accompanied by dry-land wild species after 2000 B.C. (Riehl and Deckers 2007). On the other hand, the

Table 8.1. Proportions of cereal remains from Ebla (cf. Wachter-Sarkady 2013), Tell Leilan (Smith 2012), Arbid (Wasylikowa and Koliński 2013), and Mozan (Riehl 2010b) (cf. also Charles and Bogaard 2001 concerning the paleobotanical research on Tell Brak/Nagar)

	Hordeum	*Einkorn*	*Emmer*	*Rye*	*Aest.*	*Club-wheat*	*Durum*	*Einkorn/ emmer*	*Aest./ Durum*	*Triticum sp./glume base*	*Free thresh. cereals*	*Cerealia*
Ebla, EBA III F.4843	896 78.3% (84.5%)	71 6.2% (6.9%)	89 7.8% (8.4%)	0	0	0	0	0	5 0.4%	84 7.3%	0	0
Ebla, EBA IVa	1,273 79.1% (84.9%)	106 6.6% (7.1%)	106 6.6% (7.1%)	10 0.6% (0.7)	0	10 0.6% (0.7%)	0	7 0.4%	6 0.4%	89 5.5%	0	0
Tell Leilan, 2333–2200	241 33,5% (75.3%)	18 2.5% (5.6%)	58 8.0% (18.1%)	0	0	0	4 0.6% (1.3%)	0	41 5.5%	362 50.3%	0	0
Tell Leilan, Post-2000	516 16.2% (52.7%)	22 0.7% (2.2%)	43 1.4% (4.4%)	0	126 4.0% (12.8%)	0	270 8.5% (27.6%)	0	764 24.2%	1,437 45.2%	0	0
Arbid VI, 2150–2100	22 31% (100%)	0	0	0	0	0	0	4 5.6%	0	3 4.2%	0	42 59.1%
Arbid Vb, 2100–2050	206 50.5% (89.6%)	10 2.0% (4.4%)	6 1.2% (2.6%)	0	0	0	5 1.0% (2.2%)	38 7.5%	11 2.2%	3 0.6%	0	230 45.2%
Arbid Va, 2050–2025	566 59% (97.6%)	5 0.5% (0.9%)	7 0.7% (1.2%)	0	0	0	1 0.1% (0.2%)	65 6.8%	13 1.4%	0	30 3.1%	272 28.4%
Arbid IV, 2025–1900	2 50% (100%)	0	0	0	0	0	0	0	1 25.0%	0	0	1 25.0%
Arbid III, 1900–1800	175 33.3% (83.3%)	14 2.7% (6.7%)	8 1.5% (3.8%)	0	0	0	9 1.7% (4.3%)	41 7.8%	22 4.2%	4	0	252 48.0%
Arbid IIc, 1800–1750	135 30.1% (96.4%)	1 0.2% (0.7%)	4 0.9% (2.9%)	0	0	0	0	8 1.8%	43 9.6%	0	0	257 57.4%
Arbid IIb–a, post-1750	1071 60.6% (98,3%)	0	18 1.0% (1.7%)	0	0	0	0	9 0.5%	0	17 1.0%	0	653 36.9%
Mozan EJ IIIa, 2600–2400	105 46.1% (75%)	1 0.4% (0.7%)	27 11.8% (19.3%)	0	0	0	2 0.9% (1.4%)	0	16 7.0%	16 7.0%	0	61 26.8
Mozan EJ IIIb, 2400–2300	568 46.8% (78.9%)	11 1.0% (1.5%)	130 11.3% (18.1%)	0	0	0	8 0.7% (1.1%)	28 2.4%	111 9.7%	66 5.7%	0	231 20.1%
Mozan EJ IV, 2300–2100	670 63.8% (91.8%)	10 1.0% (1.4%)	50 4.8% (6.8%)	0	0	0	1 0.1% (0.1%)	2 0.2%	70 6.6%	60 5.7%	0	184 17.5%
Mozan EJ IV–V, 2300–1950	44 24.4% (73.3%)	0	16 8.9% (26.7%)	0	0	0	0	0	31 17.2%	25 13.7%	0	67 36.6%
Mozan EJ IV–OJ I, 2300–1800	391 38.7% (68.6%)	2 0.2% (0.4%)	148 14.6% (26%)	0	0	0	24 2.4% (4.2%)	23 2.3%	110 10.9%	54 5.3%	0	261 25.8%

results from Mozan confirm increasing proportions of drought-susceptible einkorn around 1950–1800 B.C. Post-Akkadian evidence may be biased by relatively abundant and perennial water flow of local watercourses in Mozan (Çakirlar and Şeşen 2013).

4. Possible Climate Indicators in the Written Sources

4.1. *Seed/Yield Rates*

Administrative records from mid-eighteenth century B.C. document very high yields and seed/yield rates in the districts of Mari and Terqa/Tall Ašarra.[6] The highest seed/yield rates from Mari and Terqa (ARM 24 2: 1–3; text in Talon 1985) are up to 1:60 if we assume seed rates of 35 *qû*/*ikû*, 1:47 if we assume seed rates of 45 *qû*/*ikû*, and 1:42 if we assume seed rates of 50 *qû*/*ikû*. They are comparable to pre-Sargonic Girsu/Tell Telloh (max. 1:76), and they surpass the quite high ratios (max. 1:34) and yields around 1,460 l/ha from Ur III Girsu and Umma/Umm al-Aqarib (Maekawa 1984; cf. Jacobsen 1982). Butz (1983) argues that the high Babylonian seed/yield rates are accumulated yields of several years. But, there is not any evidence for such a practice (Postgate 1984) (fig. 8.2).

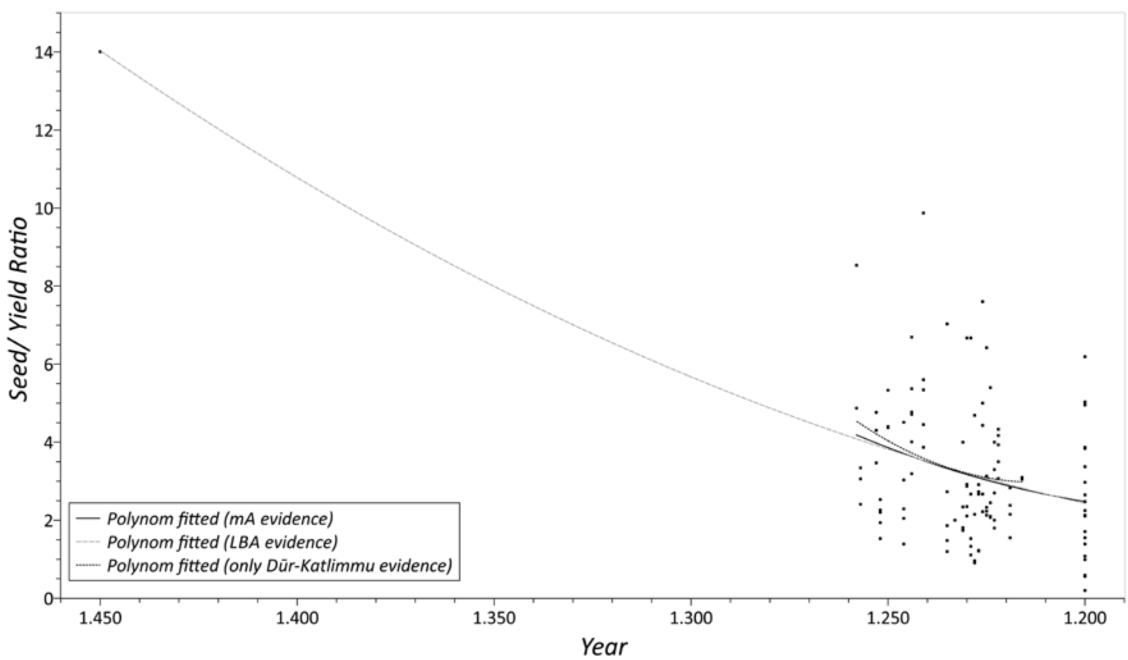

Figure 8.2. Development of Late Bronze Age Nuzi, Middle Assyrian, and Dūr-Katlimmu seed/yield rates (assuming an *ikû* of around 0.35 ha, a mean seed/yield ratio of 1:14 in Nuzi [see M. Müller 1995]; using data from G. Müller 1994 and Reculeau 2011; the diagram was generated using QtiPlot 0.9.8.9 svn 2288, © 2004–2011 Ion Vasilief)

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[6] Seed/yield rates do not only respond to humidity. Agricultural productivity also correlates with agri- and hydrocultural techniques and salinization levels of the soil (but see §§4.2 and 5.2).

Agroexperimental research from Lebanon demonstrates 25-fold yields around 2,058 l/ha (Worzella 1969). Research from Denmark proves 131-fold yields around 4,500 l/ha using a seeding rate of 34.4 l/ha and 72.7-fold yields around 5,041.7 l/ha using a seeding rate of 68.8 l/ha, both without any fertilization. This very high seed/yield rates were possible thanks to the use of agricultural techniques like seed plowing with low seeding rates, fallow, intensive tilling, and intensive irrigation (Scholz 1989 with reference to Norgaard and Pedersen 1962). This seems to justify the high Terqa and Mari seed/yield rates.

Mari yields, however, are too high: if we assume that the *ikû* of Mari is equal to the Babylonian *ikû* (ca. 0.36 ha), then ARM 24 2 proves yields up to 2,112 *qû*/*ikû* ≈ 5,866 l/ha. This is higher than the mentioned yields in modern agroexperiments. Thus, it seems inevitable to follow van Koppen 2001 and to assume a greater Upper Mesopotamian *ikû*. Low seeding rates produce high seed/yield rates. Therefore, I assume that the normal Mari seeding rate was 35 *qû*/*ikû*. If we would assume a doubled northern *ikû*, then Mari seed rates would be relatively low (48.6 l/ha), whereas yields are still very high (ca. 2,933 l/ha), and the maximum seed/yield rate remains the same (1:60). This is very plausible.

There is very rich evidence concerning the Nuzi harvest yields around 1400 B.C. Unfortunately, none of the texts is dated in absolute terms. The average seed/yield ratio from eleven settlements in Nuzi region is around 1:7 (G. Müller 1994, pp. 228–34). Since the relevant documents seem to count levies that are around 50% of the total yield (M. Müller 1995), the genuine average Nuzi seed/yield rate may be around 1:14. The Nuzi seed rate is 0.8 ANŠE/ANŠE = 80 *qû*/5 *ikû* ≈ 44.5 l/ha if we assume an *ikû* of 0.36 ha. This is roughly the same as correlated Mari seed rates (ca. 48.6 l/ha). This seems to justify the assumption that Mari *ikû* is approximately twice as much as the Babylonian *ikû*.

Extremely low seed/yield rates in Middle Assyrian yield texts indicate increasing aridity 1258–1200 B.C. with strong inter-annual climate variability in irrigated agriculture in the region of Dūr-Katlimmu and the rest of Upper Mesopotamia including the region of Yorgan Tepe (Reculeau 2011). The average seed/yield rate of barley in the region of Dūr-Katlimmu decreased from 1:7 in the year 1258 B.C. to 1:3 in the year 1216 B.C. The average Middle Assyrian seed/yield rate between 1258 and 1241 B.C. is 1:4.4. The rate decreased to 1:2.7 between 1240 and 1200 B.C. Since there are different seeding rates of 30 *qû*/*ikû* and 35 *qû*/*ikû* I calculated with an average seeding rate of 32.5 *qû*/*ikû*. This is something around 90.3 l/ha if we use a Babylonian *ikû* and around 45 l/ha if we use the Mari *ikû* (table 8.2).

Table 8.2. Seeding rates in l/ha in Mari, Nuzi, and Dūr-Katlimmu (bold numbers are used in my calculations)

	Mari	*Nuzi*	*Dūr-Katlimmu*
Babylonian *ikû* (0.36 ha)	83.0	**44.5**	**90.3**
Proposed Northern *ikû* (0.72 ha)	**48.6**	22.0	45.0

4.2. *Changing Harvest Dates*

Quite late harvests indicate quite long and strong winter precipitation. Neumann and Sigrist (1978) investigated references to the barley harvest in receipts for harvest work done on a certain day. They also considered documents that mention people committing themselves to perform harvest work when the time called for it. Since the average start of the barley harvest was relatively early, they concluded that around 1800–1650 B.C. northern Babylonia experienced a slightly more arid and warmer climate than in mid-twentieth century A.D. (fig. 8.3).

The "Middle Assyrian harvest reports" record the yield in the same year that it was counted on the threshing floor (Reculeau 2011). In essence, this means that the reports were written after threshing. Recent research done by Johnson and Cancik-Kirschbaum (2013) allows a relatively precise dating for the documents. Nearly all reports from the years between 1241 and 1220 B.C. date from 15th Hibur to 20th Hibur. This date can stray from the 24th–29th of May to the 24th–29th of June. Thus we can conclude that the average date of the reports was June 13th. At this point in time, the administration in Dūr-Katlimmu seemed to be sure that all the threshing was done. This is very early when compared with harvest and post-harvest processes in modern Iraq. This indicates that harvest started very early since the thirteenth century B.C. was relatively arid in Upper Mesopotamia.

Neo-Assyrian military campaigns started after the harvest was done. With this in mind, we can roughly calculate the conclusion of the Neo-Assyrian harvest by using references to the beginning of campaigns in Neo-Assyrian historical inscriptions. The dates we obtain for Neo-Assyrian campaigns indicate a relatively late harvest caused by relatively moist climate in the first half of the ninth century B.C. Neumann and Sigrist (1978) maintain that around 600–400 B.C. the barley harvest in northern Babylonia must have taken place primarily in May with some harvests being undertaken even in the later part of the month. Late April was the earliest date for the harvest. This indicates a quite late harvest and a moister climate than in mid-twentieth century A.D.

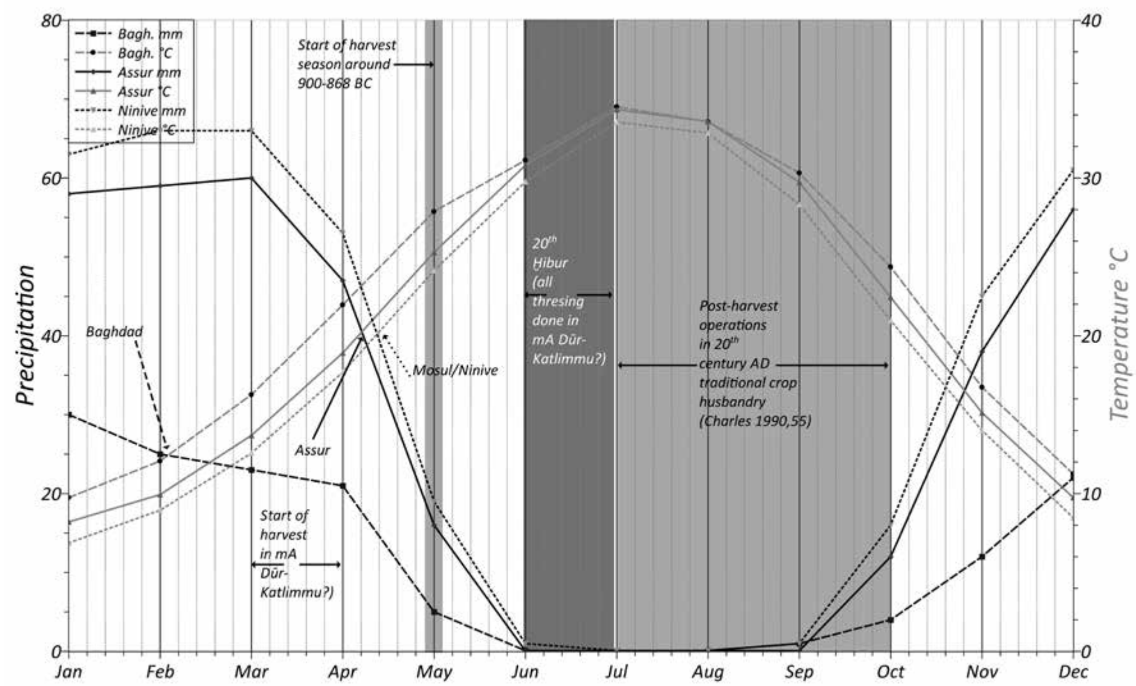

Figure 8.3. Modern climate in Baghdad, Assur, and Mosul; arrows show the average start of the arid period (using data from IPPC [1960–1990])

4.3. *Changing Family Size*

Research on pre-industrial Balkan and Levantine demographics proves that increases in pre-modern family size indicate positive breeding and relatively low mortality (Kaser 2011). The dominant factor for human mortality in antiquity can be attributed to a lack of medical knowledge. Since there is no evidence for relevant medical inventions in ancient Mesopotamia, increase of family size may be an indicator for positive fertility of the sedentary population caused by improved living conditions, especially better food supply induced by more moisture availability. Research on the Neo-Assyrian lower-class family size shows a reduction from a relatively large average family size of 4.4 persons around 800 B.C. to a relatively small family size of 2.8 persons around 680 B.C. and onward (fig. 8.4). This may indicate a negative demographic trend caused by aridity around 700 B.C.

4.4. *Drought-Susceptible and -Tolerant Crops*

In the following I present the evidence from sites according to the proportions of cereal range:

Babylonia: According to Jacobsen and Adams (1958), between 2300 and 1800 B.C. the rate of barley to wheat constantly increased, because salinization caused by excessive irrigation was occurring throughout Babylonia. Farmers preferred barley as it is the most salt-resistant cereal. However, Sumerians were aware of the effects of salinization and had taken the appropriate counter-measures (Powell 1984 and 1985). Moreover, there are also emmer varieties that are very resistant to saline soils (Hunshal, Balikai, and Viswanath 1990). Considering the

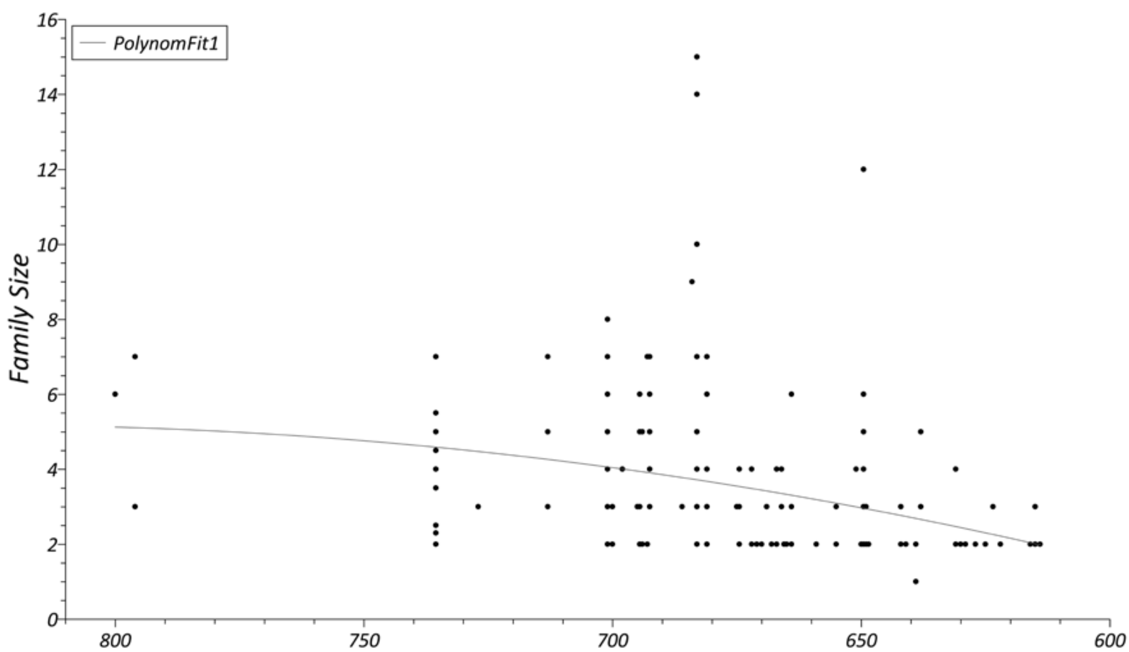

Figure 8.4. Neo-Assyrian family size (recent research using data presented in Galil 2007; the diagram was generated using QtiPlot 0.9.8.9 svn 2288, © 2004–2011 Ion Vasilief)

low rate of evapotranspiration of barley, Butz (1979) goes even so far to suggest that barley tends to increase soil salinity. Therefore, it seems plausible that the proportion of barley to wheat might have increased because barley was in fact the most drought-resistant cereal that generated higher yields in arid environments.

Ebla: The cuneiform evidence confirms the research on paleobotanical samples from Ebla concerning the relative sequence of quantities of specific cereals: 98.8% of cereals in Ebla are ŠE. Even if a considerable amount of the field crops in the written sources are characterized by SIG_{15}[7] and ZÍZ — compared to ŠE its proportions are very small (0.9% SIG_{15}, 0.6% ZÍZ). The proportion of KÌB-cereals[8] should be interpreted with a certain amount of reservation since the identification of the KÌB compounds is doubtful. Be it as it may, only around one percent of the cereals are KÌB including its compounds. Thus, only 1.5% of the crops in the written sources are crops commonly interpreted as wheat species, whereas paleobotanical research on paleobotanical samples proves 21%. On the contrary, 98% of all cereals in the written sources are ŠE, whereas 79% of all Eblaite cereal remains are barley, respectively, 84.9% if we only count cereal remains that can be accurately identified (cf. table 8.1).

The proportions of specific seeds for cultivation are roughly similar to the paleobotanical remains, for example 68.4% of seeds in the cuneiform records and 79% of seeds in the paleobotanical records are barley seeds. More or less, this is true for specific cereals given as rations to dependents. Only the royal diet is disproportionately dominated by SIG_{15}, ZÍZ, and varieties of KÌB.

Nabada: Beydar Text (TB) 49 (text in Ismail et al. 1996) proves 69% ŠE, 16% ZÍZ and 16% SIG_{15}. This is the only attestation of SIG_{15} in Beydar. This may be explained with the fact that Beydar evidence does not reflect a royal diet, and instead it reflects predominantly animal feeding. Unfortunately, TB 49 only lists numbers without units of measurement. The numbers are referred to as KI ENGAR/"place of the ploughman." Thus, we plausibly are dealing with seeding measures. The proportions in TB 49 are similar to the proportions of Eblaite seeding measures. But, they differ from the proportions of the total of all cereals since 92% of all cereals in Beydar are ŠE and 8% are ZÍZ (tables 8.3–8.4).

Gasur: According to Dsharakian (1994), the texts from Early Bronze Age Yorgan Tepe date relatively early in the era of the Sargonic empire, sometime around 2300 B.C. Most of the evidence stems from documents concerning the cultivation of fields. A total of 81% of cultivated cereals are ŠE, 8.4% are ZÍZ, and 10.5% are KÌB. In contrast to Ebla and Beydar, there is not so much ambiguity between the proportions of cultivated species and the totals of all quantities that prove 86% ŠE, 11% ZÍZ, and 2.4% KÌB. ŠE and ZÍZ seem to be only slightly overrepresented, whereas KÌB is underrepresented. There are only very small amounts for KÌB.TUR (HSS 10 105; text in Meek 1968); its cultivation is not attested. There is not any reference to the SIG_{15} crop.

[7] There is a discussion concerning the reading of the sign as KAL vs. SIG_{15} in context of cereals and processed cereals (Brunke 2012 with references). We will use the reading SIG_{15}, respectively Sumerian s i g₁₅.

[8] In older literature you find GIG instead of KÌB; note recently Marchesi 2013: "GÌB."

Table 8.3. Evidence from Early Bronze IVa Ebla (the unit of measurement is *qû* – that is, around 1 liter)

	ŠE	ZÍZ	SIG_{15}	KÌB	KÌB.TUR.(TUR)	KÌB.(TUR.)GÙN	KÌB.GARIG.TUR
Seed Measures	36,480 68.4%	12,900 24.2%	3,775 7.1%	0	0	0	140 0.3%
Rations for the King	33,120 3.7%	343,800 38%	512,940 56.7%	0	14,000 1.5%	0	0
Rations for the King and/or Workers	554,520 65.3%	84,000 9.9%	72,000 8.5%	132,000 15.5%	840 0.1%	6,000 0.7%	0
Rations, Palace, and Officials	1,755,120 85.6%	194,040 9.5%	89,040 4.3%	12,600 0.6%	0	0	0
Private Property	3,720 3.6%	45,800 44.9%	45,960 45%	0	1,440 1.4%	5,160 5.1%	0
Total: Ebla Archives	246,154,769 98.3%	1,552,860 0.6%	2,331,550 0.9%	290,640 0.1%	26,180 <0.1%	11,340 <0.1%	140 <<0.1%

Table 8.4. Evidence from Early Bronze IVa Nabada (using data from Ismail et al. 1996; the unit of measurement is *qû* — that is around 1 liter)

	ŠE	ZÍZ	SIG_{15}
Beydar Text 49	68.5%	15.75%	15.75%
Total (without TB 49)	229,760 91.7%	20,910 8.3%	0

Table 8.5. Evidence from Early Bronze IVb Gasur/Yorgan Tepe (using data from Meek 1935)

	ŠE	ZÍZ	KÌB	KÌB.TUR
Total of Seed Cereals and Seed Plots	81%	8.4%	10.5%	<0.1%
Total of Quantities of Cereals	1,426,550 86%	185,410 11%	40,416 2.4%	210 <0.1%

Old Babylonian Middle Euphrates, Upper Mesopotamia, and northern Syria: The cuneiform texts from Mari and Terqa provide only information for cultivation of ŠE, which counts for 99% of the totals. Apart from that, there is some proof for processing of *burrum*. The composition of cereals in Tuttul is reminiscent of the evidence from contemporary Mari, though with one exception, since some texts mention the unidentified cereal *qajātu*. Barley dominates with 95%, a considerable 4% of all cereals are *burrum*, and less than 1% is *kibtu*. There are only attestations concerning the processing and distribution of cereal crops and no valuable data concerning their respective cultivation in Tuttul (table 8.6).

Table 8.6. Evidence from Middle Euphrates*

	ŠE/*še*ʾ*um*	ZÍZ/*kunāšu*	*burrum*	*qajātu*	*kiššānu*	KÌB/*kibtum*
Mari: Surfaces of Seed Plots, Seed Cereals, Yields	100%	0	0	0	0	0
Mari: Total of Quantities of Cereals	52,433,161 99%	55,331 <<1%	425,187 <1%	0	0	660 <<1%
Tuttul	1,496,003 95%	0	65,270 4.2%	4 << 1%	0 0%	2,400 <1%
Tell Rimah: OBTR 322 (ii 30′–iii 26′; iii 22′–25′)	8,840 98.7%	0	60 0.7%	0	0	0
Khabur Triangle and Tell Rimah	6,741,494 99%	240 <<1%	6,090 <<1%	0	0	0
Old Babylonian Alalaḫ	355,200 55.5%	215,500 33.7%	0	0	68,800 10.8%	0

* Using data from Dossin 1950; Bottéro 1957; Birot 1960; Burke 1963; Birot 1964; Dossin et al. 1964; Durand 1983; Bardet et al. 1984; Talon 1985); Khabur Triangle (using data from Dossin et al. 1964; Bardet et al. 1984; Talon 1985; Vincente 1991; Talon 1997; Eidem 2011); Tell Rimah (using data from Dalley, Walker, and Hawkins 1976); and Alalaḫ (using data from Zeeb 2000) around 1750 B.C.

The composition of cereals from the Old Babylonian Khabur Triangle and Tell Rimah is reminiscent of the composition of cereals from contemporary Middle Euphrates. Interestingly, there is evidence for the cultivation of small amounts of *burrum* in Tell Rimah (OBTR 322; text in Dalley et al. 1976). Written sources from Old Babylonian Alalaḫ only document the drought-susceptible cereals ŠE and ZÍZ. There are quite high proportions of *kiššānu.*

Late Bronze Age Archives: In Late Bronze Age Nuzi the composition of seeds proves 75% ŠE, 11% ZÍZ.AN.NA, and 6% KÌB. This and the quantities of surfaces of fields that are cultivated with specific cereals are reminiscent of Early Bronze Age Yorgan Tepe. The body of evidence as a whole proves proportions of ŠE around 87% and ZÍZ and KÌB around 5% and 6%. Only one text (HSS 14 123; text in Lacheman 1950) counts the significant quantity of 19,500 liters *gajātu.* The written sources from Late Bronze I[?]–II Emar are almost exclusively for the processing and distribution of barley (>99%). The few attestations of ZÍZ (<1%) stem exclusively from a ritual and cultic contexts. Cuneiform records do not attest the cultivation of field plants.

The administrative documents from Middle Assyrian Dūr-Katlimmu are very interesting insofar as they count the local harvest of a specific year and the inventory of the local granaries. Thus, there is a relatively good chance that the proportions of the cereals reflect reality. Otherwise, we must be cautious, since the cuneiform tablets from Dūr-Katlimmu record the harvest of fields of the crown exclusively. Cultivation of KÌB only occurs from 1258 to 1245 B.C. In this period, 7% of all cereals are KÌB. The body of evidence as a whole proves around 98% ŠE and only 2% KÌB.

Table 8.7. Evidence from ca. 1450–1350 B.C. Nuzi*

	ŠE/*šeʾum*	*ku-ni-šu* (= ZÍZ.AN.NA), ZÍZ	*gajātu*	KÌB/*kibtum*
Nuzi Seeding Measures	186,200 74.9%	27,390 11%	19,500 7.8%	15,645 6.3%
All Cereals from Nuzi	2,266,095 86.5%	152,920 5.8%	19,500 0.7%	181,300 6.9%
Emar	567,012 >99%	1,575 <1%	0	0
Dūr-Katlimmu: Harvest Reports and Seeding Measures (1258–1245 B.C.)	260,030 92.8%	0	0	20,040 7.2%
Dūr-Katlimmu: Post-1245 B.C.	100%	0	0	0
Totals from Dūr-Katlimmu and Duara	1,103,147 98.2%	0	0	20,040 1.8%

* Using data from Chiera 1927; Pfeiffer 1932; Chiera 1934; Pfeifer and Speiser 1936; Pfeiffer and Lacheman 1942; Lacheman 1950; Lacheman 1955; Jankowskaja 1961; Lacheman 1962; Zaccagnini 1975; Wilhelm 1980–85; Lacheman, Owen, and Morrison 1987; Müller 1994; and Müller 1999); from ca. 1500–1300 B.C. Emar (using data from Arnaud 1986; Arnaud 1987; Tsukimoto 1988; Fales 1989; Tsukimoto 1990; Tsukimoto 1991; Arnaud 1991; Arnaud 1992; Dalley and Teissier 1992; Beckman 1996; Tsukimoto 1999; Westenholz 2000; and Krebernik 2001); and from 1258–1216 B.C. Dūr-Katlimmu (using data from Röllig 2009 and Reculeau 2011)

5. Discussion

5.1. *The Identification of the Relevant Cereal Species (and Some Other Crops)*

ŠE: Barley is by far the most common crop in paleobotanical archives from ancient Mesopotamia. The presented research on Upper Mesopotamian cuneiform archives shows that še/*šeʾum* is by far the most common cereal. This verifies the identification of ŠE as barley (cf. already Hrozný 1913).

In some sites there is a heavy discrepancy concerning the proportions of ŠE in cuneiform and the proportions of barley in paleobotanical archives such as in Ebla. This is to be explained by the fact that ŠE quite often means unspecific "grain" and not specifically "barley." This is supported by the fact that the proportions of seed measures are in line with paleobotanical data, whereas some specific types of documents like the type called *ṭuppi marūti* in Nuzi almost never prove any cereal but *šeʾum*. Some archives primarily reflect animal feeding. Thus, the prestigious cereals KÌB and SIG_{15} that are never proven as fodder are underrepresented. In summary, this indicates that in the written sources the proportions of cereals in Early Bronze Age Ebla, Beydar, Gasur, and Late Bronze Age Nuzi may be biased. On the contrary, Middle Bronze Age evidence from Upper Mesopotamia and Middle Euphrates and Middle Assyrian evidence seems not to be biased. This might be a matter for future research.

ZÍZ: Sumerian zíz and imĝaĝa$_{(1/2/3)}$ as well as Akkadian ZÍZ.AN/A.NA = *kunāšum* are to be identified with emmer. There is another cereal written ZÍZ or ZÍZ-*zu-um*. The phonetic complements -*zu-um* indicate a reading of *zizzum*. Since "emmer seed" is only written ZÍZ *ana* NUMUN or ZÍZ.NUMUN, it seems that *zizzum* is the cereal and *kunāšum* is the grain after husking, at least in the Early Bronze Age (cf. Powell 1984, p. 51). It is possible that ZÍZ in Lower Mesopotamia is the word for any unprocessed hulled wheat (see below). This needs more detailed research elsewhere.

KÌB/*kibtu*: In Middle Bronze Age Mari and Early Bronze Age Ebla, there is only proof for *kibtu* in a cultic context. Cultivation of KÌB is attested in the late Early Bronze IVa site of Gasur and in the Late Bronze Age sites of Nuzi and Dūr-Katlimmu. The Late Bronze evidence stems from archival contexts that proves a mix of rainfed and irrigation agriculture.

Hrozný (1913) identified Sumerian kìb and Akkadian KÌB=*kibtum* with some sort of (naked) wheat. Recent paleobotanical research indicates that hard wheat and not bread wheat is the common ancient Mesopotamian and Eblaite naked wheat, and that *kibtum* is to be identified with hard wheat (Marchesi 2013; cf. table 8.1). In contrast to einkorn and bread wheat, hard wheat is relatively drought resistant. Hard wheat needs less post-harvest operations than emmer and einkorn, which have to be husked for human consumption (Zohary 1983). Interestingly, manually grinding the glassy and hard kernels of hard wheat and emmer is relative easy and less labor intensive than grinding the soft and starchy kernels of bread wheat or the very soft and oily kernels of einkorn (Cappers and Neef 2012). Hard wheat has relatively good baking properties. (In Sicily, *pagnotte di Enna,* or "loaves of Enna," are made from hard wheat.) Thus, hard wheat perfectly meets the requirements for naked wheat in an ancient agricultural society in the semi-arid environment of Upper Mesopotamia. I will deal with this topic in future research.

Compounds of KÌB: Wheat Species or Other Crop Species? There are only very small amounts of KÌB.TUR(.TUR) and KÌB.DAR(.TUR^{gur})/KÌB.TUR.DAR in Ebla (each <0.1% of all cereals), and there is very little paleobotanical evidence of club wheat (0.6%) and rye (0.6%). Some of the unidentified naked wheat (0.4%) may be either bread wheat or hard wheat. Therefore, it seems plausible to provisionally identify Eblaite KÌB compounds with the mentioned free-threshing cereals.

Thus it is probable that Eblaite KÌB.TUR — literally "wheat.little" — is to be identified with the little variety of *aestivum*, with *Triticum aestivum* ssp. *compactum* = club wheat, whereas Eblaite KÌB.GÙN and KÌB.TUR.GÙN are a "spotted naked wheat" and a "spotted club wheat" (Archi 1999). Another explanation may be that the kernel of club wheat and hard wheat can have different colors (Baron et al. 2012). Thus, it is possible that KÌB.GÙN and KÌB.TUR.GÙN designate a mix of different-colored hard-wheat and club-wheat kernels.

But, Marchesi (2013) claims that Eblaite KÌB is the general term for any kernel. According to him, Eblaite GÚ.KÌB is a general term for pulses, KÌB.TUR is to be identified with lentil/*Lens culinaris*, and KÌB.DAR(.TUR^{gur})/KÌB.TUR.DAR = *gurgurum*$^{?}$/*kurkurum*$^{?}$ is to be identified with the field pea/*Pisum sativum*, since DAR = *šatāqum* means "to split" and split peas are a common processed form of dried peas. This identification is supported by the fact that attestations of drought-susceptible pea are considerably reduced after the Early Bronze Age and KÌB.TUR.DAR is only attested in the Early Bronze Age. Eblaite *ba-rí-sa-tum* GÌB.DAR.TUR^{gur}/"pod of GÌB.DAR.TUR^{gur}" seems to confirm that we are dealing with a legume.

In Gasur there is little evidence for KÌB.TUR together with ŠE, ZÍZ, GÚ.TUR/*kakkû* — commonly identified with *Pisum sativum* — and GÚ.GAL/*hallûrum*, presumably lentil. This seems to contradict the assumed identifications of Marchesi, at least the identification of KÌB.TUR with lentil. Regarding its literal translation "little KÌB," a provisional identification of KÌB.TUR with club wheat seems plausible.

According to Archi (1999), KÌB.GARIĜ.TUR is a species of naked wheat. In Ebla the attested seed rates for ŠE are about four times higher than that of KÌB.GARIĜ.TUR. Following the arguments in Marchesi 2013, the difference can be explained by identifying KÌB.GARIĜ.TUR with a variety of oil flax aimed to produce linseeds. But another plausible explanation for the low seed rates is that Eblaite farmers partially practiced intensive techniques like tilling and seed ploughing that are based on very low seed rates like in Babylonia or in Mari.

Furthermore, Marchesi argues that GÌB.GARIĜ(.ZÚM).TUR is to be identified with flaxseed, since flax fiber for linen has to be processed with a comb and *garîĝ* is the Sumerian word for Akkadian *muštum*/comb.[9] This indicates a literal translation of GÌB.GARIĜ(.ZÚM).TUR "kernel. comb.little." However, it is not the linseed but the fiber of the flax plant — and only flax varieties used for fiber production and not for seed and oil production — that have to be combed. Moreover, there are more plausible identifications for KÌB.GARIĜ.TUR. One of them concerns ethnobotanical research on manually harvesting cereals: cutting the stems, holding them below the ears with the one hand, and "combing" the weeds using the fingers of the other hand like a comb (Hajnalová and Dreslerová 2009).

Furthermore, some varieties of club wheat are beardless, and some are bearded with awns that look like the teeth of a comb. This is also true for rye/*Secale cereale*.

In this context, it is important to note that the paleobotanical samples from Ebla contain grains for up to four or five free-threshing cereals including *aestivum*/*durum*, club wheat, and rye (Wachter-Sarkady 2013; cf. table 8.1), and there are also four compounds of KÌB. This supports the assumption that KÌB is not the kernel of any field crop (*pace* Marchesi 2013). Instead, it is the kernel of any free-threshing cereal.

To sum up, I would propose to reject some of Marchesi's identifications and — according to a provisional understanding — to follow Archi (1999) and identify KÌB.TUR with club wheat. KÌB.TUR.GARIĜ seems to be a bearded free-threshing cereal like a bearded club wheat variety or rye.

SIG$_{15}$: The alternative reading of the logogram allows the translation kala(g) = *danāqu* "to be strong." This is reminiscent of the etymology of Latin *Triticum durum*, German *Hartweizen*, French *blé dur*, and English hard wheat. But this attractive etymologically based identification seems to be wrong, since the distribution of SIG$_{15}$ cultivation seems to be restricted to the relatively humid Early Bronze IVa Ebla and Khabur Triangle, whereas hard wheat/KÌB seems to be the naked wheat *par excellence* in Bronze *and* Iron Age Upper *and* Lower Mesopotamia (see above, §5.1 s.v. KÌB/*kibtu*). The chronological and geographical distribution supports the identification of SIG$_{15}$ with einkorn that is almost only evident in Early Bronze Age greater Upper Mesopotamia (table 8.1). Roughly contemporary with the total disappearance of einkorn in Upper Mesopotamia, the evidence for consumption of zì-sig$_{15}$ in Lower Mesopotamia after Ur III also dries up (table 8.8).

Table 8.8. Chronological distribution of zì-sig$_{15}$ (source: ePSD)

Year	Post-3000 B.C.	Post-2500 B.C.	Post-2000 B.C.	No Date
Attestations	128	56	2	4

[9] Indeed, VE 1359 proves that ^{giš}ZUM is Eblaite *mu-sa-tum* "comb" (text in Pettinato 1982, p. 337).

Besides these arguments concerning the distribution, there are arguments concerning the post-harvest processing that support the identification of SIG_{15} and einkorn. ZÌ.SIG_{15} is attested in cuneiform archives from Sargonic Ebla and from Presargonic and Sargonic Babylonia (e.g., Garshana, Lagash) as well as from the Third Dynasty of Ur. There are different possible translations of ZÌ.SIG_{15}. One is literally "flour of SIG_{15}." This is certainly true for ZÌ.SIG_{15} in Ebla. $(^{[\text{zì}]})^{\text{si-ig}}$KAL is equated in a Babylonian lexical list with (*qēm*) *hišlētu* "a kind of groat" (*AHw.* 1, p. 349). Indeed, if produced for human diet, einkorn is traditionally processed yielding groats, porridges, and soups since it is difficult to grind. Due to its bad baking properties, the traditional dough for einkorn bread is a mixture of einkorn with other cereals and crops like beans or potatoes (Hajnalová and Dreslerová 2009; cf. Peña-Chocarro et al. 2009). It is also possible to produce einkorn bread with emmer sourdough. Indeed, it seems that Eblaite NINDA.SIG_{15} "bread of SIG_{15}" is made by mixing it with *z/ṣaltum*,[10] an ingredient attested also for BAP(P)IR/sourdough used for beer production.[11]

According to Brunke (2012, pp. 23–24), Garshana archives provide the information that zíz/emmer is ground into zì-sig_{15} and ìmĝaĝa(ZÍZ.AN). NIK 57 from twenty-fourth-century B.C. Lagash shows that zì-gu-(še) is a grinding fineness of še/barley, and zì-gu-sig_{15} is a grinding fineness of a specific cereal sig_{15} (text in Selz 1989, pp. 246–47). It is plausible that zì-sig_{15} is the short form of zì-gu-sig_{15}. I have argued above (§5.1 s.v. ZÍZ) that ZÍZ means "unprocessed emmer." Since the Garshana archives indicate that zì-sig_{15} is also processed of zíz, it may well be that at least in Early Bronze Age Garshana zíz is not only the *terminus technicus* for unprocessed emmer but also for any unprocessed hulled wheat. Therefore, ìmĝaĝa(ZÍZ.AN), ímĝaĝa(ZÍZ.AN.NA), zì-sig_{15}, and sig_{15} are the processed from respectively the husked kernel of emmer and einkorn.

According to the presented evidence, the identification of Early Bronze IVa–b Upper Mesopotamian SIG_{15} with einkorn seems to be virtually certain (cf. already Archi 1999), and the identification of Lower Mesopotamian sig_{15} with einkorn seems to be quite plausible. This topic will be dealt with in more detail regarding the geographical and chronological distribution of philological evidence elsewhere.

burrum seems to be a cereal that was established by the Amorites. Hrozný (1913) already mentioned that *burrum* is a cognate of the South Arabian *burr* "naked wheat." According to van Koppen (2001) and Krebernik (2001), evidence from Tuttul and Mari for *burrum ša* ŠE and *burrum ša kabātum* indicates that *burrum* is a specific form of processed cereal made of barley or hard wheat.

But, KTT 110 from Tuttul (text in Krebernik 2001) proves that *burrum* comes directly from the ENGAR "ploughman." That is, it comes directly from the fields without any processing.

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[10] Cf. e.g., ARET 9 33 (text in Milano 1990). Marchesi (2013) renders Eblaite *za-la-tum* as *ṣaltum*. Milano (1987, p. 528) translates "emmer groats?" Babylonian lexical lists (e.g., *Ḫḫ.* XXIV 130–33; text in Civil and Reiner 1974, pp. 81–82) mention *raq/sal-tum* in the context of zíz (gu-nida) and kìb. The context of cereals may verify that Eblaite *za-la-tum* and *sal-tum* are different writings of the same word. On the contrary, W. Sallaberger, in a personal communication, doubts that *za-la-tum* and *sal-tum* designate the same things. Indeed, this issue needs detailed research.

[11] BAPIR is Sumerian babir and Akkadian *bappiru*, sourdough made of barley (Sallaberger 2012, p. 308). This may indicate that Eblaite NINDA.SIG_{15} was leavened sourdough bread. In Early Bronze IVa Garšana Sumerian ìnda $\text{gur}_4\text{-ra}$ "Dickbrot" (Brunke 2012, p. 137) was made of zì-sig_{15}. This indicates either a cake-like bread mixed with other ingredients or a leavened sourdough bread.

In Old Babylonian Tell Rimah around 1750 B.C., somebody moans, "who will cultivate barley and *burrum*?"[12] This and two administrative lists from Tell Rimah that count field surfaces and amounts of *šeʾum* seed and very small amounts of *burrum* seed verify that *burrum* is a specific winter crop.[13]

Attestations of *aklum emṣu burrum* in Mari indicate that *burrum* bread is made of sourdough. Since legumes are not processed to sourdough, *burrum* should be a cereal. This is reminiscent of the documentation of SIG$_{15}$ in Ebla. Thus, it might be assumed that *burrum* is Amorite SIG$_{15}$/einkorn. Indeed, a recognizable part of glume wheat in Tell Arbid and Mozan around 1900–1800 B.C. is einkorn. However, after 1800 B.C. cultivation of einkorn was virtually abandoned in Arbid and Mozan, whereas cuneiform evidence for *burrum* dates around 1750 B.C. (rMC$_{12}$). OBTR 299 (text in Dalley et al. 1976) seems to prove cultivation of *burrum* in [*Qa*]*ṭarra*/Tell Rimah. Tell Rimah lies too far in the south for einkorn cultivation, the climate there being simply too hot, at least at present. Since Mari documentation mentions *burrum* together with *kibtum*/hard wheat, *šeʾum*/barley, and *kunāšum*/emmer, and since there are no paleobotanical attestations from Middle Bronze II for rye and einkorn, I propose to identify *burrum* with drought-susceptible bread wheat.

gayātu and kiššānu: Administrative documents from the Middle Bronze Age site of Tuttul and the Late Bronze Age site of Nuzi mention a crop *gajātu.* Some evidence indicates that it is a processed cereal or a pastry (Krebernik 2001; cf. CAD G, 11a; *AHw.* 1, 466). However, HSS 14 123 from Nuzi (Lacheman 1950) clearly shows that *gajātu* is a field crop that is cultivated together with ŠE, *kunāšum*, and *kibtum* (Zaccagnini 1975). Since *gajātu* is also present at Middle Bronze Age Tuttul, it must be a field crop different from ŠE, *kunāšum*, *kibtum*, and *burrum*. Most presumably it is a legume. This seems also to be true for *kiššānu,* a crop in Old Babylonian Alalaḫ that is to be identified with a pulse since *kiššānu* is Sumerian *guniĝara*. Most commonly it is identified with very drought-tolerant bitter vetch (cf. arguments and references in Riehl 2010a). More research is needed regarding field crops other than cereals.

5.2. *The Climate between 2400 and 750 B.C.*

Cuneiform evidence for cultivation of drought-susceptible SIG$_{15}$/einkorn is limited to Early Bronze IVa Ebla and Nabada. In Nabada there is not any archaeological or philological proof of relevant irrigation systems in a region that today lies south of the modern 300 mm isohyet. This fact seems to support that in the Early Bronze IVa Khabur Triangle, temperatures and precipitation levels that are comparable to the relatively humid Early Bronze IVa climate in Ebla prevailed.

Einkorn is especially sensitive to heat stress. This may indicate a relatively cool and moister period around 2350 B.C. in the regions of Ebla and Nabada. This seems to support the values of the paleoclimate model (Macrophysical Climate Model; fig. 8.1) that indicate a cool and humid period around 2350–2150 B.C. in Qamishli. Even if we are not able to identify the Eblaite KÌB compounds with absolute certainty, all possible identifications (club wheat,

[12] OBTR 299: (7) ŠE-*e* ù BU.RUM-*ra-am* (8) *ma-an-nu i-ir-ri-iš.* Text in Dalley et al. 1976.

[13] OBTR 322: (ii 29′) 6-*me* 4 IKU A.ŠÀ (30′) ⌜x⌝+7 ANŠE 2 (NIGIDA) 3(BÁN) ŠE (31′) ⌜2(BÁN)⌝ *bu-rum* (32′) [*qa*$^{?}$]-*ṭà-ra*^{ki} ... (iii 22′) 3-*me* 5 IKU [A.ŠÀ ŠE] (23′) 4 *bu-rum* (24′) 3 ANŠE 5(BÁN) x (25′) 4(BÁN) x (26′) ^{uru}(x-)]*za-ri*-[...] ... (vi 19′) [... IK]U A.ŠÀ ŠE (20′) [...] *bu-rum* (21′) [...] ŠE (22′) [^{uru}...]-x-RUM^{ki} .... OBTR 335: (5′) *i-na* A.ŠÀ (6′) ^{uru}*ṣú-bat bu-rum.* Texts in Dalley et al. 1976.

rye, pea, flax) would support the assumption of a quite humid climate around 2350 B.C. (see above, §5.1 s.v. “Compounds of KÌB”).

Cuneiform tablets from Gasur do not mention SIG_{15}/einkorn. The written sources only prove the cultivation of drought-resistant ŠE/barley, zíz/emmer, and KÌB/hard wheat. They only count the consumption of very small amounts of KÌB.TUR/club wheat? (table 8.5). Thus, cuneiform records from Gasur may indicate a climate around 2300 B.C. that is more arid than the climate in Ebla and Nabada around 2350 B.C. However, this may reflect regional small-scale differences in climate development in western Iran. Moreover, we cannot exclude that the Gasur evidence reflects local and culturally induced agricultural or ecotrophological preferences.

There are no more relevant written sources from Early Bronze Age Upper Mesopotamia after around 2300–2250 B.C. The paleoclimate model (Macrophysical Climate Model; fig. 8.1) indicates a moister period around 2350–2150 B.C. The paleobotanical samples from Tell Mozan, Arbid, and Leilan indicate wet-dry oscillations with relatively arid periods around 2150–2100 and 2000–1900 B.C., and humid spells around 2100–2000 and 1900–1800 B.C. The main argument for these moister periods is the periodically high proportion of naked wheat in Mozan (Riehl 2010b). But, we must be cautious since there are only attestations of drought-tolerant hard wheat, and there is hardly any evidence for unequivocally identified drought-susceptible bread wheat (cf. table 8.1). The relatively high proportions of einkorn in Tell Arbid and Mozan may support the assumption of moister conditions around 2100–2050 and 1900–1800 B.C. If we accept that in documents from the Third Dynasty of Ur zì-sig_{15} is “the flour of the (husked) einkorn,” then it would be very plausible that einkorn was an imported cereal from northern regions because it seems impossible that einkorn was cultivated in arid Lower Mesopotamia. Since textual sources and archaeological remains seem to prove trade between Tell Arbid and Mozan with the Third Dynasty of Ur (Pfälzner 2012), it seems absolutely possible that some of the einkorn for zì-sig_{15}/einkorn-flour in Ur III Babylonia was delivered by the house of Puššam in Tell Mozan. The flourishing Ur III empire seems to correlate with a quite humid episode around 2100–2000 B.C., providing Lower Mesopotamian hydroculture with a stable supply of abundant water flow.

There is no more cuneiform or paleobotanical evidence of SIG_{15} einkorn after 1800 B.C. This supports the paleoclimate model that Middle Bronze II climate was more arid than the climate in Early Bronze IVa and climate around 2100–2000 and 1900–1800 B.C. The proposed cultivation of *burrum*/bread wheat in Tell Rimah may indicate moister conditions on a quite low level around 1750 B.C. Since bread wheat requires relatively high moisture availability, it seems inevitable that some kind of irrigation was practiced in Rimah. This seems to be proved by OBTR 295–97 (text in Dalley et al. 1976).

The extremely high Mari and Terqa harvest yields and seed/yield rates seem to indicate relatively humid conditions, too (see §4.2). But, agriculture in Terqa and Mari around 1750 B.C. was based on irrigation. The water for irrigation was derived from Euphrates and Khabur rivers. Thus, the high yields do not necessarily indicate local humidity, but a stable supply of abundant water flow and humidity in the regions of the headwaters. Evidence for slightly earlier harvest dates seems to prove slightly more arid climate in Babylonia than today and in Early Bronze III–IVa (see §4.1). The composition of cereals and the lack of any naked wheat species in Middle Bronze II Alalaḫ may indicate more arid conditions in the region of Alalaḫ in the second quarter of eighteenth century B.C. (table 8.6).

The partially very high seed/yield rates from Late Bronze Age Nuzi indicate partially intensive hydroculture and agriculture. But, even correlated double the seed/yield rates from Nuzi around 1400 b.c. are lower than the average seed/yield rates from Mari. The evidence from Terqa, Mari, and Nuzi is comparable since approximately the same seeding rates were used in these places (table 8.2).

Nuzi seed/yield rates are high in comparison with extremely low Middle Assyrian seed/yield rates. Since Late Bronze Age Dūr-Katlimmu *and* Middle Bronze Age Terqa are relatively close in distance in a region with almost the same climate and since both places are receiving their water from the Khabur River, the productivity of both sites is comparable. The highest seed/yield rates and harvest yields in Dūr-Katlimmu do not even come close to the average rates around 1:29.6 in Terqa. Dūr-Katlimmu seeding rates are double the size than the seeding rates from Nuzi and Mari. Maybe the Middle Assyrian *ikû* was the equal to the correlated *ikû* from Middle Bronze Age Mari (around 0.72 ha; see above, §4.1). But this would also result in an up to 50 percent reduction of Middle Assyrian harvest yields. Whatever the case, both the yields and the seed/yield rates in Late Bronze Age Nuzi and Early Bronze Age Mari are very much higher than their counterparts in Middle Assyrian Dūr-Katlimmu. The regressive development of seed/yield rates from Dūr-Katlimmu indicates *decreasing* precipitation levels around 1258–1220 B.C. in the region of the Khabur headwaters. The very early harvest dates indicate a contemporary aridity in southern Upper Mesopotamia — so arid, in fact, that the cultivation of drought-tolerant hard wheat was abandoned following 1240 B.C.

The period around 900–800 B.C. roughly coincides with decreasing southern Indian monsoon patterns, reduced solar irradiance, and late harvest dates around 850 B.C. as well as growing occupation and cultivation of the Upper Mesopotamian steppe. The former may have induced increases in overall precipitation in the area; the latter can be correlated with increased agricultural production in Upper Mesopotamia.

The declining family size from 750 to 610 B.C. is suggestive of aridity. We must, however, remind ourselves that the data concerning family size before the reign of Sargon II are drawn from a considerably small body of evidence.

The relatively late Neo-Babylonian harvest dates indicate, again, a relative humid climate around 600–400 B.C., at least in the regions of the headwaters of Euphrates and Tigris.

6. Conclusion

The cultivation of einkorn in Tell Beydar around 2350–2300 B.C. supports paleoclimatic models that indicate quite low temperatures and high precipitation levels around 2350–2150 B.C. (fig. 8.1). Thus, the results of this paper contradict the assumption, that there was no climate change in Upper Mesopotamia after 4000 B.C. Paleobotanical research on drought-susceptible cereals may indicate a drier spell around 2150–2100 B.C. This is after the imperial struggle at the end of the reign of Šar-kalli-šarri (2205–2180 B.C.; rMC_{12}) and his successor Dudu. This contradicts the theory of Harvey Weiss that a global drought event around 2250 B.C. forced the collapse of the Akkadian empire.

The proposed humid episode around 2100–2025 B.C. correlates with a flourishing Ur III empire, whereas an arid event after 2025 B.C. corresponds with the Isin-Larsa period in Babylonia. This seems to contradict that there was a drought event around 2100 B.C. (*pace* Roberts et al. 2013). Widespread Near Eastern aridity is not visible both in late third-millennium B.C. cuneiform and in paleobotanical evidence from greater Upper Mesopotamia. To sum up, cuneiform evidence does not support that Upper Mesopotamian climate in late third millennium B.C. followed the global trend.

Research on further humidity indicators supports the assumption of a series of downward-trending wet-to-dry oscillations as proposed by Roberts et al. (2013). Climate proxies (yields, seed/yield rates, harvest time, family size) in the cuneiform sources may indicate more humid interim periods around 1750, 1400, 850, and 600–400 B.C. and drier spells around 1250 and 700 B.C. It seems that Upper Mesopotamian climate in second and first millennia B.C. followed the global trend.

But, we must be aware that some chronological problems have not yet been satisfactorily solved. Moreover, paleobotanical *and* cuneiform evidence may be biased. Future research concerning the cereal ranges has to consider the specific agroecological and ecotrophological setting of *idealtypisch* any piece of evidence enabling us to decide which textual sources are comparable with which paleobotanical plant remains. Last but not least, some of the identifications of Akkadian and Sumerian cereal crops are of preliminary nature, and certainly will have to be modified with future discoveries. The fascinating topic of the identification of field crops including the research on legumes has to be dealt with in more detail elsewhere.

Abbreviations

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ePSD Steve Tinney. *Electronic Pennsylvania Sumerian Dictionary*. Philadelphia: University of Pennsylvania Museum. http://psd.museum.upenn.edu/epsd/

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9

Regional Environments and Human Perception: The Two Most Important Variables in Adaptation to Climate Change

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Natural and human systems are multifactorial and are characterized by high spatio-temporal variability, making predicting their future development as difficult as reconstructing their past outlines. As archaeologists we must consider an infinite number of interrelated factors and effects, including various feedback mechanisms that have influenced the development of humankind in its natural and social environments. Regarding past climate change, the consideration of natural and human-made variables is even more important for understanding archaeologically observable regional differences in the development of human societies.

This work aims to contribute to our understanding of the development of ancient Near Eastern societies by summarizing the different variables acting in natural and human systems. We utilize the available stable carbon isotope data as a record for ancient water availability in cereal agriculture and jointly integrate these different variables into a model of social-ecological transformation processes.

Collapse and Resilience in Ancient Near Eastern Societies

Definitions and Core Assumptions

While some researchers use the term *societal collapse* as an approximation of the reduction of settlements in northern Mesopotamia (Staubwasser and Weiss 2006), others question its applicability to archaeological or historical observations. Many researchers suggest *resilience* as the more appropriate term, because the complete end of a society rarely occurs in human history; survival and regeneration is generally the rule (McAnany and Yoffee 2010).

Societal collapse describes the rapid failure of socio-political and economic systems rather than their long-term *decline*, and thus, modern human perception of the speed of observable processes plays a role in defining whether we address collapse or decline. We may apply the unit of a generation, that is, twenty-five years, to determine the speed of observable changes, with two generations of observed disintegration in a socio-political and economic system representing decline rather than collapse.

Other publications use the term *crisis* in relation to socio-economic developments at the end of the Early Bronze Age (Kuzucuoğlu and Marro 2007), which allows for a possible recovery or handling of critical developments but includes a strongly qualifying connotation. Other than in the context of the collapse of a system or society, the term *crisis* is vague, and it is unclear how ancient humans may have perceived such a crisis.

The term *resilience* was first introduced by Holling to describe the dynamics of ecological systems (Holling 1973), and was subsequently incorporated into the anthropological sciences, including archaeology, as resilience theory (Redman 2005). Some researchers apply the resilience concept to contrast it with collapse (Yoffee 2010) and to describe the range from the durability of a system under stress to the ability of self-regulation to increase the sustainability of the system. Particularly with recent discussions on global change, climate resilience has developed into an independent research field with the goal of developing strategies to maintain the integrity of functional relationships.

The concept of resilience in social-ecological systems was characterized by Folke as the interplay between disturbance and reorganization and sustainability and development (Folke 2006). Resilience can be lost, which is equal to a loss in adaptability. However, *adaptation* can also be considered in a more neutral sense as a reaction to external stimuli and stress (Nelson, Adger, and Brown 2007) that brings opportunities for innovation and evolution at the same time; thus, it may also be related to collapse.

The concept of resilience assumes the existence of an adaptive cycle (see also fig. 9.4), which is often graphically expressed by the lemniscate, and includes four transformation phases as follows: (1) an exploitation or launching (r) phase, in which colonization and/or growth play a major role; (2) a conservation or institutionalization (K) phase, in which establishment through the storage of energy and material are emphasized; (3) a release or destruction (Ω) phase, in which the former achievements become vulnerable and are suddenly released by external agents; and (4) a reorganization or exploration (α) phase, leading to the evolution of a new system that is either similar to or different from the previous system (Redman and Kinzig 2003). There are qualities associated with the transformation phases that decrease or increase in their strength. These qualities are described as "potential" or "capacity," which increases from phase r to phase K and from phase Ω to phase *α*; "connectedness," which increases from phase r to phase K; and "resilience," which becomes established with the formation of phase *α* and the transition from phase *α* to phase r. The entire system is particularly vulnerable at the peak of phase K and during the transition to phase Ω, and it is within this section that we would expect external factors to influence the adaptive cycle most significantly. The existence of phase Ω requires collapse to be part of the adaptive cycle as well as resilience, which starts with the reorganization of the system. Each of these factors may be scientifically addressed separately; however, they belong together within a systemic consideration.

The most concrete application of this model to ancient Near Eastern archaeology has been suggested by Redman and Kinzig (2003) for the time period between 3500 and 2000 B.C., which they consider to represent one single adaptive cycle of 1,500 years. The entire cycle can be described as a sequence of developments in political organization. While no supra-regional administration can be observed for the Uruk period settlements at the beginning of the cycle, organizational structures were becoming more elaborate during the Jemdat Nasr period. Redman and Kinzig interpret the Uruk period as the release phase (Ω) of the adaptive cycle, in which great energy was made available in regions of low settlement density. The following Jemdat Nasr period is described as the beginning of the reorganization phase (α). They see experimentation during the Early Dynastic period in the layout of the cities, such as temple ovals, palaces, and royal burials, followed by the formation of the Sumerian civilization (Redman and Kinzig 2003). According to these authors, this step reflects the growth in social capital and connectedness of the r to K phases, followed by the creation of the

Akkadian state, showing the characteristics of the conservation or institutionalization phase (K) through its large administrative apparatus. A short period of rivalry between city-states was followed by the Third Dynasty of Ur (still part of phase K). The expansion of irrigation as part of an intensification strategy is considered the release factor (transition to phase Ω) that undermined the viability of the dynasty. The mechanisms behind this transition would have been the short-term maximization strategies of the rulers that led to salinization.

While the adaptive cycle can be considered the most comprehensive theory for addressing changes in all types of systems (Gunderson and Holling 2002), it appears to lack explanatory power. The example above effectively describes the process of political change in Mesopotamia but reduces the external factors that influence the system to only salinization. Without any further investigation of additional influential factors, the model is descriptive, rather than explanatory, of the entire process.

Based on the different meanings of the aforementioned terms, archaeologists argue about how the transition between the Early and the Middle Bronze Age may have occurred. It is possible to question whether complex systems, such as the interrelationships between climate and human societies, can even be fully explained by applying a generalizing model, or whether we should instead attempt to look at each site individually to determine a range of different applicable models throughout the large geographic area of the Fertile Crescent.

Settlement Persistence and Abandonment in Northern Mesopotamia

The most obvious archaeological criterion that demonstrates a crisis or declining resources is settlement abandonment. Although archaeological evidence between 2300 and 1900 B.C. indicates the abandonment of most of the settlements in northern Mesopotamia that were located roughly between the modern 200 and 300 mm isohyets, there are certain sites showing continuity in their settlement structures, such as Emar and Tell el-Abd on the Euphrates (map 4 in Marro and Kuzucuoğlu 2007). By contrast, sites located between the modern 300 and 400 mm isohyets exhibit predominantly settlement continuity during this period, with only a few sites having been abandoned (e.g., Tell Leilan and Tell Beydar in the wider Khabur region, or Tell Jerablus-Tahtani and Tell Shiukh Tahtani on the Euphrates). Large cities such as Mari and Terqa that were located farther down the Euphrates in an area of less than 200 mm modern precipitation persisted throughout the considered period.

The logic of the records of settlement abandonment or persistence suggests the following: (1) a general north–south decline in precipitation was involved in the abandonment processes with a probable climate-related shift of the isohyets to the north; and (2) diversified local conditions and human strategies deviate from this general pattern, including the use of irrigation technology in settlements such as Mari and Terqa.

The goal of this paper is to consider these two arguments in more detail by analyzing the direct effect of past precipitation on cereal cultivation through stable carbon isotope analysis and by reflecting on possible human factors that may have influenced the decision-making and strategies used to support local persistence.

Human Perception and the Adaptation to Environmental Change

Perception of Environmental Change

Resilience in past societies requires at least some understanding of ecosystem dynamics from ancient humans, and for the purpose of reconstructing ancient systems, it is necessary for modern researchers to understand the perceptions of ancient humans. Of course, these can only be approached in analogy with ethnographic observations of traditional societies. In agricultural science, the adaptation of traditional farmers to changing climatic conditions is considered a two-step process, including not only the actual response of farmers to changes through adaptation but also the overall perceptions of farmers regarding climate change. Both aspects are influenced by socio-economic and environmental factors.

Ethnographic studies on traditional farming in the Nile basin of Ethiopia found that farmers' perceptions of climate change were significantly related to the age of the head of the household, wealth, knowledge of climate change, social capital, and agro-ecological settings. The most important factors affecting adaptation to climate change were household size and the ownership of livestock (Deressa, Hassan, and Ringler 2011).

One important aspect is the agro-ecological setting, that is, whether the agricultural land is located in an area with lower or higher mean annual precipitation. Studies in the United States have found that farmers living in drier areas with more frequent droughts tend to perceive changes in temperatures and precipitation with higher sensitivity than farmers living in areas with less frequent droughts (Diggs 1991). A possible consequence of this awareness may be that farmers on agricultural land in drier areas are better prepared for eventual droughts and would react faster and more effectively, for example, through generally higher surplus storage or building reliable networks for short-term resource acquisition. There may, however, be considerable deviation from this observation depending on the specific landscape conditions (Deressa, Hassan, and Ringler 2011) and on the strength and continuity of climatic fluctuations. Long-term climate change is generally difficult to perceive, whereas short-term weather fluctuations are realized by everyone. Studies in modern societies demonstrate that only few people consider climate change an immediate risk and instead give greater attention to social issues, such as the economy and terrorism (Weber 2010).

One prior study in the Nile basin in Ethiopia analyzed results based on a household survey of a thousand mixed-crop and livestock farmers in different agro-ecological zones (highlands, midlands, and the dry lowlands) during the production year 2004/2005 (Deressa, Hassan, and Ringler 2011). Deressa et al. found that only 51 percent within the study group realized changes in temperatures of 0.25 degree Celsius for the average minimum and 0.1 degree Celsius for the average maximum within a decade. However, other studies, for example, in the Limpopo Basin of South Africa, revealed the perception of increasing temperature by up to 91 percent of the farming population (Gbetibouo 2009). Concerning precipitation, 53 percent of the Ethiopian farmers were aware decreasing rainfall over the past twenty years and an increasing variability in precipitation over the past fifty years (Deressa, Hassan, and Ringler 2011).

Adaptation to Changing Natural Conditions

There are a large number of rapid or long-term responses to perceived climate change, such as an immediate shift to livestock herding, higher mobility to enlarge resource availability, reduced investment in crop cultivation during dry spells, spreading out the risks associated with climate variability by utilizing the spatial and temporal diversity in the landscape (e.g., agricultural experiments; Thomas et al. 2007), and the large-scale storage of grain administered by the local authorities and provided to applicants in times of scarcity (Gómez-Baggethun et al. 2012). Under rural conditions, such as in the case of the Ethiopian study, increasing household size increases the likelihood of adaptation because larger family size is often associated with a higher labor endowment (Deressa, Hassan, and Ringler 2011). Of the 51–53 percent who perceived climate change, only approximately 58 percent indicated that they had taken measures with the goal of adapting to climate change (Deressa, Hassan, and Ringler 2011). These measures included soil conservation and tree planting, which reduce the loss of surface water. Irrigation, changing the amount of managed land, supplementing livestock feed, and changing the planting time and species of cultivated crops are other measures taken for adaptation to climate change. Additionally crop diversification has been recorded in a number of other studies (Kurukulasuriya and Mendelsohn 2007; Maddison 2007; Gómez-Baggethun et al. 2012) and possibly may have been practiced in the past, as suggested by archaeobotanical data, indicating a shift to regionally different crop species in settlements in northern Mesopotamia and in the Levant during the transition from the Early to the Middle Bronze Age (Riehl 2009a).

Technological differences among different regions have be related by some researchers to "innovation capacity" (van der Leeuw 2009) or, in a broader sense, "adaptation capacity" (Nelson, Adger, and Brown 2007), which also play a considerable role in adaptation processes. The technological preconditions of an economic system as well as the ideologies behind it may also have played a decisive role in the choice of adaptation strategies in the past (Riehl 2012). Societies that were highly dependent on irrigation technologies, such as southern Mesopotamia and Egypt, may have perceived climatic changes completely differently than farmers in rainfed agricultural systems. In traditional farming societies in South Africa, access to fertile soil and irrigation water decreases the likelihood of farmers to perceive climate change (Gbetibouo 2009). On the one hand, slight changes in precipitation in the past may not have even been recognized under irrigation systems; on the other hand, dependence on surplus cereal production for large empires probably made these systems much more vulnerable.

If adaptation is considered likely to fail or has previously failed, out-migration is the final adaptation strategy to climate change. Settlement abandonment is probably the best-documented archaeological type of information (see above), although in most cases, a straightforward attribution of settlement abandonment to climate change is impossible because environmental factors are generally intertwined with socio-economic and demographic processes.

Barriers to Human Perception and Adaptation to Climate Change

Individuals who perceived climate change in an ethnographic study but continued farming without any adaptations listed a number of reasons as barriers to adaptation (Deressa, Hassan, and Ringler 2011). In addition to the lack of information and money, the shortage of labor and land and the poor potential for irrigation were also listed by these farmers. In a study of South African farming systems, insecure property rights were also mentioned as a barrier to adaptation (Gbetibouo 2009). While a shortage of land was not found to have been a problem in the past (van Koppen 2001), the poor potential for irrigation may have played a role and can be locally addressed by geoarchaeological methods (cf. Wilkinson 2003). Interestingly, a shortage of labor has been identified in cuneiform texts from Mari and other societies of the Middle Assyrian empire in the north and during the Ur III period in southern Mesopotamia (Riehl et al. 2012). At Mari, the consequences of labor shortages have been described as local underproduction, forcing the palace to acquire barley on the market (Lafont 2000).

Cultural impediments such as short-term planning perspectives, spiritual beliefs, and traditional governance structures also play a role in adapting to changing climate. Ideological, religious, and spiritual concepts are among the most frequently mentioned barriers to human perception of and adaptation to climate change. The belief in the responsibility of suprahuman powers for climate change has often been reported (Gifford 2011; Wolf and Moser 2011). Although more than 87 percent of the inhabitants of Nausori on Viti Levu Island, Fiji, have learned from the television or newspapers about climate change, almost half of them, similar to other Pacific Islands, believe that the causes of climate change are attributable to divine will; thus, there is no justification to alter observable developments (Lata and Nunn 2012). It has also been reported that 15 percent of a test group in Nigeria practiced prayer and ritual offerings as a measure of adaptation to climate change (Maddison 2007).

Considering the large number of Mesopotamian deities, many of which carry attributes of forces of nature, a considerable inertia related to the adaptation processes to perceived environmental change may be assumed for ancient Near Eastern societies.

The Influence of Elites on Societal Adaptation to Environmental Change

Referring to the data of the Ethiopian study, it becomes clear that without governmental pressure only approximately 30 percent of a farming population would react with adaptation to climatic change. Similarly, two-thirds of the farming population in South Africa has chosen not to take any action to adapt to climate change (Gbetibouo 2009). The numbers may, of course, be different depending on the strength of the climatic fluctuations influencing the human perceptions. Nevertheless, when transferring these observations into the past, the process of adaptation to a changing climate under similar conditions as described above would probably have required external pressure by the governing elite.

The question of the influence of elites on societal adaptation to environmental change generates additional aspects in considering past resilience that are driven not only by differing interests in crop production but also by different perceptions. A recent review on the perception of climate change on the individual level worldwide found that urban groups with access to media frequently demonstrate uncertainty and skepticism toward climate change despite a generally higher level of engagement in conservation measures, while traditional societies maintaining direct relationships with nature tend to understand very complex natural phenomena (Wolf and Moser 2011). The key findings in groups of Ethiopian citizens in reference to BBC World Service Trust are particularly astounding (Wolf and Moser 2011, table 1). According to these results, Ethiopian citizens have a very low knowledge regarding climate change, with traditional communities being the least knowledgeable, which strongly contrasts with the investigation of Ethiopian traditional farmers by Deressa et al. (2011), where at least half of the investigated group had individually observed changes in temperatures and precipitation over two decades. Other results of the review by Wolf and Moser (2011) indicate that, for example, villagers in Tibet, indigenous Australians, and Inuit elders had noticed a variety of changes related to climate changes in significant detail, whereas the perception of climate change among the urban educated social class was often segmented into groups that either denied, doubted, or were uninterested in or engaged in measures against climate change (Wolf and Moser 2011). This finding supports the conclusion that urban populations view climate change indirectly through different types of filters, while communities that grew up and are living in direct contact with nature perceive climatic or environmental changes in a highly subtle manner. In contrast, engagement with adaptive mechanisms may be mobilized more easily in urban societies. Differences in perception among different social groups have also been suggested by other studies based on the degree of impact. For example, groups of higher social rank within a Nepalese population appeared to be less affected by climate change than groups of lower social rank, which was linked to reduced resource availability (Massey, Axinn, and Ghimire 2010).

The examples listed above imply that concerning adaptation strategies, integrity of a society cannot be expected. This lack of societal integrity has also been suggested for the end of the Neo-Assyrian state (ca. 1000–611 B.C.). The underlying mechanisms have been described as an extreme centralization by the Assyrian kings and the increasing integration of deportees in the lowest level of the hierarchy who had no interest in reconstructing the state after collapse (Yoffee 2010).

Regional Climates in the Middle East and Northern Africa

Parameters of Climate Variability

Modern precipitation is highly variable in the Near East and northern Africa, in terms of regional mean annual precipitation (MAP) and inter-annual variability. While the MAP along the eastern Mediterranean coast and north of 37 degrees northern latitude reaches values between 500 and 1000 mm, it is less than 200 mm at a distance of 100 km from the coast, in southern Israel and northern Egypt.

The reasons for these differences are found in the boundary position of the region between the high- to mid-latitude and tropical-subtropical climate systems and the different landforms, as recently summarized by Bar-Matthews (2014). The air masses of extratropical cyclones bring moisture from the Atlantic Ocean; consequently, precipitation is higher on the northern shores and on westward-facing mountains and slopes. The eastern Mediterranean low-pressure system accounts for the autumn and early spring rains, which are unrelated to the East African summer monsoons originating from the Intertropical Convergence Zone (ITCZ). Because there is an interaction with the southwesterly subtropical jet stream, precipitation in northern Africa is distributed over eastern Egypt, Sinai, northern Arabia, and the Negev Desert. The two different mechanisms outlined above influence the freshwater balance of the eastern Mediterranean in that they bring increased Nile River discharge by monsoon-driven mechanisms and increased rainfall by enhanced westerly activity (Bar-Matthews 2014).

The Middle East north–south precipitation gradient creates very diverse environmental conditions in the considered regions and historically separates northern and southern Mesopotamia, as well as Egypt, into distinct agricultural and cultural regions with MAP above 200 mm in the north supporting rainfed agriculture and less than 200 mm in the south requiring highly developed irrigation systems. Similarly, northern Africa demonstrates a highly diversified layout of the isohyets, particularly in relation to recent climate changes (Funk et al. 2013). Phytogeographic differences based on the north–south MAP gradient become apparent not only when comparing large geographic units such as northern and southern Mesopotamia but also when considering regional units such as the upper and middle Khabur. Diachronic comparison of the wild plant flora of three archaeological sites (Tell Mozan, Tell Brak, Tell Atij) on a north–south line of 100 km along the upper Khabur classified the area around the southernmost site of Tell Atij as an open and disturbed habitat that was probably already degraded from 2600 B.C. onward; the northernmost site of Tell Mozan was characterized by species growing under moister conditions (Riehl and Bryson 2007).

The different timing of the main precipitation periods with the typical Mediterranean winter precipitation regime in the west and a regime with two rainy seasons (spring and autumn) in the Zagros region additionally characterizes the west/east differences (Alex 1985). Cooler winters inland are responsible for the coastal distribution of wild olive and wine, which has resulted in the development of regionally different agricultural economies since the Chalcolithic period (Riehl 2014). The west–east gradient can be traced back into the past even further than the Chalcolithic, which becomes obvious in comparative pollen studies showing geographic differences in the distribution of oak after the Younger Dryas (Wright and Thorpe 2003).

The reliability of annual rainfall causes serious agricultural problems in arid and semi-arid environments; particularly, regions of low MAP suffer from inter-annual rainfall variability that exceeds 50 percent. The MAP in a series of drought years (e.g., between 1957 and 1961; Wirth 1971) may be 100 to 200 mm below the long-term mean, causing continuous crop failures in areas with rainfed agriculture and less than 500 mm long-term mean precipitation. Although regions where irrigation is practiced also suffer from inter-annual rainfall variability, the technology may buffer against a total loss of the crops.

The relationship between microclimatic diversity and moisture availability for crop cultivation is particularly relevant considering the river systems of the Khabur and Euphrates. Changes in the groundwater table particularly affect the ability of Khabur to receive its water from karst sources along the Turkish-Syrian border, whereas changes in winter precipitation also have a direct effect on the Euphrates' discharge, which is fed by an elevation-enhanced capture of winter precipitation in Anatolia.

Holocene Climatic Fluctuations around 4200 B.P.

Agriculture-based economies are highly sensitive to changes in temperature and precipitation and increases in rainfall variability. The effects of these weather and climate factors are particularly detrimental in semi-arid and arid regions with agriculture as the main livelihood. An additional factor responsible for low productivity, reduced adaptive capacity, and increased vulnerability is soil degradation caused by overgrazing and deforestation, which multiplies the negative feedback mechanisms of climatic fluctuations.

A considerable number of contributions have been published on the Holocene climatic fluctuation of 4200 B.P. and its consequences in the geographic region of the Middle East and northern Africa, both in conference volumes (Dalfes 1997; Kuzucuoğlu and Marro 2007; Giosan et al. 2012) and as peer-reviewed articles in geography and archaeology journals (e.g., Gasse 2000; deMenocal 2001; Enzel et al. 2003; Staubwasser et al. 2003; Bar-Matthews and Ayalon 2011; Finné et al. 2011; Mercuri, Sadori, and Uzquiano Ollero 2011; etc.).

Different dating methods applied to the different types of local palaeoclimate archives (lake sediments, speleothems, pedogenic carbonates) contribute to some of the chronological variation when comparing the signals from different archives and geographic areas, but the direct link between climatic fluctuation in the northern hemisphere and the eastern Mediterranean in the form of increasing aridity starting in the second half of the Early Bronze Age is widely accepted. At Soreq Cave, arid conditions have been suggested between 4200 and 4050 B.P. and have been described as the maximum of an aridity trend that started at 4700 B.P. (Bar-Matthews and Ayalon 2011). Decreasing levels in the Dead Sea and at Lake Kineret are documented starting at approximately 5000 B.P. until shortly after 4000 B.P. (Hazan et al. 2005). In northern Africa, an arid sequence was identified between 4500 and 4000 B.P. (Gasse 2000) that was related to a drop in Nile water discharge between 4600 and 4400 B.P. in the Fayum area of northern Egypt. Low levels have also been recorded at Lake Ziway-Shala in Ethiopia from approximately 4500 B.P. onward (Hassan 1997). The $\delta^{18}O$ record from Lake Van provides a long-term trend of increasing aridity somewhere between 8000 and 2000 B.P., and only the pollen record suggests, based on a reduction in oak, that there may have been some impact on the vegetation at 4200 B.P. (Litt et al. 2009). Wanner and Ritz (2014) used marine cores to demonstrate reduced moisture in the Eastern Mediterranean between 4500 and 3800 B.P. (Larrasoaña, Roberts, and Rohling 2008).

Increasing aridity at the beginning of the mid-Holocene has been linked to orbital parameters, and in association to this, with a southward shift of the ITCZ, thus changing the monsoon domain (Wanner et al. 2008). Other explanations have focused on solar variability superimposed on long-term changes in insolation, although this event has been characterized as less extensive compared with other Holocene climate fluctuations (Mayewski et al. 2004). In general, a relationship between cooling and water balance is suggested, which explains the global character of the 4200 B.P. event. However, the net moisture result must be assumed to be highly variable, depending on the geographic region, geomorphologic situation of the area, and the vegetation cover.

Local palaeoclimate proxies supporting regional geographic diversity likely played a major role in the strength of particular climate effects and the formation of the different proxy records. The particular strength of the 4200 B.P. climatic fluctuation is difficult to assess. Bar-Matthews et al. (2011) suggest shifts in annual rainfall from 700 to 300 mm for the southern Levant, which would still be beyond the limit for rainfed agriculture. The variability and ranges in other locations may have strongly differed from these modeled values, similar to the values recorded for modern drought years (Wirth 1971). The anthropogenic impact on vegetation played an increasing role during the Bronze Age and may have multiplied the negative climate effects at a regional level. Anthropogenic impacts make environmental reconstruction more complex, particularly where it is based on the pollen record.

Rapid Climate Change or Long-term Development?

In addition to the strength of a climatic fluctuation, its mode of appearance, whether as abrupt or a long-term trend, influences the possibilities and modalities for societies to adapt. Holocene climatic fluctuations are described by some researchers as rapid climate change (RCC) events according to Mayewski et al. (2004) and Bar-Matthews and Ayalon (2011) or as abrupt events (Staubwasser and Weiss 2006), with the duration of approximately 300 years for the 4200 B.P. event coming to its full expression. This value would equal twelve human generations, and it is questionable if ancient people would have considered the related changes to have been rapid. Others define an RCC event as introducing a perspective of relativity, that is, that it is not only the absolute rapidity (e.g., thirty years) within the change but also how fast the change happens compared with the underlying forcing and whether the response is linear or not (Rahmstorf 2009). According to this definition, climatic transitions of approximately hundreds or thousands of years are climatically classified as abrupt if the underlying cause acts on timescales of tens of thousands of years. Climatologists therefore classify the 4200 B.P. climatic fluctuation as abrupt because the underlying cause, that is, the earth's obliquity changing the position of the ITCZ, occurs on a time scale of 41,000 years. Climatologically, the duration of 300 years for the 4200 B.P. event appears rapid; however, from a societal perspective, it appears relatively slow.

There appears to be a need to consider these differences in the perception of the rapidity of climate fluctuations and the various responses to climate change in relation to the different archives considered.

For example, some palaeoclimate archives indicate long-term continuous trends, although they are responses to climatically defined rapid changes. Palaeoecological studies in the Ounianga region in northern Chad indicate a slow drying trend starting in the mid-Holocene, instead of abrupt changes or alternation between marked dry and wet episodes, which relate to the slow adaptation of vegetation in response to weakening insolation forcing of the African monsoon (Kröpelin et al. 2008). Similar results have been achieved for northwestern Libya (Giraudi, Mercuri, and Esu 2013). Looking at lake-level changes, the levels of Lake Qarun in the Fayum depression started to decrease at around 4400 B.P., and did so continuously for roughly a thousand years, suggesting long-term variation rather than rapid change (Hassan 1997). The records from northern Chad exhibit a gradual reduction in the abundance of tropical vegetation components beginning in approximately 4300 B.P., followed by the loss of grass cover and the establishment of modern desert plant communities at around 2700 B.P. The calculated MAP was reduced from circa 250 mm at 6000 B.P. to less than 150 mm by 4300 B.P. and less than 50 mm by 2700 B.P. These results are important for our perception of landscape change under climatic fluctuations; although individual species disappeared in relation to their drought tolerance, this change did not lead to abrupt vegetation collapse at the landscape scale (Kröpelin et al. 2008). Similarly stable oxygen isotope and pollen data from Lake Van indicate long-term changes for the first and the second half of the Holocene, with the latter indicating increasingly arid conditions that may also have been influenced by anthropogenic impacts on the vegetation (Litt et al. 2009).

Because there was no climatic signal that would have indicated a catastrophic event, we may assume that the response on the societal level was often equally slow as for other biological systems and that human populations were potentially given enough time to develop strategies to address a changing environment given previous perception.

Ancient Moisture Availability and Crop Production

Based on the previous outline of regional climates in our geographic study area, a direct investigation of the role of regional diversity in past agricultural production may help to understand the possible effects on societal development in relation to the 4200 B.P. event.

Currently the only way to directly link climatic fluctuations and agricultural productivity in the past is through stable carbon isotope analysis of archaeological plant remains. This method has been in use at archaeological sites to identify ancient environmental conditions for plant growth in arid to semi-arid environments since at least 1990 (Araus and Buxó 1993; Araus et al. 2014; Riehl et al. 2014). Stable carbon isotope values in cereals provide a drought stress signal when the amount of water received during the grain-filling period was low.

Referring to previous results, the $\delta^{13}C$ values from 524 archaeological and modern barley grains were used to assess the possible impact of the 4200 B.P. climatic fluctuation on agricultural and economic dynamics. The data were acquired from twelve Early and Middle Bronze Age sites and thirteen modern locations (fig. 9.1; table 9.1). For details on the laboratory methods, see Riehl et al. 2014.

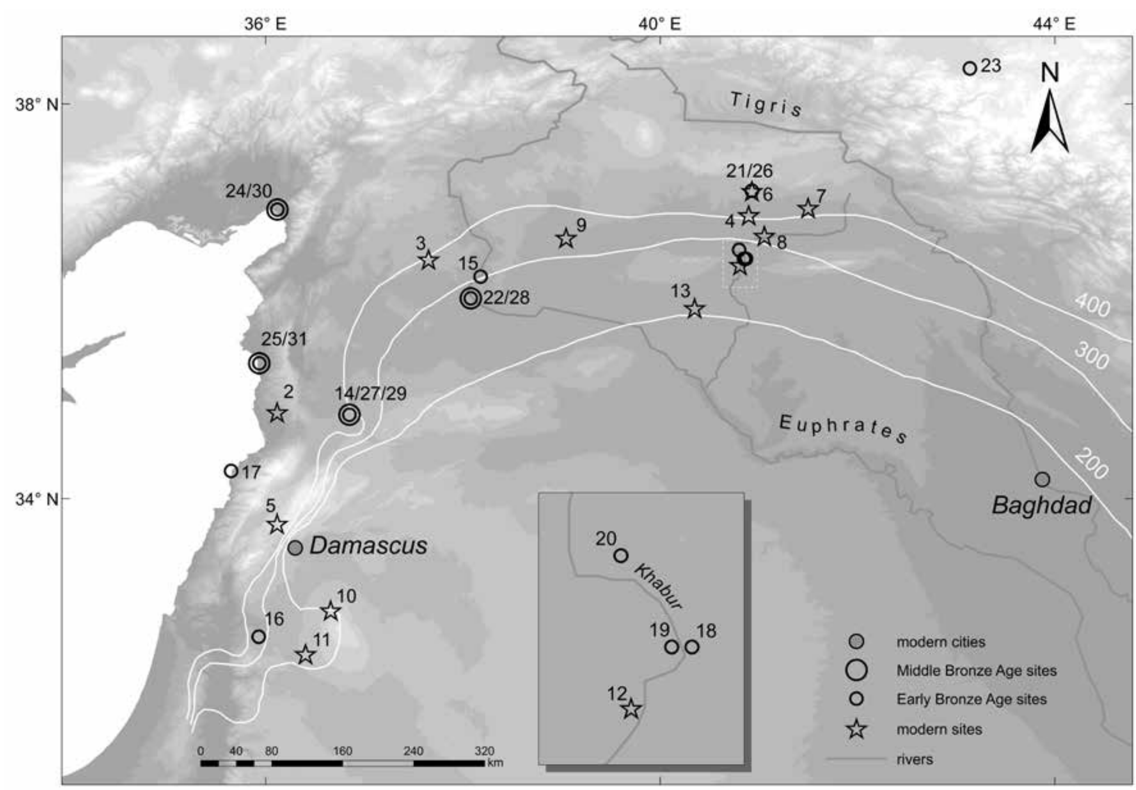

Figure 9.1. Map of the archaeological sites and modern locations that were sampled for barley grains $\delta^{13}C$ analysis: Chagar Bazar (4), Dilkaya Höyük (23), Emar (22/28), GPS_17 (10), Khirbet ez-Zeraqon (16), Kinet Höyük (24/30), Malhat ed-Deru (13), Membij (3), Qatna (14/27/29), Summakiak (11), Tell Abyad (9), Tell Atij (19), Tell Bderi (12), Tell Brak (8), Tell el-Abd (15), Tell Fadous-Kfarabida (17), Tell Kerma (20), Tell Leilan (7), Tell Mozan (6/21/26), Tell Raqaʿi (18), Tell Snan (2), Tell Tweini (25/31), Zebdani (5)

Table 9.1. Archaeological sites and modern locations from where the barley grains were taken for $\delta^{13}C$ analysis*

Site	*Modern Political Geography*	*Map No.*	*Cultural Typology*	*Chronological Range (Mean Values)*	*Geographic Latitude*	*Geographic Longitude*	*No. of Barley Grains Measured*	*No. of Contextual Units*	*Mean $\delta^{13}C$ ppm*	*Minimum $\delta^{13}C$ ppm*
MODERN										
Kücüksu (RMN_1815)[C]	Turkey	1	Modern	1990 A.D.	41,5000000	33,7166700	6	1	17,4278312	16,7133974
Tell Snan (GPS_437)[E]	Syria	2	Modern	2000 A.D.	34,8780000	36,1170000	8	1	16,2451017	15,653579
Membij (GPS_629)[E]	Syria	3	Modern	2000 A.D.	36,4270000	37,6520000	12	1	14,4210374	14,2732033
Chagar Bazar[E]	Syria	4	Modern	1998 A.D.	36,8755930	40,8977090	5	1	16,2779377	15,5812528
Zebdani (GPS_152)[E]	Syria	5	Modern	2000 A.D.	33,7480000	36,1170000	16	1	15,6544162	13,5358581
Tell Mozan[E]	Syria	6	Modern	1998 A.D.	37,1200000	40,9300000	5	1	16,602726	15,5801282
Tell Leilan[E]	Syria	7	Modern	1998 A.D.	36,9500000	41,5000000	3	1	16,4333092	16,3639864
Tell Brak (GPS_828)[E]	Syria	8	Modern	2000 A.D.	36,6660000	41,0560000	13	1	14,9521949	14,1634173
Tell Abyad (GPS_755)[E]	Syria	9	Modern	2000 A.D.	36,6469000	39,0460000	11	1	14,3295985	13,820599
GPS_17[E]	Syria	10	Modern	2000 A.D.	32,8700000	36,6600000	16	1	15,1682793	14,7763616
Summakiak (GPS_50)[E]	Syria	11	Modern	2000 A.D.	32,4280000	36,4050000	8	1	13,8084402	13,3088459
Tell Bderi[E]	Syria	12	Modern	1998 A.D.	36,3700000	40,8100000	11	1	14,4114219	14,0474723
Malhat ed Deru[E]	Syria	13	Modern	1998 A.D.	35,9333300	40,3500000	15	2	14,6340433	14,1612345
EARLY BRONZE AGE (FIRST HALF)										
Qatna[F]	Syria	14	EBA (mid-late)	3000–2500 B.C.	34,8500000	36,8500000	55	6	16,5809126	14,8992724
Tell el Abd[F]	Syria	15	EBA	3000–2500 B.C.	36,2500000	38,1800000	23	4	17,5602882	14,3606798
Khirbet ez-Zeraqon[F]	Jordan	16	EBA II–III	3000–2500 B.C.	32,6000000	35,9300000	24	8	16,7987388	13,9408697
Tell Fadous[F]	Lebanon	17	EBA	2900–2600 B.C.	34,2800000	35,6500000	10	3	18,0826367	16,4923021
Tell Raqaʿi[A]	Syria	18	EBA	2800–2600 B.C.	36,4300000	40,8700000	38	6	16,7516628	13,8541721
Tell Atij[A]	Syria	19	EBA	2800–2500 B.C.	36,4300000	40,8500000	26	3	16,3970733	14,0835974
Tell Kerma[A]	Syria	20	EBA	2900–2500 B.C.	36,5200000	40,8000000	16	3	15,877439	14,0911499
Tell Mozan[F]	Syria	21	EBA (FG III)	ca. 2500 B.C.	37,1200000	40,9300000	12	4	17,5066028	16,5190836

Site	*Modern Political Geography*	*Map No.*	*Cultural Typology*	*Chronological Range (Mean Values)*	*Geographic Latitude*	*Geographic Longitude*	*No. of Barley Grains Measured*	*No. of Contextual Units*	*Mean δ¹³C ppm*	*Minimum δ¹³C ppm*
EARLY BRONZE AGE (SECOND HALF)										
Emar[F]	Syria	22	EBA (mid-late)	2400–2100 B.C.	36,0300000	38,0800000	11	2	16,1545588	14,0074217
Dilkaya Höyük[C]	Turkey	23	EBA II–III	2400–2000 B.C.	38,3600000	43,1400000	28	3	16,2902791	13,879441
Kinet Höyük[F]	Turkey	24	EBA (late)	ca. 2200 B.C.	36,9300000	36,1200000	3	1	17,9847156	17,4322203
Tell Tweini[B]	Syria	25	EBA (late)	ca. 2100 B.C.	35,3716700	35,9363900	4	1	16,9128464	15,8698437
Tell Mozan[F]	Syria	26	EBA/MBA (FG IV–AG I)	2100–2000 B.C.	37,1200000	40,9300000	18	3	16,8412607	15,5801282
Qatna[F]	Syria	27	EBA/MBA transition	ca. 2000 B.C.	34,8500000	36,8500000	10	1	15,6886883	14,7872857
MIDDLE BRONZE AGE										
Emar[F]	Syria	28	MBA	1900–1700 B.C.	36,0300000	38,0800000	11	2	15,7095316	13,4911378
Qatna[F]	Syria	29	MBA	1900–1700 B.C.	34,8500000	36,8500000	71	9	16,674429	13,7663444
Kinet Höyük[F]	Turkey	30	MBA	ca. 1800 B.C.	36,9300000	36,1200000	20	4	17,3527386	15,9177324
Tell Tweini[B]	Syria	31	MBA (I)	1800–1600	35,3716700	35,9363900	15	3	16,9373373	15,4898488

* Superscript letters refer to researchers who provided the material: A: Joy McCorriston, B: Elena Marinova, C: Mark Nesbitt, E: Frank Hole, F: own material.

It is assumed that water availability is the strongest factor influencing crop yields in arid to semi-arid environments (Stewart et al. 1995; Araus et al. 2014). Shortages in water availability, either rainfall or irrigation water, therefore result in drought stress. Irrigation can lead to locally diverse water availability for cereal crops and thus to a broad range of values for an individual archaeological site, which must be taken into account during data interpretation. In figure 9.2, the reference lines of 16‰ and 17‰ have been plotted as a transitional range of increasing drought stress (for details, see Riehl et al. 2014).

In comparing the $\delta^{13}C$ data from the sites plotted in figure 9.2, some of the samples from locations where irrigation is suggested by the wild plant flora, produced a comparatively large range of $\delta^{13}C$ values (Riehl 2010). This result may have been due to selective irrigation on particular fields while others were rainfed (e.g., Emar and Tell el-Abd on the Euphrates). Considering the minima and mean values separately may help to further differentiate between natural and irrigation signals because the minima values of $\delta^{13}C$ indicate the maximum stress measured, which should relate to conditions without irrigation. The smallest range in the $\delta^{13}C$ values was found in coastal sites and probably reflects a lower rainfall variability during the grain-filling period and a generally higher precipitation in these regions, which is supported by the low number of $\delta^{13}C$ values below 16‰. This result implies that drought stress was probably not a major problem in the investigated sites of the coastal region. This relationship corresponds with the observed continuity in settlement patterns during the transition from the Early to the Middle Bronze Age (see also the contribution of H. Genz, this volume).

Despite the high regional and inner-site variability of the stable carbon isotope data and the probable lack of drought stress in the coastal regions, there is a continuous decrease in water availability from the Early to the Middle Bronze Age measured in the barley grains and visualized by the interpolation of $\delta^{13}C$ isolines (fig. 9.3; for details on interpolation methods, see Riehl et al. 2014).

Although the $\delta^{13}C$ data do not allow a reconstruction of the absolute drought stress during the considered time, comparison with modern values provides some indication of the relative conditions for crop growth. Modern values showing strong stress signals with means between 13‰ and 14‰ are all from extremely dry and unirrigated fields that are partial remnants from crop failures. Assuming that well-developed grains from ancient sites reflect harvests that have been stored for consumption, a qualitative difference between modern grains with high stress signals and ancient storage grains may be indicated. The modern values exhibit the strongest stress signals and are most similar to the Middle Bronze Age samples, whereas water availability appears to have been significantly higher during the Early Bronze Age.

The increased inland aridity in the Middle Bronze Age samples also correlates with archaeologically observed demographic patterns in northern Mesopotamia, the Khabur-Balikh steppe, the middle Euphrates (Wilkinson et al. 2014), and the Aleppo and Hama districts (Geyer et al. 2007), showing a reduction in the number of sites between the end of the Early Bronze Age and the Middle Bronze Age.

In total, the $\delta^{13}C$ data demonstrate that drought stress occurred in numerous agricultural settlements in the ancient Near East in relation to the 4200 B.P. event and afterward, but the strength of its impact was diverse and seemingly in line with regional climate geography. These differences generated diversified strategies in ancient subsistence and economy, even within spatially limited cultural units.

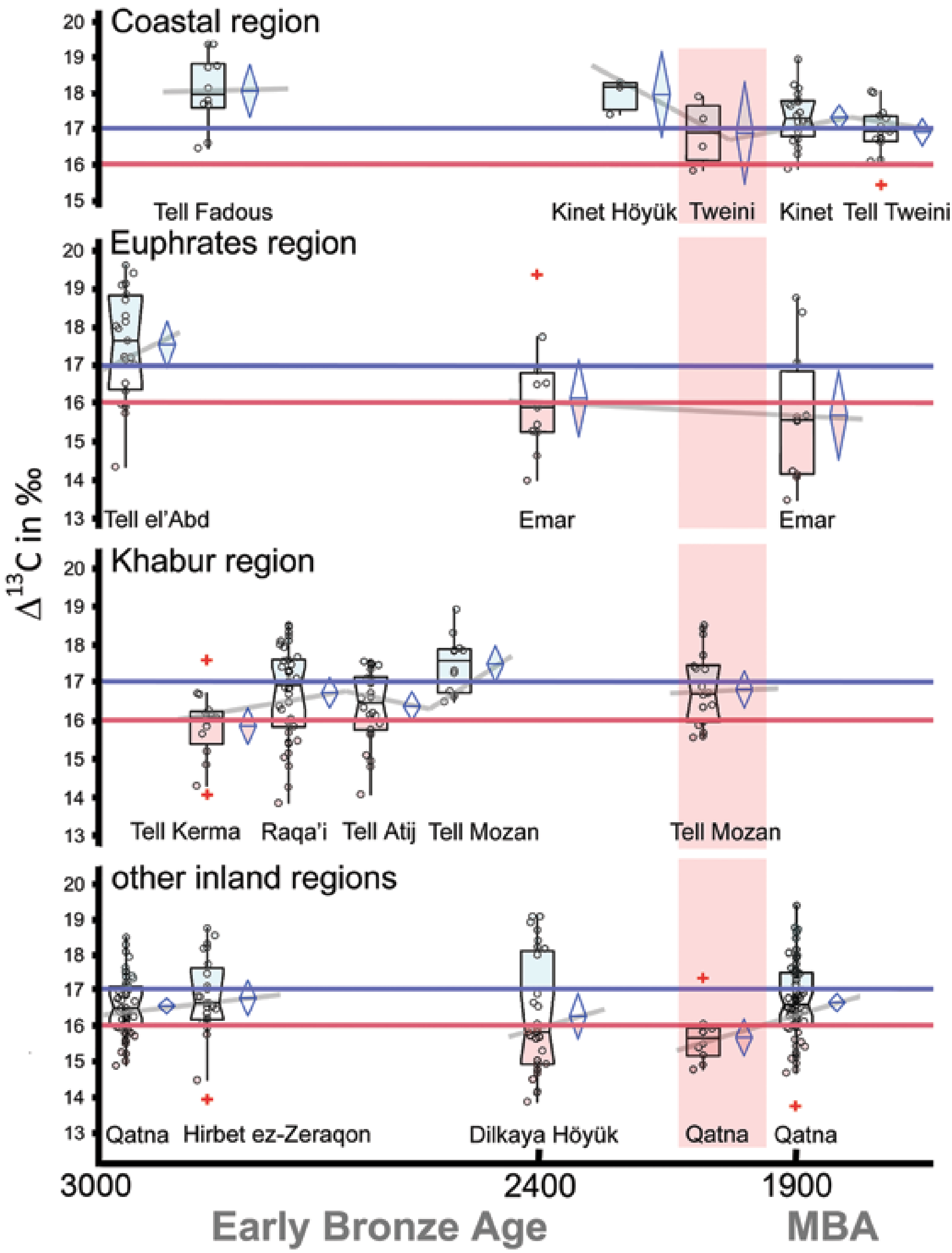

Figure 9.2. Regional and local $\Delta^{13}C$ records from 524 barley grains. Each boxplot represents one phase of a site; the circles are individual measurements; crosses are outliers; diamonds represent means; reference lines of 16–17‰ refer to the transitional range between no stress signal above 17‰ and drought stress below 16‰. The Δ refers to ^{13}C calibrated for CO_2 changes of the atmosphere

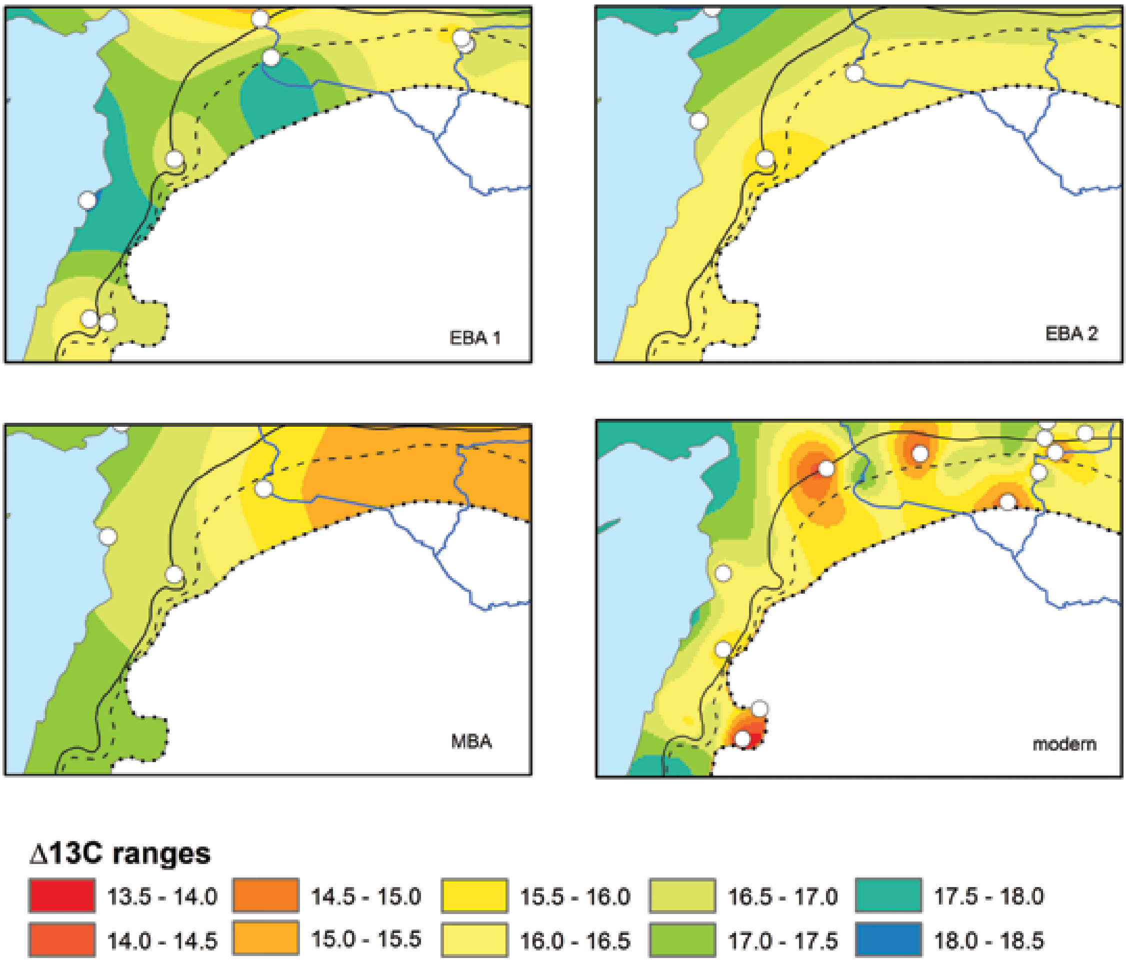

Figure 9.3. Spline interpolation of mean $\Delta^{13}C$ values (in ‰) from barley grains for the Early and Middle Bronze Age and for modern grains. Reds indicate strong drought stress, yellow considerable to slight, green moderate, and blue no drought stress (modified from Riehl et al. 2014)

Conclusions

This compilation of regional climate differences in the Near East and review of empirical studies on the role of human perception in relation to climate change highlights two important variables in the adaptive cycle of societal transformations. While differences in the strength of the climatic effects of the 4200 B.P. event are regionally traceable in the archaeobotanical and stable carbon isotope records, past human perception of environmental change is mostly imperceptible. Based on these considerations and knowledge of ancient climate and environmental conditions, a model of the interrelationships among factors and effects within the adaptive cycle can be developed (fig. 9.4). The exchangeability of factors, actions, and effects supports an earlier argument that there is no justification to expect simultaneous and uniform cultural and socio-economic change with environmental change.

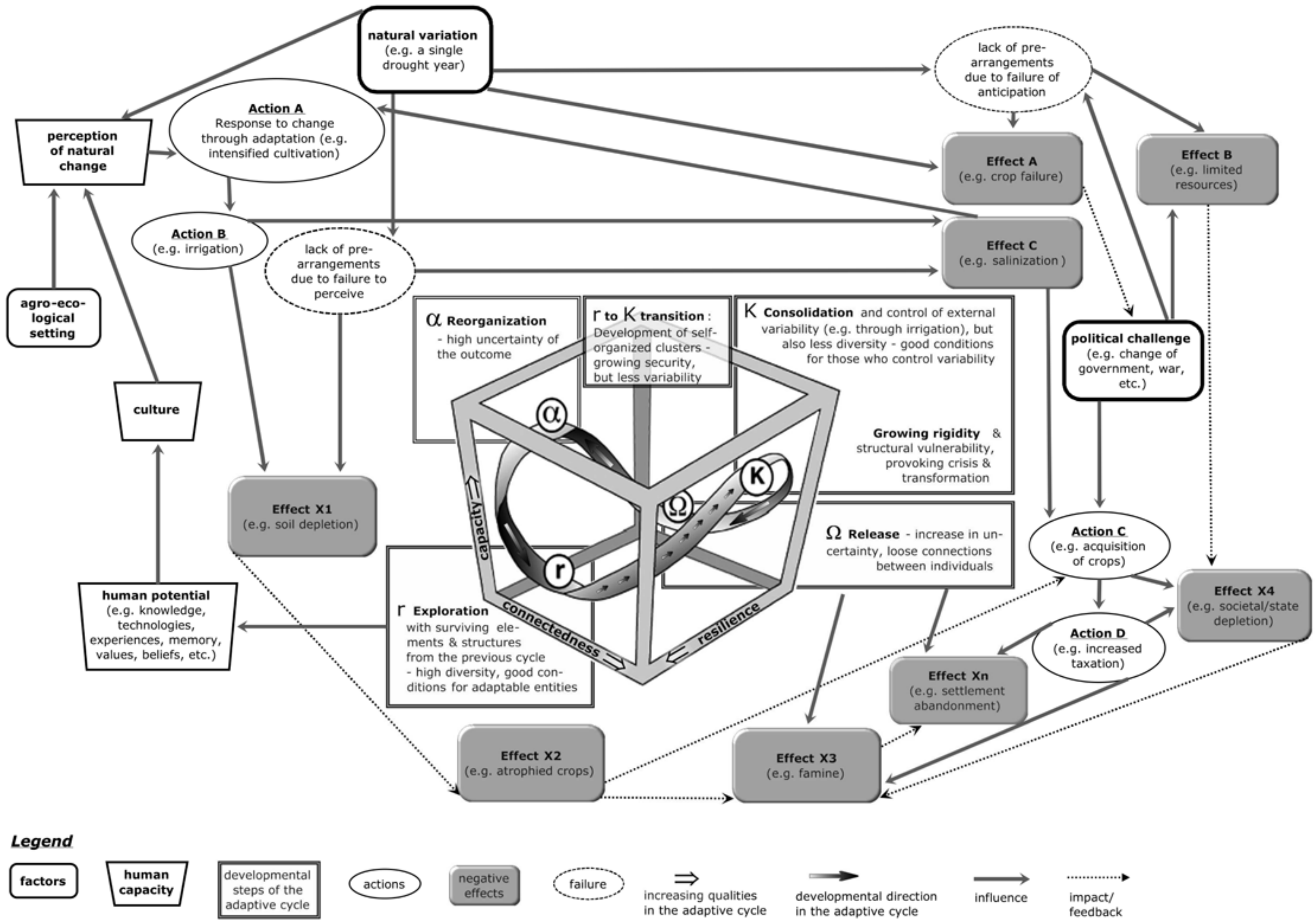

Figure 9.4. Network of factors, actions, and effects influencing the adaptive cycle of social-ecological systems. Factors from Riehl 2009b; adaptive cycle modified from Gunderson and Holling (2002). For simplification, the lemniscate was reduced to one adaptive cycle, although there may be different individual adaptive cycles nested in a hierarchy across time and space. In addition, note also that the number of factors, actions, and effects is also reduced.

The $\delta^{13}C$ data showed that the 4200 B.P. climate fluctuation cannot be considered a generally catastrophic event. Regional variability in the data suggests that the climate effects were insufficient to lead to an area-wide abandonment of cities; instead it supports a scenario in which ancient populations adapted well to environmental stress, even though certain cities could not be maintained. The model presented here demonstrates that the interplay between humans and their environment under specific types of stress co-determines the resilience, continuity, vulnerability, decline, and regeneration of societies.

Adaptation to environmental change is impossible without human perception, and both are dependent on various natural and cultural aspects, thus leading to diversified decisions and developments in human societies. Human perception of drought events may differ strongly within and among different regions depending on whether they occur regularly and on how specialized agricultural production is. The actions taken, based on the perception of climate change are equally diverse, but the perception of environmental change does not necessarily lead to any action; in many cases, people find excuses for not handling. Generally, it becomes clear that adaptation to climate change on the village community level is not straightforward and may not have occurred despite the decrease in agricultural yields. Without any documentation, many of these processes can only be hypothesized for past societies. However, using multiple lines of evidence from individual sites may explain why certain Early Bronze Age settlements were abandoned and others continued to exist.

Acknowledgments

I would like to thank a number of researchers for the generous supply of charred and modern barley grains. These were Frank Hole for modern grains from Syria, Joy McCorriston for charred grains from Tell Atij, Tell Kerma and Tell Raqaᶜi, Mark Nesbitt for modern grains from Turkey and charred grains from Dilkaya Höyük, and Elena Marinova for charred grains from Tell Tweini. Financial support for the stable isotope analyses was provided by the Deutsche Forschungsgemeinschaft (DFG) (Ri 1193/6–1).

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10

Amorites, Climate Change, and the Negotiation of Identity at the End of the Third Millennium B.C.

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Introduction

During the early second millennium B.C., much of the Near East, from the Delta of Egypt to Babylonia, was under the hegemony of dynasties of rulers who identified themselves — in one way or another — as Amorite. A scholarly consensus concerning what it meant to be Amorite is, however, difficult to articulate. Insofar as common ground can be identified, the consensus appears to center on two primary observations. First, Amorite was not an ethnic identity per se during the second millennium B.C., and instead the label "Amorite" is probably more appropriately characterized as a social identity, although perspectives on this vary considerably. Second, the processes in question that contributed to the shaping of Amorite identity reflect phenomena in the *longue durée*, starting in the mid-third millennium and lasting through the mid-second millennium B.C. By the Middle Bronze Age, the phenomena in question are present within the framework of various cultures across the full arc of the Fertile Crescent, and for this reason they do not relate to a single region of the Near East. Despite these elements of potential consensus, agreement regarding Amorite identity remains stalled around questions of the specific cultural processes that gave rise to a "pan-Amorite" identity alongside individual, local Amorite identities, analogous perhaps to Greek identity alongside individual local city-state affiliations. Insofar as one can speak of Amorites during different points from the mid-third to the mid-second millennium B.C., the central questions include the following: What constituted Amorite identity during a given period and within a certain region? How might separate Amorite identities relate to one another such that they can or should at all be understood as related? And, finally, what processes contributed to the development of these identities?

The present essay attempts to examine the early stages in this phenomenon, principally during the second half of the third millennium B.C., seeking to understand the cultural processes at work during early stages in the formation of distinct Amorite identities. Among the major issues addressed is the relationship between Amorite identity and climate change during the late third millennium B.C. To do so, this contribution seeks to evaluate Amorite identity before, during, and shortly after the period between 2200 and 1900 B.C., invoking both archaeological and textual sources. In order to clarify the significance of the late third millennium B.C. as a formative moment in the construction of Amorite identities, the starting point of this investigation is the state of affairs at the beginning of the Middle Bronze Age, a period when Amorite dynasties ruled across much of the Near East. The available evidence suggests that in the western stretches of the Fertile Crescent, a material cultural complex referred to as the Amorite *koiné* appears in the wake of unique settlement and population shifts at the end of the third millennium B.C. While in the east no material culture is readily identified with the establishment of Amorite dynasties, an Amorite *oikumene* did emerge that gave shape to interactions among elites across much of Mesopotamia and the Levant. In the context of searching for new avenues to address these changes, the limitations of earlier approaches are discussed. The primary textual and archaeological evidence for Amorite identity prior to the aridification event circa 2200 B.C. are summarized in order to set the stage for assessing the impact of the 4.2 ka B.P. climate event. In order to understand the cultural impact of climate change across these regions, a refugee-centered socio-economic framework is employed to articulate the chain of events caused by increased aridity that resulted in the formation of two distinct trajectories in Amorite identity during the late third millennium B.C., one eastern or Mesopotamian, and the other western or Levantine. The evidence for each of these processes is traced by means of the discrete archaeological signature of refugee movements, resettlement, and socio-economic integration in both the northern Levant and Mesopotamia. This study concludes that the identification of a unifying Amorite cultural milieu across the Near East during the Middle Bronze Age is owed, in large part, to population shifts catalyzed by climate change in the late third millennium B.C. A shared social identity was inscribed through the Amorite *oikumene*, while distinct, regional expressions of Amorite identity resulted in different approaches to the inscription or expression of Amorite identity within different regions, primarily by means of a conspicuous *koiné* material culture.

Evaluating Approaches to Amorite Identity

Before setting out to reconstruct the interplay of events during the late third millennium B.C. that shaped early Amorite identity, it is necessary to set this reconstruction within the context of earlier efforts. This serves to reveal how dominant scholarly trends have shaped approaches to understanding the Amorites and Amorite identity. Nonetheless, more recent, environmentally informed approaches, such as proposed by Harvey Weiss, inform our understandings of population movements that are inherent to interrogating phenomena such as the formation of Amorite identity. Consequently, it is unnecessary to discard the movement of individuals and groups (i.e., migration) within efforts to understand the formation of Amorite identity. Together with other anthropogenic factors and within a wide geographical region, the potential improves to understand the real-world phenomena that contributed to changes in Amorite identity between the mid-third and mid-second millennia B.C.

Since the inception of ancient Near Eastern studies, the origins, movements, and cultural impacts of Amorites have been intensively debated. A half century after the identification of conquest models as contributing to Amorite supremacy (i.e., Kenyon 1966), there remains limited consensus concerning the socio-economic, cultural, and environmental factors contributing to the formation of Amorite identity by the start of the second millennium B.C. The various approaches that have been and continue to be applied to questions of Amorite identity can be classified, effectively, as belonging to either conquest, social-evolutionary, or minimalist schools of thought. The first of these approaches, the conquest perspective, suggests that irrespective of the impetus for their movement, Amorites — who are effectively reckoned as a homogenous ethnic group — conquered their way into other regions, west and east, from Mesopotamia. This interpretation was, for example, at the heart of Kenyon's development of the so-called Amorite hypothesis (Kenyon 1966), at which robust critiques have been leveled (e.g., Kamp and Yoffee 1980).

More recently, social-evolutionary approaches have emerged that seek to explain Amorites principally as socio-economic phenomena, traditionally with pastoral nomadism playing a central role. These approaches downplay one or another of the elements of the conquest model such as the characterization of the label "Amorite" as an ethnic identity, increasingly seeing the label as designating an economic status or class filling an economic niche, almost exclusively of pastoralist employ (e.g., Buccellati 1992, 2010; Porter 2012). A more recent version of this approach by Weiss sets the emergence of Amorite identity in the context of environmental collapse during the late third millennium B.C. in northern Mesopotamia and the Levant (Weiss 2014). Identifiable as the *Amoritization* hypothesis, it is fundamentally a newer and more nuanced variation of the social-evolutionary school, but draws upon environmental deterioration as the driving force behind the movement of populations that habitat tracked into neighboring regions where they settled and integrated. As with other social-evolutionary approaches, pastoral nomadism plays a central role in this narrative leaving considerable room for the further articulation of the "social forces" that Weiss recognizes to be at work. It is this most recent hypothesis with which this work engages in order to explore the role played by the 4.2 ka B.P. climate event in the formation of Amorite identity.

Lastly, a fringe perspective on the Amorites has emerged in recent years that is best described as minimalist. In this school of thought, Amorites are not credited with contributions to the cultural developments of southwestern Asia from the late third and early second millennia B.C., but instead are characterized as a scholarly creation retrojected from biblical references (e.g., Tubb 2009). Instead, Hurrians and Indo-European elements — which are less prominent in biblical literature — are given greater consideration as groups more likely associated with cultural developments during the second millennium.[1] The neglect of the Amorites in this case is a direct but also rather extreme reaction to the conquest-driven interpretations of Kathleen Kenyon and W. F. Albright. Consequently, little attention is given to explaining a wide variety of Middle Bronze Age phenomena and material culture that have been widely regarded as "Amorite" in the Levant, and for which third-millennium B.C. antecedents exist, as discussed below.

If the schools of thought described above bear a resemblance to the principal approaches the origins of ancient Israel (see Finkelstein 1988, pp. 295–314), this is likely no accident. Indeed, many of the same academic figures and their progeny have played a role in shaping the central schools of thought concerning both Amorite and Israelite identities. Moreover, the perspectives distilled in these schools are a reflection, fundamentally, of the evolving scholarly trends resulting from the emergence of more and better data, accompanied by improved theoretical and scientific approaches. In short, social-evolutionary approaches to Amorite identity have become more complex as they seek to account for socio-economic, cultural, and environmental realities of the contexts that contributed to the emergence and maintenance of Amorite identities. Furthermore, since academic discourse concerning the development of Israelite identity has increasingly embraced the complex reality that various

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[1] See, for example, Tubb 2009 and Bourke 2012, 2014. Tubb in his work *Canaanites* (1998) exposes the extent to which this approach has sought to characterize developments in Levantine material culture during the second millennium B.C. as resulting entirely from endogenous processes, while mostly ignoring cultural associations and influences associated with Mesopotamia (see also Tubb 2003).

trajectories were likely at work in the shaping of Israelite identities, there is, likewise, reason to adopt an analogous approach toward the study of Amorite identities.

Before proceeding further, it is necessary to outline some of the assumptions of the present work, as the perspective presented here deviates from most of the prevailing notions of Amorite identity. This is particularly important insofar as elements of a consensus stemming from anthropological studies of identity support the approach undertaken here. Firstly, Amorite identity involves a great deal more than language, onomastics, and linguistics. This is particularly clear for the Amorites when they are individually identified as Amorites by use of the determinative (i.e., MAR.DÚ), but do not bear Amorite names, or vice versa (Whiting 1995, p. 1232). It is not necessarily constructive or correct, therefore, to seek to articulate early Amorite identities by simply identifying Amorite names, as primary markers of ethnicity (ibid., p. 1234). It is even possible that many Amorites not bearing Amorite names have been simply overlooked in second-millennium B.C. texts. Names and even spoken language are not evidence, *pars pro toto*, of ethnic affiliation. Identity is, instead, best understood as a constellation of markers attributed to or claimed by a given group, and, therefore, various sub-affiliations may be collectively identified by a single label, which is otherwise inadequate to explain either similarities or differences among subgroups. Given the geographic and temporal scope associated with the issue of Amorite identity, there is little option but to accept this as a reality if any relationship, conceptual or otherwise, is to be teased out among the many groups and individuals to whom the ascription "Amorite" is applied. With these considerations in mind, the characterization of Amorites during the Middle Bronze Age can be discussed, serving as a starting point for identifying the events and processes that contributed to emerging Amorite identities.

The Middle Bronze Age and the Amorites

A wide consensus exists concerning the Middle Bronze Age (ca. 2000–1550 B.C.) in which it is routinely characterized as the floruit of Amorite culture across the Fertile Crescent. Usually consideration turns to the processes at work during the late third millennium B.C. that brought about such conditions. Dominique Charpin has referred to the period as the "age of the Amorites" (2004, p. 38), a characterization preferable to the "Old Babylonian" period because of the recurring issues of identity that are raised by the frequent references in texts to persons, groups, and even things qualified as "Amorite." Glenn Schwartz and Lauren Ristvet similarly suggest attributing a number of characteristics to what they term an Amorite *oikumene* that emerged in Mesopotamia during the early second millennium B.C. (Schwartz 2013a; Ristvet 2012). More recently, Levantine scholars have become increasingly comfortable with describing Middle Bronze Age culture as dominated by an Amorite *koiné*, comfortably rooted in the Amorite *oikumene* of the east and, likewise, fittingly described as the "age of the Amorites," as discussed below.

Amorite oikumene

Aspects of the Amorite *oikumene* as described by Schwartz and Ristvet center on many practices and customs largely identified as Amorite by conspicuous references to them in textual sources. Examples of these include the adoption of Old Babylonian in written documents, cultural distinctions such as a proclivity for riding donkeys instead of horses, unique sacrificial practices, and distinct burial rites, among other customs. To these can be added the adoption of very similar legal traditions, which from Ḫammurapi's "code" to the recently recovered fragment of a comparable codex from Hazor (Horowitz, Oshima, and Vukosavović 2012), were clearly reflections of shared traditions of jurisprudence among distant communities. Some of these practices were clearly adopted from Ur III and earlier customs of kingship and elites, as is to be expected, and these practices therefore contributed to the legitimacy of Amorite identity as it crystalized during the Middle Bronze Age. Although Amorite language has been presumed for some time to be a potential element of Amorite culture or *oikumene*, it appears that few may have actually been speaking Amorite as illustrated by the conspicuous but limited references to it in ancient sources (Streck 2011). Although to date this characterization has been applied primarily to Amorite society in Mesopotamia, it is equally applicable in the West, where similar practices are attested archaeologically as suggested by references in the Mari letters, which address relationships between Mari and Levantine centers such as Aleppo, Qatna, and Hazor.

In an effort to understand the significance of the role played by the Amorite *oikumene*, it is perhaps best characterized as a set of what Paul Connerton has referred to as "incorporating practices" (Connerton 1989, p. 72). The existence of such practices effected tighter social bonds that contributed to a range of interactions. Strong alliances were formed, competitive emulation abounded, and the period, therefore, saw no shortage of armed conflict and shifting alliances. Whatever label we might put on it, a set of practices clearly emerged among elites who identified themselves, even if only figuratively, as Amorites. These practices functioned to overcome conspicuous differences among their various social, political, and ethnic backgrounds. Claiming Amorite affiliation and participating in Amorite identity seems to have brought with it considerable potential for cultural interaction and integration.

Amorite koiné

While the Amorite *oikumene* provided a basis for social interaction and integration, the tangible results of this integration are also evident among material remains. Trade certainly reveals the extent of these interconnections during the Middle Bronze Age but traded objects do not imply the integration of cultural customs. However, a set of discernible elements of material culture that appear predominantly in the western stretches of Amorite territories — namely from northern Mesopotamia to the southern Levant — and, by association with Amorite elites, have been identified as forming an Amorite *koiné* that reveals a greater degree of interaction than is typical of trade (Burke 2014a; 2014b, pp. 408–10). This constellation of material culture consisted, in various arrangements, of elements of public architecture including temples, palaces, and fortifications, as well as cultic practices, burial customs, and iconographic traditions, among others (see Burke 2014b; also Pinnock 2009, p. p. 79; Lönnqvist 2000).

A few of the more conspicuous elements of Middle Bronze Age material culture in the Levant serve to illustrate the point. The temple *in antis*, whose roots are in northern Mesopotamia during the early to mid-third millennium B.C., appears, for example, as the precursor of the so-called tower temples of the Middle Bronze Age in the Levant (Matthiae 2006; Morandi Bonacossi 2014, p. 418). Standing stones are likewise monumental components of state cult, while burial practices are revealed as part of a continuous tradition of patriarchal, intramural tomb complexes (Burke 2011). Fortifications from Mesopotamia to the southern Levant also conformed to remarkably similar conventions, revealing not only a common set of practices and responses to warfare but likewise direct communication between royal households and the likelihood of shared craftsmen (Burke 2008; Morandi Bonacossi 2014, p. 418). Palace architecture, while far from adopting a cookie-cutter approach to construction, reveals practices of competition and emulation from Mari to Avaris, most notably evident in the adoption of conspicuous murals, whether executed in fresco or hybrid techniques, or entirely within local traditions (Feldman 2007, 2008; Morandi Bonacossi 2014, p. 424). Royal hypogea were likewise employed below the palaces of Mari and Qatna, and possibly Byblos, conforming to the ideal type widely evidenced among Middle Bronze Age communal tombs (Burke 2011; Morandi Bonacossi 2014, p. 424).

While none of the elements of the Amorite *koiné* need be exclusively Amorite innovations, the incorporation of conspicuous elements of material culture by elites are suggestive of deliberate efforts to negotiate relationships between elites across the Levant and northern Mesopotamia at the start of the Middle Bronze Age (Morandi Bonacossi 2014, p. 430). Inasmuch as the Amorite *oikumene*, consisting of customs that are not primarily preserved in material culture, reveal incorporating practices, the elements of the Amorite *koiné* are suggestive of the formation of what Connerton describes as "inscribing practices" (Connerton 1989, p. 72), leaving their trace in material remains and as such functioning as important symbols of group affiliation with the inherent capacity to attract subsequent generations of participants (Burke 2014a). The net effect of the most conspicuous elements of the Amorite *koiné* — fortifications, palatial architecture and décor, temple architecture, and so on — at Middle Bronze Age capitals were powerful statements concerning the affiliations and relationships of these rulers. That so many Levantine settlements of the Late Bronze to Iron Ages were founded during the Middle Bronze Age, as reflected in their stratigraphic sequences, is a testament to the social, economic, and political significance of the period in shaping cultural interactions during subsequent periods.

The relationship between cultural developments during the Middle Bronze Age and the emergence of Amorite culture provides a fundamental basis for both the characterization of an overarching, collective Amorite identity, enabling inquiry into the processes during the third millennium B.C. that contributed to its emergence. Following the collapse of the Ur III empire, a number of dynasties emerged in southern Mesopotamia in the early second millennium B.C. of distinct, if varied, relationships to Amorite figures, in some cases led by individuals with connections to the Ur III military establishment (Kuhrt 1995, pp. 70–72, 76–80). By the early nineteenth century B.C., Šamši-Adad I in northern Mesopotamia also claimed Amorite affiliation, as did contemporaries at Mari, and Aleppo and Qatna in the Levant, as revealed by Mari's archives. The Execration Texts from Egypt similarly reveal that many southern Levantine rulers were characterized by their Amorite affiliation, as indicated by their choice of personal names (Redford 1992).

Amorites in the Third Millennium B.C.

Contextualizing the impact of late third-millennium B.C. climate change on the populations of northern Mesopotamia necessitates a clarification of who the Amorites were during the preceding centuries, around the mid-third millennium B.C. This is pivotal since references to the Amorites provide one of the primary datum points for attempting to trace population movements and identity, despite the caveats regarding the limits of such data. A discussion of

Amorite identity is, however, complicated by the limited number of references to Amorites, the variety of terms for Amorites, and the contexts in which these terms occur. Even so, it remains possible to outline an understanding of the processes at work behind population pressures and identity negotiation that these sources permit together with the archaeological and climatological data. The primary textual sources from before the end of the Ur III period are evaluated here for the trajectories in the formation of Amorite identities that each of them reveals.

Before Akkad: Amorites at Ebla and during the Pre-Dynastic Period

Several references to individuals qualified as MAR.DÚ appear during the mid-third millennium B.C. to reveal the presence of individuals so-named within southern Mesopotamian communities such as at Shurrapak and Lagash, and indicate a place called the "land of MAR.DÚ" (see Porter 2012, p. 314, table 5). By the reign of Ur-Nanshe, a fragment of a stela found at Ur (Frayne 2008, p. 117) suggests that a canal embankment may have been constructed "against" the MAR.DÚ, perhaps indicating tensions between MAR.DÚ and some southern Mesopotamian communities as early as the mid-third millennium B.C.

The earliest corpus of references to MAR.DÚ is, however, in the Ebla texts (Archi 1985). Therein they are identified not only near Mount Basar (Jebel Bishri), but also as active near Emar, as inhabitants of Tuttul, and the inhabitants of the land of MAR.DÚ. Archi's interpretation of these texts suggest that kings of the territory of the MAR.DÚ, referred to in the Ebla texts as Mar-tu/tum^{ki}, were referred to with the same term, "en," as were Eblaite kings. Likewise, there existed a "Council of Elders" among the MAR.DÚ as among other communities mentioned in the Ebla texts. At least one peace treaty was made with the MAR.DÚ. The exchange of Amorite personnel is also evident, including as merchants and fugitives (Archi 1985, pp. 9–10). While some of the names reveal what are in later periods identified as Amorite features, others do not and thus indicate that even in the third millennium B.C., names alone were not the sole signifiers of Amorite identity.

Archi is probably correct to suggest that, although these references would localize Amorites around the Middle Euphrates, their core areas of intensive activity were primarily in the hinterland regions to both sides of the Euphrates valley, namely to the northeast of Ebla and east of the Euphrates bend. This does not, however, vindicate the Sumerian perspective of Amorites as uncouth, but might suggest how such a perspective could be perpetuated. Indeed, the preponderance of early references connected with MAR.DÚ suggests that individuals identified as Amorites were quite often at odds with river valley communities, although it does not indicate to what extent these communities were themselves Amorite or included Amorite elements. This, however, makes sense of the Akkadian empire's encounters with Amorites at Jebel Bishri later, as discussed below, in which efforts were probably directed at securing passage through this region against raiders, as is attested in the Mari archives later (Charpin 2010, p. 242). It also explains the persistence of such traditions centuries later when a great deal of Amorite tribal activity in the Mari letters was connected with these tensions.

In light of the Ebla references, it is not difficult to understand that the Sumerian term MAR.DÚ and its Akkadian equivalent *amurru* (*amurrû*), which were used to identify Amorites, were likewise associated with the west in southern Mesopotamian traditions. Likewise, it seems reasonable that an early MAR.DÚ *ethnos,* or at least a "land" or territory in the west known by this name, served as the basis for this identity from the mid-third millennium B.C.

During the Old Babylonian period, the use of terms mâr-Yamîna (Yaminites; "sons of the right"[riverbank]) or Sim'al ("sons of the left" [riverbank]), and the Suteans ("Southerners"), reveals a fundamental fixation on directional references for labeling kinship groups in this region, and these of Amorite relation as well. Indeed, early references to Amorites as effectively "westerners" draws an apropos analogy with the English use of the term "oriental," as Whiting observes (1995), but also with notions of the modern "West" and its inhabitants over and against non-westerners.

Akkadian Rule and the Advent of Environmental Decline

Evidence from the final quarter of the third millennium B.C. now seems to indicate that climatic change provided the "tipping point" for developments in Amorite relationships with southern Mesopotamia and, consequently, for shaping early Amorite identity (Weiss 2014). While the Jazira was already becoming more arid during the third millennium B.C. (Kuzucuoğlu 2007), 2200 B.C. represents a sharp decline in the precipitation needed for dry farming (i.e., >200 mm per year). Circumstantial archaeological evidence from sites in the Khabur, in my opinion, permits us to suggest that sudden climatic deterioration in the region may have taken place specifically during the reign of Naram-Sin (ca. 2231–2176 B.C.), grandson of Sargon (see also Weiss 2014, p. 378).[2] Indeed, no written sources mentioning Upper Mesopotamia exist from the end of Naram-Sin's reign until the start of the Ur III period (Sallaberger 2007, p. 431), suggesting perhaps a growing lack of interest in the region or inability to address the changes at hand. At Tell Brak, among the many indicators are the unfinished remains of the fortress bearing bricks stamped with Naram-Sin's name and the abandonment of administrative buildings and the lower town, with the site abandoned until the nineteenth century B.C. (Weiss 2014, p. 372). An analogous situation is attested but with clearer radiocarbon evidence (Weiss et al. 2012) and more dramatic details at Tell Leilan (ancient Shekna). Not only are are unfinished buildings attested, but unformed clay balls (i.e., unused clay for tablets) were left on floors. Yet, despite abandonment by much of Leilan's population, occupation persisted for thirty to fifty years at the site, seemingly without Akkadian meddling (Weiss 2014, p. 373). In the western Khabur, Tell Mozan (ancient Urkeš) shrank from 120 to 20 ha, and south of it Tell Arbid decreased by 20 percent with a thirty- to fifty-year settlement after Akkadian departure (Koliński 2012). Rural settlement decline parallels the abandonments of large portions of these sites (Weiss 2014, p. 372). The combined evidence supports perhaps the lower of two options for the Akkadian chronology, in which Naram-Sin's reign straddles the onset of the 4.2 ka B.P. event (e.g., Glassner 1987).

The years following the onset of arid conditions across northern Mesopotamia and presumably after the resulting migrations did not apparently translate to complete lack of interest in this region by Akkadian rulers. The earliest use of the term MAR.DÚ by an Akkadian king to designate Amorites is dated to the reign of Naram-Sin, who campaigned against the Amorites of Apishal at a place identified as the "Amorite Mountain," called Bashar, which is identified with Jebel Bishri (Frayne 1993, pp. 91–94). The portrayal of the campaign against

[2] The history of Naram-Sin's military activity in northern Mesopotamia and the northern Levant is summarized by Sallaberger (2007, pp. 425–31). Dates for Akkadian chronology rely on Sallaberger 2007, pp. 419–21.

Table 10.1. Timeline of developments of relevance to Amorites. Dates follow Sallaberger (Sallaberger 2007, p. 420) for Akkadian and Ur III, and Middle Chronology thereafter (Edwards, Gadd, and Hammond 1971)

Date	*Event*
Akkadian Period (2296–2113 B.C.)	
ca. 2350 B.C.	Lugalzagesi campaigns by the Upper Sea
ca. 2350–2300 B.C.	Mari defeats Emar, towns in Lebanon, Ebla, etc. Ebla defeats Mari and installs(?) Enna-Dagan as king
ca. 2296 B.C.	Sargon (**2296–2240** or 2340–2284 B.C.) Campaigns against Mari (Palace P-1 is *burned* [2291–2200 B.C.]), Iarmuti and Ebla (*destroyed*)
2213 B.C.	Naram-Sin (**2213–2176** or 2260–2223 B.C.) *Destroys* Ebla following revolt Attacks Armānum, Ulišum, and the Amanus region *Destroys* Mari
ca. 2200 B.C.	***Approximate dateline for 4.2 ka B.P. aridification event***
2175 B.C.	Šar-kali-šarri (**2175–2150** or 2223–2198 B.C.) Ventures to Amanus Defeats Amorites at Jebel Bishri
2198–2113 B.C.	Reigns of numerous Akkadian kings of no distinction; rule of Utuhegal of Uruk (2119–2113 B.C.)
Ur III Period (2112–2004 B.C.)	
ca. 2055 B.C.	Šulgi, year 37: raids Amorites and begins building *The Wall of the Land* Year 40: First reference to booty from Amorite land (Sallaberger 2007)
ca. 2040 B.C.	Amar-Sin, year 5: last reference to booty from Amorite land (Sallaberger 2007)
2037 B.C.	Reign of Šu-Sin (2037–2027 B.C.) Campaigns against Mari, Urkeš, Tuttul, Ebla, Mukiš, and Lebanon
2034 B.C.	Year 4: *Muriq Tidnim* built
2004 B.C.	Ur destroyed

the Amorites as part of a broader campaign to suppress the "Great Revolt" is suggestive of a coordinated military resistance to Akkadian rule. In light of this observation, while totals are provided for captives, it is difficult to assess what percentage of these figures pertains directly to the Amorites (cf. MAR.DÚ). Despite a lack of direct references, this reveals one of a number of means by which Amorites were integrated into southern Mesopotamian societies, namely as prisoners of war. Šar-kali-šarri also battled with MAR.DÚ late in his reign in the same place, at Mount Bashar (Frayne 1993, p. 183), suggesting the potential of the strategic exploitation of this landscape against Akkadian interests.

Given the absence of archaeological or textual data for populations active in the Bishri region during the late third millennium B.C., it seems quite likely that Amorite exploitation of this landscape of refuge was principally an innovation of the centuries after the decline of Akkadian imperial control in this region. The actions taken against Amorites may be characterized principally as policing efforts to preserve an open Euphratean trade corridor against rogue, raiding elements exploiting this landscape, near but sufficiently distant from the Euphratean corridor as well as the desert route via Tadmor. This is analogous to the situation in the Nile valley and the use of oases away from the Nile as rebel safe havens, with raiding upon Nile inhabitants. As surveys of the Jebel Bishri have unequivocally demonstrated, the region featured no substantial permanent settlement during this period (e.g., Lönnqvist 2006, 2008; Lönnqvist et al. 2011; Morandi Bonacossi and Iamoni 2012). All in all, references to Amorites during the Akkadian period straddle fewer than sixty-five years — from the start of Naram-Sin's reign to the end of Šar-kali-šarri's — and in close proximity to the onset of aridification circa 2200 B.C. (see table 10.1).

Ur III Empire

For the Ur III period, defining Amorite identity is increasingly complicated by the appearance of several names, all of which are traditionally associated as Amorites, occurring alongside each other. Amurru (MAR.DÚ), for example, occurs alongside references in inscriptions to Tidnum and Iamʾadium, also reckoned as Amorite identities. Occurrences as, for example, from Šu-Sin's reign (Frayne 1997, p. 297) suggest that at least LUMMA (Tidnum) and MAR.DÚ, as they occur in texts, originally constituted separate identities, presumably tribal, that over time gradually came to be associated.[3] The MAR.DÚ are characterized as "a ravaging people, with the instincts of a beast, like wolves (…) who do not know grain" (Frayne 1997, p. 299). During Šu-Sin's reign it is clear that Amorite territorial transgressions were the principal problem the Ur III empire faced with the Amorites, and this likely explains the animus behind their characterization. Šu-Sin refers to building "the Amorite wall (called) 'It keeps Tidnum at a distance' (*muriq Tidnim*)," as well as to "returning the foot of the Amorites to their land" (Frayne 1997, p. 328). The latter statement suggests material efforts to forcibly return undesired migrants, an indirect witness to another means by which Amorite elements likely infiltrated southern Mesopotamian society in meaningful numbers.

Early Amorite Identity

Despite an absence of native Amorite sources, the foregoing evidence facilitates the observation that a group known as Amorites was identified in Mesopotamian but also Levantine (i.e., Eblaite) societies. The territory occupied by members of this group, although not solely by them, straddled the area between eastern stretches of the northern Levant and the western parts of northern Mesopotamia with its center more or less on the bend of the Euphrates. Limited numbers of Amorites were also scattered throughout neighboring regions *prior* to the onset of climate change, circa 2200 B.C. Textual sources from Ebla along with the archaeological data from Umm el-Marra should be taken as excellent examples of the principal economic activities in which much of the population of this region engaged, namely, rainfed agriculture, pastoralism, and trade. These sources also reveal the increasing social stratification and political complexity of this group prior to 2200 B.C. Nonetheless, increasing military engagements with Amorite tribes would suggest their growing experience with warfare and resistance, especially during the Ur III period, a factor that played an important role in the development of Amorite states by the early second millennium B.C.

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[3] A parallel here might be drawn to the confederation of the "peoples of the sea" during the reign of Ramesses III.

As this picture reveals, there is no basis to assume that Amorite identity before 2200 B.C. was analogous with Amorite identity after 2000 B.C. Indeed, the textual evidence supports the coexistence of Amorite identities by the end of third millennium B.C. since their early constituency included, at a minimum, distinct labels such as Amurru (MAR.DÚ) and Tidnum (LUMMA). For this reason the Amoritization hypothesis, as proposed by Weiss, should be further examined especially in order to identify the "social forces" at play. To do so it is necessary to address the implications of climate change for different regions from northern Mesopotamia through the southern Levant during the period in question, and to investigate the various trajectories upon which these populations may have been set from 2200 B.C.

Climate Change and Adaptation in the Late Third Millennium

Although discussions concerning the overall impact of climate change at the end of the third millennium B.C. should continue, the proxy data now available present a rather convincing dataset for the recognition of this event and thoughtful consideration of its implications across the ancient Near East (Weiss 2014, pp. 368–70; also Riehl and Bryson 2007, pp. 525–27). Furthermore, there is considerable evidence for viewing declines in settlement in the Jazira as already in progress before 2200 B.C. as resulting from increasing aridity before the crisis of 2200 B.C. (Kuzucuoğlu 2007) and potentially exacerbated by local and imperially sponsored warfare (Pruß 2013). These data increasingly permit diachronically sensitive and regionally specific reconstructions of the onset of prolonged drought conditions. The "line in the sand" was the 200 mm rainfall isohyet, the minimum rainfall required for sustainable rainfed agriculture (Wilkinson 2000, p. 3), as it contracted northward in Mesopotamia and westward in the Levant. Cereal production suggests shifts toward drought-tolerant species in the Jazira as time progressed, while a broader plant spectrum is attested at sites in the Euphrates (Riehl and Bryson 2007). Prior dependence in these areas on rainfed agriculture and pastoral nomadism for subsistence left these zones most susceptible to devastating reversals of fortune, which have been referred to as episodes of "collapse" (see Schwartz 2006). Inasmuch as conditions may have also changed in southern Mesopotamia, the impact looks to be nowhere near as drastic, except that the south was dependent upon agricultural yields from the north. Revisions to Early Bronze Age chronology in the Levant, which result in a mid-third millennium date (ca. 2500 B.C.) for the start of the Early Bronze IV (e.g., Höflmayer 2014; Regev et al. 2012), also clarify that the decline of urban culture in the southern Levant was *not* related to environmental deterioration, which followed several centuries later. Consequently, the reasons for the various local "collapses" suggested in the second half of the third millennium B.C. for the southern Levant must be sought among sociocultural phenomena, although the various options for this transformation remain to be articulated (see Greenberg, this volume). Insofar as the preliminary data indicate, increasingly arid conditions actually occurred substantially later in the south, at the tail end of the Early Bronze IV, and persisted into the early Middle Bronze Age (Finkelstein and Langgut 2014; Langgut et al. 2014).

What emerges from the combined data is the recognition that the earliest stress within the Fertile Crescent at the onset of aridification was felt in the formerly productive but most marginal zones, the most populous region of which was the Jazira, a wide and productive agricultural zone in northern Mesopotamia in which rainfed agriculture dominated. As the edge of the rainfed zone contracted northward, it also contracted westward, resulting in large population and settlement declines from north of Mari west toward Aleppo.[4] After this, the contraction began to impact the entire marginal zone along the eastern edge of settlement in the Levant. By the start of the Middle Bronze Age (MB I), from about 2000 B.C., this contraction began to impact settlement in the southern stretches of the Levant, including the area of the Negev.[5] This stands in contrast to the later Middle Bronze II–III, when humidity increased and this contraction began to reverse across the southern Levant.[6]

Beyond Pastoralism

During the past three decades, the major tenants of the Amorite hypothesis, as articulated by Kathleen Kenyon (1966), have been thoroughly engaged and largely dismantled (e.g., Kamp and Yoffee 1980). Neither the invocation of two waves of armed Amorite invasions, nor the evidence for associating cultural changes predominantly with the Amorites, are regarded as adequate to explain changes in the archaeological record from the late third millennium B.C. to the early second in the Levant. The fundamental inability to definitively, even plausibly, identify military activity with the Amorites is perhaps the leading basis for its dismissal. Indeed, there is substantial evidence for interpreting the formerly referenced destructions within the framework of imperial military activity originating from southern Mesopotamia (Burke 2008, pp. 88–92), or likewise the product of wars between states such as Ebla and Mari during the second half of the third millennium B.C. That said, in the context of climate change, efforts to understand the complex processes that contributed to the emergence of Amorite identity by the start of the Middle Bronze Age, as Kenyon first attempted, have contributed to what Weiss and others refer to as *Amoritization* (Weiss 2014).

Processes of nomadization followed by sedentarization have been identified as the primary elements of the Amoritization hypothesis (Weiss 2014). As articulated by Weiss, there were two major phases to this process that contributed to the formation of Amorite identity by the early second millennium B.C. The first phase in this model is regarded to have been brought on with the onset of the 4.2 ka B.P. event that led to "regional abandonments," subsequent "habitat tracking," and "subsistence transfer from agriculture to pastoral nomadism." This contributed to a shift of much of the population from northern Mesopotamia to adjacent regions, but with the greatest evidence for movement to the Euphrates River valley and more humid areas to the west, that is the northern Levant. These were therefore the individual steps in the process of nomadization. The second phase of this hypothesis assumes the "sedentarization of the Amorite pastoral nomads" at the start of the Middle Bronze Age when rainfall amounts returned to earlier levels. Although not specifically addressed, it appears that the assumption is that pastoral nomadic elements that did not stray far from northern Mesopotamia returned and resettled the region several centuries later and were responsible for the settlement pattern that emerged after 1900 B.C., when rainfall increased.

Although there is substantial support for observations concerning settlement shifts associated with Amoritization, the model relies on the characterization of the populations within

[4] Abandonment of sites north of Emar and south of Carchemish has been well documented (Cooper 2006).

[5] A recent analysis of pollen data from the southern Levant is suggestive of the delayed impact of this event in the south, which according to the authors contributed to population pressures on neighboring areas (Finkelstein and Langgut 2014).

[6] Contexts at Lachish indicate a more humid environment (Drori and Horowitz 1989).

these shifts, first, as predominantly engaging in pastoral nomadism, and, second, that their movements were constrained by habitat tracking. Concerning the first point, it is essential to realize that only a limited subset of the population of northern Mesopotamia had previously engaged in pastoral nomadism prior to the region's decline, quite irrespective of the variation of pastoralism in which they engaged.[7] Despite the long-held perception in ancient Near Eastern studies that non-pastoralists often reverted to pastoralism during periods of cultural or environmental stress, this simply has never been substantiated unequivocally, and it flies in the face of reason, particularly under the prolonged conditions in question. To the extent that this notion is relevant, it is only so for a limited percentage of the overall refugee population from this region. Thus, the relevance of this explanation for accounting for the subsistence activities of these refugees is limited and *a fortiori* because of the decline in environmental conditions. There is therefore little reason to assume an increase in pastoralist activity after 2200 B.C., especially given the herd losses many likely experienced before being forced to relocate.

The second characterization of the circumstances encounters similar limitations to explain the resulting circumstances. While habitat tracking as a concept presents an attractive model for explaining population movements, its explanatory potential for the 4.2 ka B.P. event does not suffice to cover the wide range of survival strategies and coping mechanisms that human populations pursue in the face of forced migration. Instead it more than likely overestimates the successes that such efforts experienced as many continued to pursue pastoralist activities and as others pursued different approaches to subsistence. Habitat tracking in the biological sciences refers to the movement of animal populations necessitated by modifications to their habitats whereby a species seeks to remain in or track a particular habitat due to changes to the habitat's extent or location. The approach is too deterministic for post-Chalcolithic environments as humans, unlike animals, often diversify their dependence on means of subsistence rather than doggedly relying on single means to see them through. Pastoral nomads were not immune to major losses during environmental crises — exceeding their ability to adapt — as modern and ancient analogs illustrate, with herds virtually wiped out by persistent drought conditions.[8] Consequently, there is need to account for more diverse subsistence strategies, not all of which may have resulted in a direct control of food production by these individuals. Nonetheless, migration west of the Euphrates and to some extent south of Mari no doubt included pastoral nomads, who fundamentally contributed to incursions into southern Mesopotamia by groups labeled Amorites from ca. 2200 B.C. But it is unnecessary and inaccurate to see such cultural elements as the dominant part of the ensuing migration (contra Porter 2012).

In light of these issues, we must ask what actual evidence of this nomadic element, pastoral or otherwise, exists to support a substantive role for it within the trajectories of the region's population, as they sought to cope with the circumstances prevailing at this time. As Weiss observes, "the social forces behind this resettlement remain to be explored" (Weiss 2014, p. 377). This is true not just in the context of sedentarization, where Weiss has raised it, but even more so in relationship to the initial nomadization process — at both ends, therefore, of the continuum of the processes associated with Amoritization. The starting point for further consideration is an evaluation of the continued reliance on interpretations,

[7] See recent discussion of variants in Makarewicz 2013, pp. 160–61.

[8] D. T. Potts notes that in the 1960s in Iran, losses sustained by some tribes were as high as 70 to 80 percent (Potts 2014, pp. 350–418).

here and elsewhere, rooted in largely romanticized processes of nomadization and sedentarization. Here the critique is less concerned with the Amoritization hypothesis than with persistence in ancient Near Eastern studies of overestimating the role played by pastoral nomads in the shaping of cultural identities.

Scholarship on pastoralism, particularly in the Near East, is extensive. Unfortunately, our understandings of pastoralism have substantially changed since the 1960s, when many of the notions of Amorites as pastoral nomads began to take shape, influencing at least two generations of scholarship. Among the difficulties is characterizing the nature of the movements in question. This is nowhere more evident than in works by Michael Rowton, who suggested, based largely on textual references, that a number of different types of nomadism can be identified (Rowton 1973a, 1973b, 1974, 1981). This was prior to the growth of archaeological datasets that provided data, if often incomplete, to permit specific characterizations of nomadism that informed the regional distribution of pastoral activity, the types of animals herded, culling patterns, potential economic interests, and so on (e.g., Bar-Yosef and Khazanov 1992). Yet, our increasing realization of the complexity of the phenomena has done little to clarify the actual percentage of the economy it represented or the number of individuals within different communities who engaged in this activity. Consequently, this ambiguity has facilitated the persistent employment of pastoral nomadism as an explanatory mechanism where the data leave open the question of agency. The data usually do not permit a clear articulation of the actual extent of such activity in the face of the possibility of a more diverse economy. In the southern Levant, for instance, far too much confidence has been placed in the explanatory potential of pastoral nomads during the Early Bronze IV and Iron I periods, for which little to no evidence is presented to demonstrate the environmental viability of this activity on any meaningful scale during these periods. The hill country of the southern Levant was largely oak and maquis forest. How then did this support a pastoralist economy prior to major deforestation during the Iron Age? Foremost among the problems is the lack of evidence for wide swaths of unforested land in the highlands of the southern Levant that would have permitted any substantive pastoral nomadic activity during either the late third millennium B.C. (e.g., Dever 1992; Cohen 1992; Finkelstein 1992) or the early Iron Age in the hill country; this has never been adequately accounted for. The reliance, instead, is on anecdotal evidence garnered from biblical texts: the patriarchal narratives, on the one hand,[9] and David as a shepherd, on the other. Additionally, well-intentioned but misguided comparisons have been made to perceptions of the deforested landscape of the highlands during the late Ottoman period (e.g., Finkelstein 1992, p. 143), which was in no way analogous to the Bronze and Iron Age landscapes that preceded it. In most cases, cemeteries identified during surveys and for which sedentary settlements were yet identified were taken *pars pro toto* as evidence of the presence of pastoralists. However, in the southern Levant, much of what had been interpreted as landscapes exploited for pasture — the Negev, for instance — turns out to consist of small settlements in support of the main copper trade network crossing the region from Wadi Feinan in the east, to the coastal plain in the west (Haiman 2009), bearing no relationship to the scale of pastoralism envisioned. In the face of such evidence, the datasets that have been used to prop up traditional explanations of pastoral nomadism as the backbone of late third-millennium B.C. economies require the inclusion of other economic activities.

[9] See critique in T. L. Thompson 1974.

More recently, Daniel Potts observes in *Nomadism in Iran* that there are simply "far too many unverified assumptions" to accept the assertions that have been advanced concerning nomadism more generally (Potts 2014, p. xii). Through an engagement with earlier and more recent scholarship, he reveals the unease in identifying pastoral nomads in archaeological contexts. In Elizabeth Bacon's discussion of pastoral nomadism in central and southwest Asia, for example, she noted,

> Since nomads leave few remains for the archaeologist to study, and the Asian pastoralists were late in acquiring writing, any attempt to reconstruct the development of Asiatic pastoral nomadism in its varying aspects must necessarily be inferential, and to some extent speculative. (Bacon 1954, p. 44)

These sentiments are echoed in the recent work of Tony Wilkinson, who notes little in the way of an improvement in the quantification of nomads in the archaeological record,

> … despite the large number of enthusiastic references to the importance of the nomadic element, they continue to be under-recognized in the survey record. … Although considerable advances have been made in recent years in locating nomadic settlements, it is still extremely difficult to recognize, estimate, and date these with any precision." (Wilkinson 2003, p. 50)

And while this is true, it is also the case that once pastoral nomadism is invoked, the nature of the questions asked by researchers becomes restrictive and the interpretations predictable. Consequently, it is likely the case that given such widespread reliance on pastoral nomadism to explain a wide range of features, from economies to tribal structures, other important socio-economic phenomena are being neglected.

In the case of northern Mesopotamia in the late third millennium B.C., there remain fundamental limitations to the archaeological data to support that pastoral nomadic activity was pursued by broad swaths of the population circa 2200 B.C., during the onset of aridification. Would not the proliferation of pastoral nomadism during the very period when climatic conditions worsened make such subsistence strategies all the more difficult for those already engaged in this activity and even harder still for there to be an increase in the number of herders seeking adequate grazing land, water, and other resources? How would pastoral nomadism meet the needs of groups whose needs were not otherwise met by prior conditions? And if pastoral nomadism is so reliable, why is it so readily abandoned as a way of life once conditions improve, as inferred from the sedentarization process of the Amoritization hypothesis? Who, after all, is resettling? Is this then *ipso facto* the way that the abandonment of settlements and decline of northern Mesopotamia's population at the end of the third millennium B.C. is to be interpreted?

The answers to these questions lie in the recognition that there is very little hard evidence to support pastoral nomadism as a subsistence strategy for much, if not most, of the population during the period in question. This is all the more so when we take into account that pastoral nomads were a traditional but limited segment of any region's socio-economic structures before but especially during this prolonged crisis. Furthermore, our attention to the number of sites and their settled area is a confirmation of our primary concern with agricultural, sedentary communities, which make up the larger part of the dimorphic society. Whatever their numbers, during the mid-third millennium B.C., pastoral nomads continued to constitute a very limited percentage of the region's population. While it is impossible to proffer with any confidence estimates of the percentage of the populations of large settlements of northern Mesopotamia that participated directly in pastoral nomadic activity, it is difficult to imagine, for example, that more than 30 percent of such communities did so and remained viable as sedentary communities of any size.

Although we are unable to be more precise about the division of communities in these marginal zones into sedentists and pastoralists, a focus on the size of settlements provides an index of potential shifts in settlement into neighboring regions. We can therefore attempt to account for the many human mouths that needed to be fed when subsistence collapsed. Doing so reveals the inadequacies of the reliance on pastoral nomadism as an explanatory device. First, we can observe that at the moment that rainfed agriculture and grazing lands started to be abandoned, the number of animals that could be supported within these areas simply declined as pastureland declined or disappeared. There was simply no room for a sudden increase of herds to facilitate a shift to pastoralism by those not already engaged in such activity at the onset of aridification; the problem is simply one of the declining carrying capacity of the region as the backdrop for the pursuit of any new subsistence strategies or the expansion of earlier means; conditions were suboptimal for such risks. Where only so many herds could be sustained before conditions declined, by any calculation an increase in pastoralists would only have resulted in a decrease in average herd size during a period of declining pastureland and increasing aridity. In sum, pastoralism was simply too risky to account for the subsistence activities of the displaced populations of the region after 2200 B.C. This being so, where did the non-pastoralist inhabitants of the Syrian Jazira go when these settlements declined or were abandoned?

Migration in the Late Third Millennium B.C.

As the foregoing discussion reveals, we must examine the social contexts, and move away from emphasis on what amounted to a niche economy relevant only to some. Social contexts were responsible for creating alternative trajectories that more adequately account for the socio-economic realities encountered in this process. The concern therefore is to emphasize human agency and socio-economic opportunities presented by the dislocation of the region's sedentary populations, and the realignment of social structures. What is not in dispute is the observation that where abandonments of settlements or large portions of these settlements took place across northern Mesopotamia, these reveal that mobility, and more specifically migration, was a major factor in this transition. As discussed below, the archaeological markers are exactly what are expected for refugee flight and resettlement.

Refugees are of central importance to understanding the impact of changing natural and socio-economic environments from the late third to the early second millennium B.C. Generally speaking, the movements, subsistence strategies, and resettlement of refugees are topics that have been given very limited *Schrift* in ancient Near Eastern studies, despite the considerable attention paid to the principal agents of refugee formation: conflict and environmental decline. The problem is so acute that one might believe that refugees are an entirely modern problem. It also appears that, to the extent that refugees are addressed, they are identified mostly indirectly in archaeological studies. There is a seeming reticence to entertain their presence, and they are almost never the primary subject of inquiry, despite their potency as a social force. By and large there has been an abject failure in the discipline to identify social agents explicitly as refugees. Consequently, many reconstructions do not address the nuances that are preserved in archaeological and historical sources to support such a clear, albeit pedestrian, explanation of social identity and agency. To begin this discussion, we may adopt A. Oliver-Smith's characterization of refugees as "the result of forced migration, whether the product of disaster of either man-made or natural causes" (Oliver-Smith 1996, p. 265). Elsewhere, I have suggested that refugees are perhaps best described as risk-initiated, self-migrants (Burke 2012, p. 265).

Refugees bring to the fore the complexities attendant to interpreting the archaeological and historical data available for the late third millennium B.C., whether addressing the abandonment of settlements, settlement changes in neighboring regions, or cultural exchanges that followed. Refugees also provide the potential for understanding cyclical historical and socio-economic processes since refugees are often driven to return to a place that they or their ancestors once called home, sometimes actually doing so. Like an invisible force, a social gravity persists among refugees that contributes to efforts to mobilize a return to if not the maintenance of social contact with the regions from which they fled.

As addressed above, among the issues that have clouded the straightforward identification of refugee phenomena in ancient Near Eastern studies has been the inordinate emphasis placed on efforts to identify pastoral nomads and nomadic behavior, originating with romanticized notions of the struggle between "the desert and the sown" (Bell 1907). Whether or not intentional, the predisposition to identify Amorites almost entirely as pastoral nomads (e.g., Porter 2012), on the one hand, acknowledges the need to account for mobility while, on the other hand, attempting to downplay the migrations implicit in the "Amorite hypothesis" and its variants. Similar efforts to compensate for earlier characterizations of mobile groups have focused on issues of nomadization and the sedentarization of nomads in various archaeological contexts (Szuchman 2009). They have dominated, quite frankly, efforts to interpret settlement patterns across the ancient Near East. When, for example, archaeologists are faced with a period of relatively rapid urban expansion or sudden sedentism characterized by the appearance of villages, the sedentarization of nomads has prevailed as an explanation. This has been the case especially for the late third millennium B.C. (Jahn 2007; Porter 2012; Weiss 2014) and for Israelite settlement during the Iron I (Finkelstein 1984, 1988). In this nearly *carte blanc* application of the sedentarization of nomads we are, however, in danger of oversimplifying the deeply disruptive nature of environmental change and anthropogenic calamities in antiquity, to say nothing of social and cultural forces that can contribute to such archaeological signatures. Refugee migrations remind us, therefore, of the substantial social pressures that can bring interactions and change across wide regions, often sudden within neighboring areas and usually less intensely or rapidly to regions farther away.

Alongside this phenomenon there also appears to be a scholarly reticence to address refugees as a subject, perhaps in part for fear that the plight of refugees in the present — many of whom face political or other forms of persecution — may somehow be diminished by drawing analogies between past and present circumstances. But perhaps the very mundane nature of refugee phenomena makes them less than romantic or exciting explanations for archaeological phenomena. Whatever the case may be, there appears to be an unspoken assumption that the term "refugee" is more appropriately reserved for modern contexts in which persecution of one sort or another is the determinant of migration.[10] Nothing could

[10] This perspective is furthered by prevailing definitions as offered by the United Nations, which imply that persecution is an essential element of refugee status: "an individual who owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable, or owing to such fear, unwill-

be further from the truth, and this disjuncture, unfortunately, damages efforts at empirical study of refugee phenomena. Indeed, a closer examination of the chain of fundamental risks and losses faced by refugees, both modern and ancient, reveals a need for broadening the scope of our inquiry in the ancient Near East by more closely examining both archaeological and textual sources (e.g., Burke 2011a, 2012). Current scenarios of refugee crises now afforded by circumstances in Sudan and Syria also provide an opportunity to illustrate the complex interplay of environmental degradation, population movements, and political changes within economies not dissimilar from that of northern Mesopotamia in the late third millennium B.C.

Identifying Refugees in Archaeological Contexts

By widening the scope of our inquiry to account for the concerns of a protracted environmental crisis with which much of northern Mesopotamia was beset, we can begin to consider the various strategies that refugees pursued to cope with their circumstances, as illustrated by archaeological and textual data. The starting point is the recognition that the choice to flee such circumstances was one that refugees as individual social groups, with different levels of tolerance as dictated by their own circumstances, whether economic, social, and/or political. The different thresholds of decision making with respect to refugee flight would have resulted in *waves* of departures and their resettlement as *vintages* (Kunz 1973). Owing to the limits of data concerning the timing of departures in relation to environmental declines, it is nearly impossible to determine whether the flights in question during the late third millennium B.C. were voluntary or involuntary, identified as either *anticipatory* or *acute* movements, respectively, in refugee studies. So what characteristics and settlement data from Mesopotamia and the Levant support the characterization of the phenomena as refugee flight and resettlement?

A minimum number of hallmarks must co-occur if refugees are to be potentially identified in ancient contexts and distinguished from other cultural phenomena, which often may exhibit some of the same individual characteristics. These hallmarks include:

1. a quantifiable decrease in total settled area within the refugees' territory of origin;
2. proxy data, whether climatological or historical, for intense pressure(s) serving as a catalyst for abandonment; and
3. a measurable increase in total settled area within one or more regions where refugees resettled, contemporaneous if not posterior to the decrease in settled area within the refugees' territory of origin.

The first criterion, the *abandonment of settlements* that results from refugee flight, is inherent to identifying refugee phenomena. The second criterion serves to suggest *causality*, the reason for refugee flight. In relationship to the population of the Jazira, these have been addressed above. The final criterion reveals the *resettlement* of refugees, distinguishing the signature of refugees from evidence, for example, of high mortality brought on by natural or anthropogenic factors or high reproduction in neighboring areas. While secondary factors

ing to avail himself of the protection of that country; or, who, not having a nationality or being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it" (United Nations 1951).

could mean that any of these observations by themselves might have other explanations, these criteria together permit the reasonable identification of refugees within archaeological contexts. Additional data, however, permit a nuanced picture of the plight of refugees after their resettlement, and further support the identification of these phenomena in the late third millennium B.C. as connected with refugee migration. These include attitudes and policies toward refugees, the extent of their social integration, and their exploitation.

Anthropological approaches to risk assessments for modern refugee populations permit outlining a model for the investigation of refugees in archaeological contexts (Burke 2011a). This model has been applied previously for the identification of refugees from the northern kingdom of Israel who settled in Judah during the late Iron Age (Burke 2012, pp. 270–84). The framework of these studies is built on the Impoverishment Risks and Reconstruction (IRR) model, which grew out of long-standing NGO efforts to address the needs of refugee communities (Cernea 2000, pp. 11–55). The IRR model delineates the primary risks identified in modern case studies of refugees. As such it prompts consideration of each risk to which refugee populations are usually exposed, and to consider their potential archaeological signatures of these risks and efforts to address these risks. These universal risks include landlessness, joblessness, homelessness, marginalization, food insecurity, increased morbidity and mortality, loss of access to common property assets, and community disarticulation (Cernea 2000, pp. 19–20, 22–35). Even though such conditions are present at the beginning of the refugee experience, notably at the moment of their flight, they are not themselves universal archaeological correlates. This is because these risks result largely from a lack of social and economic integration, which, while common to many refugees, is not characteristic of all refugee circumstances. Refugees absorbed, for example, into family units in small numbers may be imperceptible in archaeological contexts. Instead, certain archaeological phenomena, when occurring synchronically, are indicative of the arrival and integration of refugee populations in antiquity. These include radical urbanization, settlement pattern anomalies, artifactual correlates, linguistic data, major state building projects, and territorial expansion (Burke 2012, p. 271). The manifestation of these phenomena in both Mesopotamia and the Levant at the end of the third millennium B.C. are arguably suggestive of the relatively sudden absorption of refugees whose movements resulted from declining environmental conditions over a number of years after 2200 B.C.

The Middle Euphrates Refugium

The most significant shared characteristic of refugees was their loss of access to land (Burke 2011a, p. 44). Whether owned by them or merely available to them for their subsistence, its loss to individuals within agrarian economies fundamentally contributed to nearly all of the other risks to which refugees were susceptible in antiquity (joblessness, food insecurity, increased mortality, etc.). This is fundamentally important to understand since explanations of sedentists shifting to pastoral-nomadism oversimplifies the social and economic adjustments required in this transition, all the more so during the deteriorating environmental conditions that have been documented. Instead, it is more likely that sedentists sought new areas in which to remain sedentists, and that a rather limited number of their kith and kin continued to engage in pastoralism to the extent possible, whether of the nomadic type or not.

This explanation is also borne out by the archaeological evidence for refugee resettlement. Weiss in summarizing settlement pattern changes across the northern arc of the Fertile Crescent during this period attributes the resulting changes to habitat tracking (Weiss 2014, pp. 370–76). In doing so, Weiss ventures to do more than allow the actors, our refugees, simply to leave the stage. He observes, instead, that shifts in settlement patterns along the Euphrates valley coincided with changes to regions that previously hosted 200 mm or more of rainfall per annum, such as the Jazira, where rainfed agriculture had been sustainable. While particularly large settlements along the Middle Euphrates between Emar and Mari appear to have experienced considerable growth, those located along the upper stretch of the river, despite being along the Euphrates, declined severely (table 10.2; Weiss 2014, p. 374; see also Pruß 2013, p. 140, figs. 50 and 49, respectively). The sheer absence of references to these places among Ur III documents confirms the impact of this decline (Sallaberger 2007, pp. 435–39). Neither Carchemish, nor Harran, nor Nagar, to name but a few, are attested. Instead, Urkeš, the dominant surviving settlement – and one at the northern stretches of the region — appears to have assumed the most prominent status (Sallaberger 2007, p. 440).

Table 10.2. Settlement decline at large tells along Upper Euphrates during the Early Bronze–Middle Bronze Age transition

Site	*Pre-2200* B.C.	*2200–1900* B.C.	*References*
Titriş Höyük	32.7 ha	3.3 ha	Algaze 1996, p. 129
Tibleşar	56 ha	—	Kepinski 2007, p. 331
Sweyhat	45 ha	—	Danti and Zettler 2007, pp. 167, 76
TOTAL (ha)	194 ha	43.3 ha	
Estimated Population	38,800	8,600	

The Middle Euphrates region is therefore identified by Weiss as one of a number of *refugia* to which migration from the Jazira occurred (fig. 10.1). Consequently, the portion of the population that departed the Jazira may account for a substantial portion of the increase in the settlement pattern of the Middle Euphrates valley, where a signature of radical urbanization suggests the immigration of refugees. Such a phenomenon finds a parallel in the growth of Jerusalem and Judah during the late eighth century B.C., driven by refugees from Assyrian military activity in the northern kingdom of Israel (Burke 2012, pp. 272–77). While more evidence from sites along the Middle Euphrates is necessary to test the details of this reconstruction, the growth of urban centers between Emar and Mari does not correlate with traditional demographic growth in antiquity and can only be explained therefore by emigration, and most reasonably from the north.

The effects of the decline of settlement in northern Mesopotamia were exacerbated by the fact that not all parts of the Euphrates valley could serve equally well as *refugia*. Predictably, arid conditions along the watersheds leading to the Euphrates translated to a decline of Euphrates flow and an eventual decline in dry-farming (non-irrigation) practices along much of the river, which is reflected in the decline and even wholesale abandonment of many urban centers north of the bend, between Emar and Carchemish (Weiss 2014, p. 374). Not only the persistence but especially the growth of settlements downstream (south of the 200 mm isohyet) between Emar and Mari is therefore surprising (Geyer et al. 2003, pp. 246–52). The

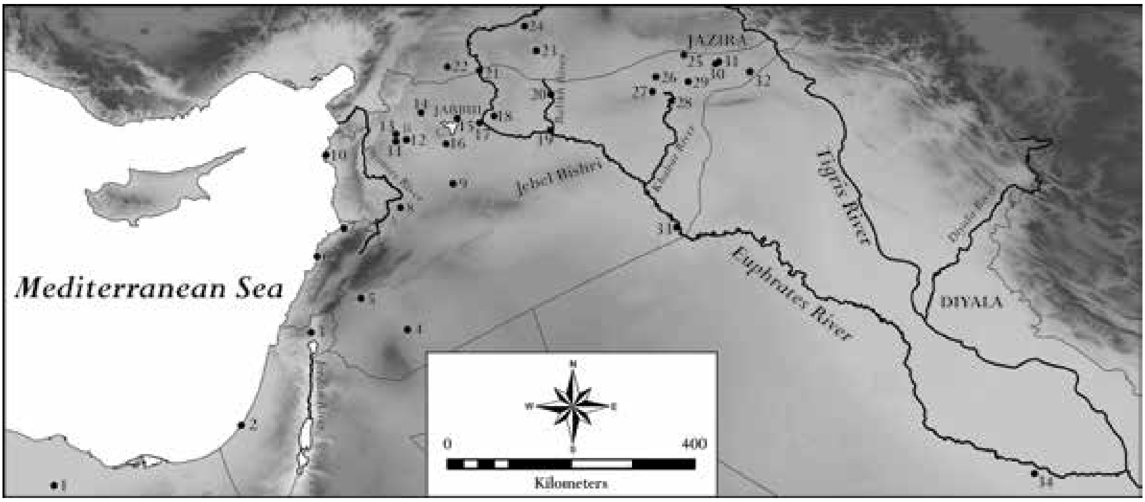

Figure 10.1. Sites mentioned in the text. 1. Tell el-Dabʿa (Avaris), 2. Ashkelon, 3. Hazor, 4. Umbashi, 5. Damascus, 6. Byblos, 7. Arqa, 8. Tell Mishrifeh (Qatna), 9. al-Rawda, 10. Ras Shamra (Ugarit), 11. Tell Mardikh (Ebla), 12. Tell Tuqan, 13. Tell Afis, 14. Aleppo, 15. Umm el-Marra, 16. Tell Munbatah, 17. Tell es-Sweyhat, 18. Tell Meskene (Emar), 19. Tell Biʿa (Tuttul), 20. Hammam et-Turkman, 21. Carchemish, 22. Tilbesar, 23. Kazane Höyük, 24. Titris Höyük, 25. Tell Mozan (Urkesh), 26. Tell Beydar, 27. Chagar Bazar, 28. Tell Bderi, 29. Tell Brak (Nagar), 30. Mohammed Diyab, 31. Tell Leilan (Shubat Enlil), 32. Hammoukar, 33. Tell Hariri (Mari), 34. Ur, A. Qattina Lake, B. Matkh Lake, C. Jabbul Lake

radical growth of settlement along the Middle Euphrates under the circumstances indicates that factors other than natural population growth led to this demographic increase. This leaves only that emigration from upstream along the Euphrates and the Jazira would have played an important role in this process.[11] There is therefore a fundamental temporal correlation, as outlined by Weiss, between the settlement decline to the north and the growth of Middle Euphrates settlements during the same period, which is indicative of refugee migration. The importance of the role played by Mari as the dominant site by the end of the third millennium B.C., during the *Šakkanaku* period, is undisputed (Sallaberger 2011, p. 331), and this appears to have contributed to substantial growth during this period (Butterlin 2007, p. 242; Margueron 2004, p. 336). The process at Mari would be analogous to the exploitation of these demographic circumstances during the Ur III period, as discussed below. At Mari, Butterlin has suggested that major building efforts were likely undertaken during this period, commensurate with public works projects employing refugees, as noted above including the restoration of Mari's temples and the construction of its massive fortifications, in a manner not dissimilar from that of the Ur III empire (Butterlin 2007, pp. 240–43), discussed below.

In the context of the late third-millennium B.C. collapse, different economic activities throughout the Jazira and Upper Euphrates would have been impacted in different stages after the onset of the crisis, as each became unsustainable. Site abandonments occurred, therefore, in stages or waves when inhabitants determined that conditions would not

[11] The expansion of sites such as Emar, Tuttul, and Mari, if it occurred as a result of refugee settlement, finds its parallel in the radical, near fourfold growth of Jerusalem during the late eighth century B.C. as a result of the influx of refugees from the southern part of the kingdom of Israel to the north (Burke 2011a, pp. 47–50).

improve (i.e., anticipatory migration) or were forced to abandon their settlements (i.e., acute migration). The vintages of refugee migration may have correlated with the retreating rainfall isohyets. To be sure, more distant circuits made by pastoralists were among the earliest attempted adaptations to these changing conditions. Crop failures, however, likely paralleled these developments, forcing the flight of the majority of the population of the home agricultural communities of many pastoralists. As indicated in the archaeological record of sites such as Leilan, smaller communities were initially left behind in the anticipation of returning once conditions improved. However, the actors in this drama had no knowledge of either the severity of these conditions, nor their potential duration. While the reasons for inconsistencies in the settlement trajectories of certain sites in northern Mesopotamia in this period have been debated, local environmental conditions (i.e., microclimates) even within the Jazira along with social agency contributed to some persistent settlement, despite an overall decline in conditions (Weiss 2014, p. 373; Ur 2012). There is no need for a singular pattern to prevail for all sites under these conditions; entirely different local environmental, as well as social and political, conditions and different responses by individual communities (i.e., agency) contributed to different trajectories across this large region, particularly at its northernmost reaches where rainfall was likely still greater (Pruß 2013, p. 141). The fact remains, however, that every settlement across northern Mesopotamia was impacted to one degree or another. No community appears to have remained insulated from these changes.

Site size estimates suggest that more than 115,000 people can be estimated to have deserted just fourteen of the Jazira's urban centers (table 10.3), using an average 200 persons per hectare. To this one could add much of Weiss' estimate of between 8,750 and 17,500 refugees from approximately 90 ha of additional settled territory in the vicinity of Leilan alone (Weiss et al. 1993), if adjusted to a 200 person per hectare estimate. Similar estimates indicate that more than 30,000 fled the Upper Euphrates (table 10.2), as inferred from the reduction in the size of sites in both of these regions. This estimate is quite conservative since it is based on excavated sites (leaving a substantial number unaccounted for), and it does not account for the many smaller satellite communities that were abandoned at the same time — to say nothing of uncounted nomadic elements. It is also reasonable to compare the terminal Early Bronze site size estimates with mid-third-millennium B.C. sizes, since the processes under examination possibly took place over several centuries and were not likely relegated to a single generation (i.e., a few decades), although the most intensive movements may have occurred within a relatively short timespan. These figures taken together with the abandonment of sites in the Levant indicate a sizeable movement of human populations over the course of several centuries. Weiss suggests a figure of as many as 300,000 based on the trend documented at these sites (Weiss, this volume). This seems wholly reasonable given the caveats above, the timespan over which these migrations may have taken place, and the presumption that we are probably accounting for about half of the affected population. While sudden population increases in adjacent regions as suggested by the growth of urban centers along the Middle Euphrates valley (Pruß 2013) suggest that the valley played host to some of these refugees, the size of these centers in no way indicates that the region hosted all of this population. Thus, we are forced to consider alternative areas to which refugees migrated. Although our knowledge of areas in the mountains of southern Anatolia to the north does not permit a comparable level of settlement resolution, this region too may have played host to some of the fleeing population. Two areas, however, serve as the principal foci for tracing this demographic shift and any attempts to suggest its relationship to the increasing appearance of Amorites in textual sources: southern Mesopotamia and the northern Levant.

Table 10.3. Settlement decline (in ha) at excavated tells in Jazira during the EB-MB transition.

Site	Pre-2200 B.C.	2200–1900 B.C.	References
Hammoukar	106 ha	—	Reichel, Grossman, and Paulette 2012*
Tell Leilan	90 ha	—	Ristvet, Guilderson, and Weiss 2004, p. 262
Mohammed Diyab	25 ha	—	Nicolle 2012* > see, however, Quenet 2011, p. 36
Mozan (Urkeš)	130 ha	< 20 ha	Dohmann-Pfälzner and Pfälzner 2002, pp. 16368
Brak/Nagar	70 ha	35 ha	Colantoni 2012, p. 52
Chagar Bazar	10 ha	1 ha	Weiss 2014, p. 373
Beydar	28 ha	—	Burke 2008, p. 168
Kazane Höyük	100 ha	—	Creekmore 2010, p. 74
Tell Chuera	65 ha	—	Orthmann 1997, p. 491
Hammam et-Turkman	3.8 ha	—	Van Loon and Meijer 1987, p. 1*
Bderi	5 ha	—	Pfälzner 1990, p. 67*
TOTAL (ha)	632.8 ha	< 56 ha	
Estimated Population	126,560	11,200	

* Indicates no known radiocarbon dates (see Ristvet 2011).

Urbanization and Social Integration in Southern Mesopotamia

Despite the evidence provided by Middle Euphratean settlements, there would have been both economic and social limitations to this region's abilities to absorb the full influx of immigrants from the north. For this reason refugees that were unable to exploit social, economic, or political ties within the Middle Euphrates would have been prompted to move still farther, with the remaining options to the southeast along the Euphrates River into southern Mesopotamia, and to the west from the Euphrates bend into the northern Levant. In parallel with settlement data that suggest population spikes in the Middle Euphrates valley during the late third millennium B.C., settlement data from southern Mesopotamia also reveal a substantive uptick in settlement sizes across the full range of the settlement hierarchy, from the largest sites to the smallest during this period. These changes occurred during the Ur III period, which permit the recognition of a correlation between a population influx, as might be accounted for with the arrival of refugees from regions upstream along the Euphrates, if not also from other affected areas.

The Ur III period reveals a century for which radical urbanization may suggest substantive influxes of immigrants, who owing to their long-standing connections to individuals who were already socially integrated are fairly inconspicuous archaeologically. Yet, radical and indisputable increase in settlement farther to the south during the Ur III and Larsa periods cannot hide this demographic anomaly (Adams 1981). This is usually correlated directly with the growth of the Ur III empire; as Adams observes, "the overwhelming concentration in large cities for a considerable part of this sequence must be regarded as a hypertrophic, 'unnatural,' condition for an agricultural civilization with preindustrial transport technology" (Adams 1965, p. 136). It is difficult to disregard how significant such dramatic growth in the number of new settlements and total settled area was from the Akkadian to the Ur III-Larsa periods, even if we were to account for the various caveats concerning the nature of the data collection and their interpretation (see Adams 1965, fig. 25). Predictably, all parts of southern Mesopotamia were not impacted equally. Settlement in the Diyala, for example, which was probably also affected by decreased rainfall, declined slightly during the Akkadian period (Adams 1965, pp. 42–45) and remained fairly flat during the Ur III except for a fewer large towns (Adams 1965, pp. 46–48).

The hypothesis that Amorite presence in southern Mesopotamia in the late third millennium B.C. owes a substantial impetus to an influx of refugees from the Jazira can be substantiated further. In addition to the evidence for radical and sudden urbanization, several other features serve to reveal aspects of this process at work. These include artifactual correlates, linguistic data, state building projects, and territorial expansion, all of which are amply attested during the Ur III period. As discussed below, conspicuous references to Amorites during the Ur III period reveal that further immigration by Amorites was unwelcomed by the state, despite the fact that Amorites already occupied a range of positions across Mesopotamian society prior to this period.[12]

The settlement and integration of refugees usually become difficult the farther that they are forced to settle from their home territory, where they possess more limited, if any, social connections to their host communities. Under such conditions the overwhelming risk is the inability to subsist, or what in modern terms is traditionally characterized as joblessness. Joblessness in antiquity was, however, the plight of the landless. Landlessness went hand in hand with the loss of access to common property assets that are also characteristics of the refugee's plight (Burke 2011a, pp. 44, 45). Despite its anachronistic sound, employment whether for rations or barterable commodities could suffice to make up for this loss, at least temporarily. It would introduce, however, a wider range of trajectories that must be accounted for in the subsistence of these refugees and thus reveals that a range of options existed. Among them was not only the resumption of former subsistence activities — sedentary or pastoralist — following resettlement, but also engagement in activities such as works projects and mercenary employ. With less social integration, refugees were more dependent on local rulers, with the result that they were more vulnerable to exploitation as a source of labor (Burke 2011a, p. 50).

As I have suggested in the context of Jerusalem's refugee-driven growth during the eighth century B.C. (Burke 2012, pp. 280–82), major building projects may reflect efforts by rulers to integrate, and support, but also exploit, refugees. As their labor force grew rapidly, refugees, desperate to subsist, presented opportunities for labor conscription. Such circumstances would seem to have existed for Ur III rulers as refugees filtered from the north, among them Amorites. Typical construction projects during the Ur III period (2112–1911 B.C.) included massive boundary walls, fortifications, temples, ziggurats, and canals, all documented among royal inscriptions and year names (Frayne 1997). Such projects began under the dynasty's founder, Ur-Nammu, and support the contention that surplus labor prevailed from the start of the Ur III period and may have been a contributing factor to the conditions that persisted for less than a century. Notable among these was the construction of defensive walls since these fortifications also appear to have been intended to control against a

[12] This phenomenon finds an apt parallel in California, where the handling of immigration pressures from Latin American populations remains a matter of contention in a region already hosting the largest population of naturalized Latinos in the United States.

regular influx of militants and migrants, notably Amorites, from the north, despite the fact that many were already inhabitants of the south.

Although under ideal conditions the southward movement of refugees might be traced through material culture, conspicuous markers of Amorite migration remain to be identified, if they can be identified. Whether artifactual markers can be easily singled out as evidence of cultural exchanges between refugee populations and host communities is a matter of debate since it is subject to various factors such as the rate of incursion, and the degree and nature of the integration of outsiders over the course of decades and even centuries.[13] In the case of refugees, the archaeological signature will largely depend on the nature of prior relationships between the refugee population and the communities into which they were absorbed. If these groups were related or experienced intensive contact prior to their migration, the differences in material culture may be negligible.[14] Given the presence of southern Mesopotamian enclaves in the north resulting from Akkadian imperial initiatives, as well as regular diplomatic and trade relations from before the Akkadian period, it is not surprising that few if any markers of northern Mesopotamian material culture would be distinguishable in the south. It is arguable therefore that one of the primary reasons for this was simply that Amorites were, in effect, already largely integrated into southern Mesopotamian culture by the Ur III period.

Since, as noted above, Amorites were already an element within southern Mesopotamian societies, the integration of refugees from 2200 B.C. may have been accelerated since the necessary social networks were already in place. Furthermore, if efforts to distinguish neighboring ethnic groups in other archaeological contexts in the Near East over the past thirty years serve as any guide, the identification of material cultural correlates requires intensive familiarity with subtle distinctions among seemingly commonplace elements of material culture that are reflective of differences in practices and customs across a spectrum of activities.[15] The question, however, is what practices or traditions were sufficiently distinct in the Jazira that their appearance in southern Mesopotamia would be conspicuous? Although Walther Sallaberger and Anne Porter have articulated Amorite identification as predominantly of pastoral nomadic associations, whether in occupation (Sallaberger 2007, p. 448) or largely in self-perception (see especially Porter 2012, pp. 319–20), as discussed above, this wholesale characterization of Amorites fixates on a single economic activity in which some Amorites engaged. It does not account for a wide range of trajectories that were likely attendant during this transition, and that are revealed by the various employments that Amorites held during the Ur III period, as well as by their ownership of land (Buccellati 1966, p. 45). A considerable body of texts from the Ur III period reveals the social integration of Amorites in southern Mesopotamia (Porter 2012, p. 306). The identification of Amorites in this context relies predominantly on their being designated MAR.DÚ or bearing linguistically

[13] Michael Dietler's model of entanglement may be as relevant for discussions of refugee phenomena as any model addressing cultural contact in archaeological contexts that has been offered to date (Dietler 2010).

[14] In many cases it is quite likely that the distances refugees migrated was relatively limited, as in the case of refugees from southern Israel into Judah (Burke 2011a), and the difference of material cultures may be minor if it is detectable. Nonetheless, other proxy data, such as DNA, will eventually permit the identifications of population shifts in the absence of material cultural markers.

[15] A number of examples of neighboring yet subtly distinct material cultures can be cited. For example, the distinctions among Phoenician, Israelite, and Judean material culture (to say nothing of Transjordanian cultures) during the Iron Age.

Amorite names. Yet, most Amorites identified as MAR.DÚ do not bear linguistically Amorite names. Only about 40 percent do, while 20 percent bear Sumerian names, and the remainder are in Akkadian and other languages (Buccellati 1966, p. 100). This too reveals the high degree of social integration Amorites appear to have experienced during the Ur III period, and certainly by the end of the period.[16] While many of these positions were no doubt held by Amorites previously living in the south, the presence of prior generations of Amorites provided the framework for socio-economic integration by new arrivals. The degree and speed of integration of Amorites likely contributed to the rapid growth of settlements around the Ur III period and why it is largely detected quantitatively, in the growth of settlements, but is not conspicuous in the artifactual assemblages of these sites.

The *Sitz im Leben* of many references to Amorites are among circumstances typically characterizing the employment of a surplus of labor by a strong centralized state, albeit with a limited understanding of how such labor was organized (Kuhrt 1995, p. 62). I suggest that a number of the undertakings for which the Ur III state is known can be seen in this light. In addition to major building projects, territorial expansion and an increasing reliance on professional soldiers or mercenaries who are often explicitly identified as Amorites created additional contexts for their integration. The appearance of Amorites in connection with some of these phenomena is admittedly ironic since during the Ur III period Amorites were integral members of the state but also seemingly among its primary security concerns. However, if we remember that Amorites dwelling in the south would have represented different vintages of immigration, however they arrived, then the varying rates of social integration of these vintages can be accounted for. The earliest vintages were, therefore, effectively full members of Ur III society even as efforts were made to limit further Amorite immigration in the south.

The quantity of surplus labor manifest in refugee populations means that refugees are often the targets of exploitation. It is therefore difficult to escape the consideration that such circumstances may explain the capacity of the Ur III state for significant state initiatives. The state, beset by what appears to have been a protracted influx of migrants from upstream, was compelled to pursue whatever means necessary to improve crop yields to meet the demands of its growing population (Powell 1985, p. 36), which included the employment of exacting means of accounting for labor (Englund 1991). Similarly, its burgeoning population, whatever its sources, presented it with increasingly larger pools of potential conscripts (Lafont 2009). Such employment opportunities were, however, also the nearest equivalent to the extension of financial assistance that refugees could expect in antiquity while, of course, often resulting in substantially positive outcomes for the state. While such projects could be directed toward the protection of refugee enclaves, as is suggested in the construction of Jerusalem's Broad Wall around the refugee community that had arrived there (Burke 2012, pp. 280–82), projects could take any form. Yet they share the characteristic that they were of unequivocal value to the state. No shortage of examples of such projects are available for the Ur III period (2112–2004 B.C.) whether the construction of *The Wall of the Land* during Šulgi's reign (2094–2047 B.C.) or *muriq Tidnim* later during Šu-Sin's reign (2037–2027 B.C.), fortresses across the empire, and ziggurats as well (Kuhrt 1995, pp. 60–70). The period itself is conspicuous for its monuments, and all the more so given its short duration.

[16] Similar circumstances are revealed in the Murashu archives from Nippur during the Achaemenid period where among the Judeans living there both Judean and local names occur, suggesting not only intermarriage but likely changes in naming traditions (Stolper 1992).

While the exploitation of surplus labor in major building projects provides a promising avenue for exploring Amorite social integration during the Ur III period, military service constituted another significant means by which Amorites appear to have achieved integration in Ur III society. Military service is perhaps the oldest male profession, and is one of the surest means of demonstrating allegiance to and affiliation with a group. According to Michalowski, the term "Amurrum" during the course of the Ur III period came to denote "elite Amorite guards" (2011, p. 110), though it remains unclear to what extent members of this group of mercenaries were also necessarily identified as Amorite, with the likelihood that they were less and less Amorite over time. It is significant, however, that of the many capacities in which individuals were identified as sedentarized Amorites during this period (Buccellati 1966, pp. 340–42) only those associated with military positions can be identified as Amurrum with certainty (Michalowski 2011, pp. 107–09). A number of notable individuals are associated with this role in the Ur III state, including one Naplanum who is mentioned in more than ninety texts. Nonetheless, as Michalowski notes, the evidence is insufficient for positing any considerable infiltration of Amorites into the south during this period (Michalowski 2011, p. 111), with the implication that much of the immigration may have taken place earlier, during the Akkadian period. To what extent onomastic conventions reveal the actual degree of social integration of Amorites during the Ur III period remains an open question. It is difficult, however, to imagine a context in which Amorite names were variously adopted in a context that did not feature the presence and influence of members of a group identified as Amurrum.

As other historical examples reveal, I suggest that sustained imperial warfare in the "tribal zone"[17] — as we might describe Akkadian and Ur III military exploits against Amorites in the north — contributed to the many "social forces" shaping Mesopotamian society and impacting the very regimes that had waged war against these populations. A steady stream of Amorite prisoners of war and a large number of battle-hardened Amorite veterans in the north would have added to the numbers of Amorites who migrated southward in pursuit of subsistence in the wake of acute migration. The Ur III war machine, which undertook such efforts against whatever threat Amorites were perceived to constitute, seems to have been quite willing to integrate corps of professional Amorite soldiery into their ranks. Although we may never fully understand the circumstances behind these events, the phenomenon of employing mercenaries from a traditional enemy is not without parallel in Roman or ancient Near Eastern history, as was the case with various elements among the Sea Peoples during the Late Bronze Age.

Migration into the Northern Levant

Inasmuch as the evidence points to a migration of refugees into southern Mesopotamia, the abandonment of territories on both sides of the bend of the Euphrates appears to have also contributed to a westward migration into the northern Levant, as Weiss notes (Weiss 2014, pp. 374–76). The net result of aridification and other factors such as deforestation and warfare (Pruß 2013, pp. 143–44) was the depopulation of sites in the western Jazira, which were not resettled between the Balikh and Wadi Ḫanzir until after 2000 B.C. (ibid., p. 139). The crisis of 2200 B.C. created therefore a significant and lengthy disruption, albeit temporary,

[17] See essays in Ferguson and Whitehead 1992.

in what had otherwise functioned as a well-trafficked corridor between Upper Mesopotamia and the northern Levant over the course of the third millennium B.C. The resulting rift in this region was what can be understood as a speciating event, which in this case contributed to two distinct trajectories in the formation of Amorite identities: one westward oriented and the other eastward. These circumstances can be identified, therefore, as fundamentally responsible for the development of distinctly Mesopotamian and Levantine strands of Amorite cultural identity. Nonetheless, the eastern and western elements maintained a core set of commonalities characterized by the Amorite *oikumene* throughout the first half of the second millennium B.C., as discussed earlier. This rift was by no means absolute, and the regeneration of urban societies at the start of the second millennium B.C. contributed to a restoration of intensive cultural interactions between these regions through political, social, and economic mechanisms, restoring many connections that existed prior to circa 2200 B.C.

References to Amorites in the Ebla texts in the years prior to 2200 B.C. reveal that Amorites clearly possessed social ties with communities in the northern Levant (analogous with their ties in southern Mesopotamia), which facilitated their relocation to this region. Such relationships would explain how preexisting socio-economic networks could be exploited by refugees, serving to reveal the importance of social agency in refugee movements. Amorites with a familiarity with the west, whether owing to their proximity or the strength of social and economic ties, were more likely to exploit these relationships insofar as they identified areas within this region as potential *refugia*. Since early core territories of Amorite settlement may already have stretched well into the northern Levant before 2200 B.C., the limited textual sources at our disposal contribute to the understatement of Amorite ties with the northern Levant. Yet the settlement data at the end of the third millennium B.C. and the trajectory of developments during the Middle Bronze Age reveal their legacy.

There is no evidence to suggest a role for Amorites in the volatile events that may have befallen these settlements around the same time.[18] In my own assessment of the evidence for violent interactions from the mid-third to the mid-second millennium B.C., there was no evidence that the military attacks in this region were the work of Amorites. Rather, they were likely the result of military incursions by Mesopotamian empires or conflicts between centers such as Mari and Ebla (Burke 2008, pp. 90–91), mostly unattested among our current sources. After 2200 B.C. such destructions were probably the result of Ur III imperial efforts, as in its military efforts near Jebel Bishri, although the evidence for Ur III military activity beyond this remains wanting. Yet, this observation permits the recognition that the social impact of these campaigns, from the beginning of the Akkadian empire through the Ur III period, was a shared experience of the region's population, urban and rural, which included Amorites. Such circumstances must be factored into considerations regarding the shaping of a common cultural experience in the northern Levant, which informed the formation of Amorite identities in the region. Nevertheless, a degree of substantive, productive, and non-violent interaction did exist during the centuries leading up to the Middle Bronze Age, and what may be called the start of the "Amorite Age." These relationships are evident in the resettlement efforts of those moving from marginal areas farther west into the northern Levant.

[18] The chronologies for the destructions of northern Levantine sites excavated during the mid-twentieth century A.D. are notoriously difficult to reckon with historical chronologies owing to a lack of radiocarbon dates and poor understandings of the stratigraphies of these sites.

Since by comparison to Mesopotamia the Levant possessed limited textual sources, the articulation of processes of the social integration of Amorites cannot be entertained in an analogous fashion for the Levant. Instead, we are almost exclusively reliant on archaeological data, both settlement pattern analyses and changes in material culture, to permit a reconstruction of these processes. These suggest that similar population movements and social forces were behind the formation of Amorite identities in the northern Levant in the wake of the population movements set in motion after 2200 B.C. Likewise, a number of developments in the region suggest comparable efforts to integrate migrants and the tensions that may have persisted during this process.

The first question to address concerning the identity of immigrant population in the Levant as Amorite concerns, as it does in Mesopotamia, labels provided in the available sources. The main difference is that following the destruction of Ebla in 2300 B.C., there exist neither native sources in the Levant, nor references outside of the region, to the identity of Levantine populations until the start of the Middle Bronze Age. The primary basis for identifying the material culture of the first part of the Middle Bronze Age as Amorite hinges therefore on the corpus of names of Amorite rulers identified with southern Levantine towns in the Egyptian execration texts of the Middle Kingdom from the first two centuries of the second millennium B.C. (Redford 1992).[19] These taken together with the Mari letters a century or so later reveal the establishment of Amorite dynasties at Aleppo, Qatna, Hazor, Byblos, and Apum (Guichard 1997), which began to take shape during a period roughly contemporaneous with the end of the Ur III period and start of the Old Babylonian period in Mesopotamia. In short, it appears that Amorite kings were in place at the major urban centers throughout the Levant by the start of the Middle Bronze Age, suggesting that this situation grew out of developments in the late third millennium B.C., as they did in southern Mesopotamia.

The data in the northern Levant resulting from the analysis of settlement patterns reveal the movement of refugees farther westward into more humid regions, with the most detectable differences in marginal zones, namely the eastern flanks of the northern Levant from Aleppo to Damascus. Within the Jabbul plain east of Aleppo, Umm el-Marra (ancient Tuba of the Ebla texts)[20] was clearly abandoned in the zone of aridification at this time, only to be resettled during the Middle Bronze Age (Schwartz et al. 2012). That the largest Early Brone IV settlements prior to the decline were previously concentrated in the eastern half of Jabbul plain and east of Umm el-Marra (Yukich 2013, pp. 194–201, fig. 5.13) indicates the role played by these settlements in Umm el-Marra's pastoralist economy, when this zone experienced higher rainfall. During the Early Bronze IV, Tuba hosted a group of elites, to whom nine centrally located monumental tombs belonged. The wealth of these individuals appears to have derived from an economy of rearing *kunga*, donkey-onager hybrids of very high value (Weber 2008; 2012, pp. 168–70). The site's location, and the period of its economic prosperity and cultural associations, suggest that Umm el-Marra's population can be reasonably identified as Amorite before 2200 B.C., focused on herding activities, of the usual sort attributed to the Amorites. Whatever the full extent of its socio-economic basis, Umm el-Marra dried up for a time in the late third millennium B.C. and was abandoned, only to be revived during

[19] Ben-Tor's speculation (2006) concerning a third-millennium context for the names appearing in the Execration Texts ignores the nature of execration texts, which seek precision with regard to detail in order to be efficacious (see Seidlmayer 2001).

[20] See Matthiae 1979.

the early second millennium B.C. Its abandonment likely meant that its inhabitants sought grazing land in areas to the west in order to continue their former activities, following the retreat of rainfall isohyets. During the course of the interlude in its settlement or upon its resettlement, the elite tombs at the site were desecrated (Schwartz 2013b, p. 507). This likely indicates a lack of kinship relationships between the earlier and later inhabitants. A settlement shift to the west within the Jabbul plain and a nucleation at a smaller number of sites (Yukich 2013, pp. 201–08, fig. 5.14) may also reveal the shifting allegiance of the site's inhabitants, from Eblaite to Yamḫadian overlordship (see discussion below).

Like Umm el-Marra, al-Rawda, situated on the 200 mm isohyet of the eastern Levant approximately 100 km south of Umm el-Marra, was also abandoned (Castel 2007, p. 161). This massive site, which was settled in approximately 2400 B.C. when it began to assume its *Kranzhügel* shape (Castel and Peltenburg 2007, pp. 611–12), clearly served pastoral nomads and hunters (Castel 2007, p. 167). A complex water reservoir system made habitation possible in this region. We may speculate that the gradual decline of al-Rawda, as its excavators suggest (Castel 2007), resulted from a decline associated with Ebla's textile economy (Castel and Peltenburg 2007, pp. 611–14; also cf. Schloen, this volume) in the wake of its 2300 B.C. destruction and was aggravated by increasing aridification, culminating in its abandonment only shortly before circa 2000 B.C. (Castel 2007, p. 161). Although some settlement in the region persisted (Castel 2007, p. 173), declining precipitation over the course of the second half of third millennium B.C. no doubt caused a shift in wild game to regions to the west, further diminishing its role in hunting migrating herds, and lessening its potential to support the large herds that may have been pastured in the region. Important elements of the site's material culture that reveals its connections with late third millennium B.C. northern Levant and Jazira include its *Kranzhügel* urban layout (Castel and Peltenburg 2007), and the occurrence of temples *in antis* (Castel 2010), and cultic standing stones (Castel 2011).

While the settlement pattern around Aleppo is not well understood, changes to the settlement pattern around Ebla south of Aleppo during the late third millennium B.C. are suggestive of not only the detrimental effects of aridification after 2200 B.C. but also the realignment of settlement around its water source, namely the ancient Matkh Lake (Mantellini, Micale, and Peyronel 2013). At Ebla itself, Matthiae identifies three sub-phases of the Early Bronze IVB decline of the site during which the settlement is characterized as hosting squatter occupation and is thereafter abandoned for a brief period before the start of the Middle Bronze Age (Matthiae 2007, pp. 505–15). To what extent this decline reflects the political decline of Ebla after its destruction in 2300 B.C., the impact of drought, or both remains to be elucidated. Matthiae suggests, however, that the abandonment of Ebla at the end of the third millennium B.C. may have been "provoked by the arrival of new population groups, who used new techniques in pottery production and founded the archaic Old Syrian town" at the start of the Middle Bronze Age (Matthiae 2010, pp. 206–08). Consequently, Matthiae views the changes in material culture accompanying the start of the Old Syrian period (Middle Bronze Age) as induced by population shifts, first a decline, followed by resurgence.

Paralleling the trend at Ebla, from the Early Bronze IVA (28 sites) to the Early Bronze IVB (24 sites) the region around Ebla experienced no less than a 14 percent reduction in the total number of sites and at least a 33 percent drop around the Matkh Lake, from eighteen sites to twelve (Mantellini, Micale, and Peyronel 2013). This is considerable given that these sites provide a mixed representation of settlement phases within the Early Bronze IVB (pre- and post-drought) and the fact that the lake was receding from 2200 B.C. and only began to recover after 1900 B.C. before eventually drying up entirely (Cantelli, Picotti, and Martina 2013). While there appears to be only a limited reduction in the total number of sites from the Early Bronze IVA to the Early Bronze IVB (see Mantellini, Micale, and Peyronel 2013, table 8.7) — that is, after 2300 B.C. — it must be kept in mind that this settlement history is a mixed dataset for evaluating the actual impact of the 4.2 ka B.P. event. A periodization based on Ebla's archaeological history means that the Early Bronze IVB (ca. 2300–2000 B.C.) concatenates perhaps as much as a century of settlement prior to drought (i.e., 2300–2200 B.C.) and two centuries reflecting its impact. It is possible therefore that the direct impact of aridification was greater than these numbers reveal.

Despite the overall decline in settlement around Ebla, the settlement pattern does not reveal a wholesale abandonment of the region, but rather reveals the potential and successful adaptation to changing circumstances. Tell Tuqan along the shore of Lake Matkh, for example, continued to be settled during the Early Bronze IV (Cantelli, Picotti, and Martina 2013) and grew during the Early Bronze IVB (Baffi and Peyronel 2013; Mantellini, Micale, and Peyronel 2013, p. 180), although it too experienced a decline in rainfall. This growth was no doubt due to its proximity to the lake, as it absorbed a shift in local settlement and potentially refugees from the more arid margins. As at Ebla, the site's morphology was later shaped extensively by its Middle Bronze Age settlement and largely by the construction of its fortifications (Burke 2008, pp. 221–23), revealing the site's persistent habitation at the start of the second millennium B.C. The same pattern also existed at a number of sites in Tuqan's hinterland (Mantellini, Micale, and Peyronel 2013, p. 179). Considerably to the east of Tuqan and south of Jabbul Lake, 5.3 ha Tell Munbatah continued to be inhabited throughout the Early Bronze IV (ibid., pp. 174–76). This site was located on routes leading around the lake toward the Euphrates and north toward Umm el-Marra. Its persistence suggests that aridification alone may not have been the primary factor for settlement shifts this far south and thus indicates this region's role as a corridor for migration from the Euphrates and a shift southward away from the Jabbul Lake. By contrast, to Ebla's west, excavations at Tell Afis reveal no change in settlement during the Early Bronze IV (Mazzoni 2013, p. 209).

To Ebla's south and west of the line defining the limits of rainfed agriculture, Qatna began an ascent during the late third millennium B.C. culminating in its establishment as the seat of a Middle Bronze Age kingdom. The expansion of the site, from 25 ha to 100 ha by the

Table 10.4. Settlement changes at the main excavated sites west of the Euphrates

Site	Pre-2200 B.C.	2200–1900 B.C.	References
Umm el-Marra	20 ha	-	Burke 2008, p. 225
al-Rawda	16 ha	-	Castel 2007, p. 161
Ebla	47.4 ha	< 47.4 ha	Burke 2008, p. 199; Matthiae 2013, p. 191
Tuqan	< 25 ha	25 ha	Mantellini, Micale, and Peyronel 2013, p. 179
Qatna	25 ha	25 ha	Morandi Bonacossi 2007, p. 70
Qatna Settlement*	-	17–34 ha	Morandi Bonacossi 2007, p. 71
Khirbet al-Umbashi	6 ha	60 ha	Braemer, Échallier, and Taraqji 2004, p. 364
TOTAL (ha)	**139.4 ha**	**> 174.4 ha**	
Estimated Population	**27,880**	**> 34,880**	

Middle Bronze Age, and the emergence of a settlement hierarchy around Qatna represent hypertrophic growth revealing the influx of population from outside of the immediate environment. Although the site, in continuation of the Early Bronze III settlement, appears to have peaked at about 25 ha during the Early Bronze IV, its settlement was accompanied for the first time by the emergence of secondary network of seventeen settlements of between 1 to 2 ha in size around Qatna during the Early Bronze IV (Morandi Bonacossi 2007, pp. 70–72), representing between 20 and 35 ha of additional settlement, possibly 4,000 to 7,000 additional inhabitants (see table 10.4 and fig. 10.2). The attraction at Qatna was the existence of a lake fed by karstic springs (Cremaschi 2007) that was likely responsible for Qatna's original settlement and its robust growth to 100 ha during the Middle Bronze Age, despite declining conditions in regions to the north and east. By the Middle Bronze Age, rainfall in this area increased (Valsecchi 2007). This likely contributed to an intensification of grain production around Qatna that is reflected in the grain storage facilities excavated in the center of the site (Morandi Bonacossi 2007, p. 69).

An expansion of settlement as at Qatna is witnessed also to its south and west. In the Akkar plain, settlement expanded considerably from the mid-third millennium B.C. and continued through the course of the Middle Bronze Age (Thalmann 2007). The expansion of settlement from the Early Bronze IV saw the construction of massive grain storage facilities at the site that continued through the early Middle Bronze Age (Thalmann 2007, pp. 225–30), as at Qatna. While no evidence exists for climatic change at Tell Arqa, or along the coast for that matter, Thalmann has referred to the process accompanying settlement as one of "agricultural colonization" by "newcomers," which was reflected in their maintenance of "burial and agricultural traditions … their marginal and short-lived installations of tombs and silos on the outskirts of the site of Arqa" (ibid., pp. 230–31). Thalmann's observations reveal the long-term process of social integration wherein the Akkar plain absorbed immigrants during the late third millennium B.C. Similar trends during the Early Bronze IV are witnessed in the region east of Lake Qatina, which is to the southwest of Qatna, as revealed during survey (Philip 2007, p. 241), as well as along the Middle Orontes (Bartl and al-Maqdissi 2007).

South of Ebla and along the margins of dry farming, the site of Khirbet al-Umbashi reveals the settlement trajectory whiplash that marginal sites experienced during these changes. During the last two centuries of the third millennium B.C., the site grew from 6 to 60 ha before declining precipitously (Braemer, Échallier, and Taraqji 2004, p. 364). The site's economic basis is identified with sheep and goat herding on the basis of faunal data (Braemer, Échallier, and Taraqji 2004, p. 367), as at sites to its north that were also located along the margins of the steppe. As with Tell Tuqan, the peak of this activity is suggested for the Early Bronze IVB, and not associated with Ebla's dominance during the Early Bronze IVA. The new inhabitants at Umbashi settled within the confines of the ancient Early Bronze Age wall. This growth surge was short-lived, and the site began to decline in size already by the end of the Early Bronze IV or start of the second millennium B.C., a situation from which it never recovered. The resettlement of the site during the Early Bronze IVB correlates with increased settlement in the western and southern stretches of Syria, which indicate a fairly sudden influx of inhabitants into the region, where in the eastern limits they engaged in pastoralism. Although the data are too limited to permit any conclusions with certainty, Umbashi's settlement would seem to reveal a later onset of aridity at this latitude, as indicated for areas farther to the south (Langgut et al. 2014; Finkelstein and Langgut 2014).

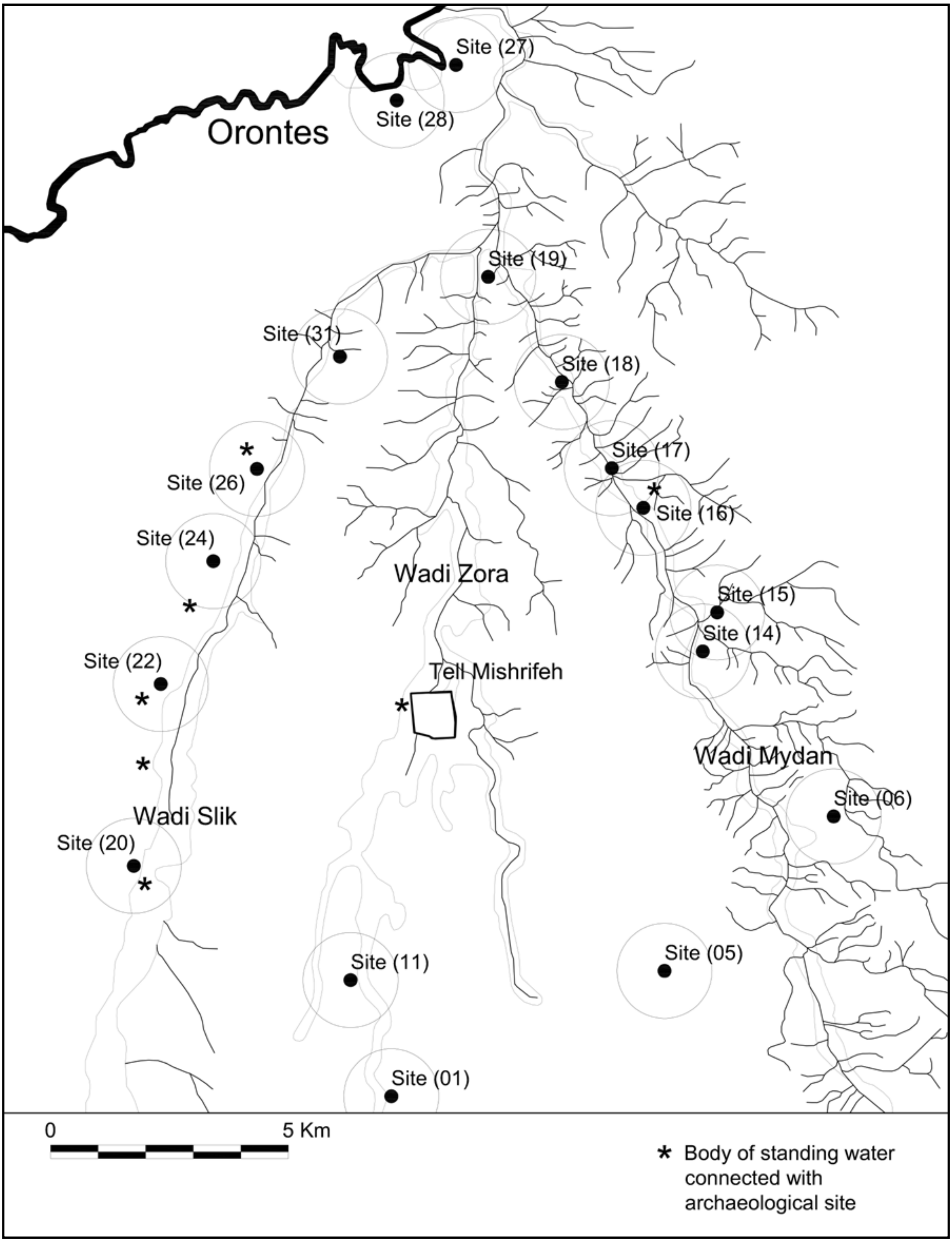

Figure 10.2. Early Bronze IV settlement expansion around Qatna showing estimated cultivated areas (Morandi Bonacossi 2007). Reproduced with permission

While the best-known settlement data for the northern Levant during this transition does support a pastoral-nomadic character for a large proportion of the population of the sites under review, this perspective is skewed by a dataset resulting predominantly from an intensive research focus on the marginal hinterlands to the east of Aleppo, Ebla, and Qatna. These data suggest that many of the inhabitants at these sites engaged primarily in pastoralist activities, having abandoned centers located within the western Jazira, Euphrates valley, and the Jabbul plain toward the west and south and, at first, to the eastern margins of the northern Levant. This, however, also happens to be where the concentration of archaeological excavations have focused, with limited attention to the more intensively settled regions west of Ebla, Qatna, Homs, Hama, and around Damascus. To the extent that these areas have been systematically examined during more recent exploration, the Akkar plain, the region around Qattina Lake, and the Orontes valley, for example, reveal the potential for accounting for immigration during the late third millennium B.C. (Weiss 2014, p. 376). The notable blindspots in this analysis remain Aleppo and its hinterland, and the details of settlement in the Orontes valley.

Although the excavation and survey data serve as mere proxies for tracking demographic changes during the late third millennium B.C. in the northern Levant, it is difficult to escape some fundamental observations concerning these changes. First, the evidence in declines in pastoralist activity in northern Mesopotamia corresponds with an evident intensification of pastoralism along the eastern margins of the Levant to the south of Jabbul Lake. Second, at the same time, preliminary data indicate that agricultural activities intensified in the Levantine steppe, as around Qatna, and in regions to the west and along the coast, suggesting a potential resettlement of displaced populations. Hypertrophic growth of older sites accompanied a pattern of settlement infilling that persisted through the early second millennium B.C. Third, the settlement trajectory revealed across the northern Levant during the several centuries accompanying the transition to the Middle Bronze Age (i.e., 2200–1900 B.C.) supports a correlation between the resettlement of refugee populations and the emergence of "Amorite" kingdoms such as Yamḫad (Aleppo) and Qatna, presumably where such "social forces" constituted a substantial element in the power dynamics of these nascent states. The settlement data from the northern Levant reveal, therefore, a classic population "creep," as waves of migration out of the mid-to-upper-Euphrates, western Jazira, and Jabbul plain occurred over the course of the last two centuries of the third millennium B.C. Had such migration been spread evenly over this period, the impact would have amounted to hardly a few people per day (roughly a nuclear family) resulting in the transaction attested. However, the movements in question, as suggested by refugee studies, likely took place on larger social level including clans, for example, as represented quite often by a single village or quarter within a larger town,[21] and thus these are reasonably described as "waves" or vintages. The process was notably uneven, and this lengthy period was punctuated by episodic migrations as minimum thresholds were not met for the sustainability of communities living in marginal zones.

The aggregate settlement data above and in light of Ebla's preeminence prior to its destruction are suggestive of a gradual balkanization of the kingdom of Ebla. The data reveal the destruction of the capital city of Ebla circa 2300 B.C. followed by a gradual dispersal of

[21] Such a social organization is attested for ancient Israel and suggested for pre-modern cultures of the eastern Mediterranean (Schloen 2001, pp. 135–83).

settlement over the course of the Early Bronze IVB (ca. 2300–2000 B.C.) when sites such as Tuqan and Qatna experienced measurable growth due to climatic factors. Immigration from regions from the northeast, where it was brought on by aridification, constituted a contemporaneous process that brought a new demographic component to a political realignment already underway. Among the results of this realignment was the division of the Eblaite territory between no less than Aleppo and Qatna, the capitals of the would-be Middle Bronze Age kingdoms of Yamḫad and Qatna. Insofar as Umm el-Marra, for example, can be identified with ancient Tuba, and can be suggested to be under Ebla's dominance during the second half of the third millennium B.C., the site's "collapse" during the Early Bronze IVB factors as an example of the abandonment, albeit temporary, of settlements in marginal zones that were subject to economic decline in the wake of changing environmental conditions. Its resettlement during the Middle Bronze Age may therefore be reckoned as a recovery owed to political circumstances surrounding Yamḫad's emergence. Greater certainty of this reconstruction remains hampered, however, by the absence of textual sources during this transition.

Conclusion

It is increasingly clear on the basis of a growing body of scientific data that substantial changes to Near Eastern environments were brought about by precipitous declines in rainfall over the period between 2200 and 1900 B.C. that most severely impacted the exploitation of marginal zones. Archaeological data confirm the attendant effects on populations across this region, revealing abandonments but also resettlement in neighboring regions that expose the movements of refugees seeking to flee these changes. Consequently, it is necessary to thoroughly consider the impact that such dynamic circumstances, lasting several centuries, would have effected in neighboring regions as the populations of the affected marginal zones of Mesopotamia and the northeastern Levant were forced to relocate. Although the available historical and archaeological data warrant discarding earlier hypotheses, insofar as they involved bellicose, invading hordes, data exist to reconstruct a chain of causality, which reveals shifts in populations to regions Weiss has aptly labeled *refugia*. This causality is not, however, synonymous with a form of environmental determinism, and for this reason I have suggested an expansion on Weiss' habitat tracking as a means to accounting for a broader range of implications that the movement of refugees had for neighboring cultures.

Although many of the movements of individuals identified to date may correlate with pastoralists, I have sought to emphasize that social agency played a major role in the choices or trajectories refugees adopted in their efforts to subsist and the ways in which the resulting trajectories are manifest in the archaeological and historical record. Integration of refugees into regions further westward and southward in the Levant, and likewise to the south in Mesopotamia, brought refugees into environments with a broad set of choices for subsistence. This is further true since climate was not the only factor at play in these movements, with substantial evidence that Amorites were already present within the northern Levant and southern Mesopotamia. While climate was one factor in creating a context for "Amoritization," it was largely a catalyst to dynamics underway prior to 2200 B.C. from southern Mesopotamia to the northern Levant. Within these areas precursors of a constellation of conspicuous elements of material culture, or Amorite *koiné*, already existed. These material elements reveal active participation in a sphere of cultural exchanges that would later contribute to the formation of the Amorite *oikumene*.

The movement of individuals hastened from 2200 B.C. added to an existing mélange of long-distance interactions that included military activity and trade from at least the mid-third millennium B.C. Pre-existing social networks facilitated refugee migration and social integration during their efforts to address the primary concerns that emerge as a result of relocation. Since these refugee migrations were likely absorbed in relatively small numbers over a period of more than a century, as the effects impacted different regions at varied rates, the accompanying shifts in material culture across these regions tend to exhibit a high degree of continuity with earlier periods, as others have noted. Nevertheless, evidence for hypertrophic growth, as Adams observed in southern Mesopotamia, and substantial settlement realignment in the Levant are strong proxy data for these movements.

While the identification of population shifts supportive of the identification of refugees can be reasonably well documented, the exact identities of the refugees remain a more complicated issue. Although there is no question that the broad impacts of this decline affected individuals of all social classes, and ethnic and cultural affiliations, as already suggested by Weiss et al. (1993, p. 1002), the material cultural correlates — what I have called the Amorite *koiné* in the northern Levant during the Early Bronze IV to Middle Bronze I transition — are highly suggestive of a correlation with Amorite populations already residing in the area from the Jazira to the northern Levant. It is, however, quite likely that other elements such as Hurrians and Subarians may be identified in the Levant and southern Mesopotamia in the future. Indeed, in the Levant the presence of Hurrian elements during the Middle Bronze Age has long held a place alongside discussions of Amorite identity. Nonetheless, the conspicuous elements of material culture and linguistic exchanges facilitate a correlation between Amorites and the changes discussed here that were brought about by the start of the second millennium B.C. in the Levant. Although not the subject of this discussion, continued climatic pressures appear to have persisted in marginal areas of the southern Levant during the early Middle Bronze Age. This sustained stress may have been responsible for the demographic "pressure wave" of migration and settlement that worked its way through the region during the early Middle Bronze Age, resulting in the establishment of further Amorite kingdoms such as Ashkelon and Hazor.

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Part III

Egypt

11

"What Is the Past but a Once Material Existence Now Silenced?": The First Intermediate Period from an Epistemological Perspective

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The so-called First Intermediate Period (FIP) has presented Egyptological historiography with significant epistemological problems. Gaps in the evidence available for historiographic reconstruction, the uncertainty about how to interpret a variety of textual sources, and new material evidence have as much led to widely different views as have modern paradigmatic shifts. As a consequence, the FIP has been described variously as a time of calamity, or to the contrary, a time of cultural innovation. Diverse economic, political, and environmental scenarios have been adduced to explain the end of the Old Kingdom and the genesis of the FIP, a transition accordingly labeled a collapse, a decline, a revolution, or more vaguely, a time of crisis (Müller-Wollermann 1986; for the history of research, see Priglinger 2011). As a starting point of reflection on the parameters that have defined modern hypotheses on the FIP, let me quote medieval historian Gabrielle Spiegel, who in her 2009 presidential address to the American Historical Association defined the "Task of the Historian" as follows:

> Precisely what instruments we will deploy in the pursuit of our historical labors is not entirely clear. But I persist in believing that there is one thing that deconstruction has taught us, more powerfully than any other strategy of reading that I know of, and that is to listen to silence. As historians of the past, we are constantly engaged in attending, as Paul Zumthor has written, "to the discourse of some invisible other that speaks to us from some deathbed, of which the exact location is unknown. We strive to hear the echo of a voice which, somewhere, probes, knocks against the world's silences, begins again, is stifled." Our most fundamental task as historians, I would argue, is to solicit those fragmented inner narratives to emerge from their silences. In the last analysis, what is the past but a once material existence now silenced, extant only as sign and as sign drawing to itself chains of conflicting interpretations that hover over its absent presence and compete for possession of the relics, seeking to invest traces of significance upon the bodies of the dead. (Spiegel 2009, pp. 14–15)

This assessment makes a powerful statement about a possible approach to the past by modern historiography. At the same time, it also misrepresents essential challenges that historians, and for that matter, historians of Egypt's FIP, have faced over the past decades. It evokes the past as "a once material existence now silenced," that is "extant only as a sign," for whose possession we would just need to reconstruct its "fragmented inner narratives." It is striking to note that Spiegel does not mention the single most important reason why the past is silenced, a reason why it indeed is not at all extant either as a sign or an echo: the loss of evidence. In two recent essays, John Gee and Karl Jansen-Winkeln have persuasively shown how limited our evidence is and to what extent our historical reconstructions are prone to false coherence and fiction (Gee 2010; Jansen-Winkeln 2009). The extreme scarcity of historical sources and the coincidences of their preservation should caution us against naively equating what happens to be attested with what actually happened, and to disregard the unknown (Jansen-Winkeln 2009, p. 161). In this respect, it is instructive to contrast assessments of the long reigns of Pepi II (the last king of the Sixth Dynasty) and Ramesses II. While the long sixty-four-year reign of Ramesses II is commonly regarded as a factor that guaranteed political stability, the long reign of Pepi II (equally sixty-four, and maybe as many as ninety-four regnal years) is, to the very contrary, often perceived as a major contributing factor to the collapse of the Old Kingdom, having led to "increasing governmental corruption and lassitude" (Morris 2006). Egyptologists have here adopted a teleological perspective (cf. Schneider 2008, pp. 189–90; Jansen-Winkeln 2010, p. 283 n. 57) that judges Pepi II from the ensuing FIP, and Ramesses II from the purportedly stable end of the Nineteenth Dynasty. In actual fact, Egypt was engulfed in a civil war and faced with external threats only twenty years after Ramesses' death, whereas to all appearances a generation after Pepi II, the Old Kingdom was still entirely stable and uncontested (Moreno García 2013b, pp. 149–50).

The most powerful narrative invested by modern Egyptology upon the relics of the First Intermediate Period goes back to the 1920s, and is still prevalent today. Scholars of those years put the end of the old monarchic order of Europe and the Communist revolutions in Russia and Germany on a level with the collapse of the Old Kingdom and the reversal of the hierarchies of society described in the so-called pessimistic literature of the early Middle Kingdom, most famously the Admonitions of Ipuwer. I quote Max Piper, who, in 1928, wrote in his *Egyptian Literature* as follows (Pieper 1928, pp. 22, 25):

> Around 2,500 BCE, the state of the Old Kingdom perished, and it did so in a great catastrophe that reminds us of the events of recent times (…). "A Bolshevik revolution in ancient Egypt," this is the perplexing first impression [of the Admonitions of Ipuwer — T.S.]. It appears as if everything was turned topsy-turvy, precisely like in the past couple of years.[1]

Texts of the FIP itself and literary works of the early Middle Kingdom that allegedly portrayed the preceding era as a period of hunger, civil war, and social unrest, were at that time understood as a historically reliable retrospective, describing a cataclysm similar to the end of the European monarchies, the Communist revolutions, and the economic crisis (Schneider 2008, pp. 133–34; Willems 2008, pp. 133–42). When Jacques Vandier, in 1936, published his seminal study on famines in ancient Egypt and cited civil war as the prime cause of famines in ancient Egypt, he entrenched even more decisively the narrative of the FIP as a period of crisis (Vandier 1936). Toby Wilkinson, in his 2010 history of ancient Egypt, emulated the apocalyptic tenor of the "pessimistic literature" when he described the First and the Second Intermediate Periods as dark ages of chaos that saw Egypt tested to the breaking point in harsh lessons incurred by a weak hereditary monarchy, climate change, and unchecked

[1] "Ungefähr um 2500 v. Chr. ist der Staat des Alten Reiches zugrunde gegangen, und zwar durch eine große Katastrophe, die an die Ereignisse der letzten Zeit gemahnt … 'Eine bolschewistische Revolution im Alten Ägypten,' das ist der verblüffende erste Eindruck. Es sieht so aus, als würde das unterste zu oberst gekehrt, ganz wie in den letzten Jahren."

immigration, only briefly interrupted by the flowering Middle Kingdom (Wilkinson 2010, 101).

Some recent scholarship provides a more nuanced treatment of the "pessimistic" literature as a retrospective historical source for the FIP, such as recent studies by Jansen-Winkeln and Ellen Morris. The latter states as follows (Morris 2006, pp. 66–67):

> Yet despite the tendentiousness of some of these sources and the inevitable indulgence in hyperbole, there is in these purported eyewitness accounts very little that one would not *expect* to observe in a society … that had suffered the effects of both environmental catastrophe and political anarchy. A document known as the "Admonitions of Ipuwer" for example, bemoans ravages caused by famine, civil war, pestilence, incursions of hostile foreigners, and the breakdown of law and order … that supposedly befell Egypt during this time of upheaval. What is fascinating, however, is that the vast majority of space in the text is in fact given over to a series of … complaints about the inversion of social order. Commoners, the text charges, have become owners of wealth …. Critiques of this work have long ridiculed the notion that the admonitions bear any relevance to the First Intermediate Period whatsoever, as the idea that commoners would have access to wealth during a time of social upheaval and want was met with scorn. Yet, this is precisely what we observe in the archaeological record.

It needs to be emphasized, however, that the papyrus on which the text of the Admonitions is preserved dates from the Nineteenth Dynasty, and thus 800 years after the end of the FIP. It is a modern conjecture to posit that the original version of the text was composed in the 12th dynasty and, if so, could be seen as a reaction to the FIP, which even at that time would have been bygone for more than a century. The same epistemological obstacle impairs Jansen-Winkeln's most recent attempt to explain the end of the Old Kingdom by a military invasion alluded to in the Instruction for King Merikare (Jansen-Winkeln 2010, pp. 297–99) — a text set in the Heracleopolitan dynasty of the FIP but preserved only in manuscripts from the Eighteenth Dynasty, 600 years after the purported historical setting, and indeed perceived by some scholars as a composition of that very time (Gnirs 2006). The fundamental problem well acknowledged by Jansen-Winkeln himself is the lack of contemporary evidence in most areas critical to a proper understanding of the FIP. Only the later part of the FIP is better known to us, and Upper Egypt (Seidlmayer 2000, pp. 138–39; Seidlmayer 2006). The earlier part of the FIP, including the Eighth Dynasty that reigned from Memphis and the dynastic history of the Heracleopolitan kingdom that controlled Middle and Lower Egypt is virtually a blank spot. Royal monuments of the Heracleopolitan kings are not presently known. Establishing a chronological sequence for private monuments, holders of offices, and thus social and administrative developments is often not possible (Grajetzki 2013, pp. 217–18). Nadine Moeller's current excavation of Tell Edfu will, for the first time, establish a complete sequence of FIP settlement layers at one significant urban site of ancient Egypt, and thus allow for a study of the interface of state and regional authorities, as well as the adaptation of a regional society and economy to changing political and environmental contexts.

Aliezer Tucker, a philosopher of history who has extensively worked on questions of epistemology, identifies paucity of evidence as the single most important cause for the underdetermination of historiographic hypotheses (Tucker 2004; Tucker 1998; for an application of this approach to the foreign policy of the Old Kingdom, see Schneider 2014). He posits that progress in underdetermined areas of historiography depends on (1) expansion in the evidential base; (2) better historiographical hypotheses; (3) theoretical innovation that discovers nested information. He concludes:

> Historiography aspires to provide hypothetical descriptions of past events as the best explanation of present evidence. This knowledge is probably true, but it is not true in an absolute sense. *A benchmark for the veracity of historiography is which hypotheses increase the likelihood of the evidence more than others.* (Tucker 2004, p. 261; emphasis T.S.)

As a matter of fact, scholarly progress has been made in all three areas singled out by Tucker for overcoming underdetermination: increase in evidence, better historiographical hypotheses, and theoretical innovation. The Egyptological debate about the motif of famine (or more precisely, food shortage) that has unfolded since the mid-1990s is an exemplary case of all three avenues of progress singled out by Tucker. Texts of the FIP mentioning famine have been re-read in alignment with an approach championed in Egyptology by John Baines that recognizes texts as instruments of social demarcation (Baines 2007, pp. 191, 308–09). In consequence, what texts tell and do not tell ("decorum") is historical inasmuch as it reflects primarily the social status of the people presented in and responsible for the texts. A first study in this spirit by Moreno García (1997) denied the famine motif any historicity, perceiving it as a purely ideological topos linked to the idea of good governance and efficace administration. In his critique of Moreno's study, Ludwig Morenz declared the motif of famines an "open fact between topos and reality" (Morenz 1998; Morenz 1999), thus effectively removing it as an argument usable in the reconstruction of FIP realities or mentalities. Continued debate on this problem has resulted in a more substantiated historiographical hypothesis that sees food shortage as a phenomenon by no means more frequent in the FIP than in other periods (cf. Coulon 2008). However, the literary use of the motif would have been part of a new rhetoric of official self-presentation that disappeared again in the early Middle Kingdom (Franke 2006, pp. 176–79; Moreno García 2013a; Coulon 1997) when the theme of food provisioning was transferred to the kings and used for royal self-presentation (Eichler 2003). Food crises were thus neither fictitious nor particular to the FIP (and can thus not be seen as a sign of crisis) but had become socially significant as contexts in which individual power and social dependence could be legitimized (Seidlmayer 2000, pp. 130, 146) and through which social memory and an offering cult could be ensured (Moeller 2005, pp. 165–66). FIP presentations of the motif are also devoid of any note of despair that is the hallmark of the aforementioned "pessimistic" literature (Seidlmayer 2000, p. 146). This new assessment of the FIP famine texts has also benefitted from a critique of the hypothesis that an abrupt change of climatic conditions could be a decisive factor in the collapse of the Old Kingdom (Moeller 2005). Climate data indicate a gradual deterioration of climatic conditions that reached an extreme in the Old Kingdom and allowed for adaptation; as a matter of fact, flood levels during the FIP were even slightly above the average of the late Old Kingdom (Moeller 2005, pp. 155-56; Seidlmayer 2000, p. 129; cf. Butzer 1997). New evidence has thus invalidated one of the underdetermined historiographical hypotheses about the FIP.

It needs to be noticed here that the notion of a climate-induced FIP continues to inform widely used textbooks (e.g., Bard 2008, p. 163) and is also perpetuated in studies that otherwise try to redefine our understanding of the FIP, producing a distorted epistemological situation. Morris' innovative article on the blossom and profusion of FIP funerary culture still posits for the end of the Old Kingdom "extended bouts of ecological disasters" and "unremitting series of low floods" that resulted in famines with catastrophic economic consequences

(Morris 2006, p. 60). She also assumes a sharp spike in the overall mortality for that period, as a consequence of famines, civil unrest, and regional warfare, and ascribes the prevalence of weapons and weapon models in tombs to an increased concern for survival (ibid., p. 60). The main references cited here for the rise in overall mortality are studies from the 1970s. In contrast, the examination of FIP cemeteries by Seidlmayer identifies demographic growth and the establishment of extensive and well-equipped cemeteries for ordinary townspeople as the main reason for the increase in graves, not a rise in actual mortality (Seidlmayer 1990; Seidlmayer 2000, pp. 121–22; for a discussion of the mortality, see Willems 2008, pp. 154–56).

Let us take the recovery of the actual bodies of the dead from the FIP as a source of knowledge for Gabrielle Spiegel's metaphorical bodies of the dead as an opportunity to briefly review the peculiarities of the material evidence. What sets the FIP apart from the Old Kingdom are significant changes in the material culture in Upper Egypt, and thus what seem to be at least partially different trajectories of cultural development (for this and the following, cf. the clear overview provided by Seidlmayer 2000). The end of the centralized government of the Eighth Dynasty entailed a shift of power to the provinces of Egypt (Moreno García 2005). The institution of nomarchs as representatives of the central authority was mostly replaced by local and largely independent leaders. Monumental royal architecture came to a total stop after the reign of Pepi II, only to be resumed under Mentuhotep II, the founder of the Middle Kingdom. Later Egyptians regarded the end of royal succession (which also discontinued the foundational myth of Egyptian kingship) as a formal period break; at least in the south where such evidence is preserved, local gods now assumed supreme authority (Seidlmayer 2000, pp. 131–32). We observe significant urban development, with the towns becoming a center of regional identity in which the local leaders established a system of patronage (Franke 2006). Distinctive local traditions of tomb construction gave the new local elites an instrument to express regional identity and authority, as in the case of the Theban *saff*-tombs. The observation of vigorous social development in the provincial towns of Upper Egypt, as well as a thriving culture among the poorer levels of society, has been at the basis of a scholarly narrative competing with that of a collapse — that of a momentous, though temporary, shift in Egypt's centers of activity and dynamism (Seidlmayer 2000, p. 147; Morris 2006, p. 61).

Guy Brunton was the first to be surprised, when excavating the cemetery of Qau in 1927, by the prosperity and wealth visible in the equipment of non-elite graves. Provincial cemeteries display broader social access to prestige goods formerly restricted to the administrative elite, an opportunity for people of lesser social position to enhance both their status and social values (Moreno García 1997; Seidlmayer 2000 and 2001; Morris 2006). Discounting the mere availability of extra income after the end of state taxation as an explanation, Ellen Morris has suggested that the presence of the burials of these "new rich" indicates social competition: when personal advancement seemed feasible, mortuary equipment was an area where formerly less privileged segments of society could emulate elite culture and thus pretend to have moved up socially, as is evident in cemeteries at Akhmim, Abydos, Elephantine, Edfu, Cusae. Such social climbing would later again have been inhibited by the "true" elites (Morris 2006, pp. 62, 65–66, 67). Beyond the mere access to prestige goods, the evidence also shows significant innovation in the material repertoire and the religious beliefs: new types of pottery took advantage of the potter's wheel; the scarab-shaped seal was invented; the funerary equipment was supplemented by wooden figures, mummy masks, and slab stelae as markers of the offering place in tombs (Seidlmayer 2000). Some of these innovations also document wider access to religious beliefs and support the idea of a "demotization" of the afterlife (Seidlmayer 2000, pp. 122–27). The well-entrenched idea, however, that the main funerary text corpus of the Middle Kingdom, the Coffin Texts, would owe its genesis to the new intellectual milieu of the FIP, has been thoroughly dismissed (Willems 2008).

It is interesting to note that scholarship seems still impaired by judgmental views on the cultural changes apparent in the FIP. In an article published in 1922, Alexandre Moret lauded the Egyptian revolution of the FIP when former royal privileges became the "common good of all classes of society"; when "monarchist socialism" ceded some of their rights to the plebs (after Willems 2008, pp. 135–36). By contrast, Hermann Kees, who as a representative of Germany's landed nobility and a right-wing politician aspired to reinstitute the monarchy and to abolish the Weimar Republic, condemned, in his book on Egyptian funerary religion of 1926, the non-educated masses of the FIP for their recourse to magic and their uncomprehending usurpation of religious texts (Kees 1926, p. 235):

> The character of this time is by all means unlettered and at a cultural low, boorish to the degree of being entirely outwardly, but at the same time, covetous for all privileges: one wants to possess, no matter whether it is suitable or not. By comparison with the aristocratic doctrine of the pyramid age, this time has by all means a proletarian demeanor.[2]

In more recent scholarship, there has been a marked tendency to emphasize the innovations of the FIP as an "upsurge of outstanding creativity, adapting and developing the existing media of literary and pictorial expression to correspond to a new range of social experiences" (Seidlmayer 2000, p. 133), despite a dramatic decline in artisanship. Egyptologists have also increasingly hailed the participation of broader segments of society in funerary culture. I quote from Seidlmayer:

> Passing on the traditions of élite culture to a wider circle of users went hand in hand with a marked loss of artistic quality. Not infrequently even iconographic patterns were misunderstood and formulaic inscriptions misconstrued. While the provincial art of the First Intermediate Period often exhibits an astonishing degree of originality and creativity (...), there is no way of denying that many pieces are simply ugly and incompetently made. This aspect, in particular, has caught the attention of historians and was taken as a sign of overall cultural decline during the First Intermediate Period. However obvious the latter interpretation may seem, to assume that this was simply a period of cultural decay would be to overlook two important processes: first, the assimilation of cultural models developed in Old Kingdom court culture on a nationwide basis, and, secondly, the emergence of mass consumption. (Seidlmayer 2000, pp. 124–25)

This tendency of a more positive assessment of the FIP (Moreno García 2013b, pp. 146–47; reflected also in the adoption of a new term for the period, "the era of regions," in Morenz 2010), which makes scholars implicitly side with the formerly less privileged populace and not the elite¸with Alexandre Moret and not Hermann Kees — seems a potential bias for our modern interpretation. At the same time (as proposed by Müller-Wollermann in 1986),

[2] "Der Charakter dieser Zeit ist durchaus ungebildet, kulturell auf dem Tiefstand, roh bis zur vollsten Äußerlichkeit, dabei begehrlich nach allen Vorrechten: man will besitzen, gleichgültig ob es paßt oder nicht. Der aristokratischen Lehre der Pyramidenzeit gegenüber hat also diese Zeit ein durchaus proletarisches Gebahren."

a growing number of Egyptologists have decided to abandon the notions of "collapse" or "decay." Rather, they are inclined to see the end of the Old Kingdom and the FIP as a period of crisis in the generic sense of the term, a time of critical decisions (Seidlmayer 2000, pp. 145–47) that allows for different historical trajectories — a use of the term as a hermeneutic lens also adopted in modern historiography (cf. Shank 2008).

In this respect, it is intriguing to contrast the cultural and political profiles of southern and northern Egypt that show significant variation, apart from much similarity. The Heracleopolitan kingdom perpetuated traditions of the Old Kingdom state, maintaining, for example, the institution of nomarchs for regions tributary to it in northern Upper Egypt (Assiut, Akhmim, el Bersheh). These nomarchs (e.g., at Assiut) also continued to emphasize their dependence on the king. By contrast, the king was no longer mentioned as a historical protagonist in the south. Here, the institution of nomarchs was abandoned; local leaders under various designations ruled prior to the establishment of the supremacy of the Eleventh Dynasty. In the area of material culture, the development of pottery follows entirely different courses in the north and the south. In other respects, however, north and south seem to have undergone similar developments — to mention only similar types of burial equipment, the same ethos of individual leadership and care for the populace, as well as newly displayed military strength, including local armies, Nubian mercenaries, and fortresses (Moreno García 2013b, pp. 147–49). The picture is ambiguous. Both the deficient archaeological evidence for the Heracleopolitan kingdom and the difficulties of dating known monuments from the FIP are obstacles for knowing whether the Heracleopolitans can indeed be considered a distinctive cultural unity (Seidelmayer 2000, pp. 139–40). They also impair our ability to understand the historical reasons leading to the end of the Old Kingdom and the fragmentation of Egypt in the first place. So what are, in the words of Gabrielle Spiegel, these "conflicting interpretations that hover over [the past's] absent presence and compete for possession of the relics"?

The majority view today is that the Old Kingdom came to an end not all of a sudden but due to a gradual failure of its central institution, Egyptian kingship that had allowed significant political and economic problems to accumulate throughout its last two dynasties. In her systematic analysis of the state of research published in 1986, Müller-Wollermann identified as most significant a number of problems of governance labeled by her "Legitimationskrise," "Partizipationskrise," "Penetrationskrise," and "Distributionskrise," respectively (Müller-Wollermann 1986; cf. also Málek 1989). These four scenarios of crisis pertain to (1) the (purported) difficulties to legitimize royal kingship; (2) a shift in power from the center to the provinces, generated by the growth of administration; (3) the inability of the center to maintain control in the parts of the country due to a lack of organized provincial administration; and (4) the overstretched economy of the Old Kingdom. These models, clearly tagged as hypotheses in 1986, are in more recent scholarship often presented as proven causes for the end of the Old Kingdom (e.g., Bárta 2013, pp. 174–75). Moreno García at the very least admits that the end of the Old Kingdom was "precipitated by political circumstances still poorly understood" (Moreno García 2013b, p. 151). Climatic factors have often been adduced as an additional factor, or a crisis accelerator (Müller-Wollermann 1986; Morris 2006, p. 60), but have been discarded in a recent study by Nadine Moeller (2005).

An alternative — and provocative — hypothesis to explain the collapse of the end of the Old Kingdom and the advent of the FIP is owed to Karl Jansen-Winkeln (2010). He demonstrates, in my opinion persuasively, that the most widely adopted view of internal political, economic, and social causes for its demise have no factual basis in our evidence. Rather, they are modern assumptions imposed on the evidence from a teleological perspective that, in a circular argument, projects elements of the FIP crisis back into the Old Kingdom in which those elements then become the inevitable cause of later disaster. A telling example are the decrees of the later Old Kingdom that exempted certain institutions from levies or services, preserved in stone copies set up by the beneficiary. They were seen as an indication of the decreasing power of the king who would no longer have had access to those resources. In actual fact, the awarding of privileges is an indication of a king's power who by doing so may have strengthened his rule; moreover, the many instances where privileges were withdrawn were not recorded in stone as the beneficiaries had no interest in communicating the loss of benefits (Jansen-Winkeln 2010, pp. 284–85). Evidence from the Eighth Dynasty indeed confirms that it was still a period of stability: the fiscal system was operative, and the authority of the crown was still acknowledged as far as Elephantine (Moreno García 2013b).

In Jansen-Winkeln's view, this state of affairs supports the idea of an abrupt end of the Old Kingdom. He posits that the Old Kingdom was ended militarily by an invasion of Asiatics to the Nile delta and their advance towards Memphis, an incursion indeed mentioned in a literary text, the "Instruction for King Merikare." This text from the genre of Egyptian wisdom texts contains advice for good governance addressed to Merikare, one of the Heracleopolitan kings, by his father, and introduces the instructions by a historical retrospective that speaks about incursions of Asiatics to the Nile delta and the Heracleopolitan fight to defeat them. The end of the Old Kingdom would then be paralleled by later instances of Egyptian history where the rule of a kingdom or a dynasty was terminated by a military invention. Jansen-Winkeln diagnoses an adversion of Egyptology to political history and sees a growing influence of sociological and anthropological models in our field as the reason that has prevented Egyptology in recent decades from considering such an explanation. He comments sarcastically (Jansen-Winkeln 2010, p. 300),

> External events are alien to their [sociology and anthropology's] disciplinary paradigms since sociological and anthropological developments happen within societies and cultures; for them one wishes to develop "models." Surprise attacks by the Huns are absolutely unwelcome in such a context.[3]

Jansen-Winkeln sees a suitable international context for this military scenario in the destruction of Ebla, Byblos, Tell Leilan, and Tell Brak around 2200 B.C. as well as the suggested role of the Gutians in the end of the empire of Akkad and of the Amorites in the end of the 3rd dynasty of Ur. Within the context of Egypt itself, he believes that the hypothesis of a military invasion is apt to account for the postulated abrupt nature of the Old Kingdom, the lack of historical evidence from the Nile delta, the abandonment of Memphis as the capital city of the Northern kingdom and the Giza necropolis, and the various changes visible in the material culture (Jansen-Winkeln 2010, pp. 233–39).

While Jansen-Winkeln successfully demonstrates the fragility of existing hypotheses about the end of the Old Kingdom and the emergence of the FIP, his own proposal cannot at present carry the burden of proof. The lack of information on the later Old Kingdom and the

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[3] "'Von außen' kommende Ereignisse sind dort gewissermaßen ein Fremdkörper im fachlichen Paradigma: soziologische und anthropologische Entwicklungen spielen sich in Gesellschaften und Kulturen ab. Für sie möchte man 'Modelle' entwickeln, überraschende Angriffe der Hunnen sind dabei gänzlich unerwünscht."

early FIP and the difficulty of dating FIP artefacts makes it at present impossible to confirm that the Old Kingdom ended abruptly rather than, say, within a period of one generation. The Nile delta is an archaeological disaster zone in which most evidence has vanished either through the sedimentation of the Nile or human impact. The absence of evidence for the Heracleopolitan dynasty has thus no argumentative weight; neither the pyramids of the kings have so far been found in the well-known necropolis of Saqqara nor have any royal monuments been uncovered in the kings' capital city Heracleopolis itself after forty years of excavation (Seidlmayer 2000, pp. 139–40). The abandonment of Memphis can in principle have been caused by other than military considerations, and since the pyramid of Merikare (and probably those of other kings of the Heracleopolitan dynasty) was indeed located in Saqqara, can we actually be sure that the kings did not retain Memphis as a residential city? Lastly, the material and cultural repertoire is only partially different in the north and the south. It seems difficult to explain why, to cite the most prominent divergence, a military intervention in the north would have resulted in a new type of pottery in the south. If the instruction of Merikare does not in fact pertain to the FIP (see p. 313), the only explicit historical source for a military incursion onto Egyptian territory is obsolete. More fundamentally, and despite the fact that the Egypt of the Old Kingdom did not possess a standing army, is there any suitable military power that, in the mid-twenty-second century B.C., would have been in a position to make a major raid from the Sinai or Palestine into the Egyptian Nile delta and advance toward Memphis?

This hypothesis, while it is certainly apt to revive the debate about the end of the Old Kingdom and to question entrenched views, is at odds epistemologically with Jansen-Winkeln's own premises not to combine the few coincidentally known historical facts into a narrative that must necessarily be wrong but to strive instead for an approach that "suits the situation of our evidence" (Jansen-Winkeln 2009, p. 161). It is also at odds with Aliezer Tucker's definition of the benchmark for the veracity of historiography — hypotheses that increase the likelihood of the evidence more than others. In consequence of our present situation of evidence, I do not think that we can, as Gabrielle Spiegel urged us to do, "solicit those fragmented inner narratives to emerge from their silences." The evidence is far too sketchy and too ambiguous to be assembled onto a reliable historiographical canvas; we possess too few relics to invest traces of significance upon the bodies of the dead. Pending substantial new sources, there is no clear echo of a voice for us to hear "which, somewhere, probes, knocks against the world's silences." In the meantime, probing the extant evidence for its purpose and premises enables us not to follow wrong echoes from the silenced past. Recent scholarship on the First Intermediate Period has been successful in making that epistemological turn.

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* The manuscript was submitted to the press in 2014. Later literature could not be included.

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12

Absolutely Dating Climatic Evidence and the Decline of Old Kingdom Egypt

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The fate of the Egyptian Old Kingdom is central to the hypothesis that an abrupt climate change caused widespread societal collapse in the late third millennium B.C. Evidence suggests that the climatic anomaly occurred around 4,200 years ago, and hence it has become known as the "4.2 ka event." Old Kingdom Egypt is integral to the debate because of the state's preeminence in the region at this time, and also because its decline is so well attested in both the historical and archaeological records. Over recent times, the collapse of the Egyptian state has become a battleground between socio-political factors and the climate determinism (Weiss et al. 1993; Butzer 1997; Hassan 1997a). The former explanations cannot easily be tested by empirical measurement and are therefore not addressed in this paper. Very briefly, however, such narratives focus on the mismanagement of the royal estates. It is well established that the late Old Kingdom saw stepwise increases in endowments of royal land to the provincial elite, often accompanied by exemptions from tax and the commitment of labor to state projects (Butzer 1997). As a result, it is contended, the balance of wealth and power migrated away from the capital to the provinces, and, during the long and troubled reign of King Pepy II, the authority of the centralized state declined to the point of insignificance. All such analyses relegate climatic effects to a subordinate role, or even disregard them entirely. The University of Oxford's Radiocarbon Accelerator Unit (ORAU) has just embarked on a three-year radiocarbon-based study that aims to determine whether this treatment is justified. The intention of this paper is to outline the rationale for the research project, and to argue that the resolution of such questions for Egypt, and elsewhere in the ancient Near East, is now within the capacity of modern scientific analysis.

A Chronometric Response to the Problem

Although contemporary accounts of climatic crises toward the end of the Old Kingdom are found in Egypt, their value and reliability have generally been challenged (see Schenkel 1965, p. 54; Seidlmayer 2000, p. 129). Nonetheless, the relationship between the early civilization and the flow of the Nile was so precarious that such possibilities are not easily rejected. Old Kingdom Egypt depended existentially on the river Nile. As well as a year-round supply of freshwater, the nutrient-rich inundation that occurred each summer nurtured the crop

* This project is being conducted under the auspices of an Early Career Fellowship (ECF-2012-123) sponsored by the Leverhulme Trust.

growth upon which the welfare of the state was based (see Hassan 1997b). So complete was their reliance on the river that even minor fluctuations in flood level could have had significant consequences. Low levels may not have allowed all the cropland to be irrigated, resulting in poor harvests and, in the worst cases, famine. This encapsulates a key feature of the climate determinist argument: it is not predicated on the Nile drying up entirely, only being reduced to detrimentally low levels. Moreover, as the state was entrusted with maintaining the grain stocks necessary for withstanding such events (see Kemp 2006, p. 304; Butzer 1976), it is certainly conceivable that a major drought would have fomented societal turmoil. Thus, in the early 1990s, when the first evidence began to emerge in support of a severe aridification event in southwest Asia in the late third millennium B.C. (Weiss et al. 1993), interest was renewed in the contemporaneous behavior of the Nile.

The primary sources of information on the Nile floods during the Old Kingdom are the records kept by the ancient Egyptians themselves. Reappraisals of such records over recent decades (see Bell 1970; Butzer 1976; Hassan 1981) have generated two conclusions germane to the debate at hand. Firstly, there are no surviving records from within about two centuries either side of Pepy II's reign, the period in which the state ultimately collapsed. Secondly, reconstructing the nature and extent of past inundations is deceptively complex. This is mainly because the base of the river has continually changed over time as a result of variations in flood volume, channel cutting, silt deposition, and sea level (see Hassan 1981). At their very best, such analyses are only able to provide coarse estimates of past activity. Despite these qualifications, the general pattern does seem to be one of decreasing Nile flow over the course of the third millennium B.C. (Bell 1970).

A second approach to reconstructing historical floods has been to extract environmental cores from the Fayum depression or the Nile delta (Hassan 1986; Stanley et al. 2003). Sedimentary analysis of such archives can provide information on the past hydrodynamics of the river. However, the principal shortcoming of this approach is the associated dating information. Few studies have obtained the density of chronometric information necessary to facilitate direct comparisons between the environmental and historical records. A major obstacle is the scarcity of good sample material for radiocarbon dating. Unfortunately, plant macrofossils and charcoal fragments are rarely found in such cores. Indeed, most dating has been based on isolated measurements on bulk organic sediment. Yet further chronological challenges must also be addressed in the case of the Nile valley and delta. It has been shown that sediments, and even plant macrofossils, in the lower valley can return radiocarbon dates that are significantly offset from expectation. Dee et al. (2012) ostensibly observed this effect. In their study, organics extracted from mud-seals impressed with early royal names often produced radiocarbon dates several centuries older than historical estimates. Current thinking is that this phenomenon relates to the extended residence times of the organics in the river channel. To elaborate, surface-level organics in Egypt may have actually originated many hundreds of kilometers away, and their passage downstream may have occurred in a prolonged and episodic manner.

Combatting all of these dating challenges was central to the rationale of the ORAU project. One of the principal strategies was to shift the focus of the environmental analysis from Egypt to the main source of the flood: the Blue Nile catchment in the Ethiopian highlands. There were two main reasons for adopting this approach. Firstly, it is self-evident that lake-level variation in the catchment must have been synchronous with flood-level variation in Egypt. Thus, dating the precipitation record in the highlands should provide direct information on water levels downstream. Moreover, this approach avoids the complications of sediment retardation en route to the Nile valley. Secondly, there is a direct connection between rainfall in the Ethiopian highlands and the climatic systems purportedly responsible for the 4.2 ka drought in Southwest Asia. The preponderance of Nile floodwater comes from the midsummer Indian Ocean Monsoon (IOM) in the Horn of Africa. Further, it is the interplay between this weather system and the Mediterranean winter westerlies that is generally thought to be responsible for the period of aridification in question (see Cullen et al. 2000; Parker and Goudie 2008). Thus, if the IOM did in fact weaken over Southwest Asia, the same effect is likely to be evident in the Ethiopian highlands. However, an important caveat must be added. Recent analysis of precipitation records (Costa et al. 2014; Levin, Zipser, and Cerling 2009) in the Horn of Africa suggests that a component of the rainfall in the Ethiopian highlands during the summer months comes from Atlantic westerlies traversing the entire Congo Basin. Indeed, the meteorological regime of the highlands appears to be highly dynamic and multi-faceted (see fig. 12.1). The majority of the precipitation does come from the IOM, but the amount contributed by the Congo Air Boundary is as yet unclear. Thus, a drought signal in the Blue Nile catchment around 4.2 ka could either confirm that the IOM was especially weak at this time, or potentially suggest that this climatic anomaly extended over a far greater geographical area (deMenocal et al. 2000; Thompson et al. 2002).

The two lakes chosen as the main focus of this study are Lake Tana, often described as the source of the Blue Nile, and Lake Hayk (fig. 12.1). Marshall et al. (2011) produced a high-resolution scan of a core from Lake Tana and the data obtained do appear consistent with reduced precipitation around 4.2 ka. This conclusion was based on a seismic reflector at this level commensurate with reduced sedimentary input or low lake level; ^{13}C isotopic shifts that implied a greater contribution from arid habitat (or C4) plants; and geomagnetic analysis consistent with dried, oxidized soil in-wash. Similar, but as yet unconfirmed patterns are also being observed at Lake Hayk. Five new radiocarbon dates are being obtained on each lake core around 4.2 ka in order to shore up the dating of these observed anomalies. However, the scarcity of good material for radiocarbon dating that besets analysis in the lower Nile is, unfortunately, also true in the catchment. In order to address this problem, the radiocarbon samples at each lake are being interleaved with new optically stimulated luminescence (OSL) dates. The advantages of this approach are twofold. Firstly, OSL dates can be made on sediments in which there are few organic remains. The measurement obtained is a chronometric estimate for when the sample was last exposed to sunlight; that is, when the layer was formed. Secondly, OSL dates are not subject to the reservoir effects that can distort radiocarbon dates on lacustrine and marine sediments. Reservoir effects arise where aquatic organisms incorporate carbon that is already significantly depleted in the radioisotope relative to the atmosphere. One such pathway involves the carbon dioxide that is absorbed at the water surface being stored for such a long period of time that significant losses occur due to radioactive decay before the carbon compounds enter the food chain. This scenario requires an immense body of water and is usually only observed in the oceans (e.g., Mangerud 1972; Stuiver and Braziunas 1993). Reservoir effects may also arise, however, in freshwater due to the dissolution geological carbonates, such as limestone (e.g., Cook et al. 2001). Such erosion introduces carbon that is often millions of years old and therefore devoid of radiocarbon. In order to ensure such issues do not affect the data obtained by this project, it is intended that some radiocarbon measurements be made on modern plants and fish at Lake Tana and Lake Hayk. One of the most immediate tests of the reliability of the results, however, will be if the radiocarbon and OSL dates cohere with depth.

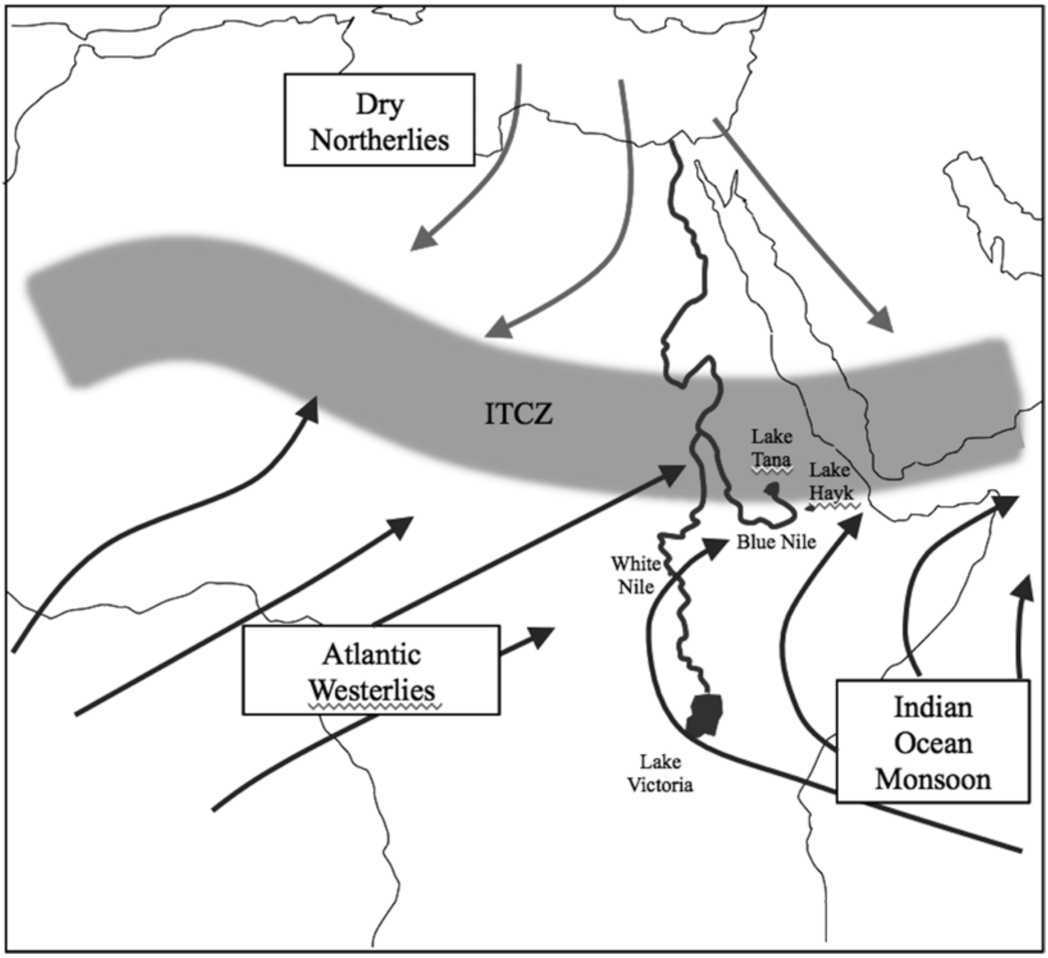

Figure 12.1. The precipitation patterns influencing the Blue Nile catchment during the summer flood. At this time, the Inter-Tropospheric Convergence Zone (ITCZ) is at its northernmost point and humid air is drawn in from both the Atlantic Ocean (the Congo Air Boundary) and the Indian Ocean (the African summer monsoon)

The chronometric strategy of this project is readily extended to the archaeological analysis. While the finer details of the historical chronology exceed what is possible by radiocarbon dating, the Old Kingdom still effectively forms a relative sequence that is "floating" in absolute time. That is to say, the ordering of many of the rulers may be resolved and the lengths of individual reigns may also be well established, but there remains significant uncertainty about the precise positioning of the chronology on the absolute timescale. This problem largely stems from the paucity of definitive astronomical tie-points in the third millennium B.C. (see Parker 1974; Kitchen 1991). Consequently, Kenneth Kitchen (1991) estimated that any calendar dates cited for the Old Kingdom are in fact only accurate to within one or two centuries. Radiocarbon dating provides a means by which absolute dates may be directly assigned to the dynastic sequence. Bronk Ramsey et al. (2010) published one of the best-known attempts at this goal. However, by the authors' own admission, their study concentrated mostly on the Middle and New Kingdoms, and the late Old Kingdom was one of the most sparingly dated sections of the whole chronology. As a result, one of the key objectives of the current project is to obtain twenty to thirty new dates on archaeological material from the Fifth and Sixth Dynasties and the subsequent First Intermediate Period. More broadly, by applying this same chronometric methodology, the archaeological and environmental analyses remain precisely analogous.

The final feature of this project that will enable it to differentiate specific events with unprecedented precision and hence reveal the exact temporal relationship between any drought event and decline of the state is the comprehensive application of Bayesian modeling. This mathematical technique (Bayes 1763; Bronk Ramsey 2009) has become a key tool for improving chronometric date ranges (e.g., Bronk Ramsey et al. 2010; Dee et al. 2013). Radiocarbon and OSL dates are in fact expressions of probability, with some calendar years being basically more likely than others. Bayesian modeling allows such expressions to be refined by combining them with independently derived chronological information. The most common example of such information is relative ordering. In this study, the two main types of ordering being utilized are stratigraphy (the depth of the lake core sample) and the king lists (the historical period of the archaeological sample). While requiring considerable computer power and complex calculations, Bayesian probabilistic analysis also makes intuitive sense. Several illustrations of how the method can achieve such reductions in age range and how effective it can be for investigations of this nature are given in figure 12.2.

Progress and Potential Implications

The three-year research project is nearing its midpoint, and progress has been both steady and informative. For the new archaeological chronology, items have already been sampled for dating from the Natural History Museum, and the Petrie Museum of Egyptian Archaeology in London. Negotiations are also in progress for permission to sample material at the British Museum. It is worth emphasizing that an updated scientific chronology of the Old Kingdom and an improved estimate for the length of the First Intermediate Period are of considerable interest in their own right, and the congruence of the new dataset with established historical dates will be an important tangential outcome of this research. Radiocarbon and OSL dating of the lake cores from the Ethiopian Highlands has proved more challenging. Initial attempts at extracting and dating pollen fragments were unsuccessful, but sufficient quantities of other datable material are present for the achievement of robust chronometric results. On the contrary, the geochemical and archeo-botanical analysis of the sediments of Lake Hayk, which will complement the data already published for Lake Tana, is proceeding smoothly. Indeed, the temporal scope of the paleoenvironmental analysis extends well beyond the focus of this particular project, and the data obtained will provide a valuable resource for a variety of future studies in the Horn of Africa.

The three pivotal absolute dates that will be obtained by this project are the accession date of Pepy II, the date for the environmental anomaly in Lake Tana, and, assuming such a feature is confirmed in Lake Hayk, the corresponding date at this location. By implementing the Bayesian modeling approaches discussed in this paper, the highest precision possible will be achieved in each case. Indeed, the examples provided in figure 12.2 illustrate what is possible with just three chronometric measurements and some basic ordering information. With more than fifty new dates being generated by this work, it is hoped the accession date for Pepy II will be decadal in range, and the key lake core strata of the order of about a

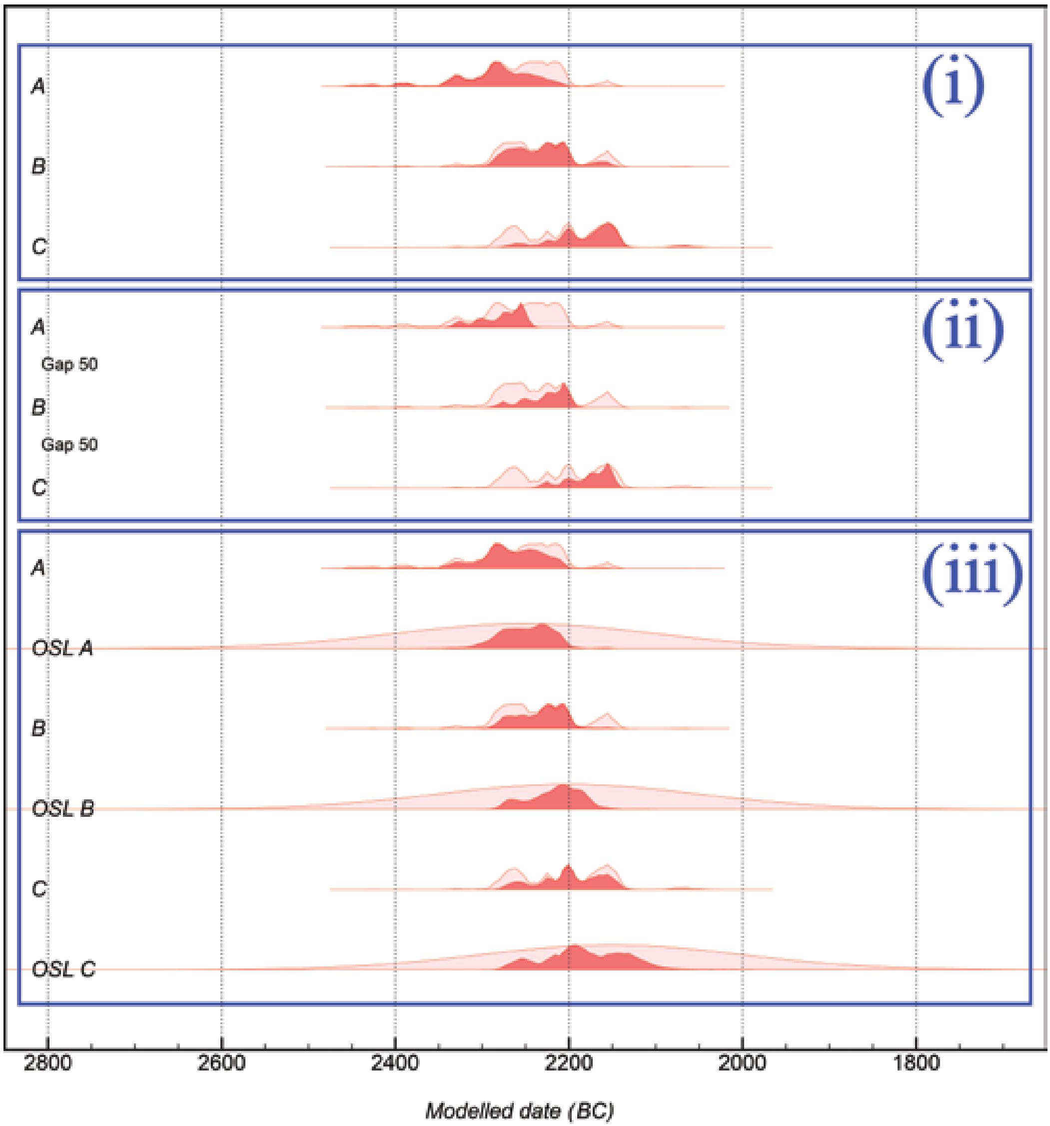

Figure 12.2. Strategies employed in Bayesian modeling, showing the kinds of improvements that can be achieved by incorporating relative dating information (light red = before modeling; deep red after modeling). (i) The output of a model of three typical radiocarbon dates around 4.2 ka, where the known relative age of the samples is A > B > C. (ii) The output using the same four dates assuming there is exactly fifty years between each sample (simplified king list example). (iii) The output using the same four dates, interspersed with four OSL dates, assuming the samples are assigned depths 5 cm apart (simplified lake core example)

century. If the climatic shifts at each lake are synchronous, and the paleoenvironmental data are consistent with an aridification event, it will be readily arguable that the same event was responsible for both. At this time, the climatic signals will be juxtaposed with the date for Pepy II generating three possible outcomes. Firstly, if the drought event predates or postdates the reign of Pepy II by several hundred years, it will be concluded that the event had little or no effect on the fall of the state. Secondly, if the aridification event itself is shown to span much of the Old Kingdom, rather than being especially abrupt, it could be postulated that long-term climate pressures exacerbated but were not fundamental to the political crisis. Finally, if it is determined that the event was intense, and occurred just prior to or during the reign of Pepy II, it could be deduced that the 4.2 ka event was instrumental in the collapse of the state. It is expected that all the analysis will be completed in 2015, and thereafter the results submitted for publication.

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13

The Significance of Foreign Toponyms and Ethnonyms in Old Kingdom Text Sources

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In loving memory of Annemarie

Introduction: Difficulties in Evaluating and Assessing Toponyms and Ethnonyms

The analysis of toponyms and ethnonyms is highly complicated because they often form an exception to common rules of word formation and semantics. The reasons for this are manifold: Toponyms and ethnonyms usually remain in use for a very long period of time so that, between the time of their creation and their first attestation, the morphological patterns and the semantics of words involved may have changed considerably. Therefore, toponyms and ethnonyms can reflect a more archaic state of language than the comparative materials which function as the basis for evaluation.[1] They even may belong to foreign languages or remote dialects which have left hardly any traces in written records except for isolated words or a substratum to be found in onomastics.[2] Furthermore, names of places and peoples may have been altered in order to explain them or to provide them with a new meaning by means of re-analysis or folk-etymology.[3]

The evaluation of toponyms and ethnonyms becomes even more challenging if the onomastic data are only found in ancient written sources, sometimes even in somewhat dubitable context, and cannot be connected to archaeological sites. This especially holds true if the toponyms and ethnonyms investigated lack a modern equivalent, if there is no continuous and uninterrupted attestation over a long period of time, if they are etymologically

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I would like to express my sincere gratitude to Felix Höflmayer as the organizer and editor of this volume, and to Julien Cooper, who is currently preparing his Ph.D. dissertation on ancient Egyptian toponyms for publication. Furthermore, I am very much indebted to Janet H. Johnson, Boyo Ockinga, and Melanie Granditsch for valuable suggestions and for proofreading my manuscript. I would also like to thank Thomas Urban, Leslie Schramer, Rebecca Cain, and Alexandra Cornacchia for their patience and efforts when laying out this intricate manuscript. However, needless to say, all mistakes and errors of fact or judgment are my responsibility alone.

[1] One can mention here the Egyptian toponym *Ṯb-nṯr* > Σεβέννυτος, ᴮϫⲉⲙⲛⲟⲩϯ "calf of god" with *ṯb* "calf," which is otherwise unattested; see Gauthier 1925–1931, vol. I, p. 191, vol. VI, p. 74; Montet 1957–1961, vol. 1, pp. 103–04; Helck 1974a, p. 179; Gundacker 2009, vol. 1, pp. 122–23; Peust 2010, p. 80.

[2] Slavic toponyms in areas which are today exclusively German-speaking, like *Zwettl* in Lower Austria, which derives from Slavic **Světla* "clearing, glade," are a good example for this; see Schuster 1989–1994, vol. 3, s.v. Zwettl.

[3] A well-known example is the name of *Babylon*, Sumerian KÁ.DINGIR.RA$^{\mathrm{KI}}$ ~ Akkadian *Bāb-ili*(*m*), *Bāb-ilu*(*m*) "gate of god" > Βαβυλών, which may go back to an older, perhaps pre-Sumerian form BAR.KI.BAR of unknown meaning and origin; see Kienast 1979; Glassner 2003, p. 24; Edzard 2004, p. 121; Lambert 2011.

impenetrable or even the language they belong to is unknown, or if there is only vague or no information at all allowing for a topographic positioning or an ethnographic identification. But even in case there are numerous attestations in a great variety of sources distributed over a long period of time, the exact classification and concrete identification is imperiled by latent and frequently overlooked difficulties. Among these the most treacherous are the *a priori* assumptions of the absolute local stability of toponyms[4] and the existence of a stable and invariable correlation between ethnic entities and ethnonyms.[5] However, history has taught that places and peoples may bear more than one name at the same time (Zibelius 1977),[6] that they may be renamed or translocated — be it due to reasons of prestige, the re-foundation of settlements in other places, or mass migration[7] — or that names may fall into disuse because of their bearers' disappearance. As a result, names of places and ethnic groups may be used secondarily in order to categorize localities or peoples, or their assignment may become confined to historicizing, allegorizing, or semi-mythical contexts.[8] Toponyms and

[4] For example, there is no (geographical) connection between the ancient kingdom of Μακεδονία (*Macedonia*), around Pella and Thessalonike, and the medieval Byzantine *thema* Μακεδονία, a military and administrative unit, which was named after the ancient kingdom but was situated farther to the east around Adrianopel in the region of ancient Thrace. The names given to the Byzantine *themata* resulted in a re-attribution of ancient geographical terms and caused much confusion all throughout the Middle Ages and later. See Hammond, Griffith, and Walbank 1972–1988; Roisman and Worthington 2010; Karayannopulos 1959; Fine 1991, p. 79; Haldon 1999.

[5] It is extremely difficult to connect the ethnic designations *Avars* and *Huns* with one or the other tribal confederation or a certain "people." The main reason for this is that the idea of a homogeneous and nationally uniform people, as it emerged and was shaped in the nineteenth century A.D., is unfitting in this instance. *Avars* and *Huns* were conglomerates or amalgamates of groups of heterogeneous ethnic origins (perhaps Mongolian, Turkish, Hunnish, Avarish, and others) with ethnonyms adopted for reasons of military prestige, political dependency, or some kind of ethnic allegiance. Therefore, the designations *Avars* and *Huns* may be met in different places in Europe and the Middle and Far East all throughout late antiquity without greater implications on the exact origins and the ethnic association of these groups. Even though *Avars* and *Huns* might be judged to be an utterly extreme example, it must nevertheless be conceived as a warning against a much too simple and too static equation of ethnonyms with tribes or peoples. See Altheim 1959–1962; Göbl 1967; Sinor 1990; Maenchen-Helfen 1997; Pohl 1998; Pohl 2002; Pohl 2003; Dobrovits 2003; Breuer 2005; Kelly 2008; Atwood 2012.

[6] One may take the *Jewish* people as an example who, in antiquity, were also synonymously called *Hebrews* and *Israel*, which could hint at the unification of previously separate tribes or peoples. Furthermore, ideological, religious, and political reasons may have advanced the adoption of additional names which later on was explained etiologically. The exact application of these terms is difficult to explain because it has varied over time and become a constituent part of the history of the Jewish people. At any rate, this example illustrates the complexity of this issue fairly well. See Zeitlin 1953; Loretz 1984; Harvey 1996; Sparks 1998; S. Cohen 1999; Bergsma 2008.

[7] When Charlemagne was crowned emperor in A.D. 800, this was specifically done in order to align with the Roman empire. Accordingly, the former *Regnum Francorum* was stylized as *Imperium Romanum*, which, for theological and ideological reasons, later was altered to *Sacrum Imperium Romanum*. Either version of this name (and the emperor's title; see Ohnsorge 1947) was obviously chosen for reasons of tradition and prestige, especially in order to equal and, eventually, to overtake and replace the Byzantine empire. See especially Zeumer 1910; see also Heer 2002; Herbes and Neuhaus 2005; Evans, Schaich, and Wilson 2011; Stollberg-Rilinger 2013.

[8] The *Scythians*, who, according to ancient authors starting with Herodotus (Hude 1927, s.v. IV.6–12), ruled territories along the shores of the Black Sea, including the Crimea, for centuries, were finally defeated and superseded by the Goths in the third century A.D. But even after their and their kingdoms' disappearance, the ethnonym *Scythians* was applied to different peoples living in this area — including the Goths — by late Roman historians such as Ammianus Marcellinus (XX, 8.1; see Seyfarth 1978; den Boeft et al. 1991–2013, vol. 20, *ad locum*) and Olympiodorus (Blockley 1981–1983; see Baldini 2004) for reasons of convenience and in an attempt to imitate the more ancient, classical historians. See also Szemerényi 1980; Cornillot 1994; Kürsat-Ahlers 1994; Lebedynsky 2003; Parzinger 2004 (with further references).

ethnonyms must therefore be evaluated and analyzed each by itself for every single period of attestation; information about a toponym or ethnonym which has been gathered from the sources of one such period in order to define its status, location, or identity cannot be used unchallenged for the interpretation of the sources of another period of time as long as the unchanged nature of the expression investigated has not been proven.

Therefore, it is of utmost importance to establish and apply a strict theoretical and methodological system that allows for the classification and investigation of toponyms and ethnonyms on different levels. Whenever possible, the kind of place, the region or type of land, the landscape formation, or the body of water they designate should be determined as exactly as possible because certain classes of toponyms denoting specific categories of places are prone to share morphological patterns or particular semantic contents and metaphoric associations (see, e.g., the abundant literature — excluding encyclopedic catalogs of toponyms — on German toponyms: Schwarz 1950; Bach 1953; Bach 1954; Kaufmann 1977; Schützeichel and Tichy 1980; Udolph 1994; van Nahl, Elmevik, and Brink 2004; Walther 2004; Haefs 2006; Debus 2008; Greule and Springer 2009; Sonderegger 2011a; Sonderegger 2011b; Greule 2011a; Debus and Schmitz 2011; Kleiber 2011; Greule 2011b; Debus 2012. For an up-to-date approach in terms of historical linguistics and Indo-European studies with a special focus on potamonyms and further hydronyms, see Krahe 1963; Krahe 1964; Tovar 1977; Wiesinger 1990; Anreiter 2005; Bichlmeier 2009; Bichlmeier and Vorwerk 2009; Bichlmeier 2010a; Bichlmeier 2010b; Bichlmeier 2010c; Bichlmeier 2011; Ernst 2011; Kohlheim 2011; Bichlmeier 2012a; Bichlmeier 2012b; Bichlmeier 2013a; Bichlmeier 2013b; Greule 2014; Bichlmeier 2014a; Bichlmeier 2014b; Bichlmeier and Vorwerk 2014). Once such a set of rules is established, this systematic framework will allow for an approximate interpretation even of those toponyms or ethnonyms that, on the one hand, display some morphological or semantic features but, on the other hand, cannot be ascribed to a specific place or people. To this end, it is necessary to collect and to analyze systematically all toponyms known from inscriptions, be it brief mentions *in situ* or more extensive texts such as (auto)biographies or royal decrees. For the Old Kingdom, this task has already been begun (see Gauthier 1925–1931; Montet 1957–1961; Gardiner 1947; Jacquet-Gordon 1962; Zibelius 1972; Zibelius 1978; Hannig 2003, pp. 153–281; see also Helck 1971, pp. 12–37), but the morphological and semantic evaluation of the data is still a *desideratum* (see, however, Grapow 1914, pp. 16–17; Edel 1955–1964, vol. 1, §254; Yoyotte 1972; Osing 1976a, vol. 1, pp. 258–67; Zibelius 1979a; Zibelius 1979b; Peust 2010; Gundacker 2011, pp. 42–43; Cooper 2015; Dhennin and Somaglino 2016). The situation is even more dramatic for the non-Egyptian toponyms and ethnonyms (Espinel 2006) found in Egyptian text sources because attestations are rare and current knowledge about the political and ethnic landscape in Nubia, Libya, the Levant, and the Tchad[9] during the third millennium B.C. is very fragmentary.[10]

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[9] See, for example, the reconstruction of the location of Nubian regions and tribal principalities for the time of the Sixth Dynasty, which largely was accomplished by Elmar Edel (Edel 1955, 1960, 1967, 1971, 1973, 1981a, 1984, 1990, 1992; see also Yoyotte 1953; Dixon 1958; Priese 1974; Fecht 1979; Vercoutter 1980; Goedicke 1981; O'Connor 1986; Goedicke 1988; Török 2009, pp. 23–74; Obsomer 2007), although recent re-evaluation in the light of new discoveries again points out the difficulties of earlier and perhaps too straightforward explanations (Cooper 2012 [with additional references]). Again, principalities may have switched positions or at least may have moved both absolutely and in relation to one another over time, and they may have changed their names. Also, the network of trade routes was much more complex and elaborate than expected (see Förster and Riemer 2013; see also Schneider 2010; Schneider 2011).

[10] For the investigation of the topography of Anatolia, Syria, and Mesopotamia in the third and early

Toponyms and Ethnonyms: First Steps Toward a Systematic Framework

First and foremost, it is essential to find out about what a certain expression designates. Examples of both toponyms and ethnonyms should thus primarily be categorized according to what they refer to (the subsequent categorization is developed on the basis of Gelling 1993; Gelling and Cole 2000; Kamianets 2000; Thériault 2007; Debus 2008; Sonderegger 2011a; Sonderegger 2011b; Greule 2011a; Debus and Schmitz 2011; Kleiber 2011; Greule 2011b; for the nomenclature, see also Liddell and Scott 1996).

The expression "toponym" serves two purposes: on the one hand, it is the generic term for *all* names of localities, territories, and places, being the Greek equivalent of Latin *nomen loci*, i.e., "place name."

- toponyms *lato sensu* (ὁ τόπος "specific place," τὸ ὄνομα "name"): names of any places or territories

But on the other hand, it is just one *terminus technicus* among many that are all used to name various lands, regions, landscapes, and places.

A first though rough and somewhat superficial classification can be made according to the size of the localities, no matter where they might be found and of whatever type they may be. As a result, the following terms can be created:

- macrotoponyms (μακρός "big," ὁ τόπος "specific place," τὸ ὄνομα "name"): names of large territories and regions
- microtoponyms (μικρός "small," ὁ τόπος "specific place," τὸ ὄνομα "name"): names of small areas and specific places

It is, however, more expedient to distinguish between different groups of toponyms that consider special features and characteristics. As such, the following distinctions can be made among the huge group of designations for regions and places, for example according to size:

- geonyms (ἡ γῆ, "land, dry land"): names of land and its parts
    - epeironyms (ἡ ἤπειρος "mainland, continent"): names of continents
    - choronyms (ἡ χώρα "region, country"): names of regions and landscapes
    - toponyms *stricto sensu* (ὁ τόπος "specific place"): names of any clearly defined localities

The natural condition and specific characteristic features of places can furthermore serve as guidelines in order to categorize them into more specific types:

- oronyms (τὸ ὄρος "mountain"): names of mountains and mountain ranges
- eremionyms (ἡ ἐρημία "desert"): names of deserts and wasteland
- pedionyms (τὸ πεδίον "plain"): names of plains

second millennia B.C., see the following volumes of the *Tübinger Atlas des Vorderen Orients,* Répertoire Géographique des Textes Cunéiformes (see Denk 1990): Farber and Edzard 1974; Farber, Sollberger, and Edzard 1977; del Monte and Tischler 1978; Groneberg 1980; Nashef 1991; del Monte 1992; Bonechi 1993; see also, e.g., Nashef 1987; Barjamovic 2011. A comprehensive overview dealing with patterns and types of Sumerian and Akkadian toponyms can be found in Edzard 1998a, §§11–12 (see also Jacobsen 1967; Selz 2014) and Edzard 1998b, §§11–12; for an analysis of Mesopotamian naonyms, see George 1993 and Edzard 1997; for Sumerian orgadonyms (especially agronyms), Pettinato 1967; Stol 1988; and for methodological outlines, the introductions of Groneberg 1980, pp. x–xix, and Zadok 1985, pp. ix–xxx.

- orgadonyms (ἡ ὀργάς "mead"): names of mead, small strips of land ("Flurnamen")
- nesonyms (ἡ νῆσος "island"): names of islands
- chersonesonyms (ἡ χερσόνησος "peninsula"): names of peninsulae
- isthmonyms (ὁ ἰσθμός "neck of land, isthmus"): names of land necks and isthmi
- probolonyms (ὁ πρόβολος "jutting rock, tongue of land"): names of tongues of land
- acroterionyms (τὸ ἀκρωτήριον "cape"): names of promontories and capes

The natural counterpart of geonyms are hydronyms which cover the names of all kinds of bodies of water and immediately neighboring strips of land and localities:

- hydronyms (τὸ ὕδωρ "water"): names of bodies of water
    - thalassonyms (ἡ θάλασσα "sea"): names of seas, their parts, and the adjacent regions
    - limnonyms (ἡ λίμνη "lake, basin"): names of lakes, basins, and ponds
    - halycidonyms (ἡ ἁλυκίς "salty spring, salt lake"): names of salt lakes and salt springs
    - potamonyms (ὁ ποταμός "river"): names of rivers
    - rheithronyms (τὸ ῥεῖθρον "stream, creek"): names of streams and creeks
    - paralionyms (ἡ παραλία "seaside, seacoast"): names of sections of coast and seaside

Depending on the amount of available information, these categories can be elaborated and subdivided in order to achieve well-defined and properly fitting classes for organizing all kinds of toponyms. For example, the following kinds of place names can be distinguished among oronyms:

- oronyms (τὸ ὄρος "mountain"): names of mountains and mountain ranges
    - coryphonyms (ἡ κορυφή "mountain peak"): names of mountain tops and peaks
    - notonyms (τὸ νῶτον "back, ridge"): names of mountain or hill ridges
    - coeladonyms (ἡ κοιλάς "vale, valley"): names of valleys
    - petronyms (ἡ πέτρα "rock"): names of rock formations
        - ceraeonyms (ἡ κεραία "spur, horn"): names of rock outcrops or spurs
        - lophonyms (ὁ λόφος "crest"): names of mountain, hill, or rock crests
    - spelaeonyms (τὸ σπήλαιον "cave, cavern"): names of caves and grots
    - placonyms (ἡ πλάξ "flat land"): names of tablelands and flat tops of hills
    - diabasionyms (ἡ διάβασις "crossing over, passage"): names of mountain passes

Similarly, a great number of different categories may be found under the heading of orgadonyms:

- orgadonyms (ἡ ὀργάς "mead"): names of meads, small strips of land ("Flurnamen")
    - hylonyms (ἡ ὕλη "forest, woodland"): names of forests and woodlands
        - alsonyms (τὸ ἄλσος "grove"): names of groves and sacred holts
        - dendronyms (τὸ δένδρ(ε)ον "tree"): names of single, remarkable trees
        - phytonyms (τὸ φυτόν "plant"): names of remarkable or sacred plants
    - leimononyms (ὁ λειμών "meadow"): names of pastures and meadows
    - agronyms (ὁ ἀγρός "arable land, field"): names of farmland and fields
    - telmatonyms (τὸ τέλμα "swamp"): names of swamps and marshes

Furthermore, eremonyms can be divided into the following subcategories:

- eremionyms (ἡ ἐρημία "desert"): names of deserts and wasteland
    - clomaconyms (ὁ κλῶμαξ "rocky place"): names of rocky deserts and stone deserts
    - psammonyms (ἡ ψάμμος "sand, sand desert"): names of sandy areas and sand deserts
    - amathonyms (ἡ ἄμαθος "dune"): names of dunes and of drifts of sand
    - halipedionyms (ὁ ἅλς "salt," τὸ πεδίον "plain"): names of salt pans and plains
    - xeropotamonyms (ξηρός "dry," ὁ ποταμός "river"): names of wadis
    - oasionyms (ἡ ὄασις "oasis"): names of oases

The same kind of subdivision is also applicable to selected subcategories of hydronyms:

- thalassonyms (ἡ θάλασσα "sea"): names of seas, their parts, and the adjacent regions
    - oceanonyms (ὁ ὠκεανός "ocean"): names of oceans, also: the mythical ocean
    - pontonyms (ὁ πόντος "a part of the sea"): names of parts of the sea
    - pelagonyms (τὸ πέλαγος "open, high sea"): names of (parts of) the open sea
    - halionyms (ἡ ἅλς "shallow sea"): names of costal shallows
    - colponyms (ὁ κόλπος "bosom, gulf, bay"): names of gulfs and bays
    - hermatonyms (τὸ ἕρμα "reef, sunken rock"): names of reefs and sunken rocks
    - paralionyms (ἡ παραλία "seaside, seacoast"): names of sections of coast and seaside
        - cremnonyms (ὁ κρημνός "(overhanging) cliffs"): names of rough cliffs
        - lissadonyms (ἡ λισσάς "bare, smooth cliff, rock"): names of smooth cliffs
        - rhachionyms (ἡ ῥαχία "rocky shore"): names of rocky sections of sea shore
        - thinonyms (ἡ/ὁ θίς "beach, sandbank"): names of beaches and sandbanks
        - heleonyms, helonyms (τὸ ἕλος "marsh"): names of mangrove coasts, wetlands, and salty swamps
    - potamonyms (ὁ ποταμός "river"): names of rivers
    - rheithronyms (τὸ ῥεῖθρον "stream, creek"): names of streams and creeks
        - aporrheithronyms (τὸ ἀπόρρειθρον "river branch"): names of branches of rivers
        - pegonyms (ἡ πηγή "spring"): names of springs and heads of rivers
        - cataractonyms (ὁ καταρ(ρ)άκτης "waterfall"): names of cataracts and waterfalls
        - camponyms (ἡ καμπή "river bend"): names of river bends and windings
        - stomatonyms (τὸ στόμα "mouth"): names of the mouths of rivers
        - ochthonyms (ὁ ὄχθος and ἡ ὄχθη "rising ground at riverside, bank"): names of riverbanks and elevations near rivers
        - poronyms (ὁ πόρος "ford, passage"): names of fords

Common to all these different kinds of toponyms is that they designate localities according to their natural state which is hardly influenced by humans. By contrast, there is also a set of designations for artificial regions and places as defined and established by humans:

- coenonyms (τὸ κοινόν "state"): names of countries and territories with man-made frontiers
  - nomonyms (ὁ νομός "province"): names of provinces and districts
  - polionyms (ἡ πόλις "town as political entity and its people"): names of towns
  - comonyms (ἡ κώμη "unwalled city, village"): names of villages
    - acropolionyms (ἄκρος, "high," ἡ πόλις "town"): names of citadels
    - astyonyms (τὸ ἄστυ "town of the commoners"): names of lower towns
  - oecodomonyms (ἡ οἰκοδομή "house, building"): names of buildings
  - hodonyms (ἡ ὁδός "road, way"): names of all kinds of routes

The subcategory of human-made buildings and structures as well as that of artificial ways and roads can further be categorized as follows:

- oecodomonyms (ἡ οἰκοδομή "house, building"): names of buildings and structures
  - temenonyms (τὸ τέμενος "sacred precinct"): names of temple precincts
    - naonyms (ὁ ναός/νεώς "temple"): names of temples
    - hieronyms (τὸ ἱερόν "sanctuary"): names of shrines and sanctuaries
    - bomonyms (ὁ βωμός "altar"): names of altars and sacrificial sites
  - necrionyms (ἡ νεκρία "cemetery, graveyard"): names of cemeteries
    - taphonyms (ὁ τάφος "tomb"): names of tombs
    - mnematonyms (τὸ μνῆμα "monument"): names of memorials
  - phrurionyms (τὸ φρούριον "hill-fort"): names of fortresses and strongholds
  - cataphygonyms (ἡ καταφυγή "refuge"): names of refuges and retreats
    - teichonyms (τὸ τεῖχος "wall, especially city wall"): names of walls, city walls
    - pyrgonyms (ἡ πύργος "tower"): names of towers
    - pylonyms (ἡ πύλη "gate, city gate"): names of portals and gates in city walls
  - anactoronyms (τὸ ἀνάκτορον "palace"): names of palaces and residencies
  - pylononyms (ὁ πυλών "gateway, gate-house"): names of monumental gateways, gate-houses and -towers
  - domatonyms (τὸ δῶμα "house"): names of common houses
  - aulonyms (ἡ αὐλή, country-house, farm, open court): names of farms
  - limenonyms (ὁ λιμήν "harbor"): names of harbors and ports
  - chomatonyms (τὸ χῶμα "dam, dyke"): names of dams and dykes
  - gephyronyms (ἡ γέφυρα "bridge"): names of bridges
  - latomonyms (τὸ λατομεῖον "quarry"): names of stone quarries
  - metallonyms (τὸ μέταλλον "mine"): names of mines and mining pits
  - phreatonyms (τὸ φρέαρ "artificial source, well"): names of wells and cisterns
  - crenonyms (ἡ κρήνη "natural source, fountain"): names of springs
- hodonyms (ἡ ὁδός "road, way"): names of all kinds of traffic area
  - agoronyms (ἡ ἀγορά "square"): names of squares and marketplaces

- dromonyms (ἡ δρόμος "road, course"): names of streets and roads
- stibonyms (ὁ στίβος "foot-path, trodden path"): names of trails and paths
- diorychonyms (ἡ διῶρυξ "trench, canal"): names of canals and artificial waterways

As already indicated, one may distinguish between, on the one hand, inhabited and man-made places and, on the other hand, those uninhabited and uninfluenced by humans. These categories overlap the aforementioned natural divisions and subdivisions and constitute, on another level (meta-level), two more types:

- oeconyms (ἡ οἶκος "house"): names of inhabited and man-made places and sites the names of which were assigned on the basis of typical or dominant man-made achievements (buildings, plantations etc.)
- anoeconyms (ἀν- "not, un-," ἡ οἶκος "house"): names of natural, uninhabited places and sites the names of which were assigned on the basis of natural features (colors, forms, fauna, flora)

The same system in use for places may also be applied to the classification of designations of peoples, tribes, and so forth; one may thus differentiate between the following terms (see Scheetz 1988; Geuenich, Haubrichs, and Jarnut 1997; Fishman and García 2010; Back 2002; Wolf 2005; Jordan et al. 2011. For surveys of certain aspects of Egyptian perceptions of ethnicity, see Davis 1951; Schoske 1982; Hall 1986; Goudriaan 1988; Valbelle 1990; Bilde 1992; Johnson 1999; Smith 2003; Moers 2004; Booth 2005; Espinel 2006; Koenig 2007; Saleh 2007; Omar 2008; for perceptions and reflections of ethnicity in Egyptian literature, see Loprieno 1988; di Biase-Dyson 2013; Salim 2013 and Fischer 1976a, pp. 97–98; Fischer-Elfert 1996; Morenz 1997; Moers 2004; Moers 2005; Moers 2006; Cooper 2015. See furthermore Zacharia 2008; Seidlmayer 2002; Hüneburg 2003; Lauterbach, Paul, and Sander 2004; Bahrani 2006; van Binsbergen and Woudhuizen 2011; Cooney 2011; Beckman 2013):

- ethnonyms *lato sensu* or ethnica (τὸ ἔθνος "people, nation"): names of peoples and ethnic groups
    - laonyms (ὁ λαός/λεώς "people bearing the same ethnic name"): names of peoples
    - ethnonyms *stricto sensu* (τὸ ἔθνος "people, nation"): names of peoples with common identity
    - genonyms (τὸ γένος "race, stock"): names of races and groups of related peoples or tribes
    - demonyms (ὁ δῆμος "district, free people"): names of peoples belonging to a common state
    - phylonyms (ἡ φυλή and τό φῦλον "tribe" and τό φῦλον): names of tribes and subdivisions of peoples
    - politonyms (ὁ πολίτης "citizen"): names of citizens of a town or a country
    - syngenonyms (ἡ συγγένεια "kindred family, kinsfolk"): names of clans and groups of families
        - hestionyms (ἡ ἑστία "hearth, house, household"): names of greater households, kin
        - dynastonyms (ἡ δυναστεία "princely house, lordship"): names of noble houses, but also dynastic names borne by their members
        - gononyms (ἡ γονή "offspring, stock, family"): names of ordinary families

- anthroponyms (ὁ ἄνθρωπος "man, human being"): names of individual humans

Beyond this set of terms, which heavily depend on a culture's specific perception of ethnicity and its interpretation of ethnic entities' hierarchical structure (see, e.g., Sollors 1996; Müller and Zifonun 2010; Cifani, Stoddart, and Neil 2012; Demetriou 2012; McInerney 2014; Mateos 2014; Spencer 2014), one may add two further expressions, which are primarily based on the language spoken (see, e.g., James and Shadd 2001; Harris and Rampton 2003; Fought 2006; Fishman and García 2010) or the religious ideas and beliefs (see, e.g., Marty and Appleby 1997; Hastings 1997; Prentiss 2003; Díaz-Andreu et al. 2005; Ruane and Todd 2011) shared by a group of people or peoples:

- glottonyms (ἡ γλῶττα "language"): names of peoples who speak languages and dialects which essentially contribute to or even constitute their common identity and who are named after the name of this particular language or group of dialects
- thresconyms (ἡ θρησκεία "cult, religion"): names of peoples with a common cultic center or religious belief which is crucial for their common identity and which forms the basis from which their designation is derived

It is moreover important to keep in mind that, in particular, peoples, their territories, and their languages may be named by those peoples themselves or by others having established contact with them. This may be one source of separate designations being applied to a single place or to a people at one and the same time. As a consequence, one may furthermore distinguish between toponyms and ethnonyms on the following level:

- endonyms (ἔνδον "inside"): names which are proper self-designations and which are commonly recognized as such by the people to whom the name is applied, although they need not be their own creations or derive from their own language
- exonyms (ἔξω "outside"): names which are used by neighboring peoples in order to designate another people and which — regardless of their language of origin — are not used by the designated people themselves

This kind of distinction can be supplemented with the following, even more restrictively defined terms:

- autonyms (αὐτός "self"): names which are used by peoples in order to designate themselves and which originate in their own language
- xenonyms (ξένος "foreign, strange"): names which are created and implemented by foreign peoples in order to designate another people, to whom those designations are foreign

Even though the most elementary categories of toponyms and ethnonyms will certainly exist in every culture, this need not apply for all subcategories. Some of the classes defined did certainly not exist in ancient Egypt — for example, it is unclear whether the Egyptians distinguished between peoples and tribes, and they certainly did not differentiate between that many maritime categories — and it is at least possible that Egyptian toponomastics will require for more classes of arid and semi-arid places than mentioned above. However, in order not to force Egyptian data into a predefined system, future research will have to describe at first which categories of toponyms and ethnonyms really existed in the Egyptian mindscape and culture. This aim will require research on a large scale, which not only will evaluate the entire toponymic and ethnonymic material preserved (be it in Egyptian texts, in sources of neighboring cultures or classical authors dealing with Egypt, or names and designations in use until today) but which will also investigate how the Egyptians viewed the world, its parts, and its constituents (for the Egyptian geographical awareness during the Fourth Dynasty, see Goedicke 2002; Schneider 2015; see also O'Connor and Quirke 2003; Cooper 2015; Schneider forthcoming) as well as humankind and peoples (see Espinel 2006; Cooper 2015; Roth 2015). Whenever toponyms or ethnonyms will be identified as non-Egyptian in origin, this will furthermore necessitate an investigation of how the Egyptians obtained and integrated these designations in the Egyptian nomenclature system, how they understood and interpreted them, and what their place was within the system of toponyms or ethnonyms of the source language. Keeping in mind this caveat, the categories presented above can serve as the first advance toward a more elaborate and more precisely adjusted system. In order to gain secure and in-depth information from toponyms and ethnonyms, they furthermore need to be evaluated linguistically. This will be useful insofar as toponyms belonging to one class or the other often share derivational and morphological patterns, metaphorical ideas and contextual references. Only this sometimes difficult and detailed approach will make it possible to determine whether the Egyptians named a place or people themselves or whether they adapted a foreign name, what — be it natural or human-made — may have served as pivotal for choosing a name, and what may have been the meaning and significance of certain toponyms or ethnonyms.

Selected Toponyms and Ethnonyms According to the Written Evidence of the Old Kingdom

Written records on Egypt's relations with the Levant are rather rare during the Old Kingdom, and, consequently, so are references to peoples and places of this geographical area. Among Egyptian sources, there are rock inscriptions of Egyptian kings documenting their activities on the Sinai Peninsula (Gardiner, Peet, and Černý 1952–1955; Edel 1983; Peden 2001.[11] For the organization of expeditions, see Eichler 1993; Hikade 2001), vague hints in the fragments of the Royal Annals (First–Fifth Dynasties: Wilkinson 2000, pp. 106, 169, 242, 244 etc.; see Helck 1982; Hornung, Krauss, and Warburton 2006;[12] Sixth Dynasty: Baud and Dobrev 1995; Baud and Dobrev 1997, pp. 35–42. For recent translations of either annals, see Strudwick 2005, pp. 65–77) concerning royal expeditions, and, literally, a few glimpses in form of reliefs in the royal pyramid temple complexes (see, e.g., reliefs of Userkaf: Labrousse and Lauer 2000, vol. 2, p. 91, figs. 310–11; of Sahure: Borchardt 1913, pl. 415; el-Awady 2009; of Unas: Labrousse

[11] For recent discoveries of archaeological sites on the Sinai Peninsula and the opposite Red Sea Coast of Egypt (in particular Wadi al-Garf, Ayn Soukhna, and Mersa Gawasis), see the reports and publications of Mumford 2006; Tallet 2010; Ward and Zazzaro 2010; Bard and Fattovich 2011; Abd el-Raziq et al. 2002; Abd el-Raziq et al. 2011; Espinel 2012; Fattovich 2012a; Mumford 2012; Tallet 2012; Tallet, Marouard, and Laisney 2012; Ward 2012; Bard, Fattovich, and Manzo 2013; Tallet 2013a; Tallet 2013b; Tallet 2013c; Tallet 2014; Tallet and Mahfouz 2013; Tallet and Marouard 2014; Bard and Fattovich 2015; Tallet 2015; Tallet 2016; Abd el-Raziq et al. 2017.

[12] See furthermore Helck 1956; Gundacker 2006, pp. 130; Gundacker 2015; and for the individual fragments: (a) *Palermo Stone*: de Rougé 1866; Pellegrini 1895; Schäfer 1902; Naville 1903; Sethe 1903, pp. 42–59; Giustiliosi 1968a; Giustiliosi 1968b; Giustiliosi 1969; (b)–(e) *Cairo Fragments I–IV*: Gauthier 1914; Gauthier 1915; Daressy 1916; (f) *Cairo Fragment V (de Cenival)*: de Cenival 1965; (g) *London Fragment*: Reeves 1979; Stewart 1979, p. 6, pl. 3.1. For additional attempts to reconstruct the royal annals, see von Beckerath 1997, pp. 13–19, 204–05; Borchardt 1917; Kaiser 1959; Kaiser 1960; Kaiser 1961; Helck 1974b; Bárta 1981; Baud 1999; for the date of origin, perhaps the reign of Nirewoser, see Caminos and Fischer 1976, p. 48; Gundacker 2006, pp. 67, 363 n. 1962; Gardiner 1994, p. 64; von Beckerath 1997, p. 14.

and Moussa 2002, pp. 16–21, 24–28, 136–37, figs. 16–21, 139–40, fig. 23–28, pl. 12; and of Pepy II: Jéquier 1938, pls. 35–38; Jéquier 1940, pl. 13. See furthermore the spolia published by Goedicke 1971, pp. 86–125) and from depictions in two private tombs (Inti at Deshasheh: Petrie 1898, pl. 4; Kanawati and McFarlane 1993, pl. 27; Kaemhesut at Saqqarah: Quibbell and Hayter 1927, frontispiece; McFarlane 2003, p. 23, pl. 48; see Smith 1949, p. 212, figs. 85–86).[13] All of them lack extant inscriptions so that the pictorial program is to be interpreted conjecturally (Wright 1988, pp. 155–56; Sowada 2009, p. 11 n. 8; de Miroschedji 2012). However, there are also three (auto)biographical inscriptions that provide a somewhat deeper insight into the ethnographic and topographic situation of the Sinai Peninsula and the Levant:

(Auto)biography of Weni, early Sixth Dynasty (Teti–Pepy I)

(Borchardt 1937, pp. 115–19, pls. 29–30; Sethe 1933, pp. 98–110; Strudwick 2005, pp. 352–57; see Porter and Moss 1928–2012, vol. 5, p. 72; Osing 1977; Doret 1986, pp. 25, 53, 62–63, 76, 82–83; Kloth 2002, no. 20 and *passim*; Hofmann 2002; Richards 2002, Richards 2010)[14]

Weni's (auto)biography contains a long section dealing with military campaigns to the east of Egypt's northern border (Sethe 1933, pp. 101(9)–105(4)). The first episode deals with the conscription of troops from all parts of Egypt and Egypt's hegemonial sphere in Nubia and Libya, after the king has decided to oppose his enemies:

> *ḫśf.n ḥm⸗f jḫ.t*[15] *ꜥꜣmw.w ḥrj.w-šꜥj jrj.n ḥm⸗f mšꜥ m ḏbꜥ.w ꜥšꜣ.w*
>
> When His Majesty opposed the plan of the *ꜥꜣmw.w* and the *ḥrj.w-šꜥj*, His Majesty conscribed an army of many tens of thousands. (Sethe 1933, p. 101(9)(10))

[13] One might, perhaps, add some personal names known from the Old Kingdom execration texts (Abu Bakr and Osing 1973; Osing 1976b; Posener 1958; Posener 1987; Wimmer 1993; Quack 2002; Espinel 2013 [with further references]; for the possible traces of Old Kingdom execration texts in such of the Middle Kingdom, see Ben-Tor 2006; see also Sethe 1926; Posener 1940; Vila 1963; Dunham 1967; Koenig 1987; Posener 1987; Koenig 1990; Ritner 2008, pp. 136–80), although they cannot be ascribed to any of the ethnic entities of the Sinai Peninsula or the Levant with certainty (for the rare instance of personal names definitely connected with the Nubian principality of *jmꜣ*, see Grimal 1985; el-Sayed 2011, p. 144; and, in particular, Cooper 2012, p. 2).

[14] Andréas Stauder is currently preparing a volume containing a new edition and commentary of this important text.

[15] The exact grammatical interpretation of this idiomatic expression is still uncertain — see Goedicke 1963, p. 189; Osing 1977, p. 169; Kloth 2002, p. 190 — but the interpretation "to oppose the plan of the *ꜥꜣmw.w*" (with *jḫ.t* "case, plan," see Hannig 2003, pp. 205, 208, 980; Erman and Grapow 1982, vol. 1, p. 124(7) etc., vol. 3, p. 336(12), as accusatival object and *nj.t ꜥꜣmw.w* as a qualifying genitive; in case *nj.t* "of" is not accepted as written defectively, one still can refer to cases where *jḫ.t* is treated as a masculine noun, see Erman and Grapow 1982, vol. 1, p. 124(2)) appears more natural (see Moers 2004, p. 102) than the alternative interpretation "to put up a thing (punishment, resistance) against (literally: to) the *ꜥꜣmw.w*" (with *n ꜥꜣmw.w* as a dative). A passage from the exemption decree of King Horus Demedjibtawi, which often is quoted as a parallel, is itself difficult to judge since there is, in a unique and perhaps even an ungrammatical manner, a prepositional phrase intervening between the accusative and dative objects (whether this is a mistake at the transition of lines or intentional for reasons of emphasis remains unclear). However, if this abnormally placed phrase is interpreted as a parenthesis, the passage can be analyzed exactly like that in Weni's (auto)biography: *jr gr ḥrj-tp nb śrjw nb nfr-n ḫśf(w)⸗f jḫ.t m śpꜣ.t⸗f nj sj.w jrw.tj⸗śn śšrw.w jpn …* "As for any chief and any official: if he should not oppose the plan, in his nome, of the men who should do those (negative) actions …" (Sethe 1933, pp. 2–3; see also Goedicke 1967; Edel 1955–1964, vol. 2, §1137; Strudwick 2005, p. 124; for the negative construction *nfr-n,* Edel 1955–1964, vol. 2, §§1130–40; Satzinger 1968, §§107–09; Brose 2009 [with further references]). Even though the exact grammatical interpretation remains uncertain, the sense and meaning of either passage are obvious. The evaluation of the underlying grammatical pattern can thus be left to future research.

Weni, although holding the rather modest rank of *jmj-rꜣ ḫntj.w-š pr-ꜥꜣ* "overseer of land-tenants of the palace" (Jones 2000, no. 710; see Eyre 1994), is appointed commander in chief and proves himself to be in complete charge of this army by precluding every kind of misconduct. He then leads forth the Egyptian army against the enemies:

> *mꜣꜥ.kj śn m*[16] *jw-mḥt.j m śbꜣ-nj-Jjj-m-ḥtp m wꜥr.t-nj.t-Ḥrw-nb-mꜣꜥ.t*
>
> And I led them to the Northern Island, and (then to) the Gate of Imhotep, and (finally to) the District of Horus "Lord of cosmic truth." (Sethe 1933, pp. 102(16)–103(1))

One of the most notable passages (see Helck 1972, p. 13; Guglielmi 1984, p. 26; Assmann 1991, p. 184; Gnirs 1996, p. 214 n. 112; Kitchen 1999, p. 71; Kloth 2002, pp. 192–93) tells about the successful army which rejoices on the occasion of its triumphant return and intones the famous "Song of Victory" (for the anaphoric style of this poem or song, see Guglielmi 1984, pp. 25–26; Osing 1992; Goelet 2001; see also the Addendum further below):

> *jjj.n mšꜥ pn m ḥtp | bꜣ.n=f tꜣ-ḥrj.w-šꜥj ||*
> *jjj.n mšꜥ pn m ḥtp | pdś.n=f tꜣ-ḥrj.w-šꜥj ||*
> *jjj.n mšꜥ pn m ḥtp | śḫn.n=f wnw.wt=f ||*
> *jjj.n mšꜥ pn m ḥtp | šꜥ.n=f dꜣb.w=f jꜣrrw.wt=f ||*
> *jjj.n mšꜥ pn m ḥtp | śtj.n=f ḫt m jtj rmṯ.w=f*[17] *nb.w ||*
> *jjj.n mšꜥ pn m ḥtp | śmꜣ.n=f ṯꜣs.t jm=f m ḏbꜥ.w ꜥšꜣ.w ||*
> *jjj.n mšꜥ pn m ḥtp | jnj.n=f ṯꜣs.t jm=f ꜥšꜣ.t wr.t m śḳj.w-ꜥnḫ*[18] ||
>
> This army has returned in peace | after it had devastated the land of the *ḥrj.w-šꜥj*! ||
> This army has returned in peace | after it had trampled the land of the *ḥrj.w-šꜥj*! ||
> This army has returned in peace | after it had torn down its *wnw.wt*! ||
> This army has returned in peace | after it had cut down its fig trees and its vines! ||
> This army has returned in peace | after it had set fire to the grain of all its people! ||
> This army has returned in peace | after it had slain troops within it of many tens of thousands! ||
> This army has returned in peace | after it had led away very numerous troops (from) within it as living captives! || (Sethe 1933, pp. 103(7)–104(3))

The second episode summarizes five more expeditions without providing any further details (the Addendum further below):

> *hꜣb wj ḥm=f r mꜣꜥ mšꜥ pn m djw sp.w r dr tꜣ-ḥrj.w-šꜥj r-ṯnw bšṯ=śn m ṯꜣs.wt jptn*
>
> And His Majesty sent me forth to lead this army five (more) times in order to vanquish the land of the *ḥrj.w-šꜥj*, each time they rebelled, with (exactly) these troops. (Sethe 1933, p. 104(6)–(8))

[16] It is difficult to judge this grammatical construction, but it appears most plausible that this use of the preposition *m* introduces the destination of the movement; see Osing 1977, p. 167; Hannig 2003, p. 503.

[17] Text restoration after Osing 1977, p. 171 n. 20. It is not clear, whether *jtj rmṯ.w=f nb* "all the grain of its people" or *jtj rmṯ.w=f nb.w* "the grain of all its people" is to be read (for this kind of ambiguity, see Edel 1955–1964, vol. 1, §318, and some of the examples quoted in Schweitzer 2005, §§232–234).

[18] For the reading of *śḳj* "to beat down," see Allen 1984, §736.

Finally, the third episode outlines another expedition and, this time, the target area is described in greater detail, although the toponyms mentioned are difficult to analyze and the ethnonyms remain hazy (see also the Addendum further below):

> *ḏd.tj wnt btk.w nḫt.w m ḫꜣśtj.w jpn m šr.t-tp-wnwḏw ḏꜣj.kj m nmj.w ḥnʿ ṯꜣs.wt jptn jrj.n=j dj-r-tꜣ m pḥ.wj kꜣjw.w nj ṯꜣs.t ḥr mḥ.t tꜣ-ḥrj.w-šʿj śṯ gś.t nj.t*[19] *mšʿ pn m ḥrj.t jjj.n=j nḏrj.n=j mr-ḳd=śn śmꜣ(w) btk nb jm=śn*
>
> And it was said that strong insurgents were among those foreigners at *šr.t-tp-wnwḏw*. And I crossed over in transport ships together with these troops. And, in fact, I made a landing at the end of the elevations of the mountain chain, to the north of the land of the *ḥrj.w-šʿj*, when the (other) part of this army was still on the road. And I returned after I had seized them all together, and after every insurgent among them had been slain. (Sethe 1933, pp. 104(12)–105(4))

(Auto)biography of Iny, Middle of Sixth Dynasty (Merienre — earlier time of Pepy II)

(Marcolin 2005; Marcolin and Espinel 2011)

In fact there are portions of two (auto)biographical inscriptions of Iny, both of which recount expeditionary activities to the Levant. Although only the concluding portion of the large (auto)biographical inscription is preserved (Marcolin and Espinel 2011, pp. 580–605), it still contains three episodes. From the earlier, only the very final lines recording Iny's reward and distinction are known, which renders every attempt to establish the destination and reason for his journey mere speculation. The second episode, however, refers to four expeditions to the northern Levant, but, unfortunately, no details are given:

> *jw jrj.n=j*[20] *ʿmꜣw ḫnt-š pꜣwtś*[21] *fdw sp.w*
>
> And I traveled Amaw, the Lebanon, and Pawtes four times. (Marcolin and Espinel 2011, p. 580, fig. 4: line x+5, pp. 589–93)

Finally, there is a third episode, which addresses a journey to Byblos:

> *jw=j hꜣb.kj r kbnj ḫr ḥm nj Mrj.n-Rʿw nb=j jw jnj.n=j ḥmt.t kbn.wt jrj.wt.n=j (m) dpw.wt ʿꜣ.wt n śtp-sꜣ jw jnj.n=j ḫśbḏ dḥtj ḥḏ śfṯ*[22] *jnw nb nfr mrj.n kꜣ=f [...] jw=j hꜣj.kj r kbnj m rꜣ-ḥꜣ.t jw=j jjj.kj jm m ḥtp*

[19] For the reading of this passage, see Osing 1977, p. 180; Edel 1955–1964, vol. 1, §§92–94; differently Kloth 2002, p. 194; see Gauthier and Lefebvre 1923, p. 160.

[20] This idiomatic expression apparently refers to the visit of places and regions abroad; see Hannig 2003, p. 188; Erman and Grapow 1982, vol. 1, p. 111(12); Kloth 2002, p. 199; Marcolin and Espinel 2011, p. 511.

[21] Since the legs of the "quail chick" 𓅱 end rather high up in this hieroglyphic square, there is sufficient space below the "quail chick" 𓅱 to accommodate a "loaf of bread" 𓏏. For the identification of *ʿmꜣw* with the town Sumur and of *pꜣwtś* with the Eleutheros Plain, see Schneider 2015.

[22] For the trade of metals in antiquity, see Muhly 1973; Penhallurick 1986; Muhly 1993; Moorey 1994, pp. 292–301; Meier 1995; Ogden 2000; Sowada 2009, pp. 187–188; The reading of the imported metal as *dḥtj* instead of *ḏḥtj* (Hannig 2006: p. 1089; Erman and Grapow 1982, vol. 5, p. 606(4)–(8)) can, by means of this spelling, be secured beyond doubt. For *śfṯ* "cedar oil," see Balcz 1934; Helck 1971, pp. 25–26; Germer 1982b, p. 552; Ward 1991, p. 13; Koura 1998; Koura 1999; Serpico and White 2000a; Serpico and White 2000b; Bardinet 2008, pp. 23–57; for further details concerning the imported materials and additional references, see Marcolin 2006; Marcolin and Espinel 2011; for the conflation of the initial voiceless sibi-

> And I was sent forth to Byblos under the Majesty of Merienre, my Lord; and I brought three Byblos-ships which I had made as great ships for the residence, and I brought lapis lazuli, lead (or tin), silver, pine-oil, and every fine product which his (i.e., the king's) ka desired. [...] And I went down to Byblos from Rahat. And I returned in peace. (Marcolin and Espinel 2011, p. 580 fig. 4: line x+7 — x+11, pp. 594–603)

In contrast to this, the minor inscription (Marcolin and Espinel 2011, pp. 605–14) is preserved almost completely and devoted to a single episode:

> *jw hꜣb.n wj ḥm nj Nfr-kꜣ-Rꜥw nb=j r ḫnt-š jw jnj.n=j kbn.t ḫmtw jmw.w ꜣṯp.wj ḥr ḥḏ ꜥꜣmw.w ꜥꜣmw.wt*
>
> And the Majesty of Neferkare, my Lord, sent me forth to the Lebanon. And I brought a Byblos-ship and three barges loaded with silver, *ꜥꜣmw*-men and -women. (Marcolin and Espinel 2011, p. 606, fig. 5: line 24, pp. 607–10)

The concluding lines address Iny's reward and honors which he received from the king for the missions he accomplished.

(Auto)biography of Pepynakht, late Sixth Dynasty (second half of reign of Pepy II)

(de Morgan 1894, pp. 174–76; Sethe 1933, pp. 132–35; Strudwick 2005, pp. 333–35; see Porter and Moss 1928–2012, vol. 5, p. 237; Doret 1986, p. 91; Kloth 2002, no. 25; for the tomb complex Qubbet el-Hawa 35, see Edel 2008, vol. 2, pp. 667–966; for the posthumous veneration of Pepynakht, also called Heqaib, see Habachi 1977; Habachi 1985; Franke 1994)

Pepynakht bears two remarkable epithets, *jnn.j ḫr.t ḫꜣś.wt n nb=f* "who brings the resources of the foreign lands for his Lord" (Jones 2000, no. 1116) and *dd.j nrw Ḥrw m ḫꜣś.wt* "who puts the fear of Horus in the foreign lands" (Jones 2000, no. 3739), which already anticipate the events related throughout his (auto)biography and particularly in its last episode (Sethe 1933, pp. 134(12)–135(7)):

> *jw gr hꜣb.n wj ḥm nj nb=j r ḫꜣś.t-ꜥꜣmw.w r jnj.t n=f śmḥr-wꜥjt.j*[23] *mḏḥw-nḫn Kꜣ=j-ꜥpr.j śmḥr-wꜥjt.j jmj-rꜣ jꜥꜣ.w*[24] *ꜥn-ꜥnḫtj*[25] *wn ḥr-śpj.t kbn.t jm r pwn.t śk śmꜣ.n św ꜥꜣmw.w nj.w ḥrj.w-šꜥj ḥnꜥ ṯꜣs.t nj.t mšꜥ ntj ḥnꜥ=f [/// lacuna /// ꜥꜣ]mw.w jpf śbhꜣ=j śmꜣ.w jm=śn ḥnꜥ ṯꜣs.t nj.t mšꜥ ntj ḥnꜥ=j*
>
> And then, indeed, the Majesty of my Lord sent me forth against the hill-land of the *ꜥꜣmw.w* in order to bring back for him (i.e., the king) the sole companion and carpenter of Hieraconpolis Kaaper's son, the sole companion and overseer of dragomans Anankhty, who was constructing a Byblos-ship bound for Punt when *ꜥꜣmw.w* of the

lant *ś* and the voiceless affricate *s* resulting in the spelling *sfṯ*, which is found in this passage of Iny's inscription, see Edel 1955–1964, vol. 1, §116; Kammerzell 1997, pp. xlvi, xlix; Peust 1999, pp. 125–27; Gundacker 2009, vol. 1, pp. 45–50; Gundacker 2010, pp. 85–88.

[23] The reading of this title follows Quack 2002; Quack 2003; Quack 2005; see furthermore Jones 2000, nos. 32–68.

[24] For this title and further references, see Jones 2000, no. 327; Schneider 1998–2003, vol. 2, p. 193; Moers 2000, p. 59 n. 55; differently Redford 1986, p. 126 n. 8.

[25] For the reading and for the interpretation of this passage as adopted here, see Edel 1955–1964, vol. 2, p. lxvi [ad §307]; Doret 1986, p. 91, for the title *mḏḥw-nḫn* "carpenter of Hieraconpolis," see furthermore Jones 2000, no. 1726. The personal name *ꜥn-ꜥnḫtj* perhaps contains the hypocoristic ending *-tj* and means "he who repeats life" (differently Redford 1986, p. 127; Scheele-Schweitzer 2014, nos. 785–86).

> *ḥrj.w-šˁj* killed him together with the troop of the army which was with him. [/// *lacuna* ///] those *ˁꜣmw.w*. And I, together with a troop of the army which was with me, forced the murderers among them to flee. (Sethe 1933, pp. 134(12)–135(4))

It is important to keep in mind that this episode develops around the topos of taking care of the funeral of someone who has died in relation to an Egyptian expedition or even abroad. An event comparable to that of Pepynakht is recorded in the (auto)biography of Sabni, son of Mekhu I (first half of Pepy II's reign; Sethe 1933, pp. 135–40; Strudwick 2005, pp. 335–38; see Porter and Moss 1928–2012, vol. 5, pp. 231–32; Kloth 2002, no. 66, pp. 203–07; for the tomb Qubbet el-Hawa 26, see Edel 2008, vol. 1, pp. 52–65), who died in Nubia (*wꜣwꜣ.t*); his body was returned to Egypt and buried by his son Sabni.

Mekhu II tells in a text found in his father's tomb (second half of Pepy II's reign; Strudwick 2005, pp. 338–39; Kloth 2002, no. 20; for the tomb Qubbet el-Hawa 26, see Edel 2008, vol. 1, pp. 52–65) that he found his father Sabni had died, either in Nubia from where he was brought back to Egypt or in Elephantine. In order to fulfill his father's mission, Mekhu II organizes the transport of the commodities his father had acquired to the residence. There he petitions to the king who grants Sabni an appropriate funeral.

Even though all three episodes resemble one another and certainly share one literary topos typical for the late Sixth Dynasty at Elephantine, they nevertheless vary considerably in setting and detail so that their historical content can be taken seriously.

Additional sources

The ethnonymic term *ˁꜣmw.w* is furthermore found in two identical execrations texts from Gizah:

> *...nḥśj nb ḥnˁ nḥśj.t nb.t nj.w jmꜣ jrṯ.t wꜣwꜣ.t ˁꜣmw.w ntj.w ḥnˁ=śn mnṯw.w m śṯ.t*
>
> ...every male Nubian and every female Nubian from Yam, Irtjet, and Wawat, and the *ˁꜣmw.w* who are with (i.e., acting like[?]) them and the *mnṯw.w* in *śṯ.t*. (Wimmer 1993)

And finally, there is an attestation of a man, known from an architrave found near Kom el-Akhdar in the delta, who was named after his appearance or after his ethnicity:

> *ˁꜣmw*
>
> "the *ˁꜣmw*" (Fischer 1976a, p. 7, fig. 2, p. 8 with n. 26; see also Scheele-Schweitzer 2014, no. 652)[26]

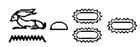
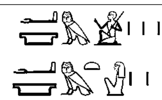
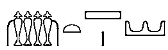
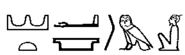
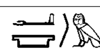
The latter example is very instructive insofar as an Egyptian man depicted in the usual manner bears the anthroponym *ˁꜣmw*. H. G. Fischer (1976, p. 8 with n. 26) supposed that, since both father and mother are mentioned and depicted as Egyptians, it is unlikely that this young man was of foreign origin or descent. Instead, this name could have been chosen because of the child's "Asiatic" appearance at birth. This conclusion, however, may be doubted because the mother's name, *Rwj* (Fischer 1976a, p. 7, fig. 2; Scheele-Schweitzer 2014, no. 513), which may be analyzed as a hypocoristicon from a name containing an element related to the word family of *rw.t* "outside" and *rwt.j* "foreigner" (Hannig 2003, pp. 705–06; Erman and Grapow 1982, vol. 2, pp. 404(11)–405(16), 405(17)–(19); see Espinel 2006, pp. 127–28), can be

[26] For a collection of early attestations (First Intermediate Period) of the feminine counterpart of this personal name, *ˁꜣmw.t*, see Schneider 1998–2003, vol. 2, p. 5.

interpreted as a reference to her foreign origin. Even though the latter explanation appears more plausible, one cannot state with certainty why this man was called *ꜥꜣmw*.

The main difficulty in analyzing the text material quoted so far is the interpretation of a few key expressions which have therefore been left untranslated. It is expedient to provide an overview of those expressions, which shall subsequently be discussed in greater detail (table 13.1).

Table 13.1. Topographic and ethnonymic key expressions concerning the *ꜥꜣmw.w*

Source	*Date*	*Passage*	*Choronyms*	*Toponyms*	*Ethnonyms*
Weni	Pepy I	Sethe 1933, p. 101(9)			 *ꜥꜣmw.w ḥrj.w-šꜥj*
		pp. 103(8), (10), 104(7), (12), (16)	 *tꜣ-ḥrj.w-šꜥj*		
		p. 103(12)		 *wnw.wt* (plural)	
		p. 104(13)		 *šr.t-tp-wnwḏw*	
Iny	Merienre	Marcolin and Espinel 2011, p. 505 fig. 5, line 4			 *ꜥꜣmw.w ꜥꜣmw.wt*
		line 2	 *ḫnt-š*		
Pepynakht	Pepy II	Sethe 1933, p. 134(16)			 *ꜥꜣmw.w nj.w ḥrj.w-šꜥj*
		p. 135(2)			 *ꜥꜣmw.w*
		p. 134(13)	 *ḫꜣś.t-ꜥꜣmw.w*		
Execration Texts	Unas/Teti (?)	Wimmer 1993, pp. 88 fig. a, 89 fig. b			 *ꜥꜣmw.w*
Kom el-Akhdar Architrave	(perhaps) Pepy II	Fischer 1976, p. 7 fig. 2			 *ꜥꜣmw* (anthroponym)

External and Contextual versus Internal and Etymological Evaluation

Most Egyptologists are inclined to interpret the expressions found in table 13.1 from a Middle and New Kingdom perspective, when they had become well established (see, e.g., Couroyer 1971 and, more recently, Darnell et al. 2005, p. 88; Marcolin and Espinel 2011, pp. 590–93; de Miroschedji 2012). But it is untenable to project Middle and New Kingdom information onto Old Kingdom inscriptions without critical evaluation of what may be the varnish of time or historicist and ideological reshaping vis-à-vis their true, but more or less veiled, roots (see Yeivin 1959). Since the external evaluation and the context do not provide enough information to determine the exact semantics of the key expressions mentioned in table 13.1, and in order to get a step closer toward their significance and meaning, it is necessary to attempt an internal evaluation. The toponymic and ethnonymic terms given above will therefore be analyzed etymologically, morphologically, and with respect to their co(n)text as well as their diachronic distribution within the Old Kingdom.

 *ꜥꜣmw.w* and  *ḥrj.w-šꜥj*

The ethnonymic expression *ꜥꜣmw.w* has found various etymological explanations, almost all of which have in common the supposition of Semitic origin. Among the ideas put forward (for further references, see Redford 1986, p. 127; Schneider 1998–2003, vol. 2, p. 5; Espinel 2006, p. 145; Saretta 2016), one may find etymologies deriving *ꜥꜣmw* from Semitic *ʿm* "people" (Sethe 1926, p. 27), *ʿrb* "to wander around" (Ember 1926, p. 311), *ġlm* "young man" (Yeivin 1959, p. 163; Redford 1986, pp. 127–32), or *ʿamm* "kin" (Saretta 2016, pp. 11–17); conversely, *ꜥꜣmw* has been linked with Egyptian *ʿmꜥꜣ.t* "throw-stick, boomerang" (Müller 1893, p. 123; see Hannig 2003, p. 271; Erman and Grapow 1982, vol. 1, p. 186(2)). The latter explanation has been refuted for phonological, morphological, and for semantic reasons (see Schneider 1998–2003, vol. 2, p. 5), but in the light of O. Rössler's investigation of Egyptian consonantal sound values (Rössler 1966; Rössler 1971; see Schenkel 1990, pp. 25–57; Satzinger 1994; Kammerzell 1997; Schneider 1997; Peust 1999; Schneider 2003; Satzinger 2003; Schneider 2016, n. 1; see also Breyer 2013 contra Steiner 2011), all of the suggested Semitic etymologies are also void. The most promising explanation was given by T. Schneider, who derived *ꜥꜣmw* from Semitic *drm* "south, southland (i.e., the Negev region)" (see Hebrew דָּרוֹם *Dārôm*, Koehler and Baumgartner 2004, vol. 1, p. 221; Gesenius 2013, p. 258); *ꜥꜣmw* thus means "man from the southland (Negev)" (Schneider 1997, pp. 195–96; Schneider 1998–2003, vol. 2, p. 5; see fig. 13.1).[27] This is either an exonym formed by a neighboring ethnic group, perhaps itself of Semitic origin, or it is an endonym derived by this specific ethnic group itself from the strip of land that they inhabited and viewed as their home. Whatever the case may be, this

[27] Coptic S ⲁⲙⲉ "herdsman" (Crum 1939, p. 7a; Westendorf 1965–1977, p. 5; Černý 1976, pp. 56; Vycichl 1983, p. 9), certainly the offspring of *ꜥꜣmw* ~ **ʿắꜣmŭw* (Osing 1976a, vol. 2, p. 413 n. 90; for the semantic change, see Schneider 1998–2003, vol. 2, p. 57), is the result of a secondary shift of word stress (for parallels, see Fecht 1960, §§26, 446–47; Osing 1976a, vol. 1, pp. 161–65, 235–42; Schenkel 1983): **ʿắꜣmŭw* > **ʿắꜣmĕ* → **ʿăꜣmḗ*. Although certainly a (Semitic) nisba derived from the toponym *drm* "south, southland, i.e., the Negev region" (for the ending -*w* as a desinence involved in the substantivation of (Egyptian) nisbae, see Gundacker 2010, p. 107 n. 300), *ꜥꜣmw* was viewed as a noun inflecting like those of noun patterns II.5 or, even more likely, III.4 (Osing 1976a, vol. 1, pp. 161–65, 235–42; Schenkel 1983; Schenkel 2008).

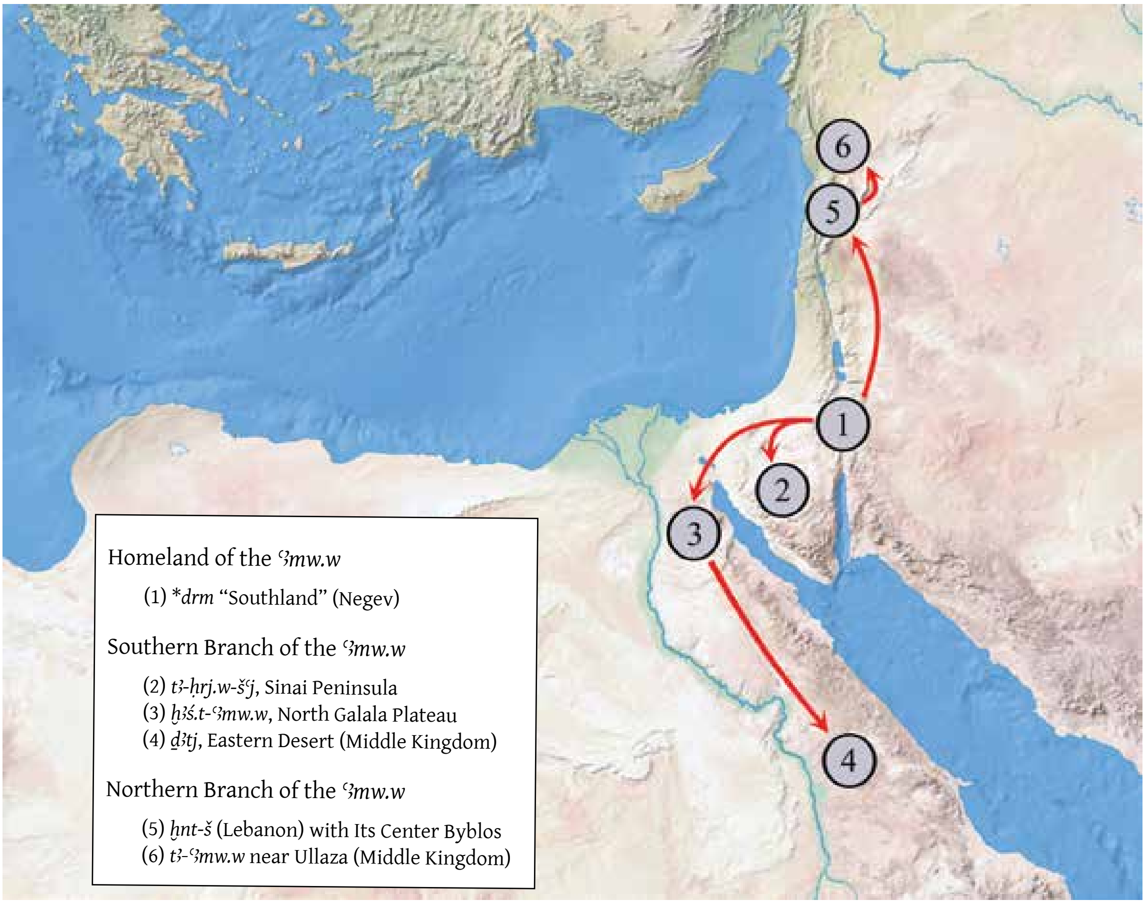


Figure 13.1. The origins and migratory movements of the *ꜥꜣmw.w* during the Old and Middle Kingdom

evaluation already renders it implausible that *ꜥꜣmw.w* designated all Semitic tribes and peoples (see, e.g., Redford 1986, pp. 126–27; Ryholt 1997, pp. 293–94; Schneider 1998–2003, vol. 2, p. 5; Darnell et al. 2005, p. 88) or, even more generally, all peoples dwelling in the Levant.

As opposed to that, *ḥrj.w-šꜥj* is obviously an Egyptian formation and therefore exonymic (and probably even xenonymic). The exact meaning of *ḥrj.w-šꜥj* is disputed, because the vast majority of Egyptologists tend to understand this designation literally as "those who are upon the sand," and thus as the name of a nomadic people inhabiting the Sinai Peninsula and adjacent desert regions (see, e.g., Helck 1971, p. 18; Gardiner 1994, p. 105; Mumford 2006, pp. 55–57; Espinel 2006, pp. 123–26; Rainey 2006, pp. 277–78; Szuchman 2009; Barnard 2009; see also Finkelstein and Perevolotsky 1990; Rosen 2008). A minority of scholars (Couroyer 1971; Redford 1986, p. 126), however, assume that the preposition *ḥr* should be interpreted more freely and thus they translate "those who are at/beside/across the sand," which they take as an argument in favor of an identification of the *ꜥꜣmw.w* with the population of the coast of southern Canaan. This interpretation rests on the assumption (Couroyer 1971) that *šꜥj* (Hannig 2003, p. 1286; Erman and Grapow 1982, vol. 4, pp. 419(23)–420(9)) only designates littoral sand. However, Old Kingdom attestations (see Hannig 2003, p. 1286; Espinel 2006, p. 125 n. 111) such as (a) the theonym *Nmtj-ḥrj-šꜥj* "Nemti who is on the sand" (Blackman 1953, pl. 31) in the "Song of the Palanquin" (variants mention *Skrw-ḥrj-šꜥj* "Sokar who is on the sand" and *Ḏꜥw-ḥrj-šꜥj* "Djau who is on the sand," see Altenmüller 1984 [with further references]), which refers to a desert procession or to the nature of this god often associated with death and yonder world, (b) a passage in the tomb of Qar (Sethe 1933, p. 252 (13)–(14); Lapp 1986, §§108–09; see Alliot 1935, vol. 2, pp. 115–17; Moreno García 1998; el-Khadragy 2002b; Strudwick 2005, p. 247; see also Porter and Moss 1928–2012, vol. 5, p. 200; Kloth 2002, no. 74) wishing him *smꜣ=f tꜣ ḏꜣj=f šꜥj r jś.wt=f nj.wt jmꜣḫw ḫr nṯr-ꜥꜣ* "that he may unite with the earth, and that he may cross the sand to his places of reveredness before the Great God," and (c) the words of a carpenter spoken to his colleague while sanding a chest, *dj mw dj šꜥj* "Put on (more) water! Put on (more) sand!" (Hassan 1936, fig. 219 [after p. 190]), demonstrate that *šꜥj* refers to any kind of sand, including desert sand. As a result, the traditional translation "those who are upon the sand" designating a perhaps semi-nomadic people living in the eastern desert and the Sinai Peninsula is preferable to any other as long as there is no additional information for a semantically more extravagant analysis.

Another difficulty concerns the relations between the *ꜥꜣmw.w* and the *ḥrj.w-šꜥj*. In Weni's (auto)biography, a group of insurgents is called *ꜥꜣmw.w ḥrj.w-šꜥj*. On the one hand, *ḥrj.w-šꜥj* has been taken as a separate phylonym or as a specifying adjectival phrase denoting a specific branch of the *ꜥꜣmw.w* (e.g., Fischer 1959a, p. 263; Helck 1971, p. 18; see Edel 1955–1964, vol. 1, §313). This interpretation is very unlikely in view of the choronym *tꜣ-ḥrj.w-šꜥj*, because it is highly uncommon that the territory of an ethnicity is named after an insignificant phylum or branch or an epithet of such. As opposed to the assumption that *tꜣ* always designates "flatlands" (de Miroschedji 2012, p. 269), *tꜣ* is a neutral designation for any kind of territory, in particular Egypt herself, and only in case the landscape is taken into account, for "flatlands" (see Hannig 2003, pp. 1398–402; Erman and Grapow 1982, vol. 5, pp. 212(6)–216(7); Espinel 2006, pp. 31–46), whereas *ḫꜣś.t* denotes "foreign regions or countries," and only in case the landscape is taken into account, "hill-lands" as opposed to Egypt as the *tꜣ* par excellence (see Hannig 2003, pp. 927–28; Erman and Grapow 1982, vol. 3, pp. 324(7)–325(21); Espinel 2006, pp. 46–84). It is thus most likely that *tꜣ-ḥrj.w-šꜥj* — with the "hill-land" 𓈉 as determinative! — is an unmarked choronym, that the *ḥrj.w-šꜥj* represent a distinct people of their own that is not to be confused with the *ꜥꜣmw.w*, and that the expression *ꜥꜣmw.w ḥrj.w-šꜥj* should be rendered "the *ꜥꜣmw.w* and the *ḥrj.w-šꜥj* (together)" (see, e.g., Strudwick 2005, p. 354). The choronym *ḫꜣś.t-ꜥꜣmw.w* is thus remarkable and should perhaps be viewed as a hill-country. This is perfectly in line with the somewhat younger attestation in Pepynakht's (auto)biography, which records a marauding band called *ꜥꜣmw.w nj.w ḥrj.w-šꜥj*. In this expression, the indirect genitive reveals that the *ꜥꜣmw.w* are subordinate to the *ḥrj.w-šꜥj*, which is the exact opposite of the most common interpretation of Weni's *ꜥꜣmw.w ḥrj.w-šꜥj* (see de Miroschedji 2012, p. 269, who notices this discrepancy but fails to resolve it by assuming a direct genitive, which anyway would be unsuccessful in view of the choronym *tꜣ-ḥrj.w-šꜥj*). The evidence evaluated so far is obviously contradictory, but this may be resolved if the chronology of attestations is borne in mind.

According to the (auto)biography of Weni from the time of Pepy I, the *ꜥꜣmw.w* (for the determinative of this expression in Weni's (auto)biography, see el-Khadragy 2002a, pp. 64–65), are involved in military conflicts, but obviously not in their homeland, which should be called **tꜣ-ꜥꜣmw.w*.[28] Since the *ꜥꜣmw.w* cannot be classified as a leading military power, one might assume that at least a part of the ꜥ3mw.w had become displaced after they had to leave their original homeland, the Negev (perhaps for reasons of continuing climate change, Frumkin et al. 1994; Avner 1998; Porat et al. 2010: p. 865; Kennedy 2016; Martin and Edwards 2013; see furthermore Issar and Brown 1998; Issar 2003: pp. 18–19; Prasad and Negendank 2004: pp. 216–18; Issar and Zohar 2007: pp. 135–42; Vaks 2008; Bar-Matthews and Ayalon 2011; see also the contributions in the present volume and, in addition, e.g., Krzyżaniak and Kobusiewicz 1990; Dalfes, Kukla, and Weiss 1997; Valbelle and Bonnet 1998; Lenssen-Erz, Tögtmeier, and Kröpelin 2002; Krzyżaniak, Kroeper, and Kobusiewicz 2003; Pachur and Altmann 2006; Staubwasser and Weiss 2006; Bubenzer, Bolten, and Darius 2007; Rosen 2007; Zereini and Hötzl 2008; Huyge, van Noten, and Swinne 2012). The regions closest to Egypt, the Sinai Peninsula, the north of the eastern desert, and, perhaps, the southernmost parts of the coast of Canaan and the Negev, must have been inhabited by various peoples. In certain parts of the Sinai Peninsula and of the northernmost regions of Egypt's eastern desert, *ḥrj.w-šꜥj* "those who are upon the sand" can be found (Helck 1971, pp. 18–21; Redford 1992, p. 57; Sowada 2009, pp. 11–12). In addition, royal inscriptions mention further peoples or tribes:

- *jwntj.w* (e.g., Gardiner, Peet, and Černý 1952–1955, vol. 1, pl. 8, no. 16, vol. 2, p. 63), whose name means either "those with *jwn.t*-bows" (see Helck 1971, p. 14; Espinel 2006, pp. 133–37) — another signal for military confrontations — or, less likely, because this would require a folk-etymological re-analysis, "those of the pillar of heaven" (which would indicate a semi-mythical expression alluding to the mountains of the Sinai Peninsula as

[28] This choronym is attested in the Middle Kingdom inscription of Khnumhotep of Dahshur (reign of Senwosret III, de Morgan 1895, p. 21, fig. 26; Allen 2008, p. 36; see Franke 1991, pp. 60–63), where this designates a strip of land to the north of Byblos around Ullaza (contra Allen 2008, p. 36, who, regardless of the mention of Byblos and Ullaza, seems to infer a location close to the east of the Nile delta). In the Middle Kingdom, *ꜥ3mw.w* is no longer a phylonym or ethnonym designating a distinct Semitic tribe or people (see Hannig 2006b, vol. 1, pp. 486–87) but had become a designation for all kinds of Asiatic people(s), including the famous Semitic refugees depicted in the tomb of Khnumhotep II at Beni Hasan (Newberry 1893, pl. 30). These migrants came to Egypt as refugees with the whole kit and caboodle although they certainly originated in southern Canaan and not in the *t3-ꜥ3mw.w* "land of the *ꜥ3mw.w*" in the northern Levant (for the interpretation of this scene, see Goedicke 1984; Kessler 1987; Staubli 1991, pp. 3035; Kamrin 1999, pp. 93–96; Rabehl 2005). The choronym *t3-ꜥ3mw.w* could thus have obtained its name from precisely that branch of *ꜥ3mw.w* who had sought help in the northern Levant and whom Iny had met near Byblos in the time of Merienre. According to this interpretation, Iny brought some members of this particular branch of the *ꜥ3mw.w* to Egypt, but the greater part of them settled down to the north of Byblos. The choronym *t3-ꜥ3mw.w* is thus a relic from the times of the *ꜥ3mw.w*'s migratory movement. Even though it is unclear when this northern branch of the *ꜥ3mw.w* ceased to exist as a distinct ethnic entity because they were merged in other peoples or tribes, this must have happened some time prior to the Middle Kingdom when *ꜥ3mw.w* was used for all peoples living in Asia (see, e.g., the use of *ꜥ3mw* in the Story of Sinuhe, Koch 1990; for the topos of the *ꜥ3mw* as the prototypical non-Egyptian, see Fischer 1976b, pp. 97–98; Loprieno 1988, pp. 41–59; Baines 1996; Morenz 1997; see also Felber 2005). See fig. 13.1.

The descendants of those *ꜥ3mw.w* who had intruded into the regions to the east of Egypt during the Sixth Dynasty may still be found as *ꜥ3mw.w* inhabiting the eastern desert during the Middle Kingdom (Murray 1935, p. 14; Darnell et al. 2005, p. 98 nn. 115–16). According to an inscription near Abisko (Roeder 1911, vol. 1, pp. 103–11, vol. 2, pls. 106–08, see Darnell 2003; Darnell 2004), the *ꜥ3mw.w nj.w ḏ3tj* "the *ꜥ3mw.w* of (the land) Djaty," appeared as marauding bands approaching Thebes. Already the Old Kingdom execration texts may indicate a branch of the *ꜥ3mw.w* that far south if the purported cooperation with Nubians (*nḥśj.w*) is to be taken seriously (see Wimmer 1993). Similar evidence has been found in the Wadi Hammamat (Couyat and Montet 1912, p. 40, pl. 5 no. 17), although the relevant passage remains difficult (see Koenig 1990, p. 107 n. a ad §B; Darnell 1995, pp. 68–69 with n. 114), at Hatnub (Anthes 1928, pp. 36–37, no. 16; Willems 1983–1984, p. 95), but this instance could be interpreted as a semi-literary metaphor, and in Wadi el-Hudi (Sadek 1980, pp. 55–56 no. 31).

their dwelling place and which became obsolete after the Fourth Dynasty; see Hannig 2003, p. 60; Erman and Grapow 1982, vol. 1, p. 55(3)–(7)).

- *(m)fkꜣtj.w* (Jéquier 1940, pl. 13), whose name is probably derived from the turquoise mining region on the Sinai Peninsula (see Espinel 2006, p. 146; see also Hannig 2003, p. 1554; Erman and Grapow 1982, vol. 2, p. 57(4)–(6); for the prefix *m-,* see Gundacker 2011, pp. 47–49).
- *mnṯw.w* (e.g., Gardiner, Peet, and Černý 1952–1955, vol. 1, pl. 5 no. 8; vol. 2, p. 58), whose name perhaps means "the furious ones" thus indicating a bellicose people (see Kees 1956, p. 41; Helck 1971, pp. 13–14; Espinel 2006, pp. 137–39; Hannig 2003, pp. 537–38; Erman and Grapow 1982, vol. 2, p. 92(4)–(6)); alternatively, *mnṯw.w* has been viewed as a member of the word family of *mnṯ* "to winnow" (Hannig 2003, p. 537; Erman and Grapow 1982, vol. 2, p. 91(17)) and as a sedentary, agricultural people living in Feyran Oasis, Sinai Peninsula (Yeivin 1965), although this remains questionable. According to a simile in PT 412 §724c T.*P.*M.*N.*Nt[a].*Nt[b], the *mnṯw.w* bore characteristic side locks (*ḥ*[*n*]*sk.t tpj.t mnṯw.w*), but in the light of the wide-spread distribution of this hairstyle (e.g., with Egyptian children, see Müller 1980; Feucht 1995, pp. 497–98), it appears unconvincing that this became the basis for naming the *mnṯw.w* (thus contra Darnell 1995, p. 68 n. 114).
- *śṯtj.w* (Jéquier 1940, pl. 13), a designation certainly meaning "those from the land *śṯ.t*," which itself was perhaps named after very particular kinds of hills (Redford 1986, p. 125) reminiscent of Egyptian shoulder-knots (Engelbach 1929; Gardiner 1957, p. 506 s.v. S.22; Hannig 2003, p. 1262; Erman and Grapow 1982, vol. 4, pp. 348(1)–(6), 349(3); Espinel 2006, p. 146).[29]

This, of course, is nothing more than a superficial glimpse of the complex ethnic landscape, which, because of the fact that all four ethnonyms are exonymic, leaves it undecided whether these peoples were Semitic or whether they represent the rest of a pre-Semitic population (Beit-Arieh 1986; Avner 2002, p. 144; Avner 2006, pp. 55–57). Nevertheless, as stated by Iny's (auto)biography, which dates a generation after Weni's, *ꜥꜣmw.w* are found somewhere near Byblos (for Egyptian contact to the northern Levant, see Sowada 2009, pp. 7–10 [with further references]) in the land *ẖnt-š* (Lebanon) and are brought to Egypt. Since no Egyptian military campaign is mentioned and since their status is not defined as that of *śḳj.w-ꜥnḫ* "living captives," they obviously are not prisoners of war or slaves, but rather migratory refugees. This is somewhat reminiscent of a scene found in Sahure's mortuary temple which shows an Egyptian flotilla bringing people ostensibly Asiatic in origin — men

[29] The sometimes supposed reconstruction of the ethnonym [*šꜣ*]*św.w* (Helck 1968, p. 477; Helck 1971, p. 18; Giveon 1971, pp. 194, 219; Ward 1972, p. 36; Wright 1988, pp. 155–57) on a block from Unas' causeway (Hassan 1938, pl. 95; Hassan 1955, p. 138; Smith 1965, p. 11; Labrousse and Moussa 2002, pp. 21–23, 136 fig. 16, pl. 1.a), which were unique in the Old Kingdom, is erroneous (Espinel 2006, p. 145 n. 253). In fact, there are no traces of the sometimes assumed hieroglyph "pool with lotus flowers" 𓆷 (Ward 1972, p. 36; see Smith 1965, fig. 13). The preserved signs, a "sedge" 𓇓 and a "quail chick" 𓅱, probably form part of a soldier's speech for which close parallels such as *śnḥ św* "Bind him!" are known from other fragments of the reliefs from Unas' causeway (de Rachewiltz 1959, pp. 41–42, pl. 5.10; Labrousse and Moussa 2002, pp. 21–23, 136 fig. 18). It is thus most likely to conjecture an archer's exclamation spurring on his comrade, e.g., [*śtj*] *św* "Shoot him!" or [*śmꜣ*] *św* "Kill him!" Moreover, secure evidence for the ethnonym *šꜣśw.w* does not predate the Eighteenth Dynasty (Erman and Grapow 1982, vol. 4, p. 412(10)–(11)), although, according to G. Posener (1940, p. 91), there may be a single attestation (as *šwśw*) in the Middle Kingdom execration texts.

and boys, but no women (see Feucht 1989, p. 177) — to Egypt, who all submissively pay homage to Sahure (Borchardt 1911–1913, IIb pl. 12–13). In all likelihood, this scene depicts the immigration of naval specialists and their assistants or apprentices (Bietak 1988; Bietak 1994, p. 17), which hints at a masterminded Egyptian immigration program. According to the (auto)biography of Pepynakht, which is another generation younger, yet a third branch of the *ꜥꜣmw.w* is found occupying a region now called after its new inhabitants *ẖꜣś.t-ꜥꜣmw.w*, but formerly dominated by the *ḥrj.w-šꜥj* or another people (see fig. 13.1). This latter region is conceivably a mountainous or hilly area close to the sea, and keeping in mind the Punt-bound (for Punt, especially during the Old Kingdom, see Stieglitz 1984; Bradbury 1996; Manzo 1999; Balanda 2005–2006; el-Awady 2006; el-Awady 2009; el-Awady 2010; Bard and Fattovich 2010; Espinel 2011b; Fattovich 2012b; Fattovich and Bard 2012; Manzo 2012; Guglielmi 2012; Bard and Fattovich 2013; Bard, Fattovich, and Manzo 2013; Tallet and Mahfouz 2013; Breyer 2016; see also n. 11) Byblos-ship (Fabre 2005, pp. 49, 90–92; see Wachsmann 1998; Ward 2000), which Anankhty was expected to put together after it had been transported to the expedition's starting point (see Creasman and Doyle 2010; for Cheops' boat, which was designed to be disassembled, perhaps for overland transport, see Nour et al. 1960; Abubakr and Mustafa 1971; Lipke 1984; Hanna 2007; Mark 2009; Mark 2010; Mark 2012), the Red Sea coast appears most plausible (see Gardiner 1994, p. 107 contra Helck 1971, p. 21; de Miroschedji 2012, p. 269).[30] Recent excavations at Ayn Soukhna strongly support this interpretation, because, in the late Old Kingdom, this harbor on the west coast of the Red Sea was perhaps the most important home base for expeditions to Punt (see Tallet 2009, pp. 713–14; Creasman and Doyle 2010, p. 14), and the nearby hills around the North Galala Plateau fit the toponym *ẖꜣś.t-ꜥꜣmw.w* "hill-land of the *ꜥꜣmw.w*" (pers. comm. with Julien Cooper). Evidence in favor of this scenario may be found in the Old Kingdom harbors on Egypt's Red Sea coast, although the opposite coast of the Sinai Peninsula cannot be excluded *a priori* (see the references in n. 11). Therefore, Egyptians did not encounter the *ꜥꜣmw.w* in their original homeland and naturally conceived them as foreigners among foreigners. Consequently, the etymology of the term *ꜥꜣmw.w* and Old Kingdom sources exclude both that *ꜥꜣmw.w* designates the inhabitants of the entirety of Asia or all Semites *in toto.* Instead they can be regarded as a particular Semitic tribe or a tribal confederation, which originated in the Negev region.

Ever since the colonization of the eastern delta had begun (Fischer 1959a; Fischer 1959b; Gödecken 1976, pp. 294–95 n. 200; Helck 1974a, pp. 199–200, 207 fig. 45; Helck 1991, pp. 163–68), there was a strong Egyptian military presence (see, e.g., Nisutnefer's titles *jmj-rꜣ rtḥ.w, jmj-rꜣ smjj.t, jmj-rꜣ mnw.w njśwt m ḥḳꜣ-ꜥnḏw* "overseer of strongholds, overseer of the desert, overseer of royal fortresses in the Thirteenth Lower Egyptian nome," Junker 1938, fig. 27, pp. 172–75; Jones 2000, no. 617; see also Mumford 2006, p. 57) securing the land and the roads (see, e.g., Hekenkhnum's title *jmj-rꜣ wꜣ.t-Ḥrw* "overseer of the Way of Horus," Hassan 1953, pp. 49–52; Jones 2000, no. 357; for a parallel from the late Third Dynasty, see Iika, Fischer 1959a, pp. 262–63; see also the *hapax legomenon ḥrj.t* "road, 'Fernstraße'" in Weni's (auto)biography, which alternatively could be read *wꜣ.t-Ḥrw* "Way of Horus"; for recent

[30] Deep-sea vessels, which were assembled on the coast of the Red Sea, were always at risk of being raided. See, e.g., the ships which Cleopatra VII Thea Philopator had brought to the Red Sea in order to sail to India and which were looted by Nabataeans under Malichus I according to Cassius Dio (*Historia Romana* 51,5.351,7.6; see Nawijn, Smilda, and Boissevain 1895–1931; Hackl, Jenni, and Schneider 2003, pp. 581–82).

archaeological excavations, see Hoffmeier and Moshier 2013; Hoffmeier and Moshier 2014) to the harbors and the Sinai mining regions. One should also keep in mind that, when the army for his first expedition is levied, Weni mentions as their origins, right after Upper and Lower Egypt, but before several Nubian and Libyan territories, *śḏrw* and the cordon of fortresses named after it, *ẖn-śḏrw.w* (Sethe 1933, p. 101(12)–(13)), but the enumeration does not allow for a conclusion on the whereabouts of these fortifications (The names of both of these localities are certainly related to *ḏrj* and *ḏrj.t* "wall" [Hannig 2006, p. 1088; see also Osing 1976, vol. 1, p. 158; Schenkel 1983, pp. 165–66], from which a denominal verb *ḏrj* "to be walled up, to be surrounded by a wall" [Hannig 2006, p. 1088] was derived. Both toponyms mentioned are thus derived via an unattested causative **śḏrj* "to surround with a wall, to fortify" and mean "fortification" and "the region od fortifications"; similarly Moreno García 2015, p. 87 [with n. 107]). This perfectly fits the route of Weni's first campaign, which makes station at *jw-mḥt.j* the "Northern Island" (perhaps a delta island, for the alternative reading *wnw.t mḥtj* [*sic*] "Fortress of the North," see Goedicke 1957, pp. 81–82; Helck 1971, p. 18 n. 49; Wildung 1977, pp. 15–16, and the critical remarks of Zibelius 1978, pp. 69–70), at *śbꜣ-nj-Jjj-m-ḥtp* the "Gate of Imhotep" (perhaps a checkpoint near the Isthmus of Suez), and at *wꜥr.t-nj.t-Ḥrw-nb-mꜣꜥ.t* the "District of Horus 'Lord of cosmic truth'" (perhaps a tightly organized desert district in the north of the Sinai Peninsula with a caravansary or a district in the Sinai mining region — see, however, Wildung 1968, p. 109; Zibelius 1978, pp. 62–63, 202–03; Gundlach 1994, pp. 109–10; differently Kloth 2002, p. 191 — where Snofru was venerated as a god, see Wildung 1968, pp. 105–14; Gundacker 2013a, p. 52). From this forward operating base, Weni may have attacked settlements and ramparts in the central and eastern parts of the Sinai Peninsula (see, however, Mumford 2006, p. 56, who suggests Wadi Gharandel and Wadi Sudr in the west of the Sinai Peninsula). Even though this interpretation remains somewhat conjectural, the cumulative evidence makes it obvious that there was an unstable continuum of peoples to the immediate east of Egypt including *ꜥꜣmw.w* and *ḥrj.w-šꜥj*, and perhaps there was even a Semitic substratum in the delta (see, e.g., Fischer 1959a; Schenkel 1975, pp. 69–70; Redford 1994; Gundacker 2010, pp. 68–69, 90 [n. 234], 102). But only from the Middle Kingdom onward, after the *ꜥꜣmw.w* had disappeared as a distinct ethnic entity, did this ancient phylonym become a generic term (ethnonym) for all people living in Asia, regardless of their ethnicity and their specific origins.

 *šr.t-tp-wnwḏw*

The reading and localization of this toponym — another *hapax legomenon* — are much debated. Currently, the most widespread interpretation is *šr.t-tp-gḥś* "nose of the gazelle-head" (Sethe 1933, p. 104; Edel 1981b, pp. 10–11; see fig. 13.5), but there are competing explanations such as *šr.t-tp-ššꜣw* "nose of the hartebeest-head" (Wilson 1955, p. 228; Helck 1971, p. 18) or *šr.t-tp-wnwḏw* "nose of the goat-head" (Doret 1986, p. 83 n. 967; Piacentini 1990, pp. 31–32 n. 40). Photographs of Weni's text (Borchardt 1937, pl. 30) reveal that the respective word is written logographically without any phonetic complements. Thus the reading rests solely upon the identification of the depicted animal, and, indeed, the shape of the body, the goatbeard, and in particular the form of the horns, which look like corkscrews, allow one to exclude the identification as *gḥś* "dorcas gazelle" (*Gazella gazella dorcas*, see Edel 1961–1963, pp. 165, 175, 184; Osborn and Osbornová 1998, pp. 175–77; Gräfin zu Stolberg-Stolberg 2004, p. 37; Bohms 2013, pp. 74–83; Strandberg 2009; Grzimek 2000, vol. 13, pp. 434–39; Grubb 2005, pp. 680–81) and as *šśꜣw* “hartebeest” (*Alcelaphus buselaphus buselaphus*, see Edel 1961–1963, pp. 171, 173, 175; Osborn and Osbornová 1998, pp. 171–73; Gräfin zu Stolberg-Stolberg 2004, pp. 18–22; Bohms 2013, pp. 34–43; Grzimek 2000, vol. 13, pp. 399–403; Grubb 2005, pp. 673–74; for antelopes in Egypt in general, see Saleh 2001; Hoath 2009, pp. 146–59). The reliefs of Nirewoser’s Re-temple (Edel and Wenig 1974, pl. F, pl. 9, 34; Edel 1961–1963, p. 180, fig. 11, see fig. 23; see also the mortuary temples of Sahure, Borchardt 1913, pl. 2, and of Unas, Labrousse and Moussa 2002, pp. 53, 157 fig. 71, pl. 11b) and of Mereruka’s mastaba (Duell 1938, pl. 152; see fig. 13.4; see also the mastabas of Kagemni, Harpur 2006, pp. 38–40, figs. 58–60, p. 144, fig. 179, see Freiherr von Bissing 1905–1911, and of Ty, Steindorff 1913, pl. 22) show exact parallels, and in the latter instance, these animals are labeled *wnwḏw*. This kind of animal is usually identified as a special kind of goat (Osborn and Osbornová 1998, pp. 185–87; Bohms 2013, pp. 429–36), that is, the Syrian goat (*Capra aegagrus forma hircus mambrinus*,[31] see Chevalier 1939, pp. 626–27; Epstein 1971, vol. 2, pp. 236–39, 263–69, 299; Espérandieu and Chaker 1994; Graff 2009, p. 12), which is also found as a very detailed determinative in an inscription in the tomb of Pepyankh (Blackman 1924, pl. 16; for further references, see Hannig 2003, p. 353). Recently, the particular form of the horns has led to the assumption that this is an early predecessor of an ancient Italian breed, that is, the Girgentana goat (*Capra aegagrus forma hircus girgentanus*, see Bertini 2011, pp. 194–95; Bigi and Zanon 2008, pp. 362–63).[32] It is furthermore noteworthy that the Egyptian zoological name *wnwḏw*, which frequently is misread as *wnḏw* (Hannig 2003, p. 353; Erman and Grapow 1982, vol. 1, p. 326(3); Doret 1986, p. 83; Piacentini 1990, pp. 31–32 n. 40; etc.), can be interpreted as *wnw-ḏw* ~ **wă*(*n*)*nắw-ḏăw* “child of the mountain” (see Osing 1976a, vol. 1, pp. 166, 224; see Schenkel 1983, pp. 167, 183), that is, “mountain goat,” which even could hint toward the origins of this breed of goats (figs. 13.2–5).

The determinative “hill-land” 𓈉 indicates that *šr.t-tp-wnwḏw* is a place or region outside of Egypt (Espinel 2006, pp. 46–84), which is corroborated by Weni’s (auto)biography speaking of *ẖꜣstj.w* “foreigners (from the hill-lands)” (Hannig 2003, p. 928; Erman and Grapow 1982, vol. 3, p. 236(1)–(2); see Espinel 2006, pp. 119, 140) who lived there; this undoubtedly designates a mixture of different peoples and not a specific tribe. Furthermore, the location

[31] For the history of this breed and its apparent modern offspring, the Baladi goat, see Epstein 1971, vol. 2, pp. 205–09, 236–39, 263–69; Espérandieu and Chaker 1994. Recent research revealed that wild goats and domesticated goats are genetically identical; the domestic goat is thus only a *forma* of the wild goat (see, e.g., Takada et al. 1997; Mannen, Nagata, and Tsuji 2001; Naderi et al. 2008; for purposes of nomenclature, see the International Commission on Zoological Nomenclature 2003; Grubb 2005, p. 702). However, in some cases, Markhor species (*Capra falconeri,* Grzimek 2000, vol. 13, pp. 484–85), with characteristically winding horns (left horn always twists counter-clockwise), and wild goats may have cross-bred (Zeuner 1967, pp. 131–32; Menrad et al. 2002; Ropiquet and Hassan in 2006), which, according to some, may also have influenced certain ancient Egyptian breeds (repudiating, however, Epstein 1971, vol. 2, pp. 284–86; Clutton-Brock 1999, p. 77; Grzimek 2000, vol. 13, p. 484; Bertini 2011, pp. 193–94, 204, 215). According to another hypothesis, breeds with twisted or corkscrew horns are offspring of *Capra prisca aegagrus* (although, more accurately, this is an early domestic variant of the Bezoar goat, see Zeuner 1967, pp. 126–27; Epstein 1971, vol. 2, pp. 286–92) or of an otherwise unknown wild goat with corkscrew-like twisted horns (left horn must have twisted clockwise just as with the Syrian, the Girgentana, the Baladi goat, and others more, see Epstein 1971, vol. 2, pp. 286–88; critical of or repudiating this explanation Epstein 1971, vol. 2, pp. 288–92; Thenius, Hofer, and Preisinger 1962; Lasota-Moskalewska, Kobryń, and Świeżiński 1991), although deliberate selection in breeding *Capra aegagrus forma hircus* appears most convincing (Zeuner 1967, pp. 120–26; Epstein 1971, vol. 2, pp. 292–93).

[32] For the domestication of goats and their first appearance in Egypt, see Zeuner 1967, pp. 113–33; Epstein 1971, vol. 2, pp. 193–310; Espérandieu and Chaker 1994; Pachur and Altmann 2006, pp. 295, 347, 450; Graff 2009, p. 12; Bertini 2011, pp. 193–94, 204, 215. See also the preceding note.

Figure 13.2. Relief depicting pairing *wnwḏw*-goats ("Chamber of the Seasons," Re-temple of Nirewoser) (after Edel and Wenig 1974, pl. F)

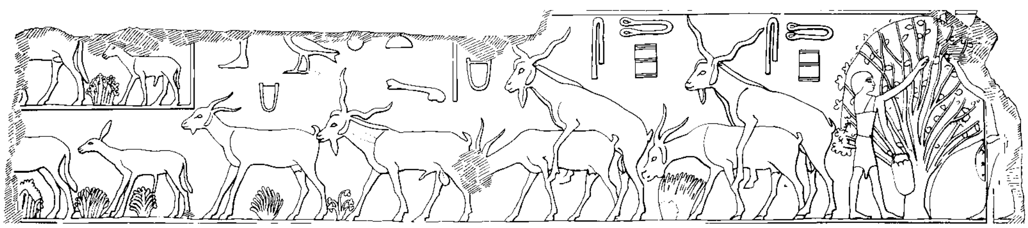


Figure 13.3. The rut and pairing of *wnwḏw*-goats ("Chamber of the Seasons," Re-temple of Nirewoser); the captions read (from left to right): *bnw.t* "rut," *jd.t* "female (goat)," *ṯꜣj* "male (goat)," [*ṯꜣj*] *jd.t* "[male] and female (goat)," *śṯp* "mounting" (twice) (after Edel and Wenig 1974, pl. 9)

of this place must be sought for not too far off a river, a lake, or a gulf or bay[33] that can be traversed by ship, but, at the same time, the open sea is excluded (thus with Mumford and Parcak 2003, pp. 89–90 contra de Miroschedji 2012, pp. 273–74), because journeys on open sea are never referred to with the verb *ḏꜣj* "to cross over" (Hannig 2003, pp. 1488–90; Erman and Grapow 1982, vol. 5, pp. 511(1)–513(14)). Therefore, it has been supposed that *šr.t-tp-wnwḏw* was located either in close vicinity of the Nile delta's eastern frontier region (Mons Cassius near Pelusium, Helck 1971, pp. 18–19; Wadi Tumilat, Goedicke 1963), on the coast of the Sinai Peninsula on the farther side of the Gulf of Suez (el-Markha Plain, Mumford and Parcak 2003; Parcak 2004; for a "pinkish, suggestively shaped ridge beside the sea ... forming a natural coastal landmark that stands out sharply from the darker hills to the east" at Hammam Pharaon, see Mumford 2006, pp. 56–58), or on the eastern shore of the Great Bitter Lake (Servin 1948). However, a reference to the Nile is implausible because then the entire army would have crossed over by ship, but Weni emphasizes that the army deployed in two divisions, on land and sea. Similarly, it appears futile that one division of the army traverses

[33] There is a single though remarkable inscription (Twelfth Dynasty: Gardiner, Peet, and Černý 1952–1955, vol. 1, pl. 10 no. 25, vol. 2, pp. 13, 68) that refers to a journey from the Sinai Peninsula back to Egypt across the Red Sea with the following words: *jw ḏꜣj.n≠j nnw ḥr špśś.w* "And I traversed the ocean (i.e., the Red Sea) with treasures." I am indebted to Julien Cooper for bringing my attention to this passage.

Figure 13.4. A *wnwḏw*-goat as depicted in Mereruka's mastaba; the caption reads: *rn* (*nj*) *wnwḏw* "a young of the *wnwḏw*-goat" (after Duell 1938, vol. 2, pl. 152)

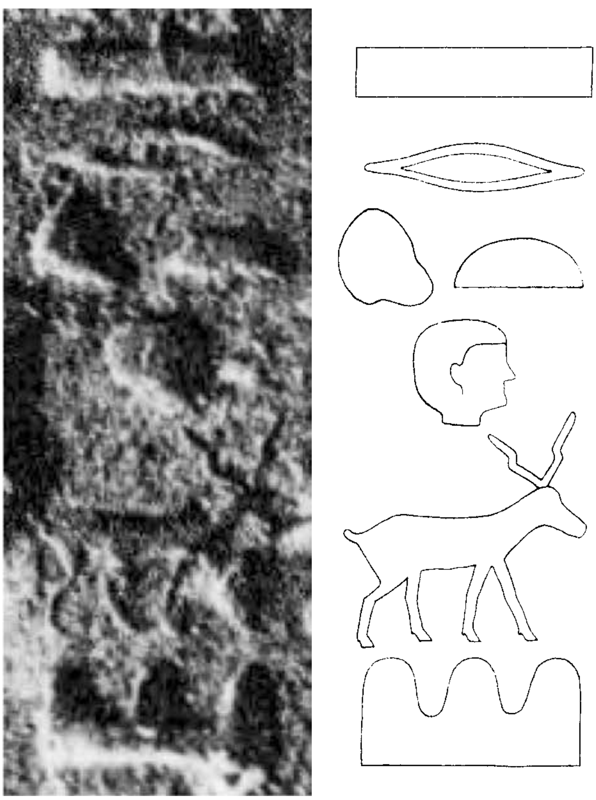


Figure 13.5. L. Borchardt's photograph of the writing of the toponym *šr.t-tp-wnwḏw* in the (auto)biography of Weni and E. Edel's line drawing of the same based on squeezes and collation with the original in Cairo (after Borchardt 1937–1964, vol. 1, Bl. 30 and Edel 1981a, p. 10, fig. 1)

the Bitter Lakes while another division circumvents it. Furthermore, the Bitter Lakes formed part of the Red Sea in the third millennium B.C. (for sea-level developments in the Gulf of Suez and for the moderate tectonic uplifting of the Isthmus of Suez during the holocene, see Bentz and Gutmann 1977; Gvirtzmann 1994; Purser and Bosence 1998; Shaked et al. 2002; Shaked et al. 2004; Kholeif 2004; Shaked et al. 2005; Moawad 2008; Shaked et al. 2009; Lambeck et al. 2011; Moawad 2013; Hegazi, Seleem, and Aboulela 2013). Since a sufficient number of Egyptian ships must have been available, the rivers and lakes of Canaan (de Vaux 1971, pp. 235–36; Ben-Tor 1981, p. 450; Ben-Tor 1983, p. 13; Roccati 1982, p. 192; see Sowada 2009, pp. 11–12) near Mount Carmel (Couroyer 1971, p. 560; Aḥituv 1984, p. 151; Schulman 1979, pp. 95–96, 101; de Miroschedji and Sadek 2001, pp. 49–50; hesitant also Edel 1981b, p. 11) and the rocky hillock at Jaffa (de Miroschedji 2012, pp. 273–74), where Egyptian dominion cannot be proven for this period of time (Mumford 2006, pp. 55–56; for radiocarbon dating of the destruction of towns in south Canaan, see Regev, de Miroschedji, and Boaretto 2012; Regev et al. 2012), can be excluded. The likeliest solution is thus to locate this toponym somewhere in the mountainous parts of the Sinai Peninsula (contra Sowada 2009, pp. 11–13 [with further references]), although this remains hypothetical (see Lichtheim 1973, pp. 22 n. 7; Wright 1988, p. 154).

If accepted for the moment, this assumption furthermore allows for a proper semantic evaluation of the toponym *šr.t-tp-wnwḏw.* Above all, it can be analyzed as an oronym (Edel 1981b, p. 11) with *tp-wnwḏw* "goat head" representing the mountain proper. Weni's (auto)biography ostensibly supports this by giving as the landing point of the naval expedition *pḥ.wj ḳꜣjw.w nj ṯꜣs.t ḥr mḥ.t tꜣ-ḥrj.w-šꜥj* "the end of the elevations of the mountain chain to the north of the land of the *ḥrj.w-šꜥj*" (see Kloth 2002, p. 194; contra Lichtheim 1973, p. 21; Hofmann 2002, p. 230; Strudwick 2005, p. 355). It thus becomes clear that Weni's wharf and the target area at the "nose of the goat head" are two different places not necessarily adjacent to each other. Remembering that *wnwḏw* means "child of the mountain" (i.e., "mountain goat"), one can assume that this mountain was populated with wild or escaped goats, which are well known for their ability to survive in the wilderness under difficult circumstances (see, e.g., escaped goats on Crete now forming an endemic species of wild goats, *Capra aegagrus cretica*, called Kri-kri or Agrimi, Manceau et al. 1999; Gardeisen et al. 2002; Horwitz and Bar-Gal 2006; see also Grzimek 2000, vol. 13, pp. 486–88; Grubb 2005, p. 702), or this mountain could have provided grass for the local community's goats in a less dry climate than is found today. To this, one may compare three wadis at Gilf Kebir (Schön 1996; Pachur and Altmann 2006, pp. 332–48; Zahran and Willis 2009, pp. 99–100; Kuper 2013) in the far southwest of modern Egypt, where, in the 1930s, cattle and livestock could still pasture (see also Redjedef's "water mountain," Kuhlmann 2005; Berger 2006; Berger 2012). Similarly, the Sinai Peninsula supported several species of gazelles at least until the 1930s (see Bohms 2013, pp. 34, 198). And even today (Beadnell 1927, pp. 73, 91, 115–20, 157; Qumsiyeh 1996, pp. 168, 206–10; Martin and Edwards 2013, p. 66), the Nubian ibex (*Capra ibex nubiana sinaitica*, see Osborn and Osbornová 1998, pp. 181–82; Bohms 2013, pp. 357–61; Edel 1961–1963, pp. 173–76; Grzimek 2000, vol. 13, p. 480; Grubb 2005, pp. 702–03) inhabits the mountains of the Sinai Peninsula. Finally, it can by no means be ruled out that there has not always existed a certain population of escaped goats and, perhaps, genuine wild goats (i.e., in all probability, a local variant of the Bezoar goat, *Capra aegagrus aegagrus*, see Hecker 1975; Horwitz 1993; Horwitz 2003; Martin and Edwards 2013, p. 66; see also Grzimek 2000, vol. 13, pp. 485–92; Grubb 2005, pp. 702–03), which sometimes cross-breed (Woodford 1992, p. 229; Geist and McTaggart-Cowan 1995, p. 96;

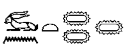
Fukarek 2000a, vol. 5, p. 500) with domestic goats and Nubian ibexes (for the desert fauna in the eastern Sahara until the end of the third millennium B.C., see Qumsiyeh 1996; Pachur and Altmann 2006; Riemer et al. 2010; Holzer et al. 2010; see also Beadnell 1926). Alternatively, *tp-wnwḏw* could be an exposed or remarkably formed mountainous formation at the foothills of a mountain chain (see Edel 1981b, p. 11).[34] The "nose" is almost certainly a rock spur or some kind of noteworthy rock formation, perhaps even one resembling a goat's nose (see Edel 1981b, pp. 10–11; Mumford 2006, p. 56); furthermore, as an analogy, one should remember the German term "Felsnase." In addition, an exact parallel may be found with the toponym *šr.t-bnbn* "nose of the conical (i.e., shaped like the *bnbn*-stone) mountain (?)" (Hannig 2006a, p. 1191; see furthermore Franke 1988; Zecchi 2001, pp. 171–72), which was situated somewhere in the Fayum region. The basic idea of this interpretation may, moreover, be supported by further Egyptian anatomical expressions applied metaphorically to landscape formations:

- *wpw.t* "vertex" and "peak, mountaintop" (Hannig 2006a, p. 203; Erman and Grapow 1982, vol. 2, pp. 297(10)–298(5)).
- *rꜣ* "mouth" and "wadi, river mouth" (compare ancient Greek τὸ στόμα, Hannig 2006a, pp. 481, 488; Erman and Grapow 1982, vol. 2, pp. 389(1)–391(13), 398(1)–(3); compare *rꜣ-ḥꜣ.t* "the mouth of the river branch (?)" in Iny's biography, Marcolin and Espinel 2011, pp. 581, 602; see Schneider 2012; Schneider 2015 against Biga and Roccati 2008; Roccati 2015).
- *śꜣ* "back" and "mountain ridge, crest" (compare German "Bergrücken" and ancient Greek τὸ νῶτον; Hannig 2003, p. 1051; see Edel 1981b, p. 11; Gundacker 2013b, p. 100).
- *ṯꜣs* "vertebra" and "sandbank" (Hannig 2003, p. 1457; Erman and Grapow 1982, vol. 5, pp. 400(2)–(7), 401(12)–(402 (5)).
- *ṯꜣs.t* "vertebra" and "mountain chain" (Hannig 2003, p. 1457; Erman and Grapow 1982, vol. 5, pp. 401(5)–(10)).
- *dhn.t* "forehead" and "cliff, crag" (Hannig 2006a, p. 1057; Erman and Grapow 1982, vol. 5, pp. 468(6)–(13)).

The reading of this toponym can thus firmly be established as *šr.t-tp-wnwḏw* "nose of the goat head" (see fig. 13.5), and it should be viewed as an exonymic or xenonymic petronym, perhaps an anoeconymic ceraeonym deriving its name from the local population of wild goats and from a rock spur's shape. Nevertheless, it remains difficult to locate *šr.t-tp-wnwḏw*, but it should not be sought for immediately on the coast, because Weni will have tried to land unnoticed by his enemies, but rather a little inland (and southward?). Weni's wharf is unknown, but should perhaps be looked for in the north of the Gulf of Suez at the foothills

[34] Morphologically, the toponym *tp-wnwḏw* "Goat-head" represents an exact parallel to *tp-nr.t* "Vulture-head" (Hannig 2006a, p. 1202 s.v. *tp-nj-mw.t*), an unknown place which was perhaps named after its vulture population, and to *tpj-jḥ.w* "Cattle-head," i.e., modern Atfih (Hannig 2003, p. 1578; see Gauthier 1925–1931, vol. 2, p. 94, vol. 6, pp. 52–53; Gardiner 1947, vol. 2, pp. *119–*20; Montet 1957–1961, vol. 2, p. 203; Fecht 1960, §§67–69; Helck 1974a, 128–29; Peust 2010, p. 15; Gundacker forthcoming, which perhaps alludes to a place particularly suitable for cattle herding or a famous cattle market. The theory sometimes proposed that this toponym was originally an epithet of Hathor (Gomaà 1986–1987, vol. 1, p. 380) is untenable because Hathor's epithet would be grammatically masculine (unless one proposes a more complicated derivational scenario) and, in particular, because such an epithet is not attested at all (see Leitz 2002–2003, vol. 7, p. 383).

of the Sinai mountain chain, maybe somewhere near Ras Sudr or even farther north on the eastern shore of what today is the Little Bitter Lake but in the third millennium B.C. formed the northernmost part of the Red Sea. This could also account for the strategic division of the army with one half levying additional forces in Lower Egypt and marching via the Isthmus of Suez and the other half crossing the Red Sea by ship, perhaps starting from Ayn Soukhna or maybe from Wadi el-Garf. A position for *šr.t-tp-wnwḏw* in the central region of the Sinai Peninsula (for a detailed description of the geology and topography, see Hume 1906; Barron 1907; Greenwood 1997; for the Way of Horus and northwest Sinai, mainly during the New Kingdom, see Moshier and el-Kalani 2008; Moshier 2014; Hoffmeier 2014), is thus most appealing (see Mumford 2006, pp. 55–58). One might furthermore suggest that Weni would have re-united the two divisions of his army near a wharf at Ras Sudr (or farther north at what today is the Little Bitter Lake), out of sight of inimical scouts; a wharf near Abu Zenima or farther to the south is highly unlikely because the coastal plains are easy to overlook. Weni then would have marched via Wadi Sudr past Gebel Sinn Bishr (or via Wadi Hag past Gebel el-Gid), would have turned south and would have attacked the rebels. It is difficult to conjecture their whereabouts, but a place somewhere near the southwesternmost branches of Wadi el-Arish or farther to the south near the western part of the mountain chain of Gebel et-Tih or near Gebel Dalal appears plausible. A scenario not too dissimilar from this could easily explain the massive Egyptian military force that was mobilized against local rebels. Uprising in this particular area would have endangered Egyptian access to the mines at Wadi Maghara, Serabit el-Khadim, and the roads to Timna. However, even if this conjectural reconstruction can be affirmed in the future, the exact localization of *šr.t-tp-wnwḏw* may never be possible given the high probability that rock falls and erosion impacted on impressive though fragile rock formations.

 *wnw.wt*

Weni's report on his military campaigns to the northeast of Egypt contains details that have been considered as indicative for a localization of *šr.t-tp-wnwḏw* and the *ꜥꜣmw.w ḥrj.w-šꜥj* in Canaan and, at the same time, as decisive against localizing these on the Sinai Peninsula.

One of the crucial terms is *wnw.t*, which usually bears as a determinative the "crenellated circular wall" . According to H. G. Fischer's (1959, pp. 261–64) convincing remarks, one should furthermore distinguish between the oecodomonym *wnw.t* "rampart, fortification" (Hannig 2003, p. 346; Erman and Grapow 1982, vol. 1, p. 315(12)) and the choronym *wn*(*w*)*.t* (Hannig 2003, pp. 346–47), which certainly are etymologically related. Surprisingly enough, there is a Coptic offspring, *wnw.t* (f.) ~ **wĭ́nwv̆t* > ^{S,B}ⲟⲩⲁⲛ (m.) "dam, dyke" (Crum 1939, p. 480a; Westendorf 1965–1977, p. 273; Černý 1976, p. 210; Vycichl 1983, p. 233; see Demotic *wn* "dam, dyke," Erichsen 1954, p. 89; Johnson 2002–2010, fasc. *w*, p. 93).[35] The term *wnw.t* "rampart, fortification" (see Espinel 2006, pp. 164–65, 323, 325, 328, 360, 365–66) is usually considered a designation for large towns with city walls and bastions or towers, which were represented with crenellations, in southern Canaan (Helck 1971, pp. 16–17; Sowada 2009, pp. 11–12; de Miroschedji 2012, pp. 271, 279–80, 284) like Arad (Amiran 1978, pl. 173–74; Schulman 1979,

[35] For the determination of the stressed vowel as *-*i*-, and not as *-*u*-, because the sound law *-*ŭ́Cwv̆*- > *-*ŭ́Cv̆*- did not operate, see Schenkel 1983, pp. 93, 96, 123. For the change of *genus* over time, see Osing 1976a, vol. 2, pp. 510–11 n. 234, pp. 629–30 n. 639.

pp. 101–02; Piacentini 1987, pp. 10–11), Jericho (Kenyon 1981, p. 97, pl. 229b), Ai (Callaway 1980, fig. 6), and Tel Yarmuth (de Miroschedji 1999, p. 7; de Miroschedji et al. 2001, p. 84; de Miroschedji and Sadek 2001, pp. 34–36).

However, Old Kingdom scribal convention makes the case particularly complicated since, although the "crenellated circular wall" ⬭ and its rectangular variants can designate settlements protected by some kind of fortification, this need not be the case (see Étienne 1999; Moeller 2004; Vogel 2004, pp. 29–59; Jesse and Vogel 2013). Consequently, this hieroglyph is of limited use for categorizing the types and size of a particular settlement, especially of foreign ones. At least in the New Kingdom, the "crenellated circular wall" ⬭ also served a magical purpose, that is, to enclose and lock up the non-Egyptian entities represented (for the New Kingdom, see the elaborate lists of foreign toponyms from the reign of Amenophis III, Edel 1980; Edel and Görg 2005; for further examples and references, see Stockfisch 2004). It is therefore impossible to state *a priori* whether a toponym enclosed in a "crenellated circular wall" ⬭ or determinated with such stands for a building, a settlement, or a region; since even toponyms like *kbnj* "Byblos" (Hannig 2003, p. 1358; Erman and Grapow 1982, vol. 5, p. 118(2)), though certainly towns and not regions or countries, are, in the Old Kingdom, always determined with a "hill-land" 𓈉, this matter becomes even further complicated. Even H. G. Fischer's (1959, p. 264) statement that, until the Fifth Dynasty, *wn*(*w*)*.t* designates a region or country is thus put to the test, because this solely rests upon the determinative "hill-land" 𓈉. In fact, even the reading of the "crenellated circular wall" ⬭, when used as a logogram, exclusively as *wnw.t* "rampart, fortification" is challenged by PT 683 §2047c N (after Sethe 1908–1922), where *jnb.t* "fortification, fortress" (Hannig 2003, p. 153; Erman and Grapow 1982, vol. 1, p. 95(10)) displays two determinatives: the "crenellated circular wall" ⬭ and the "(rectangular) wall" 𓊅. In another passage which is traditionally read *ẖbꜣ*(*w*)*=f n=f wnw.wt śṯ.t* "He shall hack up for him (scil. the king) the *wnw.wt* of the land *śṯ.t*!" (PT 650 §1837b N), the reading of the word conventionally interpreted as *wnw.wt* remains hypothetical because the "crenellated circular wall" ⬭, the "(rectangular) wall with additional bastions" 𓊅, and the "(rectangular) wall" 𓊅 do not allow for an unambiguous reading.

If the material assembled by H. G. Fischer (1959, p. 263, fig. 23) is reconsidered, his interpretation requires some modification: The earliest attestations from the Thinite Period (Petrie 1900, pl. 2 no. 8, pl. 11 no. 4, pl. 15 no. 18; Petrie 1901, pl. 7 no. 11) are most likely to denote a specific settlement *wnw.t*, be it in the Nile delta or be it farther east. This town or village was viewed as prototypical for a special type of installation or building, which therefore obtained its name *wnw.t*. From the late Third Dynasty onward, a region characterized by installations of the *wnw.t*-type was itself named after them. This allows one to identify H. G. Fischer's choronym *wn*(*w*)*.t*, which for the first time is found in Iika's title *śtp mjṯn.w wn*(*w*)*.t ẖꜣś.t nb.t* "recruiter of the guides of *wn*(*w*)*.t* and of every foreign land" (Fischer 1959a, pp. 262–63; Jones 2000, no. 3628), as a collective noun "(region of) *wnw.t*-installations" (for this type of noun, see Lacau 1909; Osing 1976a, vol. 1, pp. 290–94; Fecht 1982; for a toponym of this kind, compare *nbśjj.t* "sidder grove" besides *nbś* "sidder," Allen 2002, p. 122). Kaaper's titles *sẖꜣ mšꜥ njśwt m wn*(*w*)*.t, sẖꜣ mšꜥ njśwt m srr, sẖꜣ mšꜥ njśwt m tpꜣ, sẖꜣ mšꜥ njśwt m jdꜣ, sẖꜣ mšꜥ njśwt m ḫtj.w-fkꜣ.t, sẖꜣ mšꜥ njśwt m ẖꜣś.t jmn.t jꜣb.t* "scribe of the king's army in *wn*(*w*)*.t,* scribe of the king's army in *srr,* scribe of the king's army in *tpꜣ,* scribe of the king's army in *jdꜣ*, scribe of the king's army at the turquoise-terraces, and scribe of the king's army in the western and eastern desert" (early Fifth Dynasty; Fischer 1959a, pp. 259, 261–65; Jones 2000, nos. 3120–3125; see Bárta 2001, pp. 143–92, esp. pp. 179–80)[36] reveal that his area of responsibility covered in particular the east, because the *ḫtj.w-fkꜣ.t* "turquoise-mining terraces" (see Gundacker 2011, pp. 47–49) are a highly prominent locality and are certainly situated on the Sinai Peninsula. Even though, in theory, an unknown number of the other toponyms might have belonged to the western desert, it is more likely that they all formed part of the eastern territories in which Kaaper served as army scribe of Egyptian troops stationed there. The last title given, *sẖꜣ mšꜥ njśwt m ḫꜣś.t jmn.t jꜣb.t* "scribe of the king's army in the western and eastern desert," is most likely a title that sums up Kaaper's responsibilities on a larger scale, perhaps hinting at areas in which he had to administer military expeditions beyond his other duties in the specified areas east of Egypt. As such, it is most likely that *wn*(*w*)*.t, srr, tpꜣ*, and *jdꜣ* were nothing but *wnw.t*-installations that lay within the Egyptian hegemonial sphere. One should furthermore remember that, according to two passages in the Pyramid Texts (PT 366 §628b T.P.M.*N and PT 593 §1630d *P.M.N.*Nt^{a}.*Nt^{b}), which both use the "(rectangular) wall" 𓊅 as a determinative for the toponym (i.e., colponym or halycidonym) *km-wrr* "the great black," that is, the Great Bitter Lake which in the third millennium B.C. formed the northernmost part of the Red Sea (see Fecht 1960, §§24–29; Allen 2005, p. 87 [T.198], p. 217 [M.206], p. 431; Gundacker forthcoming), there must have existed Egyptian strongholds, although this need not represent Egypt's actual eastern frontier. The people of some of these *wnw.t*-installations mentioned in Kaaper's titles may even have asked for Egyptian military presence because of the onset of a migratory movement of certain tribes and peoples including the *ꜥꜣmw.w*. According to the grouping of toponyms, all of them are expected as direct neighbors of the eastern Nile delta and as parts of the Sinai Peninsula. This interpretation is supported by a scene in Seneb's tomb (Junker 1941, p. 69 fig. 16), which mentions two toponyms, *wn*(*w*)*.t* and *jdꜣ*, in an episode of navigation connected with the journey to the afterlife. In the New Kingdom, these toponyms are found in the Book of the Dead (chapter 17, see Rößler-Köhler 1979; Lapp 2006; chapter 150, see Lüscher 2010) as *wn*(*w*)*.t* and *jꜣdw*, and, according to H. G. Fischer's (1959, pp. 262–63) interpretation, these mythological places are reflections of the regions *wn*(*w*)*.t* and *jdꜣ* somewhere in the east delta, maybe near Lake Manzala or Lake Bardawil. The population of these installations was at least in part Semitic, because one such installation, *wnw.t ndjꜣ* (Petrie 1898, pl. 4; Kanawati and McFarlane 1993, pl. 27), was etymologized as the "*wnw.t*-installation *Naṭa-'el* ('God has turned [towards us]')" (Rössler 1966, p. 225; Schneider 1998–2003, vol. 1, p. 20; for an alternative, but improbable, reading, see Piacentini 1987, pp. 12–13; Moreno García 2015, p. 87 [n. 113]; see also n. 39 further below).[37]

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[36] For the supposed toponym *wnw.t-Jttj* in the Royal Annals (Gauthier 1915, p. 53; Wilkinson 2000, fig. 9), see Gundacker 2006, pp. 29–30. The additional example suggested for Djedkare's pyramid temple (Sowada 2009, p. 11 n. 8; see Redford 1986, p. 137) is void in view of A. Grimm's (1985, pp. 31–35, pl. 1) explanation of the scene; it is also notable that this scene most likely mentions African toponyms.

[37] In addition, the already mentioned names of *wnw.t*-installations (see Fischer 1959a, pp. 259, 261–65; Bárta 2001, pp. 179–80; see also Jones 2000, nos. 3120–25) may — under the speculative premise that all of them are of Semitic, or, more precisely, of Canaanite origin — tentatively be explained as follows (consonantal equations based on Rössler 1966 with special concern of a more archaic phonological state for some consonantal graphemes, see, e.g., Rössler 1971; Osing 1976b, pp. 165–69; Hoch 1990, pp. 487–504; Satzinger 1994, pp. 192–94; Kammerzell 1998; Kammerzell 1999; Peust 1999; Loprieno 1995, pp. 28–38; Kammerzell 2005; Gundacker 2011; Allen 2013, pp. 31–56): *srr* (Hannig 2003, p. 1573): compare Semitic √סרר *srr* "to be restive" (Ruppert 1987; Koehler and Baumgartner 2004, vol. 1, pp. 727–28; Gesenius 2013, p. 904), ergo "place of resistance" or, alternatively, √סלל *sll* "to heap up (a dam or a way)" (compare סְלָלָה; *silᵉlâ* "siege ramp," Ez 26,8, Fabry 1987; Koehler and Baumgartner 2004, vol. 1, p. 715; Gesenius 2013, pp. 889–90), ergo "place with heaped up walls, dams" (for Egyptian *s* as an affricate in the Old Kingdom,

In addition to the written material, there are two pictorial scenes which probably depict *wnw.t*-installations. A scene in Inti's tomb at Deshasheh (late Fifth Dynasty; Petrie 1898, pl. 4; Kanawati and McFarlane 1993, pl. 27; Mourad 2011, pp. 139–44; see fig. 13.6) depicts a *wnw.t*-installation that is besieged by Egyptians who make use of a scaling ladder and of pikes in order to break through the wall with its characteristic crenellations (Burke 2004, vol. 1, pp. 72–73; Mourad 2011, pp. 145–46). Outside this installation, a brutal battle is going on between Egyptians and men of Asiatic appearance, who are killed or taken as prisoners of war in great numbers (see Gilbert 2004; Spalinger 2005; Moreno García 2010). This scene is usually considered a proof for the identification of the besieged *wnw.t*-installation with a fortified town in southern Canaan (Helck 1971, pp. 16–17; Sowada 2009, pp. 11–12; de Miroschedji 2012, pp. 271, 279–80, 284). However, if the scene is observed more closely, it becomes obvious that this cannot be viewed as a town, because there are no edifices or any kind of internal structures within the enclosure. Even the chair or throne of the local chief or prince is depicted under the open sky without any kind of architecture which would indicate a palatial structure. There are only men destroying their weapons, which look like *jwn.t*-bows, in despair, women crying and trying to help their wounded family members; in some instances, women and men may even kill one another or themselves facing Egyptian conquest. The same holds true for a comparable scene (for a synopsis of details, see Mourad 2011, p. 142) from the tomb of Kaemhesut at Saqqarah (second half of Fifth Dynasty; Quibbell and Hayter

see Baer 1985; Schenkel 1986, pp. 70–71; Peust 1999, p. 126; for its Semitic counterpart, see Steiner 1982; Faber 1985; von Soden 1995, §30); *tpꜣ* (Hannig 2003, p. 1578): compare Semitic √פלל *pll* "to observe, to watch" (Akkadian *palālum* "to observe," von Soden 1965–1981, vol. 2, p. 813; Roth et al. 1958–2006, vol. 12, p. 51; a *nomen loci* with prefix *t*-, see von Soden 1995, §26a; Meyer 1992, §40.7; Gesenius and Kautzsch 1995, §85p; Joüon and Muraoka 2006, §87ov; Fischer 2006, §66a; Koehler and Baumgartner 2004, vol. 2, pp. 891–92; Gesenius 2013, p. 1056; the common Hebrew meaning "to pray" is perhaps a back formation from תְּפִלָּה *t*^{e}*pillâ* "(cultic correct, official, i.e., observed) prayer" and is thus a secondary development, see Gerstenberger 1989), ergo "place of observation, observation spot" or, as some kind of taboo with pejorative connotation, Semitic √תפל *tpl* "to spit (> to prattle nonsense)" (Arabic *tafala* "to spit," Wehr 1985, p. 141; compare the biblical toponym תֹּפֶל *Tōpæl*, Dt 1,1, the localization of which is unknown, though it is said to be a place in the desert; the look-alike root, perhaps only a secondary offspring due to semantic specialization, √תפל *tpl* "to become stale, saltless" is also possible; Marböck 1995; Koehler and Baumgartner 2004, vol. 2, p. 1634; Gesenius 2013, p. 1452), ergo "place of spitting (i.e., cursing, scil. the enemies)" (or "saltless place" as opposed to a salty depression or the Dead Sea region?); *jdꜣ* (Hannig 2003, p. 1549): compare Semitic √אטר *ʾṭr* "to curve, to surround" (in the context of a tapping of a spring or a well; Koehler and Baumgartner 2004, vol. 1, p. 36; Gesenius 2013, p. 43), ergo "enclosure" (for Egyptian *d* as an emphatic dental, see Rössler 1971; Schenkel 1990, pp. 25–57; Kammerzell 1997, p. xlvi; Peust 1999, pp. 80–84; see also Satzinger 1999; Satzinger 2003); *ʿnn.t* (Petrie 1898, pl. 4; Kanawati and McFarlane 1993, pl. 27; for the reading, see n. 39, below): compare Semitic √דנן *dnn* "to fortify" (compare Akkadian *dannatum* "fortification," von Soden 1965–1981, vol. 1, p. 160; Roth et al. 1958–2006, pp. 89–90; compare also the biblical toponym דַּנָּה *Dannâ*, Jos 15,49, which is situated in Judah; Koehler and Baumgartner 2004, vol. 1, p. 219; Gesenius 2013, p. 256), ergo "fortified place" (for Egyptian ʿ as a voiced dental, see Rössler 1971, pp. 218–29; Schenkel 1990, pp. 25–57; Kammerzell 1997, p. xlvi; Peust 1999, pp. 80–84; see also Satzinger 1999; Satzinger 2003; Schneider 2012; Schneider 2015, pp. 442–43; The alternative identification of *ʿnn* with Semitic *ʿain* "spring, source," Petrie 1898, p. 5; Albright 1934; de Vaux 1971, pp. 235–36, which is also problematic because of the two nasals, thus becomes untenable.); *wn*(*w*)*.t*: compare Semitic √ינה *jnh* < *wnj* "to be violent, to suppress" (mostly used in a metaphor as an attribute of a sword, חֶרֶב הַיּוֹנָה *ḥæræb hajjônâ* "violent sword," Jer 25,38 [conjecture], 46,16, 50,16; Ringgren 1982; compare Akkadian *wanāʾum* "to suppress," von Soden 1965–1981, vol. 3, p. 1459; Roth et al. 1958–2006, vol. 20, p. 402, and Arabic *wanā* "weak (< suppressed)," Wehr 1985, p. 1440; Koehler and Baumgartner 2004, vol. 1, p. 398; Gesenius 2013, p. 468), ergo "place of violence (i.e., fighting?)." Unfortunately, these toponyms (cataphygonyms) neither can be identified with sites known from excavations nor can they be connected to places found in other text sources.

Figure 13.6 (above). Egyptians besieging a *wnw.t*-installation and fighting against its defenders, with accompanying inscription; tomb of Inti at Deshasheh (after Kanawati and McFarlane 1993, pl. 27)

Figure 13.7 (right). Fragment of a siege scene from the causeway of Unas depicting part of a *wnw.t*-installation under attack and a foreigner in it having fallen to the floor. Compare the lower left portion of the *wnw.t*-installation in Inti's relief which depicts a similar scene (after a drawing in the notebook of J. Černý; Espinel 2011a, p. 61, fig. 9)

1927, frontispiece; McFarlane 2003, p. 23, pl. 48; Mourad 2011, pp. 135–39; see figs. 13.8–9). Although the representation of the *wnw.t*-installation is slightly different — there are no crenellations and its overall shape is almost rectangular — the content of the scene is quite similar. Egyptian soldiers use a scaling ladder in order to surmount the enclosure wall (Burke 2004, vol. 1, pp. 72–73; Mourad 2011, pp. 145–46), while others attempt to destruct it with axes and rakes or hoes (Gilbert 2004; Spalinger 2005; Moreno García 2010). Once more, there are no buildings or any kind of internal structures, there are only heaps of hay or grain that the goats[38] and cows inside the *wnw.t*-installation start to consume. The people inside the walls, all of Asiatic appearance with long hair, the men bearded, though dressed somewhat differently than those depicted in Inti's tomb (McFarlane 2003, p. 33; see fig. 13.6), are crying in desolation and preparing themselves for killing their relatives. Outside the walls, the Egyptians are fighting against foreign soldiers, taking captive men and capturing livestock as booty. It is impossible to identify the ethnicity of these peoples ("Asiatics," see Mourad 2011 [with further references]), but one may surmise that it is one of the peoples or tribes known from the rock inscriptions on the Sinai Peninsula, perhaps even a pre-Semitic tribe (Beit-Arieh 1986; Avner 2002, p. 144; Avner 2006, pp. 55–57) in one or the other instance if the *jwn.t*-bows from Inti's scene are indicative for the ethnicity of the besieged people (*jwntj.w*?).

Inti's scene is accompanied by a very fragmentary inscription that once consisted of six columns but now preserves only a few words and phrases (Petrie 1898, p. 5; Kanawati and McFarlane 1993, p. 25, pl. 26; see fig. 13.6):

> [1]| /// *wjj* /// [2]| /// *wḏꜣ*[*.n=j*] /// [3]| /// *mšꜥ nš* /// [4]| /// *nj sj śmꜣ* /// [5]| /// *wnw.t ndjꜣ wnw.t ꜥnn*[*.t*] [6]| /// *wjj ḥśj* /// *św* (or: *njśwt*) *ś.t nb.t* (or: *nb=j*)
>
> [1]| /// [insufficient for translation] [2]| /// and I proceeded /// [3]| /// the army which ousted /// [4]| /// of the man who had killed /// [5]| /// the *wnw.t*-installation *ndjꜣ*, the *wnw.t*-installation *ꜥnn*[*.t*] [6]| /// [insufficient for translation] sing /// him (or: king) /// every (or: my Lord) ///.[39]

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[38] According to the shape of their horns, these must be *wnwḏw*-goats.

[39] Previous treatment of this text (see Kanawati and McFarlane 1993, p. 25) requires corrections: Column 1 remains incomprehensible, though the recurring sequence (-)*wjj*(-) also found in column 6 could be the rest of an anaphoric element (Guglielmi 1984, pp. 25–26; Osing 1992; Goelet 2001). If this conjecture was correct, this text could be a second "Song of Victory" similar to that found in Weni's (auto)biography. The last two signs in column 3 probably represent a participle or a *śḏm.n=f* in a virtual relative clause, *nš.n=f* "after it (had) ousted" (see Hannig 2003, p. 662; Erman and Grapow 1982, vol. 2, pp. 337(13)–338(3)), because otherwise one would expect the syntagma *mšꜥ pn* "this army" (see the passages from Weni's (auto)biography quoted above). The reading of the "seated man" as the suffix pronoun *=j* "I, me" is untenable for Old Kingdom inscriptions and attested only very sporadically from the late Sixth Dynasty onward (see Edel 1955–1964, vol. 1, §160). The "seated man" is thus either the determinative of some kind of designation of a person or a profession, or it is the logogram *sj* "man" or *rmṯ* "person, man, human being" (see Edel 1945, §68; Edel 1955–1964, vol. 1, §53). It is thus most likely that the preceding "ripple of water" stands for a genitival *nj* "of" or the dative *n* "for" and that, again, the following *śmꜣ* is either a participle or a *śḏm.n=f* in a virtual relative clause, i.e., *śmꜣ.n=f* "after he had killed;" however, one has to admit that passive forms or a relative form are not excluded (*śmꜣw* "who was killed" or *śmꜣ.w/śmꜣ.n* /// "whom /// had killed" etc.). Column 5 preserves two place names preceded by "crenellated circular walls" that enclose a "man with his arms tied behind his back". Since there is not enough space after the remains of the second toponym for a third hieroglyph of this kind, these signs cannot function as determinatives. Accordingly, they must be read as logograms *wnw.t* "*wnw.t*-installation" with the name of the respective structure or region following. If one assumes that all *wnw.t*-installations were listed the same way, which is most plausible, it becomes impossible to read an indirect genitive with the first preserved toponym, i.e., *nj djꜣ* (Piacentini 1987, pp. 12–13) or *nj jdꜣ* (Moreno García 2015, p. 87 [n. 113]). There is

Unfortunately, further details and information cannot be obtained from this inscription due to the very fragmentary state of the entire scene and the text accompanying it. However, a third scene, which once belonged to the decoration program of Unas' pyramid causeway (Espinel 2011a, pp. 61–62 with fig. 9), is known from a very small fragment that contains a segment of the crenellated *wnw.t*-installation and a man having fallen onto his knees (see fig. 13.7) just as in Inti's scene (see also the war scenes on Old Kingdom spolia from Amenemhet I's pyramid, Goedicke 1971, pp. 59–78 and, in particular, pp. 139–40, 142–44).

Information gathered so far leads to the conclusion that *wnw.t*-installations were a kind of building typical for the easternmost part of the Nile delta, the adjacent regions of the eastern desert, and the greater part of the Sinai Peninsula and perhaps also the Negev. Except for a superficial resemblance of bastions or towers in the ground plan, there is no indication of large fortresses or city walls. The crenellation, which obviously formed a not indispensable part of *wnw.t*-installations, is perhaps more likely an emblematic or figurative feature triggered by the hieroglyph "crenellated circular wall", which is nothing but a variant of the "(rectangular) wall" always displaying such a crenellation. After all, the *wnw.t*-installations have turned out to be rather small-scale local ramparts,[40] in part made up of earth walls, in

obviously some space at the end of this column which is sufficient for one hieroglyph, perhaps a "bread". If the entire fifth column contained names of *wnw.t*-installations under attack, perhaps three or four more toponyms must have been mentioned. Column 6 remains incomprehensible though it shows several hieroglyphs. Nevertheless, the common assumption that this records the reward which Inti received for his military achievements, is certainly wrong, since, in the Old Kingdom, as a rule, *ḥsj* "to laud, praise" (Hannig 2003, pp. 880–83; Erman and Grapow 1982, vol. 3, pp. 154(2)–155(25)) is always spelled with the "tall water pot" and the "door bolt", but never with the "folded cloth" (see, however, n. 22, above), and the following determinative, a "forearm with hand holding bowl", should perhaps be emended and be read as a "forearm with palm of hand downwards", which is the usual determinative of the verb *ḥśj* "to sing" (Hannig 2003, p. 885; Erman and Grapow 1982, vol. 3, pp. 164(11)–165(1)). This, then, could be another hint in favor of a "Song of Victory" although this remains highly conjectural and cannot be proven at the moment. For an additional fragment that might belong to this text and reads perhaps /// *ḥꜣj wj* /// "/// O how unfortunate is/are ///" (for *ḥꜣj* "to mourn, beweep," see Hannig 2003, p. 754; Erman and Grapow 1982, vol. 3, pp. 6(10), 6(12)–7(4); for passive adjectives without an ending, see Osing 1976a, vol. 1, p. 216; Schenkel 1983, pp. 116–21, 181, for passive adjectives as predicates in adjectival sentences, see Edel 1955–1964, vol. 2, §§944, 951), see Kanawati and McFarlane 1993, p. 38, pl. 57.

[40] Even if only some of the etymologies for names of *wnw.t*-installations proposed above (see n. 36) were proven correct, then, also on this level, they would turn out to be rather refuges of clans or branches of tribes than walled cities. None of these names is suitable for large towns, since most of them are designations of military architecture (*srr* "place of resistance" or "place with heaped up walls, dams," *jdꜣ* "enclosure," *ꜥnn.t* "fortified place," *wn*(*w*)*.t* "place of violence (i.e., fighting?)."), only one being, perhaps, filled with pejorative magic (*tpꜣ* "place of spitting, i.e., cursing, scil. the enemies," if not "place of observation, observation spot"), and another one being a religious statement (*ndjꜣ* "God has turned [towards us]")

If the Semitic etymologies are accepted, this could be viewed as an argument in favor of locating the *wnw.t*-installations rather in the northern, central, and southwestern parts of the Sinai Peninsula, since the pre-Semitic population had receded to the southeastern and southern parts according to the analysis of archaeological finds (Beit-Arieh 1986; Avner 2002, p. 144; Avner 2006, pp. 55–57). However, there is also one *wnw.t*-installation the name of which is not of Semitic origin because it is mentioned as *sꜣ jrp wnw.t śṯ.t* "the phyle of wine (of the) *wnw.t*-installation *śṯ.t*" on a seal impression found at Beit Khallaf (reign of Djoser, Garstang 1902, pl. 10(12); Kahl, Kloth, and Zimmermann 1995, p. 16). The choronym *śṯ.t*, which forms part of the name of this *wnw.t*-installation, denotes the Sinai Peninsula and perhaps the Levant *in toto* from the late Old Kingdom onward (Gauthier 1925–1931, vol 4, p. 95; Erman and Grapow 1982, vol. 4, p. 348(3)–(4); Hannig 2003, p. 1262), but, in its origins, it might have been restricted to the region around Wadi Feyran in the southwest of the Sinai Peninsula (Espinel 2006, p. 139). It is even likely that the seal impression alludes to the wine produced in Wadi Feyran where the tradition of viticulture is maintained until today (differently Moreno García 2015, p. 88).

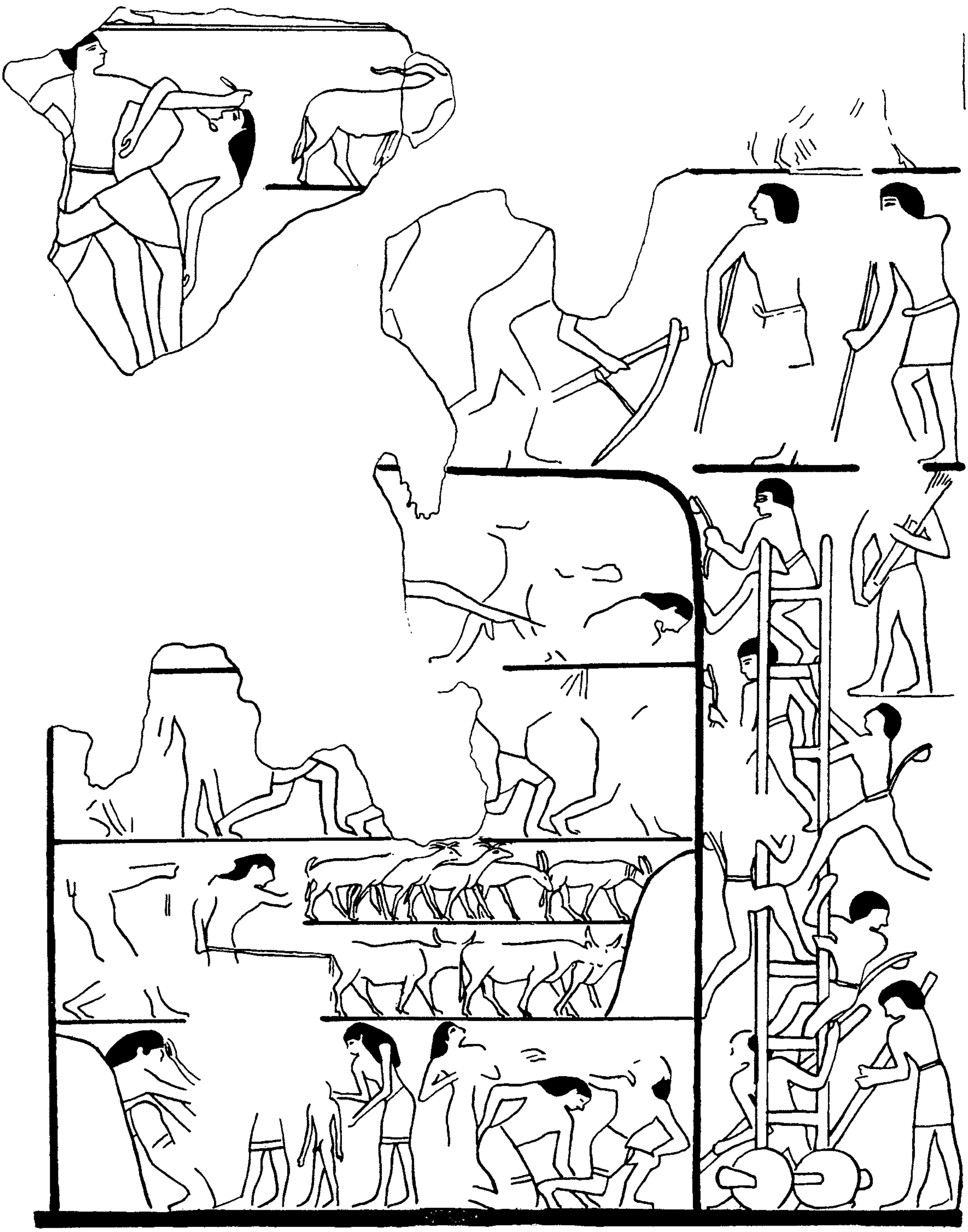

Figure 13.8. Egyptians besieging a *wnw.t*-installation and fighting against its defenders; tomb of Kaemhesut at Saqqarah (older record of the scene) (after Smith 1965, fig. 15)

Figure 13.9. Egyptians besieging a *wnw.t*-installation and fighting against its defenders; tomb of Kaemhesut at Saqqarah (later record of the scene) (after McFarlane 2003, pl. 48)

part maybe of dry stone walls or mudbrick walls (Mourad 2011, pp. 145–46; Moreno García 2015, p. 88), which served as refuges for the local population or semi-nomadic herdsmen whenever they were under pressure from marauding bands, like those of the *ꜥꜣmw.w*, or Egyptian troops. Obviously, some of these communities must have accepted Egyptian military presence (see Kaaper's titles, Fischer 1959a, pp. 259, 261–65; Jones 2000, nos. 3120–25; see Bárta 2001, pp. 143–92, esp. pp. 179–80), and some appear to have submitted themselves to becoming an Egyptian protectorate. It is also important to remember that Weni devastated and plundered *wnw.t*-installations in the land of the *ḥrj.w-šꜥj* without specifying to whom they belonged; the only thing known is that they did not belong to the *ꜥꜣmw.w* who were foreigners in this particular region. It is thus possible that most of the measures taken by Weni aimed, on the one hand, at driving back intruders who perhaps would endanger the acquisition of materials and commodities on the Sinai Peninsula (see Ben-Tor 1983, p. 14; Marfoe 1987, p. 267) and, on the other hand, at demonstrating Egypt's power in order to secure a sphere of influence (see de Vaux 1971, p. 236; Callaway 1978, p. 55; Redford 1986, pp. 140–41; Redford 1992, pp. 53–55). If his account is to be taken verbatim, Weni's scorched-earth policy will also have caused significant casualties among peoples and tribes who had prematurely accepted foreign dominion in place of Egyptian control and among uninvolved peoples. Since there is no information available, this remains a hypothesis, but it appears at least possible that Weni's military expeditions were the Egyptian reaction to a changing ethnic landscape in the Sinai region that threatened access to the resources of the Sinai Peninsula and, since it evoked local uprisings, intimidated Egypt's local protectorate. This also becomes obvious if the execration texts (see Wimmer 1993 and n. 13, above) are remembered, which also indicate that Egypt felt her position endangered and sought to make a warning example to others.

Even though the exact political events remain unclear, there is yet another title, borne by Mereri (Sixth Dynasty; Drioton 1943, p. 488; Jones 2000, no. 418; Moreno García 2015, p. 88), which further elucidates the nature of the *wnw.t*-installations: *jmj-rꜣ wnw.wt* "overseer of the *wnw.t*-settlements," but this time *wnw.t* shows three "houses" 𓉐 as determinatives. In contrast to the semi-nomadic clientele of other *wnw.t*-installations, this particular instance must have involved hamlets or villages which had erected local refuges, that is, *wnw.t*-installations. This analysis is also perfectly in line with the Coptic offspring of *wnw.t* (f.) ~ **wĭ́nwv̆t* > $^{S.B}$ⲟⲩⲁⲛ (m.) "dam, dyke" (Crum 1939, p. 480a; Westendorf 1965–1977, p. 273; Černý 1976, p. 210; Vycichl 1983, p. 233),[41] which suggests rather primitive ramparts (similarly Moreno García 2015, p. 88). The scaling ladders depicted in Inti's and Kaemhesut's tombs (see figs. 13.6–9), which might be taken as an argument against this interpretation, are unquestionably exaggerated in height since they extend as far as the ground plans of the *wnw.t*-installations range. It is thus, in part, the so-called Egyptian aspective (Brunner-Traut 1963; Assmann 1987; Assmann 1990; Brunner-Traut 1992; Vomberg 2004, pp. 33–56) that defines the height of the scaling ladders, although artistic conventions and the composition rules of these two scenes may also have influenced their height. Furthermore, the traditional

[41] A close parallel may be found in New Kingdom Nubia, where people sought refuge in structures called *jnb.t* "fortification, fortress" (Hannig 2003, p. 153; Erman and Grapow 1982, vol. 1, p. 95(10); see Edel 1976, pp. 86–87), which prompted the Egyptians to call these people *jnbtj.w* "wall-people" as was shown by E. Edel (1976, pp. 85–88). A few years later, E. Edel pointed out that these refuges are nothing but simple, shallow niches and hollows high up in the cliffs of the Nile valley, which were protected with dry walls built of unhewn stone (Edel 1992, pp. 39, 41). Refuges of this kind were still in use in the middle ages, when the Christian population fled Muslim raids.

assumption that the scaling ladder as depicted in Kaemhesut's tomb displays wheels should be questioned. Wheels of this kind would have destabilized the scaling ladder and would have endangered the lives of the soldiers climbing it. It is thus more likely that the so-called wheels are two stones co nnected with a beam of wood and placed in the sand at the bottom of the scaling ladder in order to prevent it from sliding away, tilting, or falling over. Mineurs, low scaling ladders, and men attempting at breaking through the walls with pikes, axes, and rakes or hoes (see Kanawati and McFarlane 1993, p. 25; McFarlane 2003, p. 33; Mourad 2011) are the measures expected when rather primitive walls made up of earth, dry stone or mudbricks are under attack. There are no battering rams or massive siege poles (for an early Twelfth Dynasty example in the tomb of Amenemhat, Beni Hasan no. 2, see Newberry 1893, pl. 14; Burke 2004, vol. 1, pp. 78–80), siege towers (for an early example in the Eleventh Dynasty tomb of Intef, TT 386, see Jaroš-Deckert 1984, pp. 37–41, pl. 17, folding plates 1, 3; Burke 2004, vol. 1, pp. 80–81), or comparable military equipment that one would expect if massive city walls with bastions and towers were under attack (see Partridge 2002, pp. 127–48, 165–74; Burke 2004, vol. 1, pp. 52–53). The measures that the Egyptians take appear totally insufficient for attacks on large towns with massive city walls but utterly adequate for attacks on ramparts with surrounding walls of earth, dry stone, or mudbrick. One must also keep in mind that *wnw.t*-installations may have varied in size and construction because the hieroglyph "crenellated circular wall" ▢ is certainly schematized, stylized, and simplified in its appearance.

It is furthermore interesting to note that, in the Middle Kingdom (see Papyrus Berlin 100–21 found at Lahun, Scharff 1924, pp. 45–46; see Drioton 1943, p. 488 n. 2), *wnw.t*-installations, which are the home of servants and workmen, were located in the vicinity of the royal residence in the Fayum region (Helck 1971, p. 80; Bietak 1994, pp. 18–20; Fischer 1959, p. 264). Since for the same period, besides numerous *ꜥꜣmw.w* in Egyptian service (see Meurer 1996, pp. 131–32), the titles of *sẖꜣw nj ꜥꜣmw.w* "scribe of the *ꜥꜣmw.w* ('Asiatics')" (Kaplony-Heckel 1971, pp. 3, 5–6) and of *jmj-rꜣ mšꜥ nj ꜥꜣmw.w* "commander/officer of *ꜥꜣmw.w* ('Asiatics')" (Darnell et al. 2005, pp. 87–88; see Posener 1957) are attested, there must have existed some kind of a separate, and maybe partially autonomous, administration of *ꜥꜣmw.w* (above all mercenaries and those not assigned to Egyptian temples or institutions as serfs, see Helck 1971, p. 345). Consequently, the *wnw.t*-installations within Egypt must be viewed as settlements of the *ꜥꜣmw.w* that were surrounded by enclosure walls and thus somewhat like "ghettos" (see Meurer 1996, pp. 131–32). Unfortunately, it is impossible to examine the origins of the *ꜥꜣmw.w* living in these "ghettos"; they could be offspring of those *ꜥꜣmw.w* who had come to Egypt as refugees in the late Old Kingdom, but, alternatively, they may be viewed as serfs who had come to Egypt during the Middle Kingdom as prisoners of war (see Posener 1957, pp. 157–58; Goedicke 1991; see the annals of Amenemhet II, Altenmüller and Moussa 1991; Altenmüller 2015, pp. 28–29, 67–82, 116–20; for the toponyms mentioned, see Quack 1996). All this makes it extremely implausible to view the *wnw.t*-installations as fortresses because, on the one hand, the Egyptian authorities never would have accepted a foreign military base right in the heart of Egypt and, on the other hand, one would not expect these installations as the home of workmen, be it free men or corvée workmen (for a prosopographic overview, see Schneider 1998–2003, vol. 2; see also Helck 1971, p. 345; Luft 1998, pp. 28–29).

In this context, it is noteworthy that, in the "Song of Victory," Weni makes mention of the felling of *dꜣb.w* "fig trees" (*Ficus carica*, Hannig 2003, p. 14–62; Erman and Grapow 1982, vol. 5, p. 417(9)–(15); Germer 1982a, pp. 24–25; see Eisen 1901; Fukarek 2000b, vol. 4, pp. 138–39; Lansky and Paavlilainen 2010, pp. 13–116; Zohary, Hopf, and Weiss 2012, pp. 126–30), of *jꜣrrw.wt* "vines" (*Vitis vinifera*, Hannig 2003, p. 32; Erman and Grapow 1982, vol. 1, p. 32(12)–(14); Germer 1982a, pp. 116–17; Meeks 1993; see Fukarek 2000b, vol. 4, pp. 425–27; Arnold 2002; Zohary, Hopf, and Weiss 2012, pp. 121–26), and of the torching of *jtj* "barley, grain (in general)" (Hannig 2003, pp. 233–35; Erman and Grapow 1982, vol. 1, p. 142(10)–(20); see Osing 1977, p. 171 with n. 20; Hofmann 2002, p. 230), which probably denotes provisions and need not necessarily have been grown locally. Even today, figs (*Ficus carica* var. *rupestris*) grow semi-wild and in horticulture, for example, in Wadi Turfa, around St. Catherine Monastery, and on Gebel Musa (Bodenheimer and Theodor 1929, pp. 34–35, 105; Moustafa and Klopatek 1995; Zahran 2001, pp. 213, 235; Zahran and Willis 2009, p. 243; for the beginning of this plant's domestication, see Tengberg 2012, pp. 191–92; Banning 2012, pp. 400–01).[42] However, the vine (*Vitis vinifera* L.), regardless of whether the cultivated (*Vitis vinifera* L. ssp. *vinifera*) or the wild grapevines (*Vitis vinifera* L. ssp. *sylvestris*), has never formed part of the epichorian flora of the Sinai Peninsula (Fukarek 2000b, vol. 4, pp. 425–27; Terral et al. 2010; Tengberg 2012, pp. 184–88), but it grows in horticulture, for example, around St. Catherine Monastery (Caner 2010, pp. 22, 258 n. 25, p. 259 n. 32; remember also the vine on Mount Musa that allegedly was planted by St. John the Evangelist, Manley and Abdel-Hakim 2009, p. 29), in Wadi Ledia, Feyran Oasis, and Wadi Kyd (Hume 1906, p. 69; Bodenheimer and Theodor 1929, p. 36; Walsh 2000, p. 101). Today, Bedouins grow barley, sweet melons, cucumbers, and other vegetables near el-Arish and Gebel Maghara, though this requires intensive use of artificial irrigation (see Greenwood 1997, pp. 75–79, 91, 116–18). Even though the wild variety of barley (*Hordeum vulgare* ssp. *spontaneum* (L.) K. Koch) is native to the northeastern-most parts of the Sinai Peninsula, production of grain — especially of barley (see Schiemann 1948; Germer 1982a, pp. 208–11; Badr et al. 2000; Fukarek 2000b, vol. 4, pp. 486–500; Komatsuda et al. 2007; Willcox 2012; Zohary, Hopf, and Weiss 2012, pp. 51–59; Jakob et al. 2014; Langlie et al. 2014), be it two-row barley (*Hordeum vulgare* ssp. *vulgare* f. *distichon* (L.) Alef.) or six-row barley (*Hordeum vulgare* ssp. *vulgare* f. *hexastichon* (L.) M. Hiroe) — on a large scale in order to sustain a greater population is extremely unlikely in the third millennium B.C., although a mixture of pollen of wild and cultivated cereal was detected in an Early Bronze Age stratum at Nebi Saleh in the southern Sinai (Beit-Arieh 1977: p. 148) and, therefore, small grain fields are imaginable for some areas (e.g., Feyran Oasis; see Yeivin 1965). Certain parts of the Sinai Peninsula (see Parcak 2004, pp. 54–55; Mumford 2006, pp. 55–58) are obviously suited for trees and bushes (Hume 1906; Barron 1907; Zohary 1935; Zahran and Willis 2009, pp. 213–50; see also Beit-Arieh 1977, p. 148; Liphschitz 1998) as well as for semi-wild fruit-bearing trees and horticulture (for detailed data, see Bar-Yosef and Philipps 1977, in particular Shmida 1977; Danin 1978; Danin 1979; Danin 1983; Danin 1986; Danin and Plitman 1986; Abd el-Wahab et al. 2008 [with numerous references to literature on local vegetation patterns]). Consequently, Weni's felling of fig trees and vines (and the torching of grain) is, at best, inconclusive (contra Helck 1971, p. 18; de Miroschedji 2012, pp. 270–71) for the identification of the target area of his military campaigns. Equally, the exact localization of the cataphygonyms denoting *wnw.t*-installations and known from Egyptian texts, after which the immediate surrounding was named, remains impossible for the moment.

[42] Allah's oath in the Qurʾān (Sura 95, 12) "By the Fig and the Olive, by Mount Sinai and this sacrosanct place!" (Reynolds 2011, pp. 16–17 [with further references]; see also Gilbert-Carter 2013, p. 49) should also be considered.

Conclusion

The above re-evaluation of a few toponymic and ethnonymic key expressions found in Old Kingdom written sources and their morphological and semantic analysis in context made it necessary to change the current view (see Sowada 2009, pp. 11–14; de Miroschedji 2012) on Egypt's foreign affairs. Above all, for the period of the Old Kingdom, the *ꜥꜣmw.w* must be viewed as a distinct Semitic tribe, which originated in the Negev region and left their homeland for various reasons, *inter alia*, climate change (Kennedy 2016). One branch of the *ꜥꜣmw.w* settled down on the Sinai Peninsula and came to an accommodation with resident tribes but later on was involved in unrest, perhaps even in an uprising (*ꜥꜣmw.w* and *ḥrj.w-šꜥj*). A second branch of the *ꜥꜣmw.w* sought its fortune in the northern Levant, where they were met by Iny, who brought some of them to Egypt. However, the rather unstable ethnic landscape on the Sinai Peninsula was permanently stirred up by the *ꜥꜣmw.w*, another branch of whom, for the price of submission to the *ḥrj.w-šꜥj*, finally managed to obtain a strip of land, which was then to bear their name (*ẖꜣś.t-ꜥꜣmw.w*). This third branch of the *ꜥꜣmw.w* was then called *ꜥꜣmw.w nj.w ḥrj.w-šꜥj* because of its relations to the *ḥrj.w-šꜥj* (see fig. 13.1).

Those events put Egypt's protectorate on the Sinai Peninsula to the test, and it required repeated and severe military actions to secure control over the main roads and the mining regions in the south. The complex and fragile system of *wnw.t*-installations, that is, local refuges for the semi-nomadic and in part perhaps also sedentary population, was crucial in this respect. Even though information is limited and, probably, adjusted to an official version of historical events (for the possibility that Weni imitates royal phraseology or copies earlier royal texts, e.g., the "Song of Victory," see Kloth 2002, pp. 193–94), recent discoveries of texts (Marcolin and Espinel 2011), pictorial scenes (Espinel 2011b), and archaeological sites (Mumford and Parcak 2003; Mumford 2006) have added new stones to the mosaic. This has not only stimulated present research, but will, hopefully, further complete the picture of late Old Kingdom Egypt on the crossroad with her neighbors.

Addendum

Recent excavations by the Mission archéologique française de Saqqâra brought to light a block that bears a portion of a new version of Weni's (auto)biography from a second tomb of his near the pyramid of Pepy I (Collombert 2015). Among the preserved portions, a differing, though closely related, version of the episodes on war against certain ethnic groups to the east or northeast of Egypt and of the "Song of Victory" is extant.

According to P. Collombert's conjecture (Collombert 2015, p. 150), the anaphoric verse in this edition of the "Song of Victory" was simply [*jjj.n mšꜥ p*]*n* "This army returned," without the phrase *m ḥtp* "in peace." This refrain was given only once at the very beginning of the song, but it was most likely intended to go together with every stanza. Even though the discovered text duplicates for the greater part the text known from Abydos, the "Song of Victory" from Saqqara must have contained considerably more stanzas than its Abydos recension. However, the assignment of additional portions of text is highly tentative since the transition from one column to the next cannot be determined with certainty, even though the lacunae as such can be calculated with approximately 13–14 hieroglyphic squares each.

Following P. Collombert's presentation of this remarkable text (Collombert 2015, pp. 150–52), the following passages may be advanced as follows:

(x+18) *[jjj.n mšꜥ p]n* | *ẖbꜣ.n⸗f <tꜣ-ḥrj.w-šꜥj>* ||
pdś.n⸗f [tꜣ-ḥrj.w-šꜥj] ||
[śẖn.n⸗f wnw.wt⸗f] ||
(x+19) /// ||
šꜥ.n⸗f dꜣ[b.w⸗f jꜣrrw.wt⸗f] ||
[śtj.n⸗f ẖt m jtj rmṯ.w⸗f nb.w] ||
(x+20) /// *ẖꜣś.wt jptn* ||
jnj.n⸗f ḏꜥm /// ||
(x+21) /// ||
/// *gś nj djw šsp.w m ꜣwjw⸗f* ///? ||
[śmꜣ.n⸗f ṯꜣs.t jm⸗f <m ḏbꜥ.w ꜥšꜣ.w>?] ||
(x+22) *[jnj.n⸗f ṯꜣs.t jm⸗f <ꜥšꜣ.t wr.t>? m śḳj.w-ꜥnḫ]* ||

(x+18) Th[is army has returned] |
after it had devastated <the land of the *ḥrj.w-šꜥj*>, ||
after it had trampled [the land of the *ḥrj.w-šꜥj*,] ||
after it had torn down its *wnw.wt*, ||
(x+19) /// ||
after it had cut down its fi[g trees and its vines,] ||
[after it had set fire to the grain of all its people,] ||
(x+20) /// those foreign lands, ||
after it had brought electrum ///,] ||
(x+21) /// ||
/// leather five palms in its length ///?, ||
[after it had slain troops within it <of many tens of thousands>?,] ||
(x+22) [after it had led away <very numerous>? troops (from) within it as living captives!] ||

If the tentative integration of text from the Abydos recension is correct, the Saqqara recension may be viewed as strictly composed in thought couplets: (a) devastating — with lexical variation *bꜣ* (Abydos, cf. Hannig 2003, p. 406; Erman and Grapow 1982, vol. 1, p. 415(17) vs. *ẖbꜣ* (Saqqara, cf. Hannig 2003, p. 933; Erman and Grapow 1982, vol. 3, p. 253(1)–(5)) — and trampling the land of the *ḥrj.w-šꜥj* (with graphic abbreviation due to a split column in the suggested Vorlage, cf. Sethe 1908–1922, vol. 4, §109; Edel 1955–1964, vol. 1, §89); (b) tearing down the *wnw.wt* and, by conjecture, demolishing the accommodations (?); (c) cutting down fig trees and vines and torching the grain; (d) perhaps looting some kind of resources (turquoise?) and carrying off electrum; (e) ransacking certain goods (?) and leather products; (f) killing people and taking others more captive (maybe again with a phrase mentioned only once at the end due to a split column in the Vorlage, but the space available is hardly sufficient for the text of the Abydos recension).

No matter to what degree this interpretation is accepted, P. Collombert's assumption that, in column x+20, one should segment *jnj⸗j n⸗f ḏꜥm* "I brought off for him (i.e., the king) electrum" (Collombert 2015, p. 151) hardly matches context and stylistics. Keeping in mind the refrain referring to the army, it was certainly not Weni but the army that devastated and trampled the land of the *ḥrj.w-šꜥj* and cut down its fig trees and so on. A sudden shift of syntactic patterns appears thus highly improbable, and re-analyzing the entire "Song of Victory" would disrupt its stylistic coherence.

It is furthermore remarkable that, just as in the Abydos recension, in the extended version from Saqqara, nothing can be found that decidedly would hint at large fortifications or urban settlements under attack. Altogether, the commodities mentioned fit the conclusions drawn above fairly well, since electrum (cf. Ogden 2000, pp. 161–64; cf. n. 22, above) and other mining products are among the expected booty when invading and plundering the Sinai Peninsula. However, it is particularly difficult to contextualize the leather mentioned in column x+21 (cf. Junker 1957; van Driel-Murray 2000, pp. 299–319), although it might denote some special kind of local product, maybe of a semi-nomadic population largely dependent on pastoral agriculture. However, leather from gazelles and other prey seems equally possible in the light of kites found on the Sinai Peninsula and in the Negev (Horwitz 2005; Holzer et al. 2010). In this regard it is particularly noteworthy that desert kites are also known from the central and southern parts of the Sinai Peninsula (Perevolotsky and Baharav 1991; Segal and Carmi 1993, p. 103; Meshel 2000). Even though many of those kites were constructed in the late neolithic or chalcolithic periods, some of them remained in use until the end of the third millennium B.C. or even longer though, as it seems, in part with changing purpose (Sebbane et al. 1993; Holzer et al. 2010; see also R. Cohen 1999; Rosen 2002; Avner 2006; Davidovich et al. 2014). Similar though somewhat bigger enclosures are known from the Negev and Jordan, but this kind of structure was more likely used for gathering and protecting livestock (Davidovich et al. 2014; see also Haiman 1996; compare also much larger buildings of this kind in Jordan, Abu Azizeh 2011), although, again, re-use as a primitive refuge against military attacks should not be precluded. Therefore, one might ask whether some of the desert kites (e.g., Kobusiewicz 1999; see Nadel et al. 1999; Bar-Oz et al. 2011; Davidovich et al. 2014) were adapted or, beyond their original purpose, were used as refuges and could thus be connected to what the Egyptians called wnw.t-installations (similarly Moreno García 2015, p. 88)?

According to the available space, Weni's laudation by the king (Sethe 1933, p. 104(4)) did not form part of the Saqqarah recension, at least not in this place. Instead, immediately after the conclusion of the "Song of Victory," the next episode about campaigning against the land of the *ḥrj.w-šꜥj* commenced, but, according to the preserved traces, this was a blend of what the Abydos recension offers as two separate episodes:

> (x+22) [*hꜣb wj ḥm=f r*] *mꜣꜥ mšꜥ pn m* [*śrś.nw sp r dr tꜣ-ḥrj.w-šꜥj*] (x+23) [*btk.w nẖt.w*] *m ẖꜣśtj.w jpn m* [*šr.t-tp-wnwḏw ḏꜣj.kj m nmj.w ḥnꜥ ṯꜣs.wt jptn*] (x+24) [*r tꜣ-ḥrj.w-šꜥ*]*j śk gś.t nj.t* [*mšꜥ pn m ḥrj.t ///*]
>
> (x+22) [And His Majesty sent me forth to] lead this army for a [sixth time in order to vanquish the land of the *ḥrj.w-šꜥj*] (x+23) [and the strong insurgents] among those foreigners at [*šr.t-tp-wnwḏw*. And I crossed over in transport ships together with these troops] (x+24) [to the land of the *ḥrj.w-šꜥ*]*j*, when the (other) part of [this army was still on the road. ///]

The suggested restoration, basically a fusion of passages of the Abydos recension (Sethe 1933, pp. 104(6)–(17)), is even more tentative than the passage given above. In particular, it is by no means certain that the campaign against the land of the *ḥrj.w-šꜥj* really was the sixth (cf. for the numeral Sethe 1916, pp. 19–20; Edel 1955–1964, vol. 1, §392), but this would fit the chain of events as found in the text from Abydos. Nevertheless, there are other options such as *kjj sp* "another time" that would match the preserved hieroglyphs on the block from Saqqarah. The target area of this military intervention can be deduced from the unique phrase preserved in column x+24, because troops approaching the target area on entirely different routes by land and by sea conceivably were rare. One may thus conclude that the "strong insurgents" were mentioned together with the target area, the land of the *ḥrj.w-šꜥj*, and that their whereabouts were moreover specified by mention of *šr.t-tp-wnwḏw*, although this toponym is unfortunately lost. If this conjecture be correct, this would strongly indicate that *šr.t-tp-wnwḏw* was a locality right within the land of the *ḥrj.w-šꜥj*. Unfortunately, the inscription on this block terminates before the text proceeds to the defeat of the foreign insurgents near *šr.t-tp-wnwḏw*. Maybe future excavations will lead to the discovery of further portions of the Saqqarah recension of Weni's (auto)biography, which certainly is one of the most important sources on the foreign policy of Egypt during the Sixth Dynasty.

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Part IV

Eastern Mediterranean

14

A Gap in the Early Bronze Age Pottery Sequence at Troy Dating to the Time of the 4.2 ka cal. B.P. Event

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Over the past decade, environmental and palaeoclimatological studies have provided increasing evidence for the occurrence of widespread and persistent drought in the Northern Hemispheric around 4.2 ka cal. B.P. Staubwasser and Weiss (2006) provide a thorough review of the regions that appear to have been affected. These include East Africa, the Andes, the Red Sea, northwest India, Pakistan, Tibet, eastern Anatolia, and Mesopotamia — but not necessarily the Mediterranean, which they did not study. In geographic terms, the 4.2 ka event appears most prominent between the Tropics and Middle Latitudes. It is clearly seen, for example, in the high-resolution terrestrial monsoon records of China (Dongge Cave: Wang et al. 2005) and India (Mawmluh Cave: Berkelhammer et al. 2012), as well as in a near-synchronous southward switch of the Intertropical Convergence Zone (ITCZ) in the near-equatorial Cariaco Basin (Haug et al. 2001). Furthermore, a contemporaneous switch in the position of the ITCZ (the global rain-belt) is documented in a number of records from the Chinese Loess Plateau, and here in particular at Lake Qinghai where there is evidence for a regional switch in the relative strength of the Indian and Asian Summer Monsoon (Ji et al. 2005). Similar to Dongge Cave, in the Yuexi peat $\delta^{13}C$ record there are further indications for a weakening of the Indian Monsoon at this time which is also associated with regional drought in southwestern China (Hong et al. 2014; Chen et al. 2014). In contrast, until recently there has been no clear evidence for the 4.2 ka cal. B.P. event at very high latitudes (e.g., Greenland ice-cores: Grootes et al. 1993), nor indeed anywhere at Middle Latitudes, for example not in the high-resolution stalagmite from Sufular on the Black Sea coast of Turkey (Fleitmann et al. 2009). Another example for the difficulties we must address is that, according to Roland et al. (2014), there is no compelling evidence for the existence of the 4.2 ka cal. B.P. in northwest Europe. Up to now, therefore, the majority of records with evidence for the 4.2 ka event, and especially those with high-dating resolution and sampling density, have all pointed to a geographic restriction of its impact to regions between the equatorial Tropics and northern Middle Latitudes (figs. 14.1–2). All difficulties put together, and although this is widely expected, we cannot assume *a priori* that the 4.2 ka cal. B.P. event actually impacted the Mediterranean Basin, nor — given such an influence — do we yet know for sure that *drought* (and not other responses) is the only possible climatic reaction in this region.

Since we are especially interested in climate conditions that are specific for Troy at the time of the 4.2 ka event, our targeted study site in northwest Anatolia (for site location, see fig. 14.3), let us first turn to the palaeohydrology of the Mediterranean. In general terms, as

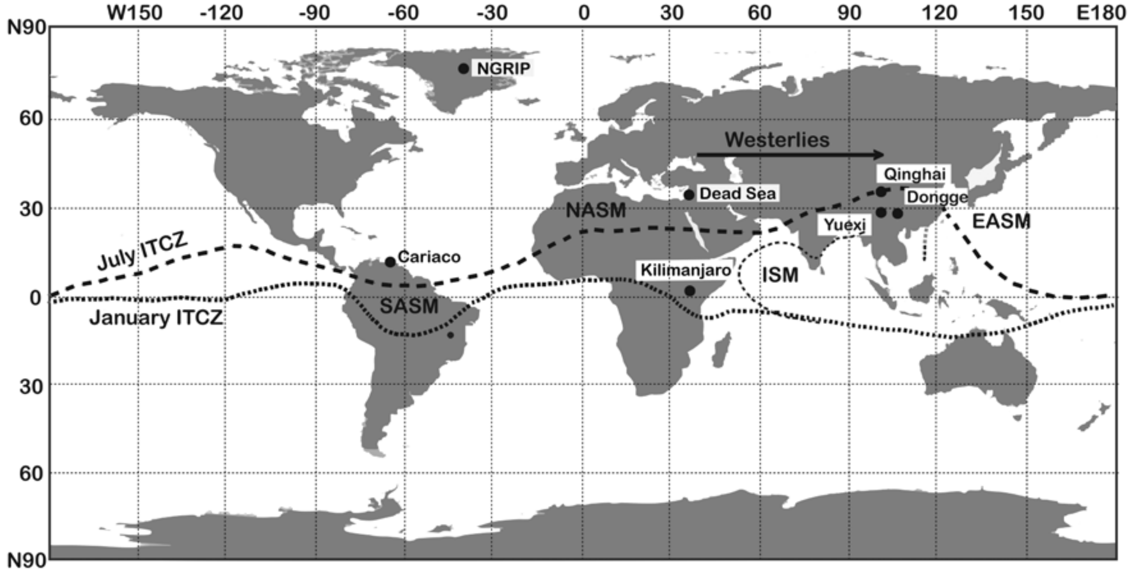

Figure 14.1. Map showing the geographic location of Northern Hemispheric climate records (cf. fig. 14.2, A–H) and the modern position of the Intertropical Convergence Zone (ITCZ) in July and January. Abbreviations: NGRIP: North Grip; SASM: South American Summer Monsoon; NASM: North African Summer Monsoon; ISM: Indian Summer Monsoon; EASM: East Asian Summer Monsoon (redrawn from Cheng et al. 2012, fig. 1)

a result of a recently completed multiproxy-synthesis for the Holocene, Magny et al. (2013) propose a complex and geographically contrasting pattern of wet and dry periods in the Mediterranean basin. They base this conclusion on a variety of climate proxies (e.g., lake levels, fluvial activity, pollen records, marine sediments). What complicates matters is that these wet-dry periods do not *all* appear synchronous. This observation is not unexpected, due to the many (and known) limitations of the data sources and in particular the varying quality of available age-models which are mainly ^{14}C-based. Nevertheless, and perhaps more importantly for our purposes, the authors conclude that the observed regional contrasts are particularly strong in a north–south direction. The alternative hypothesis would be to emphasize the existence of regionality in a west–east direction. What the authors propose, specifically, is that — based on a north–south transect through Italy — there exists a marker latitude at around 40° north to the north of which regions experience generally wetter climatic conditions than today, with opposing drier climatic conditions for regions farther south. Now, since Troy is situated at exactly this location (fig. 14.3), we could judge this finding to be of minor relevance, at least indecisive: it may appear to be of little avail that expert analysis cannot yet decide, for Troy, whether "wetter" or "drier" conditions prevail at this our study site around 4.2 ka cal. B.P. Looking closer, however, the reasons for the existence of a marker latitude at around 40° north are actually quite helpful in evaluating the potential climatic sensitivity of Troy's geographic location.

The key to understanding such climatic differentiation of the Mediterranean basin in north–south direction, and now applying the model results of Magny et al. (2013), can be sought in the quite similar "climatic" (a more appropriate term would be "meteorological") switches that are known to occur in the course of each year. Already on an annual scale, the general trend for Mediterranean climate is that it switches each year between winters that

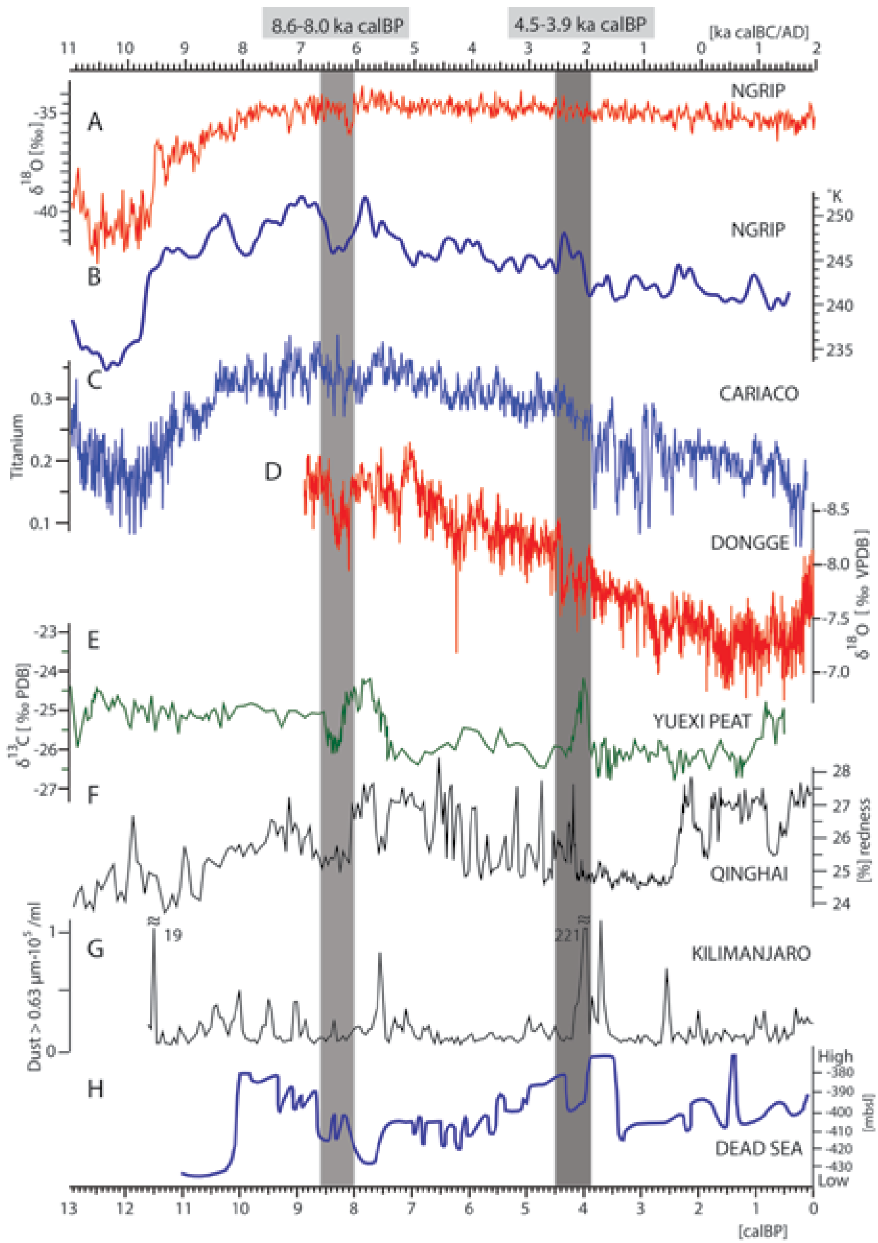

Figure 14.2. Compilation of Northern Hemispheric records (for site locations, see fig. 14.1) showing climate variability in the Holocene, with focus on the so-called 4.2 ka cal. B.P. event (shaded interval at 4.53.9 ka). Also shown is the 8.6–8.0 ka cal. B.P. RCC-interval. (A) Greenland NGRIP ice-core, $\delta^{18}O$ (Andersen et al. 2004; Andersen et al. 2007); (B) Greenland NGRIP ice core, surface temperature reconstruction from water vapor diffusion (Gkinis et al. 2014); (C) Cariaco Basin, coastal Venezuela, Titanium influx as precipitation proxy (Haug et al. 2001); (D) Dongge Cave, southern Chinese stalagmite, $\delta^{18}O$ as proxy for East Asian Summer Monsoon strength (Wang et al. 2005); (E) Yuexi, southwestern Chinese peat core, $\delta^{13}C$ of peat cellulose as proxy for Indian Summer Monsoon strength (Hong et al. 2014); (F) Lake Qinghai, northwestern Chinese Loess Plateau, sediment color as proxy for Indian and Asian Summer Monsoon strength (Ji et al. 2005); (G) Kilimanjaro ice core, East Africa, Dust fraction > 0.63 µm [105/ml], extreme values at 3950 and 11500 cal. B.P. are truncated to fit in the graph (Thompson et al. 2002); (H) Dead Sea levels, Levant, precipitation proxy (Migowski et al. 2006)

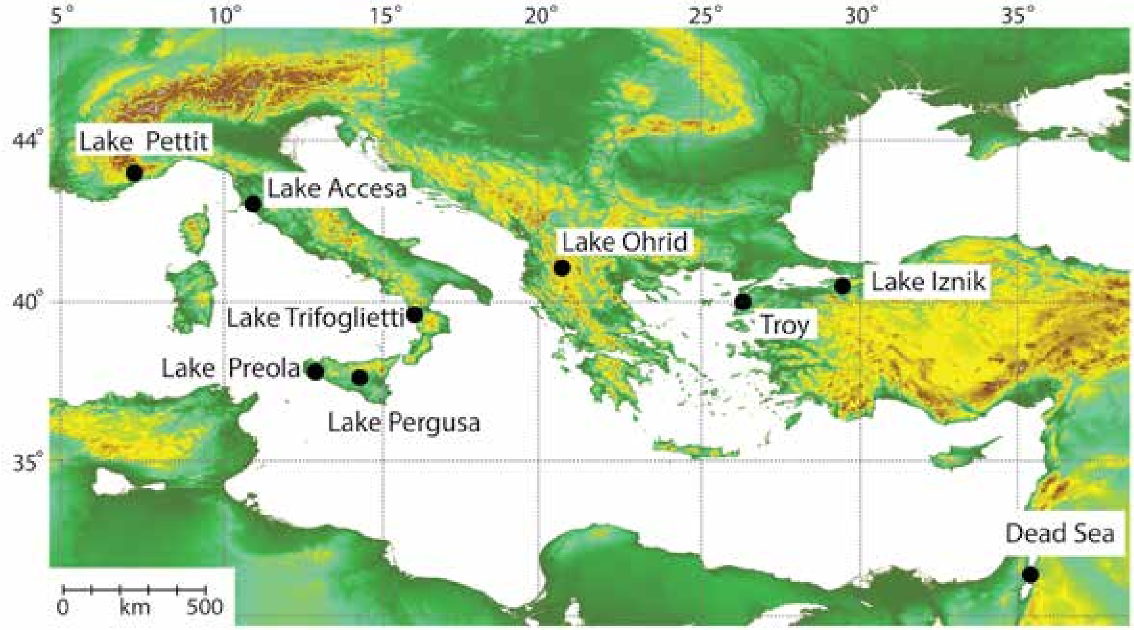

Figure 14.3. Map showing the geographic location of Mediterranean climate records (cf. fig. 14.2, A–H) and study site Troy (northwest Turkey)

are relatively mild and humid, and summers that are warm and dry. This annual contrast can be quite extreme. For example, on Cyprus, following winters with precipitation values of about 110 mm/month (e.g., December and January at Larnaca), in the summer months (June–August) it is quite normal that not a single drop of rain is experienced (Todd 2005). The overall range of inter-annual rainfall variability at Troy (Çanakkale) is similar, although on an absolute scale much less extreme, with mean rainfall values given as 634 mm/yr in comparison to June values of 21 mm (Pustovoytov et al. 2010, table 2). In essence, when aiming to understand simultaneously both the longer-term (centennial) climatic variability in Mediterranean climate, as well as the specific short-term conditions that prevailed at Troy during the 4.2 ka cal. B.P. event, we are clearly best-advised to evaluate (as modern analog) the reasons for these marked seasonal changes.

Being non-experts in these matters, we adhere closely to the record descriptions in figure 14.2 (global records) and figure 14.4 (Mediterranean records) as given by their various authors. According to Goudeau (Goudeau 2014; Goudeau et al. 2014; with further references), the main reason for its strong seasonality is that the Mediterranean basin lies on the boundary between the subtropical high-pressure belt and the mid-latitude system of westerly winds. An important feature of this boundary, which is defined by the position of the Intertropical Convergence Zone, is that the north African Hadley cell collides here with the southern hemispheric Hadley cell. During summer, the ITCZ shifts north, which brings the southern regions of the Mediterranean under influence of the subtropical anticyclone belt, resulting in dry and warm conditions. During winter, with southward migration of the ITCZ, the Mediterranean comes under control of the Westerlies. This enhances transport of moist air from the Atlantic Ocean, in particular, to the northern regions of the Mediterranean. The annual movement of the ITCZ readily explains, in qualitative terms, the existence of a marker latitude at around 40° north, with geographic separation of wetter northern conditions from dryer southern conditions, as observed by Magny et al. (2013). Of course, in the present state of research, the 40° N line can only be taken to represent an approximate boundary. It is likely to show large geographic variability in the course of the Holocene.

In a nutshell, the well-known seasonality of Mediterranean climate can be enhanced (or reduced), in the course of the Holocene, depending on the geographic position of the ITCZ. This position is known to have changed significantly during the course of the Holocene, and not always gradually but at certain times apparently step-wise (fig. 14.2).

In addition, however, during winter (and with the Westerlies penetrating farther south) what also happens is that the strengthening of the Siberian High pressure regime over Asia stimulates outbreaks of extremely cold air masses from the polar regions into the Mediterranean. We know of the importance of such effects from previous studies (Weninger et al. 2014). The main point is that, at certain times during the Holocene (for example, during the Little Ice Age), there is an influx of extremely cold air masses from the polar regions into the Mediterranean, whereby these air masses are typically channeled along a geographic corridor that extends — in reversal of the Westerlies — from regions north of the Himalayas through the Ukraine, either into the northeast Aegean (via winds known as Vardar) or into the Adriatic (via winds know as Bora), or both. What complicates matters is that, according to an interesting observation by Goudeau et al. (2014, p. 119 with further references), the intensity of the Siberian High and the North Atlantic Oscillation (NAO) are heavily correlated phenomena, making it difficult to distinguish between the two. The cold outbreaks to the Mediterranean — which we have found to be so important in research into the societal impact of the 8.2 ka cal. B.P. event ("Rapid Climate Change") — are therefore both consistent with a more positive NAO-mode and dry conditions in the Mediterranean as well as with increased intensity of the Westerlies (as documented in the Greenland Ice Sheet Project Two [GISP2] non-sea salt [K^+]-record: Mayewski et al. 1997). Further, given that the GISP2 Na^+-record (as proxy for wind-blown ocean water, that is, storminess in the North Atlantic) also partly reflects changes in the NAO, it is no easy matter to find a combination of high-resolution proxies (e.g., GISP2 K^+ and GISP Na^+) that might allow us to easily distinguish (e.g.) between cold/dry and cold/wet winter conditions, and at best — simultaneously — also between warm/dry and warm/cold summer conditions. In the meantime, awaiting further advances in palaeoclimatology, we are therefore well-advised (1) to be cautious in conclusions, and (2) to make as much use as possible of available empirical climate records from terrestrial locations in close proximity to our archaeological study sites. Unfortunately, it is most typical that such terrestrial (e.g., lake) records have a dating resolution that is insufficient for the advanced conclusions we would like. All pros and cons for the different records put together, again, probably the best thing to do is to obtain some basic (theoretical) understanding of the climate system.

The above-mentioned (winter/spring) outbreaks of polar air cannot be recognized in the specific Mediterranean climate records assembled in figure 14.4. This is because, for the purposes of the present paper, we have focused on records that presumably all (but with many question marks) provide evidence for the 4.2 ka cal. B.P. event. In selecting these records, the main criterion we applied was the corresponding (and typically quite cautious) interpretation by the prime authors. What the 4.2 ka cal. B.P. record collection (fig. 14.4) does indeed clearly show, we judge, is the real existence of an extended time-interval ca. 4500 to 4000 cal. B.P.,

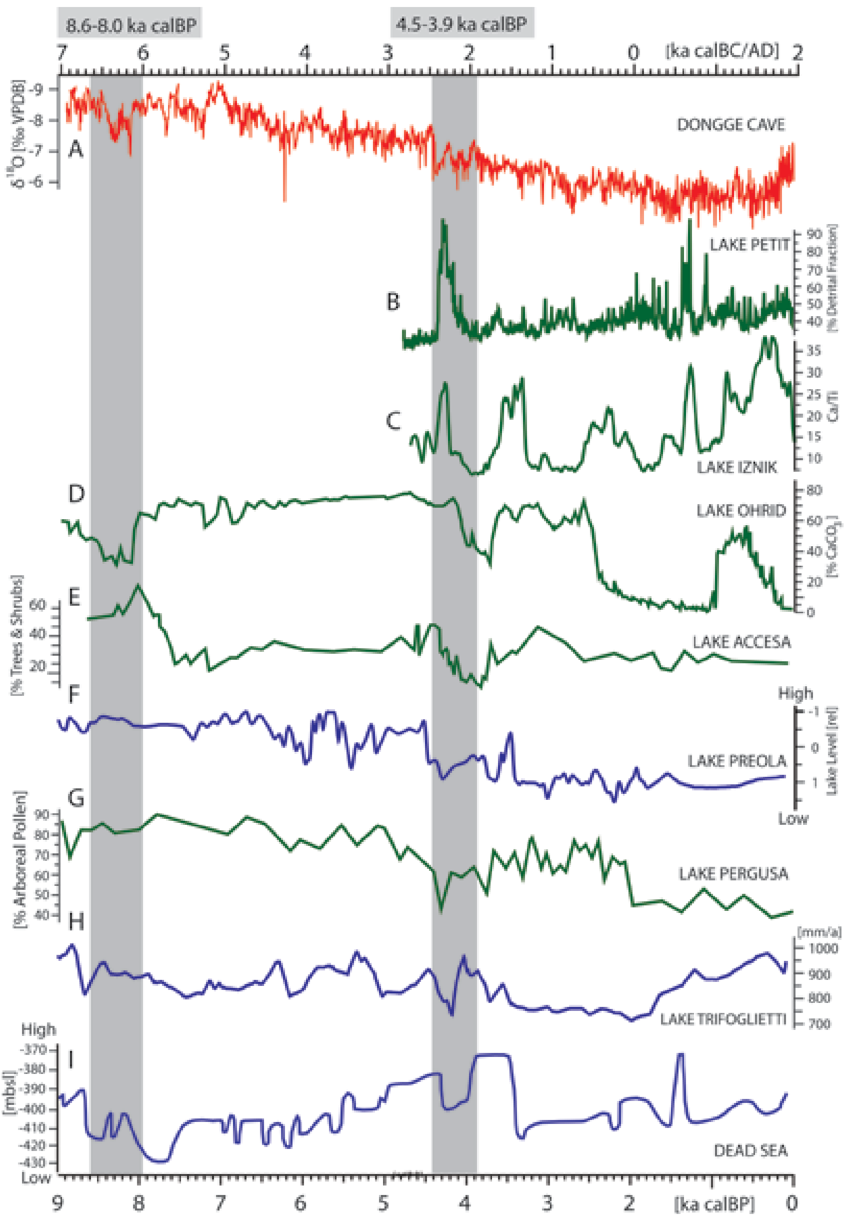

Figure 14.4. Compilation (mainly) of Mediterranean lake records (for site locations, see fig. 14.3) to demonstrate large climate variability and strong geographic contrasts in the Holocene, as well as reproducibility for the 4.2 ka cal. B.P. event (shaded interval at 4.5–3.9 ka). Also shown is the 8.6–8.0 ka cal. B.P. RCC-interval. (A) Dongge Cave, southern Chinese stalagmite, $\delta^{18}O$ as proxy for East Asian Summer Monsoon strength (Wang et al. 2005); (B) Lake Petit, French Mediterranean Alps, detrital fraction as proxy for soil weathering (Brisset et al. 2013); (C) Lake Iznik, northwestern Turkey, Ca/Ti as proxy for precipitation (Ülgen et al. 2012); (D) Lake Ohrid, Albania/Macedonia, $CaCO_3$ (Wagner et al. 2009; Holtvoeth et al. 2010); (E) Lake Accesa, Italy, pollen of Mediterranean trees and shrubs of pollen as proxy for precipitation seasonality (Peyron et al. 2011); (F) Lake Preola, Sicily, lake level fluctuations reconstructed from vegetation data (Magny et al. 2011); (G) Lake Pergusa, southern Italy, arboreal pollen as proxy for precipitation seasonality (Sadori et al. 2011; Joannin et al. 2012); (H) Lake Trifoglietti, southern Italy, pollen-based reconstruction of annual precipitation (Joannin et al. 2012); (I) Dead Sea Levels, Levant, precipitation proxy (Migowski et al. 2006)

during which — according to Magny et al. (2013, p. 2044) — a "major palaeohydrological oscillation" occurred in Mediterranean lakes. We therefore both confirm and illustrate their findings, in figure 14.4, by providing a careful (but admittedly biased) selection of available records. But why is this (our specific) collection *biased*? Simply, we set aside the many records that did not show, in our view, any unusual shape around the time of the 4.2 ka cal. B.P. event. For this decision we cannot provide many serious grounds, except that we have questioned — in particular (1) the quality of the respective age-models and (2) the choice of some potentially unsuitable environmental proxy, that is, which does not show us (perhaps in contrast to other researchers) what we are trying to find out. Put differently, given this new data, if colleagues were now to come along with the proposal that the 4.2 ka cal. B.P. event does not actually exist in the Mediterranean, then we can at least put forward these specific records to initiate some further and hopefully fruitful archaeological discussion. On the other hand, if other (and less doubtful) colleagues would come along with records that demonstrate not drought but instead (e.g.) flash-floods, or human impact, then all the better for the discussion. The main thing is that something "unusual" happened in the climate system at around this time.

The records shown in figure 14.4 are mainly from lakes in southern Italy (Lakes Pergusa, Trifoglietti, and Preola), central Italy (Lake Accesa), southern France (Lake Petit), the Balkans (Lake Ohrid), the Levant (Dead Sea), and in particular from the Marmara region of northwest Turkey (Lake Iznik). This last record is from a lake in the immediate vicinity of Troy. Of course, each of these records is different. For example, the record from Lake Petit is interpreted as representing a "progressive change from 4800 to 4200 cal. B.P. of podzol-type soils that developed under forest cover," which was then "interrupted by a major detrital pulse" (i.e., soil erosion) at around 4200 cal. B.P. that "we consider as a tipping point in the environmental history" (Brisset et al. 2013, p. 1863). Quite different, but equally complex, is the description given for Lake Ohrid (Ülgen et al. 2012, p. 98) where "differences in humidity lead to significant changes in lake level, weathering, fluvial input and aquatic primary production and vegetation, clearly reflected in physical (MS), mineralogical (clay, aragonite/calcite), chemical ([Zr + Rb]/Sr, Ca/Ti, TIC, TOC, C/N) and biological (pollen) proxies." The authors conclude that "especially abrupt lithologic and geochemical changes [exist] at 4.2 and 3.3 ka cal. B.P. [and which] may outline intense droughts, which extremely lowered the lake level." Due to given interpretational complexity, and surely in part due to remaining problems in the underlying age-models, we (as users of this data) must of course acknowledge that to talk of "drought," for any of the records, is surely an over-simplification and open to critical discussion. Nevertheless, the remarkable coincidence of such climatic/environmental "oscillations" in so many different lakes and regions geographically so far apart, does appear promising for studies in what we would like to call "Mediterranean 4.2 ka climate-archaeology." We apply here the specific descriptor "Mediterranean" to remind the reader that previous studies of the 4.2 ka event in the Aegean Bronze Age (e.g., Maran 1998; Wiener 2014) were obliged to proceed with little, if any, clear climatic evidence that the 4.2 ka cal. B.P. event can actually be observed in the Mediterranean.

By the same token, and as mentioned above, until recently neither has there been any clear evidence for the 4.2 ka cal. B.P. event in Greenland ice cores. In the past, this has been particularly disturbing. From the overall flatness of the previous $\delta^{18}O$ ice-core record (fig. 14.2:A) one might easily infer a climatically stable Holocene epoch, but which essentially *everybody*, in the past, acknowledged was somehow wrong.

Before moving on to Troy, we briefly draw attention to a new and promising climate proxy that was recently published by Gkinis et al. (2014). With their *discovery* that Holocene temperature variations have left an imprint in the spectral characteristics of Greenland $\delta^{18}O$ time series there is now, for the first time, clear evidence that the 4.2 ka cal. B.P. event can also be found in the North Greenland Ice Core Project (NGRIP) ice core. For purposes of comparison, the new climate record is included in figure 14.2:B, where it is contrasted (by its chosen graphic position) with the previously established NGRIP stable oxygen isotope ($\delta^{18}O$) record (fig. 14.2:A). It is important to note that both records (fig. 14.2:A and B) represent measurements made on the same physical variable, that is, made on the same ice samples from the same core. The observable difference in shape between the two $\delta^{18}O$ time-series, since they are based on the same data, is *not* due to any respective mathematical *unsmoothing.* Instead — stated more clearly — the shape-difference is due a detailed analysis of the physical processes underling the ice-deposition. In brief, previously, the time-series was based directly on measured $\delta^{18}O$ values at the time of condensation. Note that, what figure 14.2:A actually shows is not the originally measured series, but instead a mathematically smoothed version. However, next to this (avoidable) mathematical smoothing, what happens in the real world is that already during the initial stage of firn densification the isotopic signal experiences some physical smoothing. This smoothing (which is allowed for only in fig. 14.2:B) is due to a molecular diffusion process which takes place in the vapor phase, that is, in the uppermost firn layers, before the initially loosely packed snow is solidified at a certain depth (in the order of 0–20 cm, depending on locality). Let us take as analogy a snowball that is pressed harder and harder, until it becomes an ice-ball (which, when thrown, becomes dangerous to the game participants). As the densification of firn continues, the diffusion process slows down until it ceases at pore close off. What thereby happens is that the high-resolution ice-temperature signal experiences some physical smoothing (signal attenuation) which can be calculated, and hence allowed for, by application of appropriate mathematical models. What Gkinis et al. (2014) have now achieved, based on previous studies (e.g., Johnsen et al. 2000) is to extract from the given high-resolution data the actually available high-frequency ($\delta^{18}O$)-temperature signal, but which previously had been physically smoothed, even prior to the applied mathematical smoothing.

Let us now take a closer look at the new ice-core temperature record (fig. 14.2:B). If only at first glance, the record has a rather smooth appearance. This is deceptive. The record is based on the highly precise and accurate Greenland Ice Core Chronology 2005 (GICC05) time-scale (Vinther et al. 2006) which has annual-decadal time solution (depending on core depth). Further, the record is scaled to reconstructed ice-sheet surface temperatures that vary, in the course of the last 13 ka, between 233°K (Younger Dryas) and 250°K (Holocene optimum), whereby 273°K ≈ 0°C. This scaling is of minor interest for our purposes. More important is the observation that the curve, in its overall pattern (during the last 10 ka), reproduces the slow variation in solar intensity already known from (e.g.) the Cariaco Basin Titanium record at lower latitudes (fig. 14.2:C) and from Dongge Cave $\delta^{18}O$ record at middle latitudes (fig. 14.2:D). Since the further interpretation of the new record is complicated, and we have yet to become acquainted with its application, we henceforth follow more exactly its discussion as given by the authors. In contrast to the abrupt character of the so-called 8.2 ka cal. B.P. cold event in the original data (fig. 14.2:A), but which only shows the well-known (~150 year long) Hudson-Bay outflow, what the new record demonstrates is that this event was embedded within a much longer cooling period with a duration of approximately

500 years. As pointed out by Gkinis et al. (2014, p. 6), similar palaeoclimate signals have been reported from regions of the North Atlantic as well as from Monsoon areas (e.g., Africa: Gasse 2000, and China: Wang et al. 2005).

What we consider especially interesting is that on this point the authors give specific reference to the paper by Rohling and Pälike (2005), wherein the idea was first put forward that the Hudson Bay cooling is only one (basically oceanic) component, important as it is, within a much wider interval of (atmospheric) "Rapid Climate Change" (ca. 8600–8000 cal. B.P.). In recent years we have studied the archaeology of this specific RCC-interval in some detail. Particularly interesting in regard to the recently postulated connection between the abrupt spread of the Neolithic first into the Aegean around 6600 calBC, and then out of the Aegean around 6000 calBC (both in phase with the beginning and the end of RCC-conditions) and quasi-immediately all the way up to the northern fringes of the Pannonian Basin (Weninger et al. 2014), is the specific observation by Gkinis et al. (2014) — namely — that the ca. 500 year cooling interval is followed by a — previously unknown — major warming (fig. 14.2:B). Hence, putting these observations together, we can suggest that the process of Neolithization out of the Near East and into southeast Europe may not only be due to a strong *push*-factor (during the cold-dry RCC-interval) but was also enhanced by an equally strong (warm-wet) *pull*-factor out of the Aegean, into southeast Europe (as well as along the Mediterranaean coast all the way to the Iberian Peninsula; cf. Weninger et al. 2014). Equally intriguing, although also yet to be explored, is the (inverse) observation by Gkinis et al. (2014), namely, that the 4.2 ka cal. B.P. warming is followed by a significant shift to cooler temperatures. Prior to moving to our main topic, in which we address in more detail the question whether it is possible (or not) to recognize the 4.2 ka cal. B.P. at the site of Troy, we complete this section with direct citation from Gkinis et al. (2014). They conclude (p. 7): "The climatic shift at around 4 kyr b2k is of particular interest. It possibly indicates that traces of the 4.2 ky climatic event, observed in wide range of sites (Staubwasser and Weiss, 2006; Fischer et al., 2008; Berkelhammer et al., 2012; Walker et al., 2012) at low and high latitudes, can now also be found on the Greenland Ice Sheet."

Troy (Northwest Anatolia)

Turning now to Troy, the results of the pottery seriation (described below) from which we infer the existence of the Gap are only to be understood by careful recapitulation of the site's long excavational history. In essence, this is as follows. In the years 1932–1938 extensive excavations were undertaken at Troy by a team of archaeologists from the University of Cincinnati, working under the direction of Carl F. Blegen. The results of the Bronze Age excavations were published soon after the end of the Second World War in four volumes, two of which address the Early Bronze Age finds (Blegen et al. 1950; Blegen et al. 1951), and two the Middle and Late Bronze Age finds (Blegen, Caskey, and Rawson 1953; Blegen et al. 1958).

Over the course of the last 130 years, the nomenclature used to describe the stratigraphy at Troy has become increasingly complex. In the present paper we make use of the Blegen nomenclature, which is the most well-known to present scholars and which has a strong historical background in the terminology of the earlier excavators, Heinrich Schliemann and Wilhelm Dörpfeld. However, prior to continuing, it is necessary to address a number of problems relating to the Blegen nomenclature. As a result of his initial excavations, Schliemann was able to identify within the lowest eleven meters of deposits a threefold number of

"Cities" or "Schichten" (formally translated as "layers," but in the sense of deep deposits) which he called First, Second, and Third Schicht. Dörpfeld introduced further subdivisions of these Schichten which he called Troy II.1, II.2, and II.3 and which are mainly defined by the threefold extension of the Troy II fortification system. In their publications, Carl Blegen and his team undertake much effort in refining the phasing and stratigraphy. In general terms, these refinements are put into effect by the introduction of sub-phases (written with small letters e.g., Troy I a, b, c, … , Troy IIa–IIg). Although there are many exceptions, the broad rule is that Blegen simply renamed Dörpfeld's Troy II.1, II.2, and II.3 as Troy IIa, IIb, and IIc.

Dörpfeld's periodization was reviewed and extended a second time by Ünlüsoy (2010), now with the aim of incorporating the excavation results of the Tübingen team under direction of Manfred Korfmann. At first sight it may appear as if Ünlüsoy's introduction of architectural sub-units called IIa1, IIa2, IIb1, IIb2 … IIc3 represents little more than a refinement of Blegen's periodization of Troy II. But the apparent similarity is deceptive. The phase-names IIa, IIb, and IIc (in the terminology of Ünlüsoy), have indeed been *re-recycled* from Blegen, hence lie in a historical sequence stretching back to Dörpfeld (Schichten II.1, II.2, and II.3). What is maintained, in this recycling of letters, is that Megarons IIA and IIB were indeed built in Troy IIc (as defined by Blegen). In contrast, in Unlüsoy's system there are no direct analogues for Blegen's phases IId, IIe, IIf, IIg. By deleting phase Blegen's IId , which is possibly to be seen not so much as an architectural phase but as a time of special feasting-activities within the Temenos (Bachhuber 2009), as well as by deleting phase IIe (based on a very small excavation area with only minor walls), and finally by re-assigning IIf and IIg to Dörpfeld's Troy III, due allowance is made for the findings in Pinnacle E4/5 by Mansfeld (2001, pp. 195–97), namely, that Blegen was wrong in supposing that any of the great megarons survived to the very end of Troy II (so also Easton 1989, pp. 512–13; Easton 1990, figs. 5–6; Easton 2000). There were in fact two destruction phases: one following Blegen's "Phase" IId when the megarons — including Megaron IIA — finally burned down, and another at the end of IIg. Further, as predicted (Easton 1989, pp. 511–12) the Tübingen excavation season of 1998 showed that Blegen was further wrong in placing Megaron IIR in the same phase (Troy IIc) as the two great Megarons IIA and IIB. To understand this, we must again go back to Dörpfeld's view of the matter, according to which Megaron IIR is not only one, but actually two phases earlier. Dörpfeld's observations are confirmed by Korfmann (1999, p. 8 and fig. 6) who notes that the relevant architectural unit No. 18 (the west wall of Megaron IIR), *underlies* unit Nos. 2, 5 both of which belong to Dörpfeld's Schicht II.2 (alias Blegen's IIb). In consequence, within Troy II there is a whole "column" of excavated material above and below Megaron IIR which requires shifting relative to the rest.

There are further difficulties in Blegen's periodization, but which are also already anticipated in the Troy II phase-definitions of Ünlüsoy (2010). As mentioned above, in Ünlüsoy's system the use of letters d, e, f, and g is carefully avoided. This allows for the fact that the architecture attributed by Blegen to phases "IIf" and "IIg" in reality belongs to Dörpfeld's "Schicht III." But further, most of what Blegen calls Period III was originally attributed by Dörpfeld to Schicht IV (Easton 1990, fig. 7; Easton 2000, pp. 78–79, fig. 1; Jablonka 2000, p. 103).

In combination of all these findings, the new periodization of Troy II by Ünlüsoy (2010) represents a quite radical reorganization of Troy in its Period II. At last, the existence of such many errors in Blegen's studies at Troy, although perhaps difficult to understand by researchers less well-acquainted with the site, has been confirmed over and over again, for

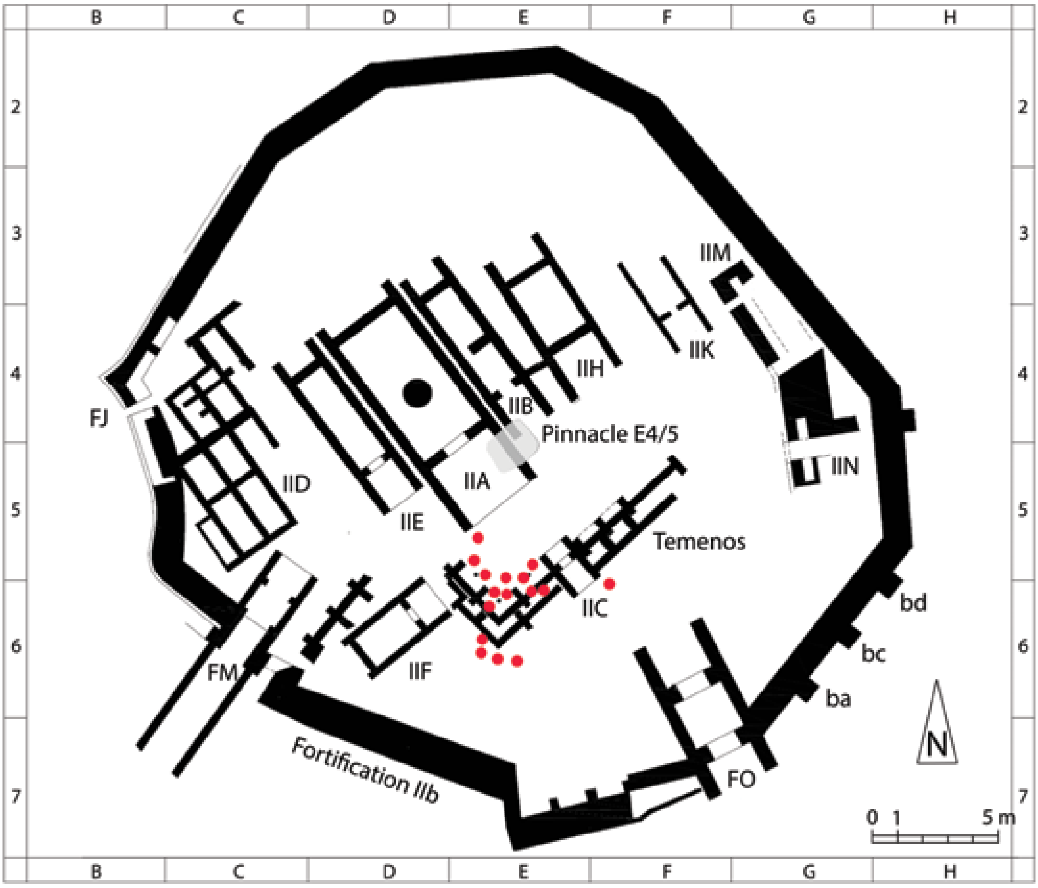

Figure 14.5. Plan of Troy in Phase IIc (redrawn from Ünlüsoy 2010, plan 12, with additions) showing location and names of major architectural units. Note the pits (shown as red dots) from "Phase IId" (Blegen's pit period: Blegen et al. 1950, pl. 457) can perhaps now be attributed to recurring feasting activities during Phases IIc1–3 (cf. Bachhuber 2009). The location of Pinnacle E4/5, from which an important series of stratified radiocarbon ages derive (cf. fig. 14.6), is shown with shaded outline

us most convincingly by Peter Jablonka's impressive three-dimensional reconstructions of the site, based on a vast Harris Matrix (Jablonka 2000, fig. 12, layer 53). The plan of Troy during Ünlüsoy Phase IIc1 (reproduced in fig. 14.5) illustrates the basic architectural elements of the Early Bronze Age settlement at some very short time (perhaps a few decades) prior to one of the two major fire destructions which together make up what Schliemann called the "Burnt City."

Due to its architectural monumentality, and quality of finds (that include some of the well-known Schliemann treasures), this specific phase of Early Bronze Age Troy (Blegen IIc, Ünlüsoy IIc1) has always been of special interest to Anatolian and Aegean archaeologists. It witnessed not only the construction of the two central buildings (Megaron IIA and IIB), but also the strengthening and an expansion of the fortifications (Dörpfeld's Fortification IIb), the construction of large gates (Gate FM with ramp, Gate FJ, Gate FO with superstructure), and the construction of the temenos with Gate IIC. With all these major components, the plan of IIc provides a vivid impression of economic wealth at Troy, and presumably also of social stratification, during this period. Still today, the central Megaron IIA at Troy represents the largest building that is known from the Early Bronze Age of western and central Anatolia (Bachhuber 2009, p. 7).

Finally, turning to Troy III, IV, and V, we again face a number of terminological issues. Important in terms of nomenclature is that, one after the other, the excavators Schliemann, Dörpfeld, Blegen, and Mansfeld have apportioned the strata overlying Troy II to Periods III, IV, and V in a different manner. The fact is that in Square E6 the Troy III and IV of Dörpfeld have become the Troy II and III of Blegen. This was first noticed in 1976 by Easton (1976, p. 149; cf. Easton 1990, p. 436 and fig. 7; Easton 2000, pp. 78–79) and later confirmed when Blegen's section in this excavation area was inversed and superimposed onto Dörpfeld's (Jablonka 2000, p. 103). In essence, everything that previously was called Troy III by Dörpfeld was included by Blegen in his Troy II; the previous Troy IV Blegen turned into Troy III.

From all this a number of critical issues emerge. If it is accepted that Blegen's numbering of Troy II-III-IV-V is to some extent erroneous (and which ultimately affects only a limited number of his site-internal conclusions) then it follows that the long-established ceramic sequence from Blegen's excavations at Troy can (with the exception of Troy I) no longer be used as it stands. This applies, in particular, to the linkage (via pottery synchronisms) of the Trojan Early Bronze Age stratigraphy to other sites in southeast Europe, the Aegean, and not least in the western and central parts of Anatolia. As seen today, Troy is not the *only* central site on the Aegean coastline, but — like many other sites — it does have a quite unique position within the Anatolian Early Bronze Age network (as defined by sites such as Kültepe, Limantepe, Tarsus, Beycesultan, and Küllüoba). To translate the relevance of the problem we are studying into the language of dendrochronology, for example, discovering a gap in the Early Bronze Age sequence at Troy has implications similar to those that occur when a (potential) error is discovered within the long established tree-ring width master curve. To continue with this analogy, the once identified error may reverberate — for example — in the necessity of rebuilding the tree-ring based ^{14}C-age calibration curve. If the existence of the gap at Troy is confirmed, there follows (later) the necessity of reconsidering what is probably quite a long chain of cultural and chronological conclusions. But, before jumping to wrong conclusions, what is first required is a clear description of the (potential) position of the gap at Troy, along with an evaluation of its possible length. These are the questions, in a nutshell, that are addressed in the following sections.

Early Bronze Age Troy: Radiocarbon Chronology

In a previous study, making use of these terminological changes, we have re-analysed the available (n=76) published ^{14}C-ages for the Early Bronze Age (Weninger and Easton 2014). It is important to recognize that essentially all these dates derive from the earliest years of the Tübingen excavations, long before it was possible to use ^{14}C Accelerator Mass Spectrometry (AMS) technology for dating of small (mg-size) samples, for example, short-lived animal bone and grain. Since the majority of ^{14}C-ages were measured on charcoal, they most likely derive from long-lived trees (old-wood effect). This necessitates taking some quite unusual care in the ^{14}C-analysis, the details of which are provided in Weninger and Easton 2014.

The main results of these studies are shown in figure 14.6. We provide here two variants of the same studies, namely, (1) the initially achieved ^{14}C-based chronology, as yet uncorrected for the old-wood effect, and (2) the same chronology, but systematically shifted by fifty years to younger calendric ages. By this measure due allowance is made for the old-wood effect, to which aim we have undertaken an actually quite large number of studies, the results of which are finally confirmed by comparison with the only one ^{14}C-age that was measured (fortunately to high-precision) on a short-lived sample.

As discussed in more detail in the above reference, already based on the ^{14}C-dates that are available for Troy III, IV, and V, there are indications for the existence of a gap (in the sense of a real settlement hiatus) of 100–200 years between the end of Troy III and the beginning of Troy IV. However, lacking the necessary stratigraphic control over these dates, and all the more since the samples are either charcoal (old-wood) or indeed short-lived (but from "historical," i.e., uncontrolled sources) we have refrained from their further analysis. Fortunately, at least for the Pinnacle (Square E4/5), there exists a small but nevertheless useful sequence of stratified ^{14}C-ages that allows application of advanced ^{14}C-analytical procedures — despite the fact that even these samples were measured on charcoal.

Pottery Seriation

The corrections applied to Blegen's architectural nomenclature for Early Bronze Age Troy, as proposed above, have only been possible due to the high quality of publication standards maintained throughout all volumes of the Cincinnati Troy publications. This high quality also applies to the description of the pottery finds. Blegen's detailed (phase-by-phase and unit-by-unit) description of the pottery finds has allowed us, by accordingly careful (word-by-word) reading of volumes I and II, to reconstruct the "complete" pottery shape inventory for Troy I–V excavated between 1932 and 1938. To keep a long story short, the construction of this pottery inventory, as it was based on qualitative descriptions of the excavated materials, necessitated — first — a system of language-calibration that could be used to translate the reported pottery shape amounts (e.g., "most frequent," "some," etc.) into numbers. Second, by careful text-reading and application of the language-calibration, a pottery database with altogether 14,917 entries for ceramic finds (mainly sherds) was produced. These finds are stratigraphically documented on sherd-by-sherd basis for 171 excavation units. Third, in yet another number-crunching (NC) step, the inventories of these 171 units were added up and combined (via stratigraphic interpolation), finally to produce a now quite compact database for Blegen's n=27 "certified" architectural phases. The final NC-step was to apply the method of Correspondence Analysis (CA) to this database.

Initially, our research intention hereby was no more than to provide a quantitative measure for the dating precision that is achieved for Early Bronze Age pottery at Troy. As it turned out, given a handful of Early Bronze feature-sherds classified according to Blegen's vessel-shape system, the CA-analysis is capable of dating the large majority of excavation units with dating precision of ± 1 phase (at best for Troy I) and of ± 2 phases (at worst for Troy IV–V). These values translate to dating errors on the calendar scale of ± 50–100 years (68% confidence). This may sound rather low, and unfortunately it is (in comparison to achievable ± 30 years for the pottery of Troy VI–VII). But the same dating precision can be qualified as "higher," by a factor of two, than achieved by radiocarbon dating (which is strongly limited by the wiggles in the ^{14}C-age calibration curve). The dating precision is also higher, in this case by a factor of three, than achieved by single-entity shape-analysis.

Having quantified the dating precision of Blegen's classification, we are now in position to apply these results to the seriation. What we may expect, with given (average) dating

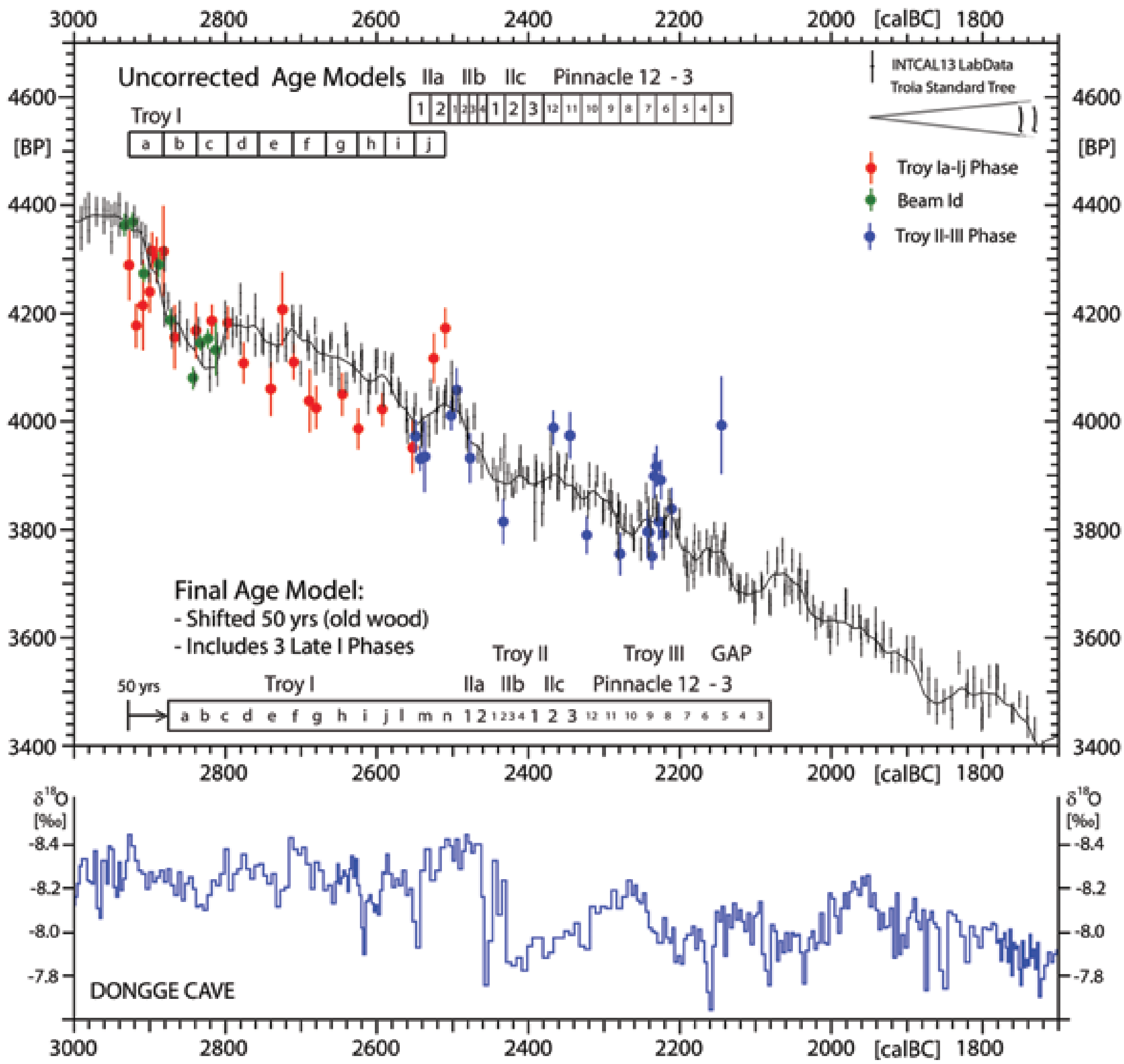

Figure 14.6. Top: Stratigraphic succession of ^{14}C-ages for Early Bronze Age Troy (Periods I–III), referenced to the periodization of Blegen et al. (1950 and 1951) and Ünlüsoy (2010). The figure shows the combined ^{14}C-age charcoal-based sequence according to different age models initially without (top graph: upper) and including (top graph: lower) an average fifty-year-old wood correction. The analysis is by Monte Carlo ^{14}C-Wiggle Matching of ^{14}C-ages sequenced according to architectural phases and stratigraphy. Bottom: Dongge Cave (southern China) stalagmite $\delta^{18}O$-record (Wang et al. 2005). The proposed settlement desertion ("Gap") between Troy III and IV is synchronous within limits of dating error (decadel scale) with the $\delta^{18}O$-excursion at 2160 calBC (cf. text). We localise the gap onset in the vicinity of Pinnacle (E4/5) phase 6, with older Pinnacle phases belonging to Blegen Period III, and younger Pinnacle phases 1–5 possibly belonging to Blegen Period IV

precision of ± 1 phase (68% confidence), is that the CA-technique should be capable of recognizing gaps in the stratigraphic sequence, supporting they exist, as long as they have clear visibility. In statistical terms, to be recognizable, the gap must have a duration longer than, say, two–three architectural phases (95% confidence). Note that, with its complex excavation history, at Troy there is an a priori higher likelihood that any observed data gap will have its true reason *not* in site abandonment, but in documentation.

This now quantified "gap-prediction-capability" of the CA-technique is confirmed, in the transition from Troy I to Troy II, where the new excavations by the Korfmann team provide architectural evidence for the existence of three phases (called II, Im, In, in fig. 14.7)

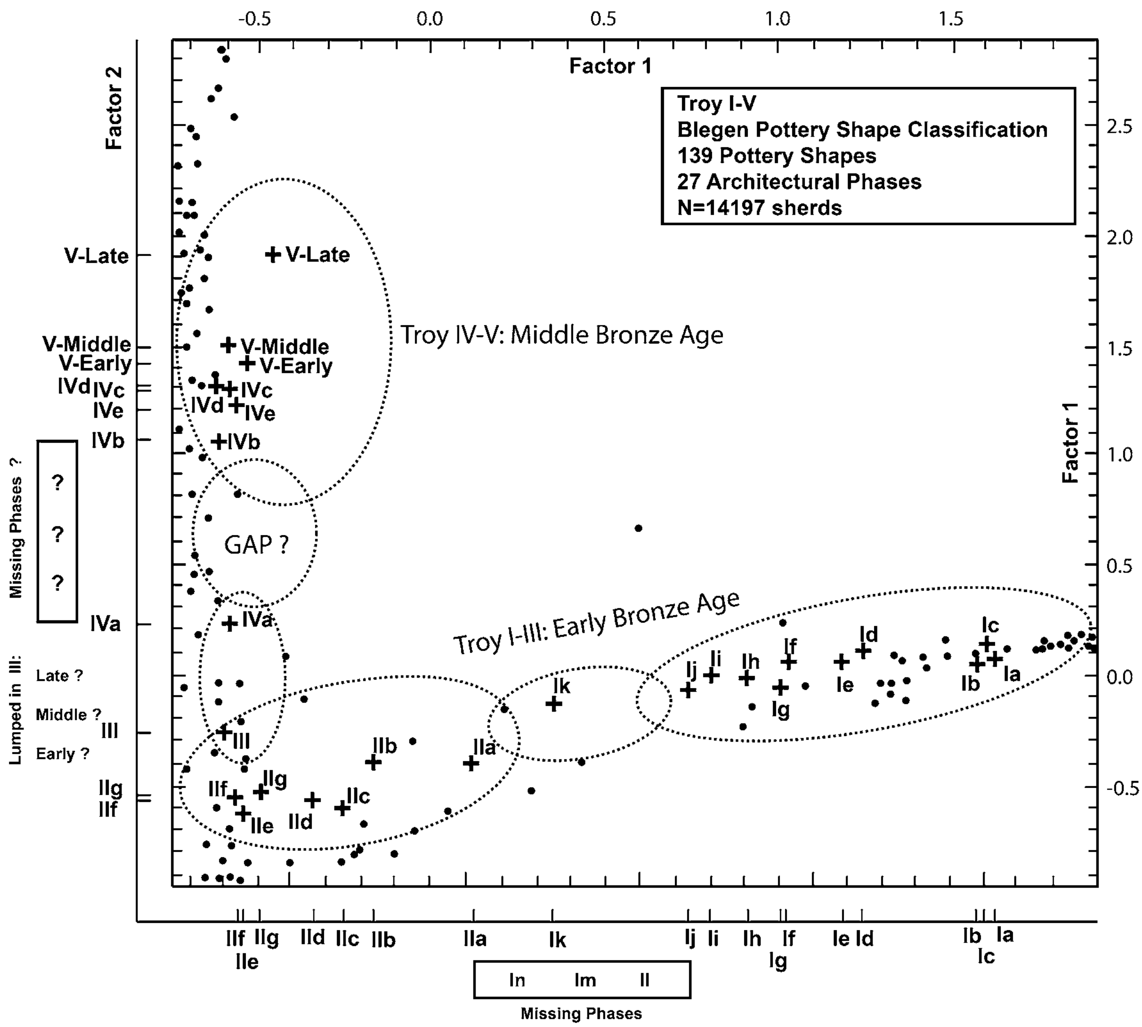

Figure 14.7. Correspondence analysis applied to the Blegen pottery shape database for Troy periods I–V (Weninger 2002). Original (unrotated) Correspondence Analysis with score values for (individual) pottery shapes (dots) and for (summed) Blegen's phase-certified excavation units (crosses) for Troy I-II-III on Factor 1, and for Troy II-III-IV-V on Factor 2. Ellipses drawn to enclose shapes and units for Troy I–III (Early Bronze Age "Maritime Troy") and for Troy IV–V (Anatolian Middle Bronze Age). For discussion of the Gap, see text (graph redrawn from Weninger and Easton 2014)

unknown to Blegen. What further strengthens the argument, in our judgment, is that the existence of a similar number of missing phases was actually forecasted by Easton (1976, table 1). What we have also done (in the meantime, since the publication of Weninger and Easton 2014) is confirm that the III–IV gap, visible in figure 14.7, is not simply due to the previous lumping of all Troy III material (for Troy III sub-periods Early, Middle, and Late) into one seriation unit. We apologize for not being able to demonstrate that point, here, due to lack of space. If we now use the length of the (now-filled) Troy I–II "gap," as observed on CA-Factor 1, to calibrate the length of the equally conspicuous CA-gap on Factor 2 between Troy III and Troy IV (fig. 14.7) then the immediate conclusion is that, here also, there are likely to be some "missing" phases.

Having now extended the seriation by including the material published by Schliemann, we conclude that the CA (fig. 14.7) is quite likely to be telling us the truth. There exist other arguments for the existence of a gap (in the sense of a real settlement hiatus) at Troy, as described in Weninger and Easton 2014, but which are — admittedly — not as conclusive as we would like. Based on detailed stratigraphic-historical analysis of Schliemann's results in combination with the results of the new Tübingen excavations, we are therefore even now undertaking efforts "to make the gap go away." Whatever the outcome of these studies, and what we infer with more confidence, is that the search for the (possible) impact of the 4.2 ka cal. B.P. event at Troy is most likely to be successful, if focus is placed on the transition from Troy III to Troy IV. Interestingly, as can be taken from figure 14.7, the Troy III–IV transition coincides *exactly* (within error limits of a few decades at Troy) with the conspicuous major spike in the Dongge Cave $\delta^{18}O$-record at ca. 2160 calBC. Note that, since the Dongge $\delta^{18}O$-record is fine-tuned to the global $\delta^{14}C$-record (Wang et al. 2005) (by which measure the Dongge stalagmite age-model is referenced to the European tree-ring master chronology), the date for this spike at Dongge itself has a much smaller error, in the range of maximum one–two decades.

Conclusions

In conclusion, by providing a review of previous and contemporary climatic studies, we hope to have demonstrated that further research into the impact of the 4.2 ka cal. B.P. event on the late Early Bronze Age cultures of the Mediterranean is likely to be rewarding. Already now there exists a large corpus of similar or at least related studies, from which we select Maran 1998 and Wiener 2014 as particularly interesting. In addition, taking Troy as a case study, we put forward the hypothesis that a gap exists between (Blegen) periods III and IV which has every chance of having been caused by a major "drought" event. It should be emphasized that, in the pottery seriation, this gap has so far been observed only in the Blegen material. It remains to be seen whether it can be observed also in the material from the new excavations. At this stage, therefore, it is unclear whether the gap represents a total abandonment of the site or merely a diminution in the scale of its occupation. We are still working on the details of this gap, at Troy, from both a stratigraphic and a historical perspective, which is quite challenging. But the real challenge will be, given such confirmation, how to explain the abandonment, or partial abandonment, of the site in social, economic, and religious terms. With the present paper we hope to have provided the interested reader with a compact introduction as to where the idea of a gap at Troy derives from (namely, from Correspondence Analysis pottery analysis), what makes the gap (namely, stratigraphic analysis), and, if it exists, where it may be leading us (toward a possible 4.2 ka cal. B.P. climate impact). With reference to this last question, we draw attention to the hypothesis, first formulated some thirty years ago by Jeremy Rutter (1984, p. 85), that an equivalent gap may exist, and that would be on a much wider scale, in the contemporary cultural development of the Aegean. The title to Rutter's paper is quite intriguing: "The Early Cycladic III Gap: What It Is and How To Go About Filling It Without Making It Go Away."

Acknowledgments

We are grateful to Elodie Brisset (Aix-Marseille University) for numeric data from Lake Petit. Many thanks are also to Harvey Weiss (Yale University) for drawing our attention to the research of Vasileios Gkinis and collegues (University of Copenhagen).

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15

Comments on Climate, Intra-regional Variations, Chronology, the 2200 B.C. Horizon of Change in the Eastern Mediterranean Region, and Socio-political Change on Crete

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Introduction

In this paper I wish to try to widen, and to some extent re-orient, discussions about the relevance and role of a climate-change episode around 2200 B.C. I do not seek to present a detailed and comprehensive thesis — rather, comments. With regard to the climate aspect, I wish to critique some issues that have been oversimplified in previous work. With regard to chronology, I seek to highlight the reality of a period of more or less but not entirely contemporary change across a wide region (an appendix argues this *does* include the end of the Philia *facies* on Cyprus — contrary the recent claims of Bourke 2014), and thence to note the relevance of process, versus mere event. With regard to the island of Crete, I discuss briefly the relevance of the intersections of climate, time, and place around and following 2200 B.C. for socio-political history and apparent changes, suggesting that this is critical to the (much discussed) changes observed in the Early Minoan III–Middle Minoan IA period. The aim is not to argue some reductionist "climate-caused" thesis, but, rather, to engage in a discussion of how plural, interdisciplinary, and integrative approaches, including the important role of past climate change, can together offer productive perspectives on the interpretation of the past (McCormick 2011).

Climate Change(s): Complexities and Differences

There is now widespread agreement that there was some form of significant climate-change episode or shift around 2200 B.C./4.2 ka B.P. (which continued over a couple of centuries ending by ca. 1900 B.C./3.9 ka B.P.). It has been proposed as a marker episode dividing the Middle and Late Holocene (Walker et al. 2012, pp. 653–56). Altogether, the 2200 B.C. episode has moved from a hypothesis associating several observations in the early 1990s (Weiss et al. 1993), to become a generally accepted episode of regional to global significance at lower latitudes with a range of paleoclimate records indicating its existence in Africa, North America, and Asia as well as the Mediterranean and Near East (e.g., Dalfes, Kukla, and Weiss 1997; Cullen et al. 2000; Mayewski et al. 2004; Staubwasser and Weiss 2006, pp. 380–83; Booth et al. 2005; Wang et al. 2005; Weiss et al. 2012, pp. 185–87; Weiss 2014; Salzer et al. 2014; Dixit, Hodell, and Petrie 2014; Manning et al. 2014a). It falls in the "cool poles, dry tropics" category of rapid climate change episodes in the Holocene synthesis of Mayewski et al. (2004).

Some of these paleoclimate records are of high or higher precision — most notably and recently the bristlecone pine record investigated by Salzer et al. (2014) — but other records sometimes cited are much less secure or precise. Weiss et al. (2012, fig. 26) offer an example of the situation, showing datasets with a range of precisions (and thus usefulness) among the selection of records they illustrate. The marine sediment core LC21 from the southwest Aegean is a good example of the issues and uncertainties in some cases. As published by Rohling et al. (2002, fig. 1 items c and d), there is potentially an apparent signal around 2200 B.C., with a sharp change to cooler temperatures, following a highest $\delta^{18}O$ value for several thousand years (either direction) a couple of centuries earlier. The chronology for the core in this 2002 paper used a polynomial fit through the calibrated ^{14}C ages (Rohling et al. 2002, p. 589, caption to fig. 1; see also Casford et al. 2007). But Rohling et al. (2002, pp. 590–91) then in their discussion suggest there is likely a 300–400 year offset at play (due to the nature of the material, the foraminifera, dated) when they compare their record against the Greenland Ice Sheet Project Two (GISP2) ice core and other markers like the Santorini/Thera eruption. Of course, this "tuning" comment relates to the situation as *then*: the GISP2 chronology in the relevant period was subsequently questioned and should be somewhat older for the mid-second millennium B.C. and before (see Southon 2004), and, while the approximate Santorini/Thera eruption-date range they use remains "ok" versus the scientific evidence, the date of the Santorini/Thera eruption remains a controversial issue among at least some archaeologists (see Manning et al. 2014b). Thus Rohling et al. (2002, p. 590) note that their original chronology places the Santorini/Thera eruption tephra ca. 3.9 ka B.P. versus what they consider as the correct age ca. 3.57±0.08 ka B.P. This means they are suggesting that their dates are 300–400 years *too old*. This is illustrated clearly in Mayewski et al. 2004 — a paper on which Rohling is second author — where in their figure 1 (m) the LC21 data are shown and the original (light line) and proposed corrected (dark line) LC21 plots are shown with the dark line moving the sequence to more recent dates (by around ca. 300 years or so at the end of the third millennium B.C.). This is, for example, the chronology/placement of the LC21 data employed by Drake (2012, fig. 3) and is needed to achieve an apparent cool/arid trend for the late second millennium B.C.

I note this point in some detail as it is a source of confusion with regard to statements regarding climate and Minoan Crete by a scholar influential in this regard. Jennifer Moody (2009, pp. 241–44) discusses the LC21 core and at p. 243 n. 3 comments on the apparent age offset, *but* then says to "arrive at the dates given in my text, I have therefore added 300–400 years to the dates" — this would be correcting in the opposite direction (and, e.g., now in effect placing the Minoan ash ca. 4.2 ka B.P. or ca. 2200 B.C.). This is definitely incorrect, and is either a typo or a momentary error. For, when mentioning the highest $\delta^{18}O$ value in the last 10,000 years as corresponding to ca. 2200–2000 B.C. (pp. 243–44) and suggesting this shows that "summer evaporation soars to an interglacial high between ca. 2200–2000 B.C.," it is clear that Moody in fact seems to be correcting to more recent ages — that is, *subtracting* and not adding 300–400 years. Others then cite Moody, but without even considering the chronological issues and precision (e.g. Wiener 2013, p. 583; Wiener 2014, p. S5).

So, at the far end of this extended review, what is happening? With the original chronology there is a several-century period of increasing warming to a maximum, with, then, a sharp change to cooler conditions after ca. 4.129 ka B.P. (or ca. 2179 B.C.) — which could nicely fit the 4.2-3.9 ka B.P./2200–1900 B.C. climate episode — whereas, with the revised chronology, this peak and shift are instead at 3.779 ka B.P. (or ca. 1829 B.C.), and it no longer seems relevant to the 2200 B.C. episode, and 2200 B.C. in this revised record merely lies in the later part of a long warming trend which starts at the beginning of the fourth millennium B.C. I show both the original and revised chronologies and the LC21 core data for warm/cold percentage foraminifera in figure 15.1 and as compared to the GISP2 modeled temperature record. Thus in the first scenario, the 2200–1900 B.C. episode is a sharp shift to colder and more arid conditions after a long warming period (see the LC21 $\delta^{18}O$ record in Rohling et al.

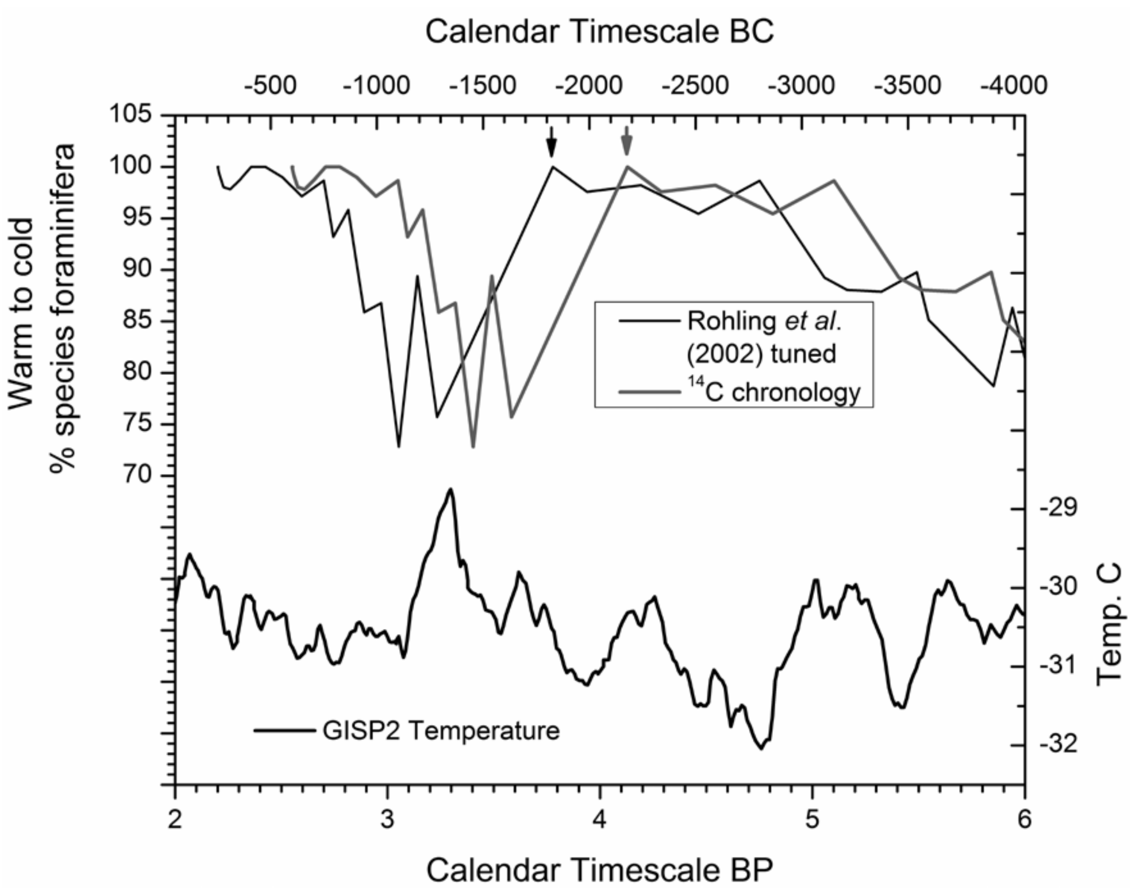

Figure 15.1. Top: Southwest Aegean Sea, marine sediment core LC21, planktonic foraminifer data showing changes in percent warm to cold foraminifera from Rohling et al. 2002. Two chronologies for the LC21 record are available. The original one based on interpolation from radiocarbon dates and another one based on tuning versus the GISP2 ice-core records (see Rohling et al. 2002, fig. 1 and pp. 590–91). Both timescales are provided along with the foraminifera data at http://www.highstand.org/erohling/Rohling-papers/LC21_W-C_data_M_et-al-2004.xls (accessed February 2015). The two arrows indicate the very different placements of a shift to markedly cooler conditions. The gray ^{14}C chronology could suggest that this is a reflection of the 2200 B.C. climate episode; the alternative placement from Rohling et al. 2002 suggests otherwise. Bottom: Modeled Greenland summer temperature record from the GISP2 ice-core $\delta^{18}O$ data. For the data and references to original publications, see ftp://ftp.ncdc.noaa.gov/pub/data/paleo/icecore/greenland/summit/gisp2/isotopes/gisp2_temp_accum_alley2000.txt (accessed February 2015)

2002, fig. 1 item c). This more or less matches with the GISP2 ice-core record, where after a period of warming peaking about 2300 B.C. there is then a shift to cooler conditions until a little after 2000 B.C., and a cool and dry episode ca. 2200–2000 B.C. corresponds with the general assumption/synthesis for this period (e.g. Mayewski et al. 2004, p. 251). Whereas, in contrast, with the second revised view, 2200–1900 B.C. is the peak of a long warming trend in the LC21 dataset, and this also could be a cause of marked aridity (and the observed $\delta^{18}O$ record from LC21) — there is a less successful match with the GISP2 record. Thus two entirely opposite situations (cooling versus warming) are proposed depending on core chronology. But, ironically, either could, plausibly, record or account for apparent aridity from around and after ca. 2200 B.C. in the eastern Aegean. Confusing? Yes — and it is my point in dwelling on this case at some length to highlight that a number of proxy paleoclimate records are not entirely secure, and this can often undermine any interpretative synthesis. Paleoclimate records for the prehistoric era from the eastern Mediterranean region with truly rigorous high-precision chronological frameworks remain relatively rare (see comments to this effect in, e.g., Finné et al. 2011; Manning 2013b, pp. 105, 118).

Some archaeologists — led notably by Harvey Weiss — have gone on to accord this 2200 B.C. climate-change episode prime-mover status, whereas some other scholars note variations in evidence (temporal and/or spatial or in terms of type of urban-social unit) and the lack of a single comprehensive picture (or a lack of evidence for such a clear climate change in regional evidence) and suggest critique of a straightforward uniformitarian climate change–driven model for this period (e.g. Pfälzner 2012; Ur 2012; Middleton 2012, pp. 273–74; Finné et al. 2011; Wossink 2009; Koliński 2007). Wiener in his recent synthesis discussions also notes such differing assessments (2013, pp. 581–82; 2014, pp. S3–S4), but avoids really taking sides. However, Wiener's review of the archaeological evidence for change highlights that this occurred over a period of several centuries in different places (Wiener 2014, pp. S4–S6). A critical reading of Wiener 2014 also highlights the relevance and importance (again) of establishing the correct chronology *if* events are to be (correctly) associated or distinguished. Wiener (2014, p. S4), for example, chooses, without any adequate explanation, to dismiss the recent comprehensive re-dating of the end of the Early Bronze III period in the southern Levant based on detailed Bayesian chronological modeling analysis of several large sets of modern radiocarbon dates and careful site review (e.g., Regev, Miroschedji, and Boaretto 2012; Regev et al. 2012; Höflmayer et al. 2014; Höflmayer and Eichmann 2014; see also several papers this volume). This re-dating entirely separates and distinguishes the end of the Early Bronze III and start of Early Bronze IV in the southern Levant (around 2500 B.C.) from what happens (for whatever reasons) in the northern Levant and elsewhere around 2200 B.C. — and can nicely fit a differential north–south historical and economic scenario (Schloen, this volume). In the opposite direction, although Wiener (2014, p. S5) notes that perhaps the breakdown of the Philia system on Cyprus was associated with ca. 2200 B.C. (as the most recent radiocarbon-based analysis available indicated: Manning 2013a), then, on p. S10, Wiener in contrast places the end of the Philia period instead ca. 2300–2250 B.C. (following a previous chronology), which suggests a distinction. Which placement is correct? On each such instance hangs — or not — a coherent assessment and narrative. I return to chronology in the next section.

But first let us consider climate. How a climate change around 2200 B.C. might play out across even just the Mediterranean–Near East region is likely a complicated issue, as already noted in several previous studies that highlight inter/intra-regional variability in climate effects even within the eastern Mediterranean–Near East zone across this period (Riehl 2012). There is general support for a shift over a period of time in the later third millennium B.C. to a more arid climate regime in the eastern Mediterranean and Near East (e.g. Roberts et al. 2011), and in contrast to the period from the earlier to the mid-third millennium B.C. However, how such a shift played out and its effects on human societies will have varied at both the macro and micro scales. The environmental setting — for example, already marginal context, versus favorable (e.g., in terms of water availability, susceptibility to other risks) — the nature of relevant societies (urban, pastoral) and the accessibility of trade resources (on trade route(s)/coastal versus not, or inland) will, among other factors, have seen very different scenarios *even if* the climate change was similar at all loci. But, in fact, we may guess that the climate impacts varied by location and over time. This is evident looking at both longer- and shorter-term climate records and historical records for the past couple of millennia from the Mediterranean region (e.g., Cook et al. 2015; Haldon et al. 2014; Manning 2013b; Roberts et al. 2012; McCormick et al. 2012; Luterbacher et al. 2012; Köse et al. 2011; Nicault et al. 2008).

Some clear spatial patterns and regional differences are evident looking at Mediterranean climate over the longer term. As Roberts et al. (2012, p. 24 and esp. fig. 1) summarize, there are varying correlations (and strengths of correlations) between the North Atlantic Oscillation (NAO) and different parts of the Mediterranean region. (Why the NAO? The NAO describes the key atmospheric circulation pattern relevant especially to precipitation in the region from the Atlantic to Mediterranean: e.g., Trigo, Osborn, and Corte-Real 2002; Wanner et al. 2001.) In particular, there are opposite correlations (with winter NAO) for precipitation between the western Mediterranean and parts of the northern and northeast Mediterranean (some of the Balkans and western Anatolia), versus the southeast Mediterranean (Roberts et al. 2012; López-Moreno et al. 2011). On the longer term and a generalized scale, there is evidence for a link between drier, cooler (and unstable) conditions in the eastern Mediterranean and a generally negative phase of the NAO — as during the Little Ice Age (LIA), and the reverse (wetter and warmer conditions) during generally positive phases of the NAO — such as during the Medieval Climate Anomaly (MCA; see Roberts et al. 2012). But, again, patterns are regional when examined in detail. Thus even within the eastern Mediterranean there are major differences from the northwest to the southeast. For example, while a positive phase of the NAO index is associated with decreased precipitation over Greece (e.g., Feidas et al. 2007), we see the opposite in the southern Levant, where, in recent years, there is instead a linkage of more of the wettest/rainiest years to the NAO-positive years (Black et al. 2011, pp. 21–22; Black 2011) — note there is no reverse (negative NAO) correlation (and it should be remembered that other combinations of atmospheric circulation regimes have important effects in the eastern Mediterranean in combination with local topography and distance to the sea, and so on: for example, Kutiel et al. 2002; Hasanean 2004). It is worth highlighting that the northern Levant, and the area around Tell Leilan, is close to where responses to the winter NAO change correlation, and it is thus a sensitive region, potentially affected (substantially) by even relatively modest northward or southward or east–west shifts in circulation patterns — and the NAO centers of action are known to move on decadal time scales (Jung et al. 2003).

However, at the same time on an inter-annual basis, we see marked variability, both locally and regionally. To pick three years (A.D. 2005, 2008, 2011) from the Drought Severity Index (DSI) study of Mu et al. (2013) derived from remotely sensed data A.D. 2000–2011 — see figure 15.2 — we may observe such variations in practice in the Mediterranean region. The

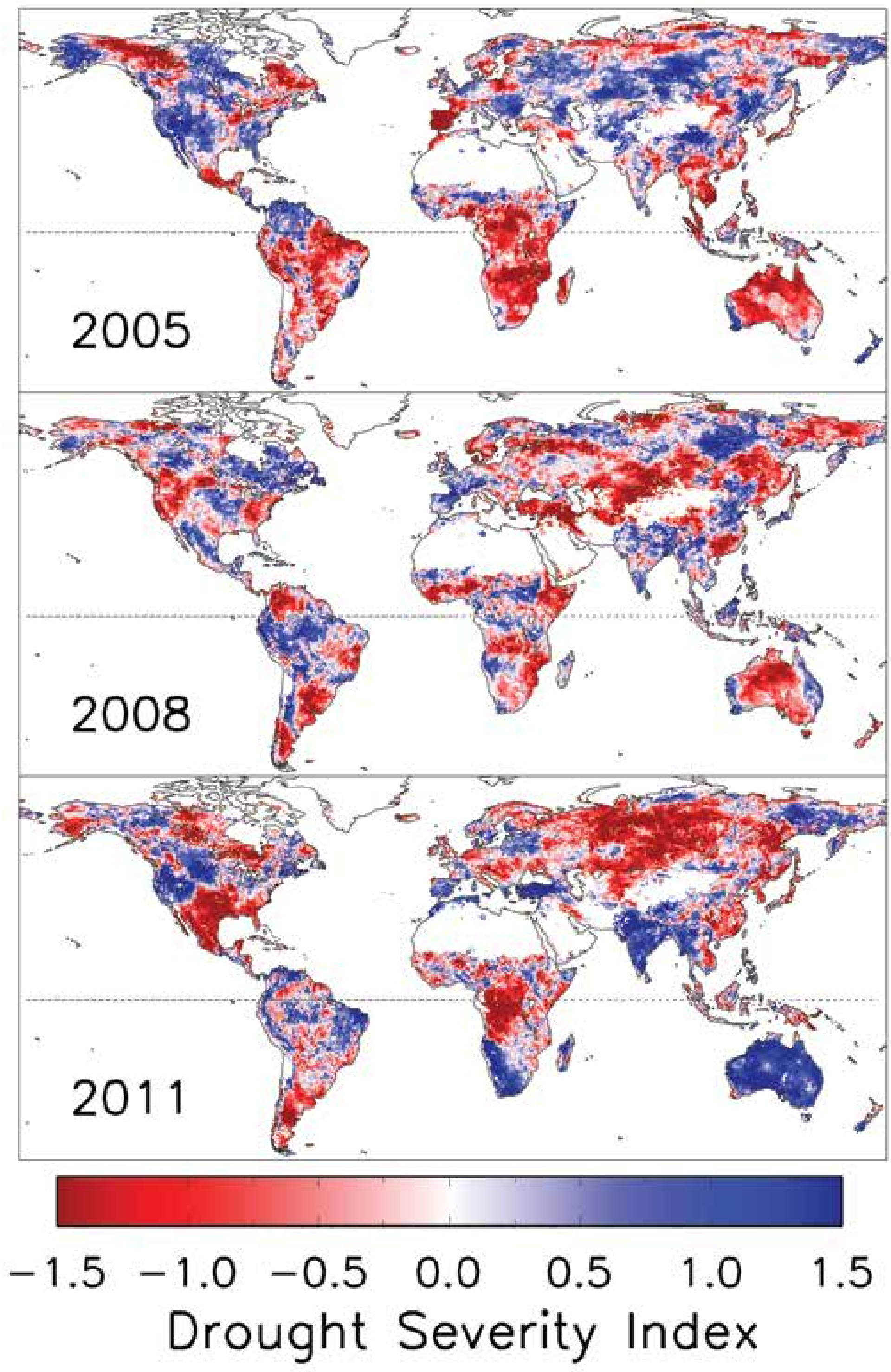

Figure 15.2. Drought Severity Index (DSI) data from Mu et al. 2013 for the years A.D. 2005, 2008, and 2011. Negative values = more arid; positive = wetter (greater moisture availability). Data from: ftp://ftp.ntsg.umt.edu/pub/MODIS/Mirror/DSI/Annual/ (last accessed February 2015)

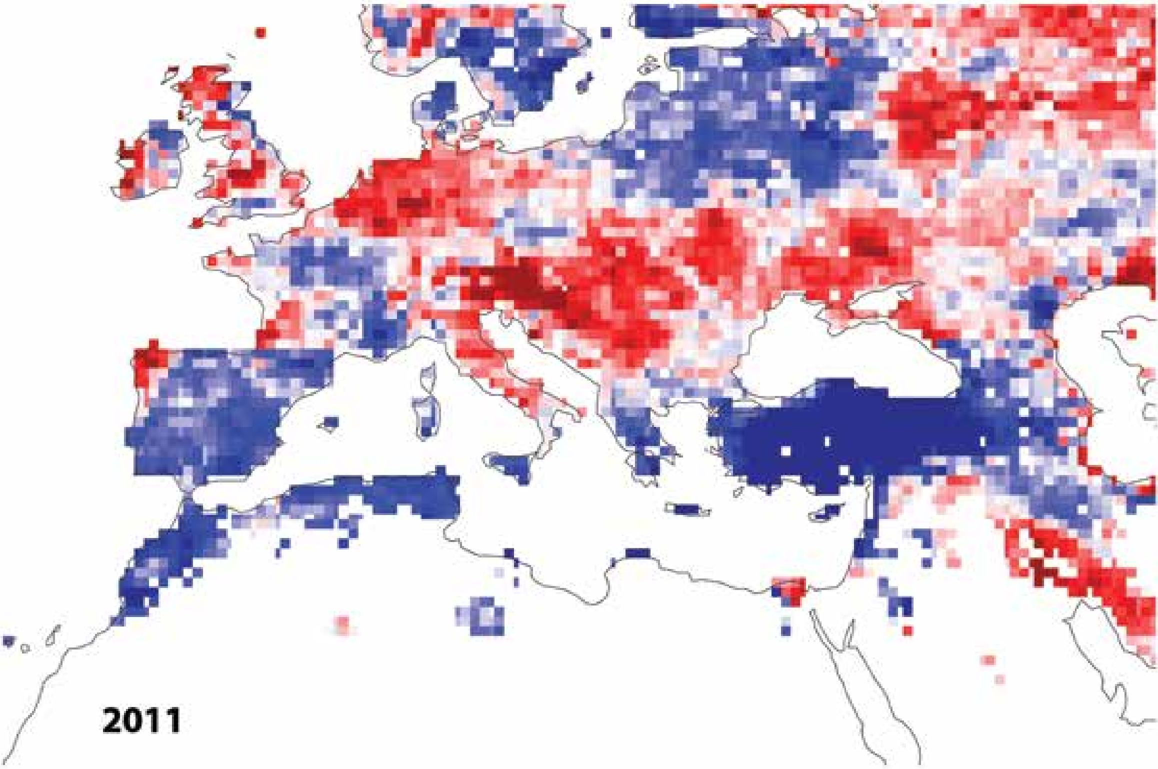

Figure 15.3. Detail for Europe and Mediterranean for 2011 (for plot details, see figure 15.2). Note even in a generally "good" year with favorable moisture conditions in both west (Iberia) and eastern Mediterranean (Greece–Anatolia) that this pattern is not uniform with arid conditions in most of Italy and also part of the southern Levant and the Nile delta

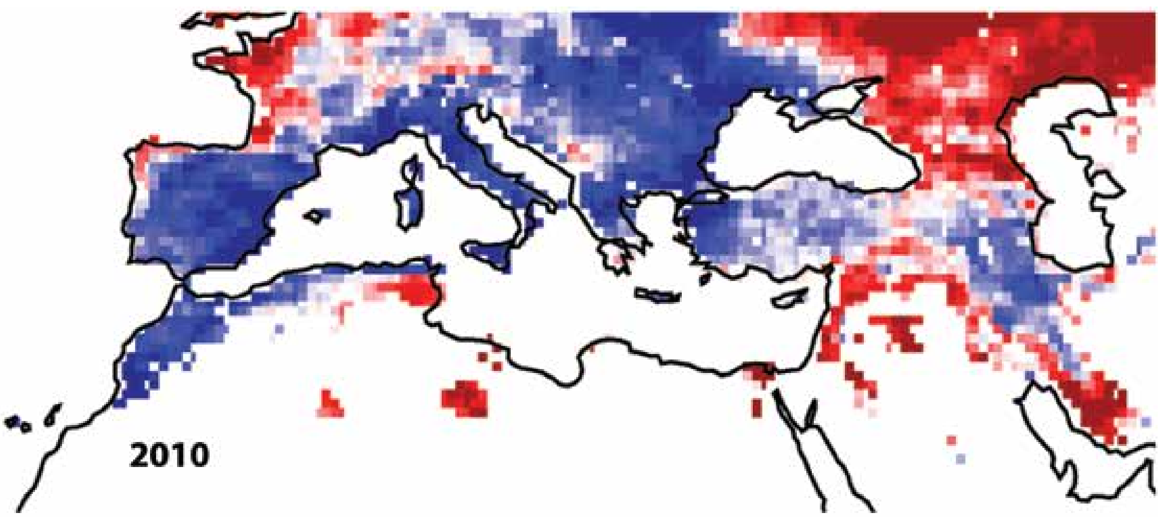

Figure 15.4. Detail of Mediterranean area for 2010 (for plot details, see figure 15.2) — coastlines emphasized. Note in this case the north–south and west–east variation in the eastern Mediterranean/Levant. Thus there is favorable moisture in most of the northern Mediterranean region (from Iberia to Anatolia), but more arid conditions in the Levant and Nile delta

year 2005 was relatively dry in both Iberia and Anatolia, but not in Italy or Crete or Cyprus or in parts of the southern Levant and Nile delta. In contrast, 2008 was like a one-year Little Ice Age, with wet conditions in the west Mediterranean and very arid conditions over most of the east Mediterranean. The season 2011 was largely the opposite of 2005, with relatively good, wetter conditions in both Iberia and Anatolia but arid conditions in the northern central Mediterranean and also the southern Levant and Nile delta. Figure 15.3 shows a close-up of 2011 in the Europe-Mediterranean area. In turn, we may then contrast figure 15.3 with figure 15.4, which shows a close-up of 2010 — here there were generally good (wetter) conditions right across the northern Mediterranean from Iberia to Anatolia, but in contrast arid conditions in the Levant. Looking even just at Anatolia on an annual timescale, the detailed high-frequency drought reconstructions by Köse et al. (2011) demonstrate variability in intensity across the gridded areas. In sum, we see marked variability, whether on a Mediterranean-wide or regional basis, and whether on short- and longer-term timescales. Apart from highlighting why various climate proxies should not, and do not, necessarily offer spatially homogeneous records — but rather a regionally and temporally varying palimpsest (as illustrated in Manning 2013b, figs. 1a, 1b, 21) — the nature of the data mitigates against generalizing meta-narratives where change is simultaneous across a large area like the Mediterranean, which comprises several diverse bioclimatic zones, and instead argue for processes in which general change plays out in different ways and over different timescales across any larger region(s). Impacts on humans will in turn depend on the local environment, agricultural systems in place, nature of settlements, nature of social organization, and so on.

Several studies have shown some degree of correlation at some frequencies between solar activity and climate indices such as the North Atlantic Oscillation (e.g. Georgieva et al. 2007; Alvarez-Ramirez, Echeverria, and Rodriguez 2011). Interestingly, the correlation is most apparent during periods when solar activity is high; at these times NAO-related associations extend over the whole of the Northern Hemisphere, whereas, during periods of low solar activity, they are more restricted to the Atlantic area. Thus prediction/association with the NAO index is stronger during periods of high solar activity; in contrast, at times of low solar activity, the wider North Hemisphere climate breaks into more local patterns and is thus less predictable. If this situation can be generalized to periods of higher versus lower solar activity, then it is worth observing that, in contrast to several other periods when major climate-associated change seems to occur associated with major solar minima (like the widely recognized ninth- to eighth-century B.C. episode: e.g., van Geel, Buurman, and Waterbolk 1996; Blaauw, van Geel, and van der Plicht 2004; Plunkett and Swindles 2008), the mid-later third millennium B.C. is notable for several major solar maxima (ca. 2520 B.C., 2240 B.C., and 2070 B.C.: Usoskin, Solanki, and Kovaltsov 2007), and Mayewski et al. (2004, p. 251) accordingly note a maximum in ^{10}Be (the Steinhilber, Beer, and Fröhlich 2009 record of ^{10}Be places this peak at the start of the twenty-first century B.C.). The GISP2 ice-core record indicates a temperature peak especially around 2330–2150 B.C. Thus, on a general lower- to mid-frequency basis (contrasting high frequency), and allowing for variations due to physical geography, one might suspect a more coherent climate process over this period.

Some Issues and Patterns in Chronology

When does change occur across the eastern Mediterranean in the period around 2200 B.C.? Some sources of climate-related evidence are precisely dated: thus the sharp tree-line decline observed by Salzer et al. (2014) at Sheep Mountain, White Mountains, California, is dated specifically from 2209 B.C. (period 2209–2139 B.C.). Evidence of eastern Mediterranean climate change preserved in cedar wood (assumed to be from Lebanon) dates somewhat later — from during the twenty-second century B.C., and into the twentieth century B.C. (Manning et al. 2014a). Archaeologically, the picture is also likely complex. Let us examine three cases across the eastern Mediterranean.

Cycladic Islands

In the Cycladic Islands of the southern Aegean, there is a period of apparent change/transition, or, in fact (and much debated), a "gap" (the "Rutter Gap"; see esp. Rutter 1983), following the late Early Bronze II (Anatolianizing) Kastri Group phase and before the Middle Cycladic period begins (Broodbank 2000, pp. 321, 331–35; Broodbank 2013b). Conventionally, ca. 2200 B.C. was the date for the end of Early Bronze II and the start of Early Bronze III (and this change horizon in the Cyclades). But, in a recent study, Renfrew, Boyd, and Bronk Ramsey (2012) dated this change (the end of Dhaskalio Phase C in the data they investigate) from a sequence analysis of radiocarbon dates at ca. 2300 B.C. They also did not assume, and thus found no evidence for, the Rutter Gap. This date is rather earlier than 2200 B.C. Thus the question arises whether the late Early Bronze II Cycladic transition was associated with the 2200 B.C. and later episode, or different, and earlier (even if not entirely distinctly earlier as in the case of the end of Early Bronze III and start of Early Bronze IV in the southern Levant: see above).

The samples analyzed by Renfrew, Boyd, and Bronk Ramsey (2012, fig. 9) in their refined model comprised animal bones, charcoal, and seeds. The key Dhaskalio, Keros, samples are all charcoal. Species include long-lived candidates like *Olea europaea*, *Juniperus* sp., *Pistacia* sp., and some shorter-lived cases, (in bold in fig. 15.5) notably *Hedera helix* (R7, OxA-22746) and *Ericaceae* (R51, OxA-22760; Renfrew, Boyd, and Bronk Ramsey 2012, table 2 — note "Ericaeae" appears to be a typographic error). Renfrew, Boyd, and Bronk Ramsey (2012, pp. 149, 151) admit that the olive samples might be from roof timbers (and so could be use of long-lived wood), but otherwise they suggest that the wood charcoal derives from branches and twigs. It is, however, noticeable that there is a range of ages in the dates for each phase, and especially that the date of the *Ericaceae* sample is the most recent for Phase C (Renfrew, Boyd, and Bronk Ramsey 2012, table 4) and that the date for the *Hedera helix* sample is the second most recent for Phase B, but, most obviously, over 100 ^{14}C years more recent than the two oldest dates in this set (R4, OxA-22745 and R8, OxA-22747), which, interestingly, are on olive wood (perhaps confirming the caveat mentioned by Renfrew, Boyd, and Bronk Ramsey 2012, p. 151). It must also be noted that branches of some of the tree species mentioned, like juniper (assumed *Juniper phoenicea*), can easily have a number of years of growth.

We might therefore reconsider the Renfrew, Boyd, and Bronk Ramsey (2012) analysis applying the Charcoal Outlier model in OxCal to the charcoal samples belonging to potentially long-lived wood (thus allowing to some extent for the potential of in-built age in at least some of the data: Bronk Ramsey 2009b) — versus the General Outlier model for the other samples (shorter/short-lived). This is a minimum step (this and some other thoughts were initially raised in Manning 2015; the present discussion is a slightly revised assessment). We might also wonder whether there is a real internal sequence: older charcoal data versus the two dates (Phases B and C) on shorter-lived plant material. The other issue is the Rutter

Gap. Renfrew, Boyd, and Bronk Ramsey did not consider this in their sequence. They state their reason as "the evidence of Dhaskalio indicates a striking continuity between the successive phases there, with no suggestion of a gap" (2012, p. 157). The logic problem is that the gap — if it exists — is *after* the Dhaskalio sequence and before the evidence from entirely different initial Middle Cycladic sites (Phylakopi on Melos, or, for the radiocarbon dates employed by Renfrew, Boyd, and Bronk Ramsey 2012, from Akrotiri on Thera). Rutter (2013, p. 593) recently highlights this point referring to the "pronounced break in material culture that separates the Kastri Group of the terminal [Early Cycladic] II period and the Phylakopi I assemblage that is largely, if not entirely, of Middle Cycladic date." Renfrew, Boyd, and Bronk Ramsey (2012, p. 157) also state that the radiocarbon dates they report "for Dhaskalio Phase C are comparable with the earlier part of the estimate then reached for the Phylakopi I culture." This statement apparently justifies the statement of an assumption that "the end of Dhaskalio Phase C corresponds to the inception of the Middle Cycladic period." In fact, the radiocarbon dates from Dhaskalio Phase C barely overlap with those from initial Middle Cycladic (and certainly not the main probability parts of the respective ranges). This is apparent in Renfrew, Boyd, and Bronk Ramsey (2012, fig. 9). Altogether, there is a lack of any real evidence suggesting that the end of Dhaskalio Phase C really does equal (or abut/overlap with) the start of Middle Cycladic (at most it seems that Dhaskalio Phase C perhaps extends into at least earlier Early Helladic III based on observations such as by Rutter 2013, p. 593 n. 3 that there are perhaps a few imports of central Greek Early Helladic III date in the Dhaskalio Phase C assemblage). Therefore, there *could* (even should) still be a Rutter Gap — even if this is shorter and less empty than it seemed in 1983 (as Rutter 2013 discusses, and see also Broodbank 2013b — there are also hints that some Phylakopi I types may exist during Early Minoan III: see Brogan 2013, p. 561, which may further shorten the original gap). It would thus seem worth re-running the sequence analyses, asking: Is there likely an interval in time between the end of Dhaskalio Phase C and the start of Middle Cycladic (rather than *assuming* the opposite and reaching a circular logic result), and, if there was such a gap, then when would it occur, and is it feasible within the model and data available?

Figure 15.5 shows the Renfrew, Boyd, and Bronk Ramsey (2012, fig. 9) model re-run with the Charcoal Outlier model applied to the non–shorter-lived charcoal samples (and the General Outlier Model on the rest) and asking what is the possible interval in time between the end of Dhaskalio Phase C and the start of Middle Cycladic — see the inset for details. The other difference is that I employ a weighted average (R_Combine) on the three initial Middle Cycladic dates since these were all on short-lived seeds from a single "lump" of compressed seeds, and the dates can best be considered as estimates of the same radiocarbon age. The answer is that there could be an interval of 0–105 calendar years at 68.2% probability (and 0–181 calendar years at 95.4% probability) with a mean of eighty-one calendar years and a median of seventy-five calendar years. Thus the answer is that no interval (or no gap, or no extra Early Bronze III period) is relatively unlikely (contra Renfrew, Boyd, and Bronk Ramsey 2012); most likely there is a period of time centered around circa seventy-five to eighty years long that is presently missing in the evidence we have. While not impossible, there seems little plausibility that Dhaskalio Phase C equates with (or is immediately followed by) the start of Middle Cycladic. Instead, some Early Bronze III phase and/or Rutter Gap remains to be accounted for.

Figures 15.6 and 15.7 show the re-run analyses outlined above and assuming that there could be an Early Bronze III period or Rutter Gap; for calendar date ranges from figures 15.5–7

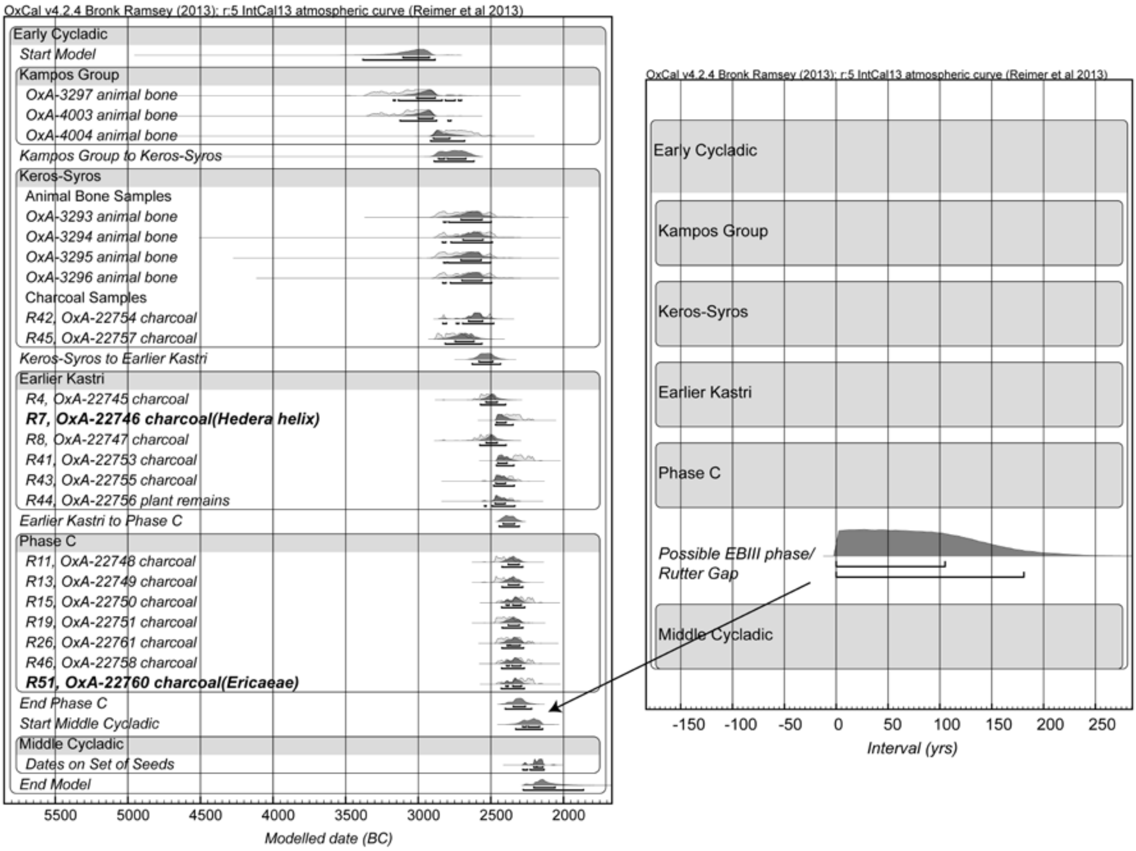

Figure 15.5. The Renfrew, Boyd, and Bronk Ramsey 2012 Early Cycladic sequence re-run with the Charcoal Outlier model applied to non-short/shorter-lived charcoal samples and the General Outlier model applied to the other dates, and asking the likely length of the calendar interval between the End of Phase C and the Start of the Middle Cycladic period (see inset to right). Data from OxCal (Bronk Ramsey 2009a; Bronk Ramsey 2009b) and IntCal13 (Reimer et al. 2013) with resolution set at 5

(for the end of Dhaskalio Phase C through to the Middle Cycladic seeds), see table 15.1. We see that Dhaskalio Phase C likely ends even a little earlier than Renfrew, Boyd, and Bronk Ramsey (2012) suggested — in the late twenty-fourth century B.C. An Early Bronze III period in the Cyclades, or a Rutter Gap, lies mainly in the twenty-third century B.C., and the Middle Cycladic period does not start until — perhaps not coincidently — more or less ca. 2200 B.C., with the dates on the initial Middle Cycladic seeds most likely lying in the twenty-second century B.C. Thus, in the Cycladic Islands, significant cultural change seems to begin in the twenty-third century B.C. (post-Kastri Group), and a new status quo (Middle Cycladic) starts from around or after ca. 2200 B.C.

Crete

Remarkably, over forty years after its publication, the small Early Minoan site of Myrtos, excavated and published in exemplary fashion by Peter Warren, remains the only site on

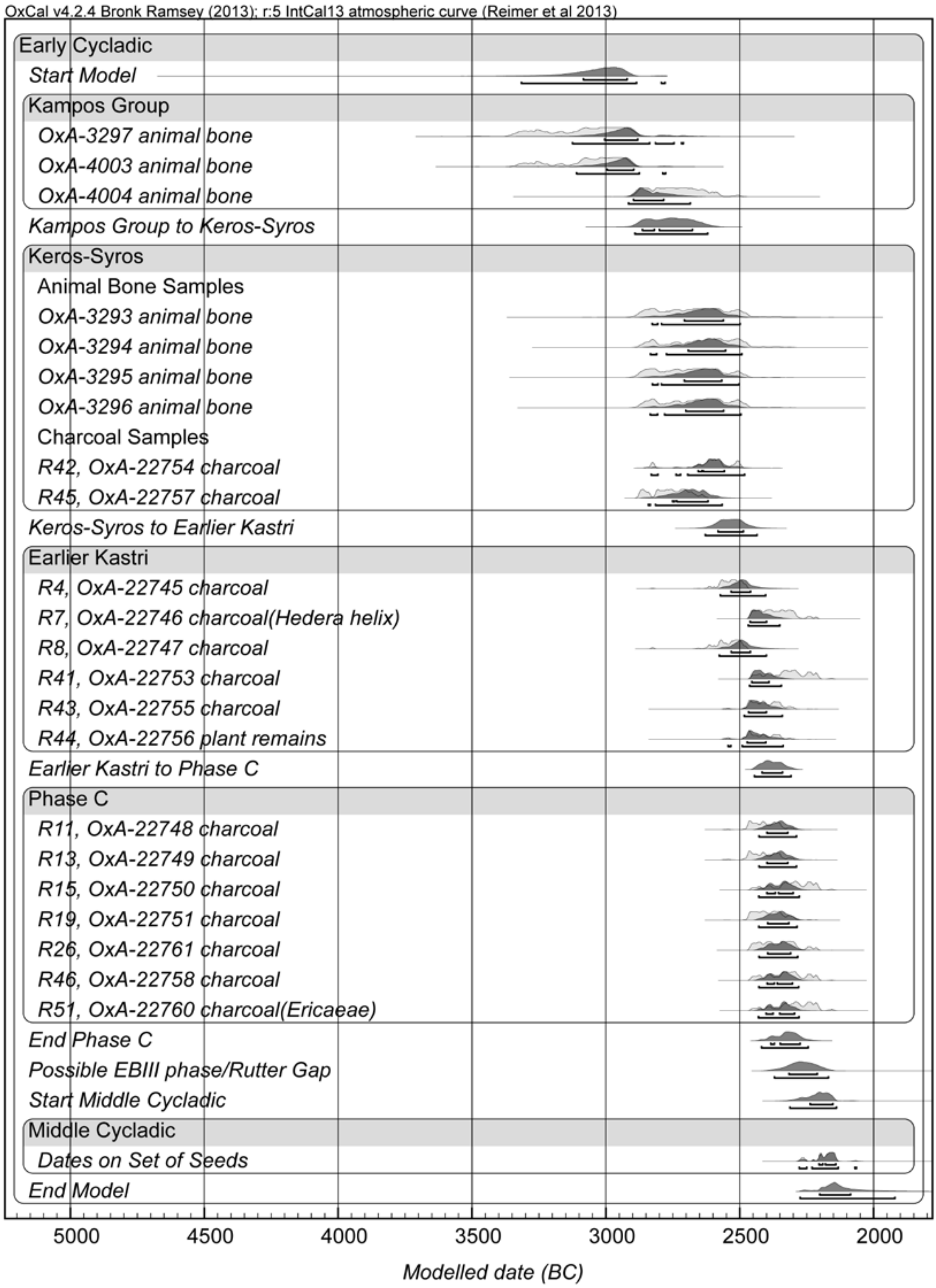

Figure 15.6. The model in figure 15.5 re-run assuming a possible Early Bronze III phase or Rutter Gap interval between the end of Dhaskalio Phase C (at most reaching into Early Helladic III) and the start of the Middle Cycladic period. For the date ranges calculated for the end of Phase C, the possible Early Bronze III phase/Rutter Gap, and initial Middle Cycladic, see table 15.1

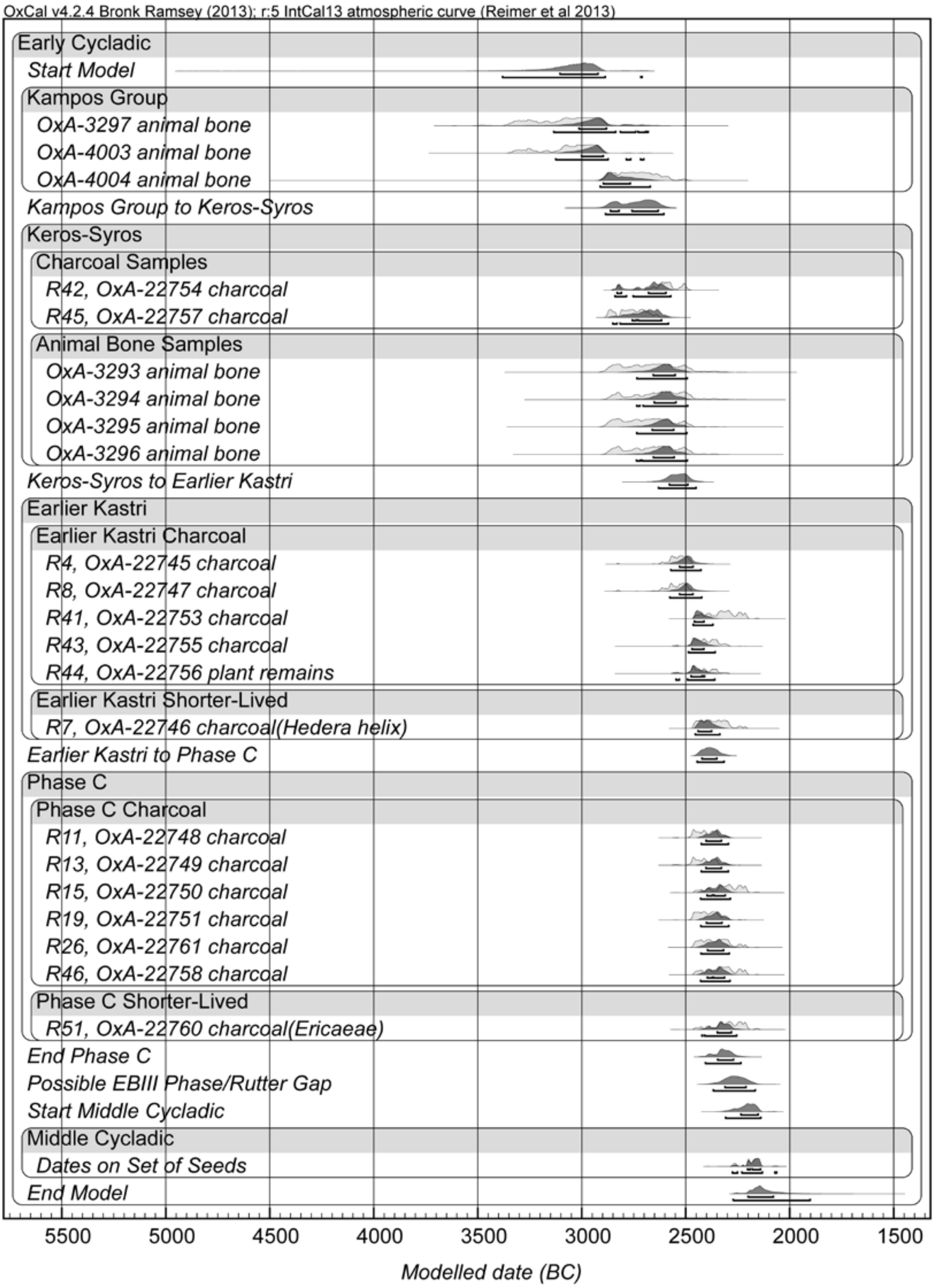

Figure 15.7. The models in figures 15.5 and 15.6 re-run now assuming that the two known shorter-lived samples (*Hedera helix* and *Ericaeae*) are more recent than the other wood charcoal samples from their contexts and also assuming a possible Early Bronze III phase or Rutter Gap interval between the end of Dhaskalio Phase C (at most reaching into Early Helladic III) and the start of the Middle Cycladic period. For the date ranges calculated for the end of Phase C, the possible Early Bronze III phase/Rutter Gap, and the Middle Cycladic, see table 15.1

Table 15.1. Modeled and re-modeled calendar age ranges for the Early Cycladic sequence in Renfrew, Boyd, and Bronk Ramsey 2012 (see figs. 15.5–7)

	68.2% Probability cal. B.C.	*95.4% Probability cal.* B.C.	*Mean (μ) cal.* B.C.	*Median cal.* B.C.
Renfrew, Boyd, and Bronk Ramsey (2012, table 6)				
End Phase C		*2387–2193*	*2290*	*2292*
Model 1 (fig. 15.5): Charcoal Outlier Model and General Outlier Model — Early Bronze III/Rutter Gap Question				
End Phase C	2347–2264	2401–2221	2311	2309
Start Middle Cycladic (MC)	2282–2166	2230–2145	2230	2224
Date on set of early MC seeds	2205–2059	2278–1863	2109	2137
Model 2 (fig. 15.6): Assumed Rutter Gap — Charcoal Outlier Model and General Outlier Model				
End Phase C	2385–2275	2419–2245	2325	2321
Putative Rutter Gap/Early Bronze III	2316–2211	2371–2169	2267	2267
Start Middle Cycladic (MC)	2238–2153	2313–2140	2209	2203
Date on set of early MC seeds	2202–2087	2275–1921	2117	2140
Model 3 (fig. 15.7): Assumed Rutter Gap — TPQ Model (and Charcoal and General Outlier Model)				
End Phase C	2347–2271	2406–2236	2320	2319
Putative Rutter Gap/Early Bronze III	2312–2211	2368–2167	2264	2264
Start Middle Cycladic	2235–2153	2309–2140	2207	2202
Date on set of early MC seeds	2204–2141	2276–2064	2174	2169

The gray cells report the placement of the end of Phase C in the refined model of Renfrew, Boyd, and Bronk Ramsey (2012, table 6). The rest of the table reports results applying the Charcoal Outlier Model to all charcoal samples except the two dates on shorter-lived species (R7, OxA-22746 *Hedera helix*, and R51, OxA-22760 *Ericaeae*) and the General Outlier Model on the other dates (on animal bones, or seeds plus the two samples just identified on shorter-lived plants), and then considering different assumptions in the different models. The data uses OxCal and the two outlier models mentioned above (Bronk Ramsey 2009a; Bronk Ramsey 2009b) and IntCal13 (Reimer et al. 2013) with curve resolution set at 5.

Model 1 is as Renfrew, Boyd, and Bronk Ramsey (2012) except for (i) applying the two outlier models, and (ii) it does not assume that there is no interval between the end of Dhaskalio Phase C and the start of the Middle Cycladic period; rather, it asks what the likely interval between these two is.

Model 2 is as Model 1 but assumes there could be a Rutter Gap in the cultural sequence and dates this.

Model 3 considers the charcoal samples in each phase to be older than (setting a *terminus post quem*, TPQ, for) the dates on animal bones or dates on shorter-lived plant material (R7 and R51, mentioned above) but otherwise (adding outlier models) is as Renfrew, Boyd, and Bronk Ramsey (2012) and assumes there could be a Rutter Gap in the cultural sequence and dates this.

Crete with a set of Early Minoan IIA and then Early Minoan IIB radiocarbon dates (Warren 1972; Manning 1995, pp. 145–49), and indeed very few Early Minoan radiocarbon dates *in toto* have been published (a recent exception is mention of a single Early Minoan I period date on seeds around or *after* ca. 2200 B.C. from Priniatikos Pyrgos: Molloy et al. 2014, p. 322 and n. 71).

Whereas major advances have been made in third millennium B.C., eastern Mediterranean chronology centered on the use of modern radiocarbon dating and Bayesian chronological modeling in Egypt, the Levant, and Cyprus (e.g., Bronk Ramsey et al. 2010; Regev, de Miroschedji, and Boaratto 2012; Regev et al. 2012; Manning 2013a; Manning 2013c; Höflmayer et al. 2014; Höflmayer and Eichmann 2014; several papers in this volume), and even, as we have just seen, the Cycladic Islands (also Manning 2008a), Crete, especially, and southern Greece, generally, have seen remarkably little modern chronometric research. This is a regrettable situation holding back research on Crete and in the Aegean (contrast the 1960s–1970s, when the southern Aegean was at the vanguard of radiocarbon dating) — this author commented on the same problem eighteen years ago (Manning 1997), and little has improved since — it unfortunately reflects a negative attitude toward radiocarbon dating in some influential quarters of the Aegean field.

Despite the radiocarbon dates being from over forty years ago, and not being of the higher precision now possible (on the history of radiocarbon and archaeology, see Taylor and Bar-Yosef 2014; Manning 2015), nor on short-lived samples contemporary with find context, it remains instructive to consider what the Myrtos radiocarbon measurements tell us about the date for the end of Early Minoan IIB. We can use the Charcoal Outlier model (Bronk Ramsey 2009b) and also add a few extra constraints: a date range for later Early Minoan I (a *terminus post quem* for Early Minoan IIA) from Priniatikos Pyrgos, and some *terminus ante quem* dates from late Early Helladic III (from Kolonna, Aigina: from Wild et al. 2010) and from initial Middle Cycladic (the same three dates from Akrotiri, Thera, used for the Cycladic case, above). The sequence analysis is shown in figure 15.8. The notable observation is that the Early Minoan IIB period is found to end more or less exactly around 2200 B.C. There is a set of late Early Minoan II destructions or changes on the island (see below), and this horizon of change thus seems to correlate more or less with the 2200 B.C. climate change episode. The subsequent Early Minoan III–Middle Minoan IA periods attest dramatic changes on Crete (see below). These changes seem very much temporally associated with the 2200–1900 B.C. period of climate change. I return to this issue below.

Tell Leilan

Tell Leilan formed the basis of the original case for a widespread ca. 2200 B.C. climate change event of archaeological and historical relevance (Weiss et al. 1993). Weiss et al. (2012) presented a large set of radiocarbon dates from the Center for Accelerator Mass Spectrometry (CAMS) at Lawrence Livermore National Laboratory and a Bayesian sequence analysis of these using the site's stratigraphy, and found that the final post-Akkadian occupation of the site ended in the last half of the twenty-third century B.C. (e.g., final Phase IIc occupation/use placed 2252–2202 B.C. at 95.4% probability). Additional radiocarbon dates have been run especially at Arizona (AA) and one date at Heidelberg (Hd): see figure 15.9 and table 15.2. Cases for comparisons between the laboratories are shown in figure 15.10. The Phase IIc dates are all very comparable, and the Phase IIb2 dates have only a very slight difference between the AA and CAMS values. There is some difference, however, for the Phase IIa comparison and, while it passes the 95% confidence limit, the relatively higher T value for the AA dataset for Phase IIa indicates some range of values perhaps indicating that not all the samples are so clearly representative of the same age (the AA data in this case, alone of those cases in figure 15.10, also include some AA dates run some time ago — and thus the data are not strictly all comparable).

The Weiss et al. (2012) analysis employed weighted averages for each Phase. Given that different contexts within a phase are involved in some cases — especially for Phases IIb2, IIb1, and IIc — and noting for example the range of ages obtained for the Phase IIa context (commented on above), it might be argued that in the cases where there are multiple non-identical elements making up the phase set (versus dates on exactly the same set of seeds), or where there seem (by eye) to be a range of ages and some perhaps residual or older material, that use of an analysis in OxCal employing a Tau Boundary paired with a Boundary (Bronk Ramsey 2009a) might be a more appropriate approach to quantify the likely last use of each context. The exponential (Tau Boundary) model is particularly relevant here because it assumes that all the radiocarbon-dated samples are older (most only very slightly but some by greater margins and a few even by a significant amount) than the end of the relevant Tell Leilan phase. Thus this modeling approach expects the majority of the samples to closely define the

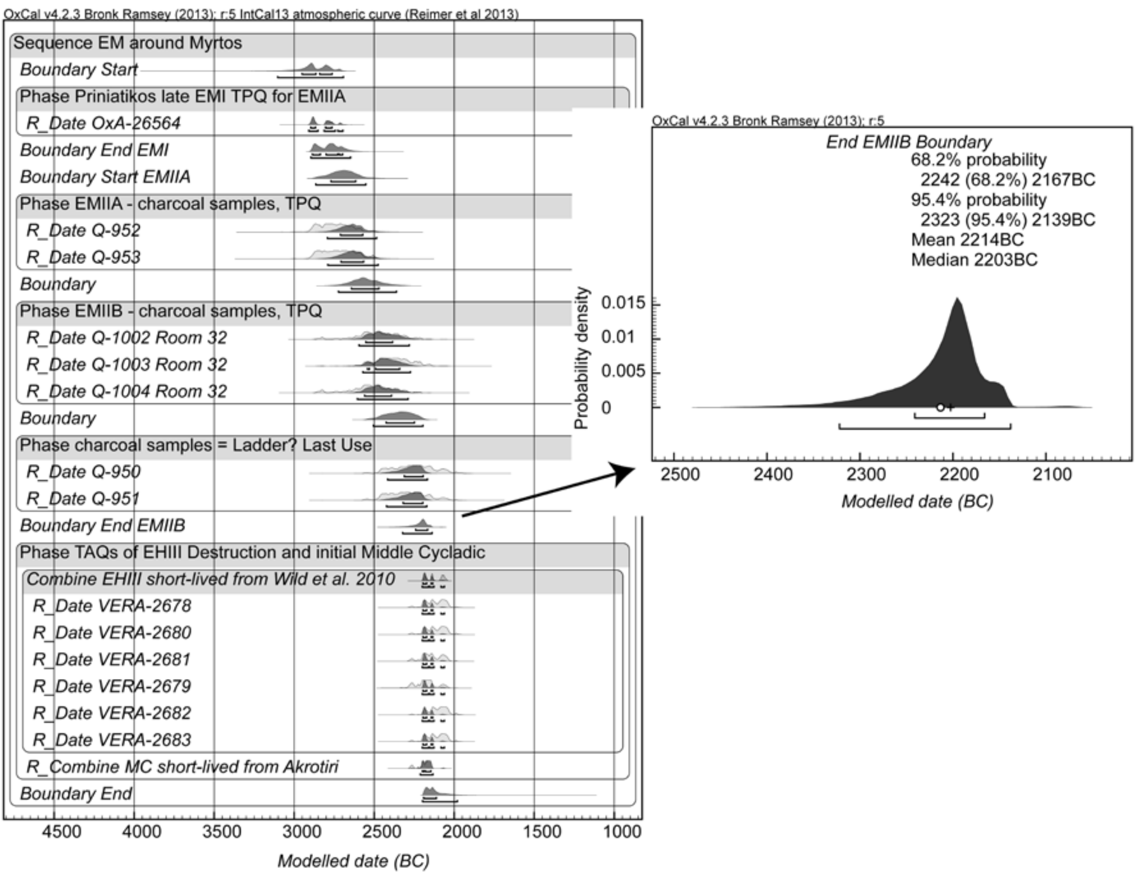

Figure 15.8. Left: sequence analysis of the radiocarbon dates on Early Minoan IIA and Early Minoan IIB Myrtos charcoal samples (Warren 1972, pp. 344–45; Manning 1995, pp. 145–49) applying the Charcoal Outlier Model (Bronk Ramsey 2009b) and with (1) a *terminus post quem* (TPQ) from the (contemporary) later Early Minoan I date (OxA-25564, 4226±32 ^{14}C years B.P.: I thank Barry Molloy for kindly providing details on this date) on a short-lived sample (seeds, legumes) from Priniatikos Pyrgos and (2) the *terminus ante quem* (TAQ) data supplied by (i) the short-lived barley (*Hordeum vulgare*) samples from the Early Helladic III (Ceramic Phase E) destruction horizon at Kolonna (from Wild et al. 2010, table 1) and (ii) the three ^{14}C dates on a set of seeds from initial Middle Cycladic from Akrotiri, Thera (Manning 2008a). The calculated date for the Boundary representing a *terminus post quem* or date for the end of Early Minoan IIB is shown in detail to the right. Data from OxCal (Bronk Ramsey 2009a) employing IntCal13 (Reimer et al. 2013) with resolution 5. The lines under the distributions show (upper) the 68.2% probability ranges and (lower) the 95.4% probability ranges

Table 15.2. The Arizona (AA) and Heidelberg (Hd) ^{14}C ages for Tell Leilan contexts employed in the plots and analyses shown in figures 15.9–11. The CAMS data employed are from Weiss et al. 2012

Lab. No.	*Tell Leilan Context and Sample*	*^{14}C Age B.P.*	*SD*
AA7022	44W13 lot 15 grain	4020	65
AA7023	44W13 lot 15 grain	4020	60
AA7025	44W13 lot 15 grain	3940	60
AA7026	44W13 lot 15 grain	3930	60
AA7027	44W13 lot 15 grain	4100	65
AA46558	44W13 lot 15 grain	3958	38
AA46559	44W13 lot 15 grain	3901	42
AA46561	44W13 lot 15 grain	4018	39
AA7021	44W16 Lot 29 grain	3825	65
AA7202	44W16 Lot 29 grain	3885	65
AA46563	44W16 Lot 29 grain	3822	66
AA46564	44W16 Lot 29 grain	3866	40
AA46565	44W16 Lot 29 grain	3892	36
AA46566	44W16 Lot 29 grain	3790	44
AA46567	44W16 Lot 29 grain	3746	47
Hd-22221	44W16 Lot 29 grain	3881	28
AA97238	L06-44S16 / 114- 8.1 *Triticum* spp.	3806	23
AA97239	L06-44S16 /114- 8.2 *Triticum* spp.	3848	25
AA97240	L06-44S16 / 114- 8.3 Aegilops	3836	25
AA97241	L06-44S16 / 114- 8.4 *Hordeum vulgare*	3810	30
AA97242	L06-44S16 / 114- 8.5 *Triticum* spp.	3843	29
AA97243	L02-44S16/ 38.3.1 *Hordeum vulgare*	3828	38
AA97244	L02-44S16/ 38.3.2 *Hordeum vulgare*	3814	23
AA97245	L02-44S16/ 38.3.3 cereal indet.	3830	25
AA97246	L06-44S16/ 105.1.1.a grain	3827	26
AA97247	L06-44S16/ 105.1.1.b grain	3827	27
AA97248	L06-44S16/ 105.1.1.c /cereal	3844	29
AA97249	L06-44S16/ 105.1.2 *Triticum* spp.	3854	23
AA97250	L06-44S16/ 105.1.2.b *Hordeum vulgare*	3825	23
AA97251	L06-44S16/ 105.1.2.c/ t. Triticum spp.	3764	44
AA97252	L06-44S16/ 105.1.3./ t. Triticum spp.	3857	26
AA97253	L06-44S16/ 105.1.2.4./ Aegilops	3778	28
AA97254	L06-44S16/ 105.1.3.1 *Hordeum vulgare*	3819	28
AA97255	L06-44S16/ 105.1.3.2 *Hordeum vulgare*	3867	26
AA97256	L06-44S16/ 105.1.3.3 Aegilops + cereal	3839	30

end of the relevant phase (what we wish to date) but also prevents a few dates on individual residual samples, or individual samples older for some other reason, from causing an over-estimate of the date of the relevant end of phase estimate.

A re-modeling of the Tell Leilan sequence employing all the data in Weiss et al. (2012), but adding also the additional AA data and the one Hd date available, and employing Tau Boundaries paired with Boundaries for several phases, and also applying the General Outlier model of Bronk Ramsey (2009b), is shown in figure 15.11. One radiocarbon age is excluded in the initial analysis (fig. 15.11.A): barley (*Hordeum vulgare*; sample CAMS-130627) from context 44S16 lot 210 sample 4.13, late room ash from the Phase "5a. Main IIb1 = late Akkadian Palace." This is because the set of six radiocarbon dates from this context does not satisfactorily combine within the 95 percent confidence level (Ward and Wilson 1978), and the exclusion of just this (oldest in set) date resolves this problem (whereas removal of the most recent age does not). Hence I adopt this most efficient solution. The overall model works well with

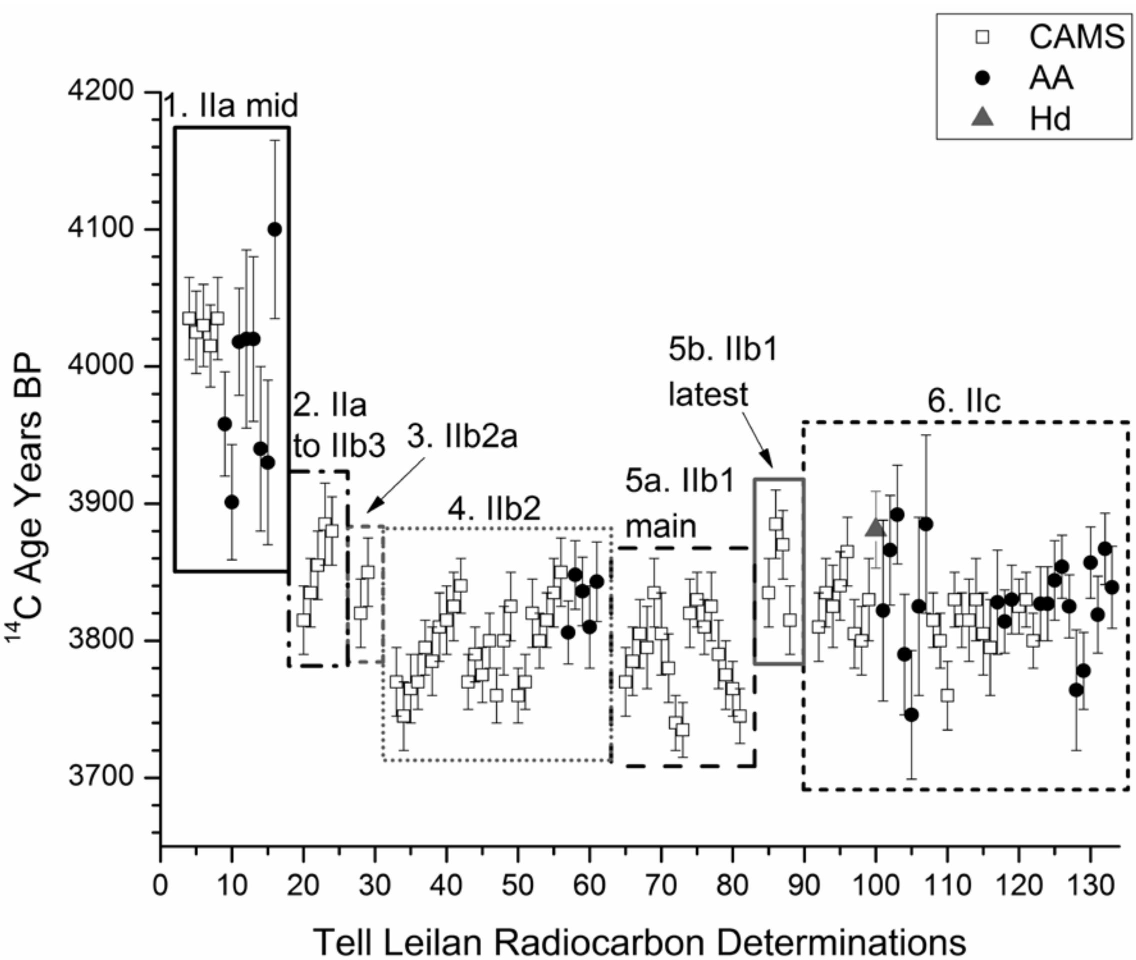

Figure 15.9. Radiocarbon dates from Tell Leilan employed, grouped by the main stratigraphic phases at the site (as in Weiss et al. 2012). The CAMS dates are as in Weiss et al. (2012). The Arizona (AA) dates include both older measurements (those with the larger error ranges) and 19 recent measurements: see table 15.2. There is also one Heidelberg (Hd) measurement: see table 15.2

just a few minor exceptions. Three contexts are very slight outliers (Posterior values of 6 versus the Prior of 5), and one date (AA46559 from Phase IIa, mid) is a moderate outlier. If the model is re-run without these outliers, very similar results are obtained. Figure 15.11.B and figure 15.11.C show the modeled calendar age probabilities for the end of Phase IIc at Tell Leilan (the end of post-Akkadian occupation). Figure 15.11.B is from the original model in figure 15.11.A, and figure 15.11.C is from a re-run excluding the four outliers in figure 15.11.A. The outcomes are all but identical. We see that the end of occupation at Tell Leilan can be placed very precisely and specifically in the last few decades before or around 2200 B.C.: 2240–2196 B.C. at 95.4 percent probability and most likely (most likely 53.6% part of the 68.2% probability range) about 2219–2204 B.C.

These three cases, and adding some others that have been recently examined, like the timing of the transition from the Philia *facies* system to the Early Cypriot I period on Cyprus at around and shortly following ca. 2200 B.C. (Manning 2013a; Manning 2014a, pp. 24–29) (see *Appendix*), highlight that there does indeed appear to be an important eastern Mediterranean-wide episode of substantive cultural change in the twenty-third century B.C., around

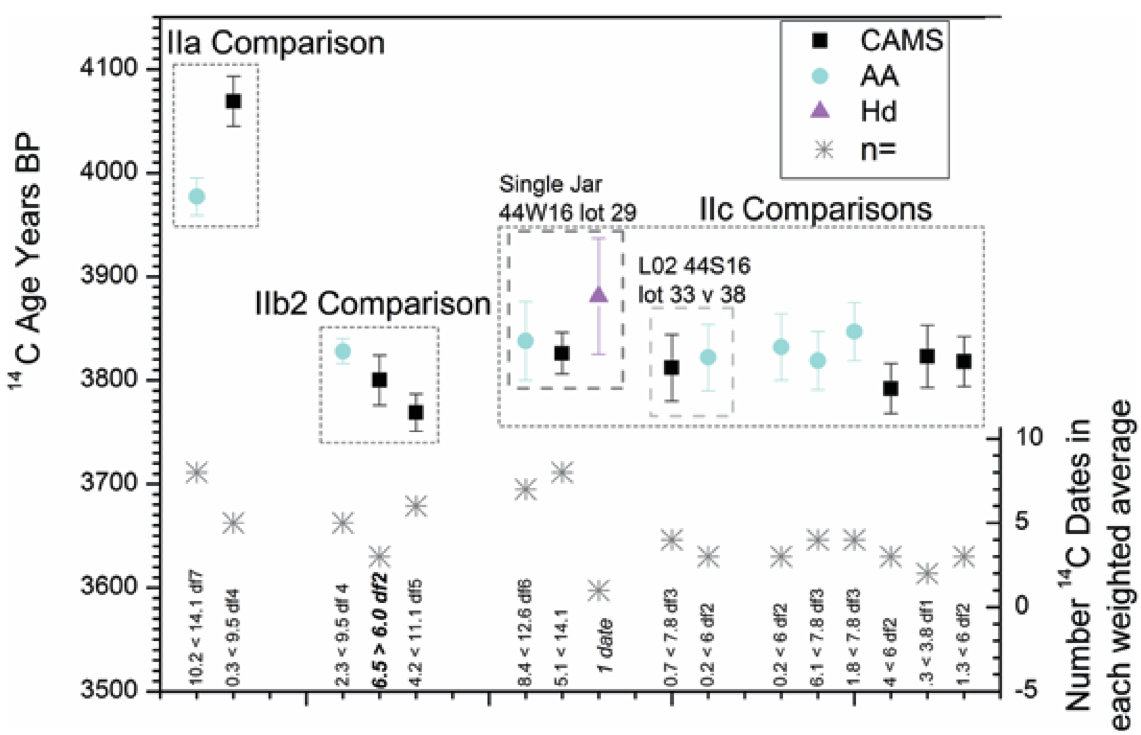

Figure 15.10. Comparisons of the weighted average ¹⁴C ages between CAMS and AA for samples on the same material from the same contexts from Tell Leilan and one comparison with a single radiocarbon age measured at Heidelberg (selected from data in fig. 15.8). The "n=" value is the number of individual radiocarbon measurements in each of the weighted averages. One weighted average on 2 dates from CAMS narrowly fails the Ward and Wilson (1978) test for being representative of the same radiocarbon age within 95% confidence (indicated in bold italics). The error bars shown are 2SD (95.4% probability). All the Phase IIc data from the same contexts are comparable. The Phase IIb2 data show a very small offset comparing AA (all) (3828±12 B.P. — 1SD error) to CAMS (3780±7 B.P. — 1SD error), but this is a very small difference. The only case of a clearer difference is for Phase IIa — this time the AA data are somewhat older — but the AA data include several AA dates run some time ago and so the comparison is not strictly relevant/appropriate

2200 B.C., and in the following century (and a process entirely distinct from the ca. 2500 B.C. Early Bronze III/IV transition in the southern Levant). This does not of course mean that such change affects all sites and areas (as several critics of the generalized 2200 B.C. hypothesis have highlighted). It is also important to note that some period of time is involved; not all these changes are necessarily contemporary. Such change in the period around and following 2200 B.C. is very much contemporary with evidence of climate change in (at least) the lower latitudes of the Northern and Southern Hemispheres generally (but not higher latitudes as noted by Staubwasser and Weiss 2006, p. 383), and a shift to drier conditions in the eastern Mediterranean and Near East in particular (see above). This does not mean that the latter

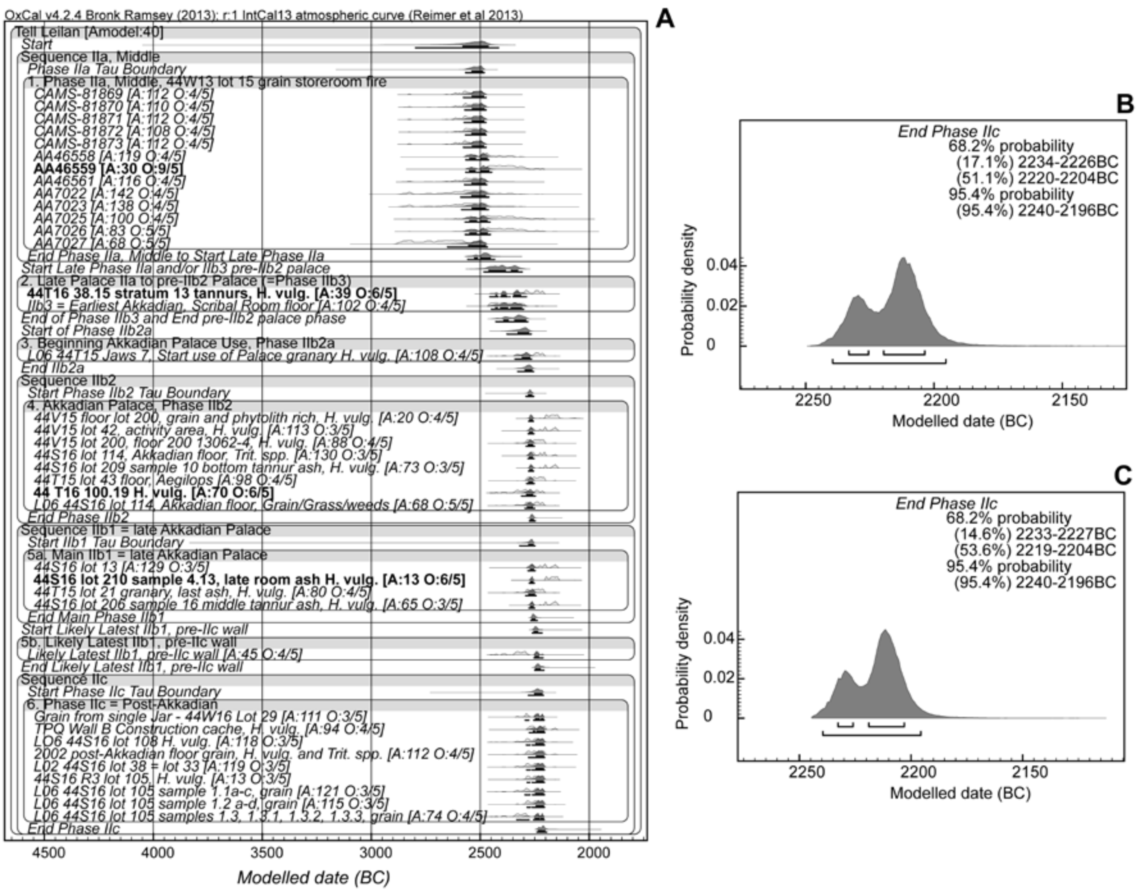

Figure 15.11. A. The re-run and revised Tell Leilan Bayesian sequence analysis (see text). The light gray histograms are the individual calibrated age probabilities without the sequence analysis. The smaller dark histograms are the modeled calendar age probabilities. The four samples/sets shown in bold are those where the General Outlier model (Bronk Ramsey 2009b) indicates a Posterior value greater than the Prior of 5, and hence an "outlier." Three of the four cases are very marginal (6 v. 5). These minor outliers lead to an A_{model} value of 40 (usually around 39.7), and an $A_{overall}$ value of 37.4, both less than the satisfactory level of 60. B. A detail of the modelled calendar age range in A for the end of Tell Leilan Phase IIc (the end of post-Akkadian settlement at the site). C. shows the same as B but after a further re-running of the model in A after excluding the four outliers observed. This achieves very similar results but now with A_{model} = 74.1 greater than the threshold value of 60, and $A_{overall}$ 73.4 also greater than the threshold value of 60. Data from OxCal (Bronk Ramsey 2009a) and IntCal13 (Reimer et al. 2013) with curve resolution set at 1

is necessarily responsible for the former, but allows that it may well be a relevant, and even causative, factor.

Climate Change, Cultural Change, and the Rise of Crete at the End of the Third Millennium B.C.

Some years ago, I reviewed the (then) evidence from the Aegean around about 2200 B.C. regarding cultural change (Manning 1997). It seemed that there was a pattern of marked decline, dislocation, and change around this time especially in the southern mainland of Greece (e.g., Forsén 1992), and also the Cyclades (the "Rutter Gap"), but less so on Crete (and indeed some indications there of positive developments and of the Early Minoan III–Middle Minoan I "revolution" scenario proposed by Cherry 1983). It seemed chronologically and logically possible that the climate change episode (then) recently suggested for the Near East was also relevant in the Aegean. The issue was how to explain the apparent exception of Crete (positive versus negative change around/following 2200 B.C.).

One solution was to try to push Crete into line with the rest of the greater region. Watrous (1994, pp. 717–20) tried to argue away much of the evidence for Early Minoan III and depict it as a period of recession — a view that could have matched the pattern of evidence from the rest of the Aegean and eastern Mediterranean. Watrous (2001, pp. 221–23) revised his 1994 position on Early Minoan II and III a little, but still regarded Early Minoan III as "an era of isolation and retraction, as it is elsewhere in the contemporary Aegean and Near East" (p. 223). However, despite the (understandable) desire for a general synchronization of lines and boxes in regional chronological tables, it is clear (and especially when taking into account subsequent critical assessments of recent years) that in fact civilization on the island of Crete really does begin to take off in the period *after* 2200 B.C. (in Early Minoan III–Middle Minoan IA) and that it critically begins this process (Early Minoan III to start Middle Minoan IA) while the rest of the Aegean *is* largely in decline (until the Middle Cycladic and Middle Helladic periods, or ca. 2000 B.C.), as also the principal centers in the eastern Mediterranean (see, for example, the papers in Schoep, Tomkins, and Driessen 2012 — especially Whitelaw 2012). Crete was, and is, the anomaly as also highlighted by Broodbank (2013a, pp. 352–53). It is also, to emphasize the point, in effect an isolated, internally focused or concentrated, anomaly in the Aegean region at this time, since there is minimal evidence for external contacts in Early Minoan III (also Watrous 2001, p. 180; Cherry 2010, p. 122).

In the 1997 paper (see also Manning 1994; Manning 2008b), I argued that Crete's geographic position was a critical variable. In the mid- to later third millennium B.C., it lay at the peripheries of two world systems, creating a special, historically contingent, circumstance. Crete was the extreme southern margin of the Aegean Early Bronze I–II system, receiving some contacts (especially north coast and northeast) but sending few visible exports (Papadatos and Tomkins 2013; Renfrew 2010; Brogan 2013; Cherry 2010, pp. 117–18). But Crete was also the very extreme western edge of the Early Bronze II Near East/eastern Mediterranean system, and, regardless of whether contact was direct or indirect (Cherry 2010 suggests the latter), and regardless of what knowledge of cultural meanings was or was not transmitted, distorted, and received or instead created (see Wengrow 2010), and regardless of which groups were participating on Crete (whether various elites or other ambitious groupings: Schoep 2006), only Crete, of the Cycladic and mainland centers, has yielded *any* (even after critical evidence culling: Cherry 2010, pp. 118–20, 128–31) real evidence of Early Bronze II material contacts with the eastern Mediterranean and Near East. This has seemed materially important to many archaeologists over the past century or so. However, the find contexts or loci (e.g., central Knossos, or tombs as at Mochlos) of these objects imply a status association in pre-palatial Crete also; thus, without entering into discussion of the inter-cultural complexities, these were likely prestige goods within the Early Minoan societies. There was thus some powerful (and for the region unique) *but* limited stimulus. Crete was at the margins: the exotic, the prestigious, and the material and esoteric resources and representations of status were present, but controllable, and capable of restriction and monopoly.

This marginal context, allied with the circumstances that Crete (i) had several discrete agriculturally intensifiable areas and a highly varied but closely associated topography (Rackham and Moody 1996), and (ii) had developed only some limited emergent complexity and hierarchy through Early Minoan II, and (iii) *lacked* the much more dramatic or trading-dependent specialized developments seen elsewhere in the Aegean by the later Early Bronze II period (or locally named equivalent) where much larger and more elaborate settlements and structures within these and agricultural and economic and administrative systems had appeared by late in the period (see, e.g., Hägg and Konsola 1986; Wienke 1989; Konsola 1990; Broodbank 2000; Rutter 2001; Pullen 2008; Renfrew, Boyd, and Bronk Ramsey 2012; Kouka 2013), left Crete in a position where its systems were operating within capacity (able to be resilient: e.g., the case argued in Halstead 1981), rather than toward the limits of its technological and social horizon. The elites of Crete were also not reliant on acquiring a steady supply of prestige goods and other materials, and had not become dependent on the connectivity and networking seen elsewhere in the Early Bronze Aegean. Crete was thus in a relatively robust and sustainable position in terms of its agrarian base and its elite's use and successful control of a limited prestige-goods economy, whereas the impressive developments by later Early Bronze II elsewhere in the Aegean had perhaps taken those societies more to the limits of development potential within the available technological, environmental, and socio-political constraints (so they were more "brittle" and vulnerable to substantial changes in circumstances — compare discussion of Wilkinson 1994), and many of their elites also relied on regular access to external networks linking to the world of the Anatolian Trade Network (Şahoğlu 2005).

When troubles came, that is, more arid climate conditions around 2200 B.C., and the breakdown of trading networks from Anatolia and the eastern Mediterranean, Crete was thus, perhaps, less susceptible to (and resilient against) such changes in external circumstances than the until then larger, more developed societies elsewhere in the Early Bronze II Aegean. Instead, the emergent elite on Crete could not only sustain themselves into the post-Early Bronze II period (Early Minoan III), but, on their relatively isolated major island (a mini-continent: Rackham and Moody 1996), the circumstances allowed, or rather forced, a (still only) emergent elite to engage in additional increasing levels of *internal* competition — but (1) with scope for still significant increases in agricultural and other production to support these demands at the discrete intensifiable areas (such as around Knossos, Malia, Phaistos), and (2) without the risk that external sources could undermine the successful monopolization of the key value items, resources, and symbols. In the "black box" incubator of Early Minoan III Crete, new hierarchies and social structures were formed during this period of closed (or caged: after Mann 1986) increased and internal competition. Crete was thus ready to seize new opportunities when they became available at the start of the Middle Bronze Age; whether the eastern Mediterranean brought these and the new technology of the sail to a ready and receptive Crete, or some groups on Crete reached a threshold where they engaged in building and using capital to create the infrastructure to start to reach out, both into the southern Aegean and to the northeast Mediterranean in Middle Minoan IA.

In these ways Crete, and its society, was very different from much of the rest of the Aegean, and especially in marked contrast to many of the later Early Bronze II elites of southern Greece, the Cyclades, and western Anatolia, where greater levels of connectivity seem to have led to a boom and then bust cycle, perhaps pushed over the edge by climate change in some cases. But it was not unique. Some similar precocious processes occurred to enable developments from the start of the Middle Bonze Age at Kolonna on Aigina (e.g., Rutter 2001, pp. 125–30), and the formation of the Phylakopi I material culture zone (Broodbank 2000, pp. 351–56). The Cretan emergence, an "exceptionalism," from late Early Minoan IIB and into Early Minoan III to Middle Minoan IA was then, it seems, able to keep developing further (and further intensify into the state-level society — or whatever name we wish to apply — of Protopalatial Crete) and be sustained (versus hit a boom-and-bust end like most prestige goods-type economies) because (i) it managed to expand into the southern Aegean, annexing what was otherwise a different but alternative version of a similar emergence in the post-Early Bronze II era associated with the Phylakopi I material culture zone evident across the Cyclades (Broodbank 2000, pp. 351–56), and (ii) it engaged with, or was engaged by, the re-emerging Levant/Near East in the period around 2000 B.C. (also Manning 1994, pp. 244–46). These twofold circumstances were possible through geographic context. And, unlike Kolonna, or the Phylakopi I zone centers, the major centers on Crete had the scale of agrarian and primary resource base to support the transformation to the next level. Both these key extra-island (and the later interregional) developments were facilitated by the all-important (then) new technology of the sail, which derived from the eastern Mediterranean, from Egypt, and the Near East (Broodbank 2000, pp. 255–56; Broodbank 2013a, pp. 353–54). These developments and the new (sail) technology created the means for Crete to connect directly to the eastern Mediterranean and to become the key Aegean node/focus for such interregional trade and contact — replacing the previous model where a peripheral Aegean was merely connected at best as the very far end to the overland Anatolian to northern Levant/Mesopotamian trade route that had, Broodbank (2013a, p. 354) observes, "dominated the third millennium B.C."

Much by way of data, and also the terms, of discussion has changed in scholarship since 1997, but the general issue of the unusual nature of the Crete case has remained clear over many decades (e.g., Lewthwaite 1983; Broodbank 2013a). Considerable attention to the Prepalatial period of Crete has revealed a more complicated and nuanced interpretation of the Final Neolithic through Early Minoan II era (for summaries, see Papadatos and Tomkins 2013; Tomkins and Schoep 2010; Schoep and Tomkins 2012; Tomkins 2012). Traces of a developing external trade with the Aegean (especially the Attic-Kephala area) are attested now from the close of the Final Neolithic through to its relatively marginal or restricted involvement in the Early Bronze I–II "international spirit" (Renfrew 1972; Renfrew 2010). There is evidence for specialized crafting (ceramics but also metals) on Crete that reaches back to Early Minoan I. The origin of some important communal open spaces, and associated social activities, extends back even to the end of the Neolithic. There is settlement growth at some key agricultural sites through Early Minoan II (Knossos, Malia), and Early Minoan II also witnesses the likely beginnings of (some) urbanization and of elite/corporate monumental construction and central place making (court-centered compound) at Knossos and the development of some form of representational if not administrative system employing seals and sealings. Peter Tomkins (2012, p. 74) ends suggesting that key social-civilization transformation on Crete can be placed perhaps in Early Minoan IIA (if not as far back as the Final Neolithic), however, as even Tomkins (ibid., pp. 74–75) accepts in the final analysis, the Early Minoan II changes (however important and key background conditions) "did not directly drive" the "dramatic later demographic growth during EM III and MM I."

This Early Minoan III–Middle Minoan IA "take-off" is the remarkable observation, and (with our very partial and dirty lens) is best seen at Knossos, where the settlement appears to explode in scale and size, growing not only three to six times larger than in Early Minoan I–II, and transforming from a large village/small town of around 6.5 ha and fewer than 3,000 estimated population to an urban center of 20 to 37 ha and an estimated population of 6,000–11,100 (Whitelaw 2012, esp. table 4.1, fig. 4.12). Such a relatively rapid urban-scale "take-off," rather than long-term gradual growth, is a feature observed in the history of many urban cases through history (Fletcher 1986). Although we have even less adequate data, similar but smaller-scale growth transformations are also observed at Malia and Phaistos (Whitelaw 2012, fig. 4.14, table 4.2). Whitelaw (ibid., p. 154) observes that the largest settlements on Crete through Early Minoan II could still fall within the scale of societies with up to two levels of decision-making hierarchy. He suggests of Knossos that "the community may have been unable to expand further until another social transformation had occurred, allowing the development of more complex and hierarchical authority structures." Indicative of such a radical transformation of society between Early Minoan II and Early Minoan III–Middle Minoan IA, and contrary to any form of gradualist model, Legarra Herrero (2012) highlights what seems a key pattern and changes in burial practices on Crete that occur between Early Minoan II and then Early Minoan III and Middle Minoan IA.

Our focus is thus on Early Minoan III, especially. This period follows on from rather differing immediate precursors in different areas of Crete. At Knossos, after starts in Final Neolithic to Early Minoan I, there are signs in the center of the settlement for larger-scale place making and the associated development of emerging new social forms, and Early Minoan II sees major earth-moving and terracing episodes and construction of larger, elite, structures, and, perhaps by the end of Early Minoan IIB, an incipient Court Compound (from initial Court Building) at the center of the settlement (Tomkins 2012, pp. 44–49). The seeds, given the forces for transformation, for sudden growth and a full urban expansion, seem to be in place. In complete contrast, elsewhere, Early Minoan III follows a set of late Early Minoan II destructions/abandonments at several sites, especially in the northeast (perhaps reflecting the decline of external networks — since Crete's involvement in Early Minoan I–II Aegean connectivity is mainly concentrated in a few north coast sites: Brogan 2013, pp. 556–58) and east of Crete, and notably in more marginal areas including in the south (Watrous 1994, p. 717; Watrous 2004, pp. 266–67; Brogan 2013, p. 559).

How might climate change to more arid conditions circa 2200 B.C. feed in? It certainly might help explain the various late Early Minoan II destructions and abandonments of more marginal areas of the island. In the recent period, drought especially affects the southern and eastern parts of Crete (e.g. Koutroulis, Vrohidou, and Tsanis 2011), and it is likely no coincidence that the late Early Minoan II destructions and abandonments are primarily in these areas. This same climate change may have also promoted the growth and nucleation processes involved in the Early Minoan III–Middle Minoan IA transformation with the movement (or return to kin) of people to the relatively few more favorable areas of Crete — in terms of both better agricultural land and water *and* social and economic networks. Thus Whitelaw (2012, p. 160) is correct to argue that internal growth at the main settlements could explain the demography (rather than having to be the result of emigration from the countryside: Watrous 2004, pp. 268–70), but change to a more arid climate regime offers an important additional forcing that would promote the observed transformation. One additional factor may also come into play. Whitelaw (2012, p. 160) dismisses modern comparisons for population movement to urban centers (Watrous used early twentieth-century A.D. Athens), saying they reflect "a consequence of a rapidly developing manufacturing and service economy," but, perhaps, his critique is missing one issue. Apart from climate forcing, we might speculate that the earth-moving operations of Early Minoan II Knossos almost start to call for a non-agricultural workforce, and the massive Early Minoan III terrace and façade and the elaborate and skilled quarrying and crafting of the "distinctive decorative style of masonry" (Tomkins 2012, p. 50) and the likely court compound and other major structures of this period at Knossos (ibid., pp. 51–54, 67; Macdonald 2012, pp. 84–89) even more certainly so. Such monumental construction projects may have created a regional-scale labor need/pull — and a reason for those promoting the projects to engage in building intensified production models to provide for and entice the necessary support inherently required for such a workforce and the wider community-socializing mechanisms. At the same time, such great enterprises will have also served to help more formally integrate the constituent region — and the ability to harness its overall agrarian base — around the developing super-site, and its social, political, and ideological project.

Beyond architecture and civic infrastructure, other instances of corporate activities and elite capital investments might have included sea-going ships. While it seems obvious to assume that renewed contacts with the eastern Mediterranean and Near East originated in the Levant, where ships with sails were already known from earlier in the third millennium B.C., it is possible that Crete was also proactive, driven by the needs of intensifying competition among Cretan elites as the efficacy of the limited local resources reached their development threshold. One or more groups may have invested to reach outward, remembering contacts and stories behind exotic goods (even if received indirectly, down the line), and sailed east, triggering a transformational step-change as the island's elites and political economy went interregional. Some centers on Crete (e.g., Knossos, Mochlos) had received at least a very few Levantine–Near Eastern goods (directly or indirectly) in the Early Minoan II period (Cherry 2010, pp. 118–20; Watrous 1994, p. 712), and the ship models from Mochlos (Soles 2012; see general discussion of Brogan 2013, pp. 588–89) show that the inhabitants knew about ships, and were potentially capable of greater imagination and endeavor. On the most recent assessments (revising previous more general Early Minoan III–Middle Minoan I dates), the pictorial evidence for sailing ships in the Aegean begins in Middle Minoan IA (Broodbank 2013b, p. 539), synchronous with (and one must assume the existence of such ships slightly precedes in reality) Crete's expansion into the Aegean and its renewed linkages to the eastern Mediterranean.

In all, the processes of rapid settlement growth, regional integration, and nucleation would have provided great challenges, but also enormous opportunities, among the ambitious emergent elites to build up followers and support groups, and the circumstances (intensifying competition) in which new social formations and hierarchy could rapidly evolve (or fail). Through the increasing elite-driven competition of Early Minoan III to Middle Minoan IA, the corpus of socializing and social and ideological display activities and arenas (including, notably from this time, the regionally integrating peak sanctuaries: Haggis 1999) — feasts, funerals, public speaking, religious performance, and so on — will have offered important roles for what this society recognized as prestige or status-laden objects: the material culture that identifies, signals, or fuels the political and social processes. Thus, although the agrarian basis to Cretan development is clearly central (Whitelaw 2004) and forms the primary basis of production to support other spheres of activity, the material and ideological aspects of social power — and thus the role of prestige goods and the place making of venues — are also vital, and likely the initial and precipitating factor starting and driving the "emergence" engine.

The new central urban spaces and court to court-compound structures, funerary areas, and the peak sanctuaries (and the processions to/from each of these gathering places) will have formed the prime arenas. In the settlements not only will this elite (or elite-led, at least) place-making have shaped and created the physical form of the new urban centers, and made the elites more central and permanent societal cores, but the acts of making and the experience of the made places will have in turn shaped a new urban, elite, and polity-focused society (compare discussion of Fisher 2009). By Early Minoan III, there were likely two scales of place-making at work: urban center, and polity region; and thus the conditions existed for the significant scale-shifting socio-politico transformations seen by Middle Minoan IA and consequently in Protopalatial Crete.

In conclusion, the circa 2200 B.C. climate-change episode would appear a relevant and likely important (but not only) element in the development of Protopalatial Crete. It created conditions — on Crete and in the Aegean–eastern Mediterranean region — that helped promote and force both the caged, or circumscribed, social *and* economic/agrarian processes that could see increased complexity, hierarchy, and societal transformation on Crete, focused on the main centers in the Early Minoan III–Middle Minoan IA period. This internally forced "take-off" transformation, to survive and become long lasting, was in turn followed by the need to break out into the interregional world so as to be able to further sustain and develop the now Protopalatial societies of Crete.

Appendix: Dating the Philia *facies* and the start of the Early Cypriot Period: Response to Bourke 2014

In a deliberately provocative recent paper, Stephen Bourke (2014) argues for much earlier dates for the Philia *facies* on Cyprus and for the start of Early Cypriot than (all) recent proposals. He wishes to suggest that an early third-millennium B.C. copper object (an ax) found at Pella in Jordan, which lead isotope analysis suggests *could* be consistent with production from Cypriot ores, is from the Philia *facies*. The idea of Cypriot copper being exploited in the earlier third millennium B.C. is not impossible (and pre-Early Bronze Age linkages for Cyprus have received some recent attention; see Bolger 2013). Indeed, if, as some including this author have previously hypothesized, there were one or more major centers in northwest Cyprus in the pre-Philia period (so late Middle Chalcolithic and especially Late Chalcolithic; Manning 1993, p. 47; Manning 2014a, pp. 24–25), then these could be the source of such materials as this ax (as Bourke 2014, p. 83 wonders). This is at best speculative given the evidence to hand. If it were correct, then copper production on Cyprus would accelerate significantly with, but not start with, the Philia *facies* (and such pre-Philia copper-based activities and trade could very plausibly then formulate a motive for the Philia developments and links into the Anatolian Trade Network: Webb and Frankel 1999; Webb and Frankel 2013, pp. 60–63).

However, the dates proposed by Bourke (2014, p. 85) for the cultural phases on Cyprus are untenable given the evidence we have. Bourke suggests the Philia *facies* begins 2900/2800 B.C. and Early Cypriot I begins 2600–2300 B.C. While we of course need more evidence and not all the evidence we currently have is well defined, and so on, as Bourke suggests, there is sufficient evidence at hand clearly to rule out Bourke's suggestions.

In particular, we can state that there is a large, and in calendar terms clearly placed, set of twelve modern radiocarbon dates, eleven on short-lived sample material and one on charcoal, from Politiko *Kokkinorotsos* (Webb et al. 2009), which lie (most likely 68.2% ranges) in the twenty-ninth to twenty-seventh centuries B.C. and which, when modeled, indicate an end date for this occupation about 2784–2671 B.C. (68.2% probability) or 2807–2599 B.C. (main 92% probability region): see figure 15.12. This context and assemblage lie between the Middle Chalcolithic and Late Chalcolithic of Kissonerga *Mosphilia* — thus might be placed as either late Middle Chalcolithic or slightly later — and Bolger (2013, p. 5), for example, regards the ceramic assemblage as "within the LChal [Late Chalcolithic] monochrome tradition," so it might even be regarded as around the start of Late Chalcolithic. Kokkinorotsos represents a relatively brief episode (fig. 15.12.C). Thus, even if Bourke (2014, p. 86) is correct to suggest a more substantial overlap of the Late Chalcolithic period with the Philia *facies* on Cyprus, the start of the Philia *facies* must still, on any assessment, come no earlier than, and in general understanding *after*, the Kokkinorotsos occupation and thus *after* the twenty-eighth to twenty-seventh centuries B.C. Hence the Philia *facies* cannot begin circa 2900/2800 B.C., as Bourke suggests. An earliest date in the twenty-sixth century B.C. or more likely around 2500 B.C. seems plausible given the radiocarbon evidence to hand (Peltenburg, Frankel, and Paraskeva 2013; Manning 2013a; Manning 2014b; Paraskeva in press); this evidence in turn suggests a transition to the Early Cypriot I period around 2200 B.C. (Manning 2013a; Manning 2014b; Paraskeva in press).

Bourke's claimed case for a long (even complete) overlap of Late Chalcolithic with the Philia *facies* — necessary for his overall argument — misrepresents the available evidence and scholarship. For example, Bourke (2014, p. 81) writes, "the 'Philia-influenced' ceramic forms in LChal Mosphilia Period 4b assemblages, are widely recognised to imply some degree of overlap between these two cultures (Bolger 2013, p. 5)." But if one reads Bolger's text cited by Bourke, it says no such thing — instead Bolger states that Philia Red Polished (PRP) "sherdage is … found in relatively small numbers at *Kissonerga* in Periods 4b (LChal) and 5 (Philia)." It is of course important to highlight that Kissonerga Period 4b is the second and later phase of the (thought to be rather long) Late Chalcolithic period at the site (Peltenburg, Frankel, and Paraskeva 2013, pp. 321–24) — there are no Philia associations before this last Late Chalcolithic phase including in earlier Late Chalcolithic tombs (Peltenburg 2013, p. 343). Thus, as Peltenburg (2013, pp. 343–44) suggests, it seems that only the last buildings of Kissonerga Period 4 (so Period 4b) provide possible evidence for a *later* Late Chalcolithic–Philia *facies* overlap. While Peltenburg (2013, pp. 343–44) likes to see the people of Lemba *Lakkous* as Philia *facies* rejectionists — since there is no Philia material at this Late Chalcolithic site (also Bolger 2013, p. 5), this evidence too suggests that there was no general Late Chalcolithic–Philia overlap and instead at most partial contact/integration in *later* Late Chalcolithic.

Bourke (2014, pp. 81, 86) twice refers to supposed Late Chalcolithic Red on White ware in Philia contexts — again as part of his claim for a long Late Chalcolithic–Philia *facies* overlap — writing, "the presence of southern LChal Red on White ceramics in northern Philia assemblages (Peltenburg 2013, p. 342)" (p. 81) and "presence of what seem likely to be LChal Red on White ceramics in Ovgos Valley Philia tomb assemblages (Peltenburg 2013, p. 342).” This is a serious misunderstanding or misrepresentation of what Peltenburg writes. Peltenburg is discussing whether maybe Middle Chalcolithic Red on White persisted a little longer — hypothetical only — in the north than the south and southwest of the island. And Peltenburg wonders if this *might* explain the presence of patterned ware — that is, White Painted Philia (WPP) — especially at some northern Philia *facies* sites like Kyra *Kaminia* and Philia *Vasiliko* (and it is these WPP examples that Peltenburg refers to). At no point does Peltenburg say there is Late Chalcolithic Red on White ware. No Red on White ware has been found at any Philia site on Cyprus to date.

Bourke’s (2014) discussion contains some further serious internal contradictions or misrepresentations of the archaeological evidence that contradict his arguments. Bourke (2014, p. 86) “acknowledges the relatively secure dating of the Kissonerga Period 4 to around

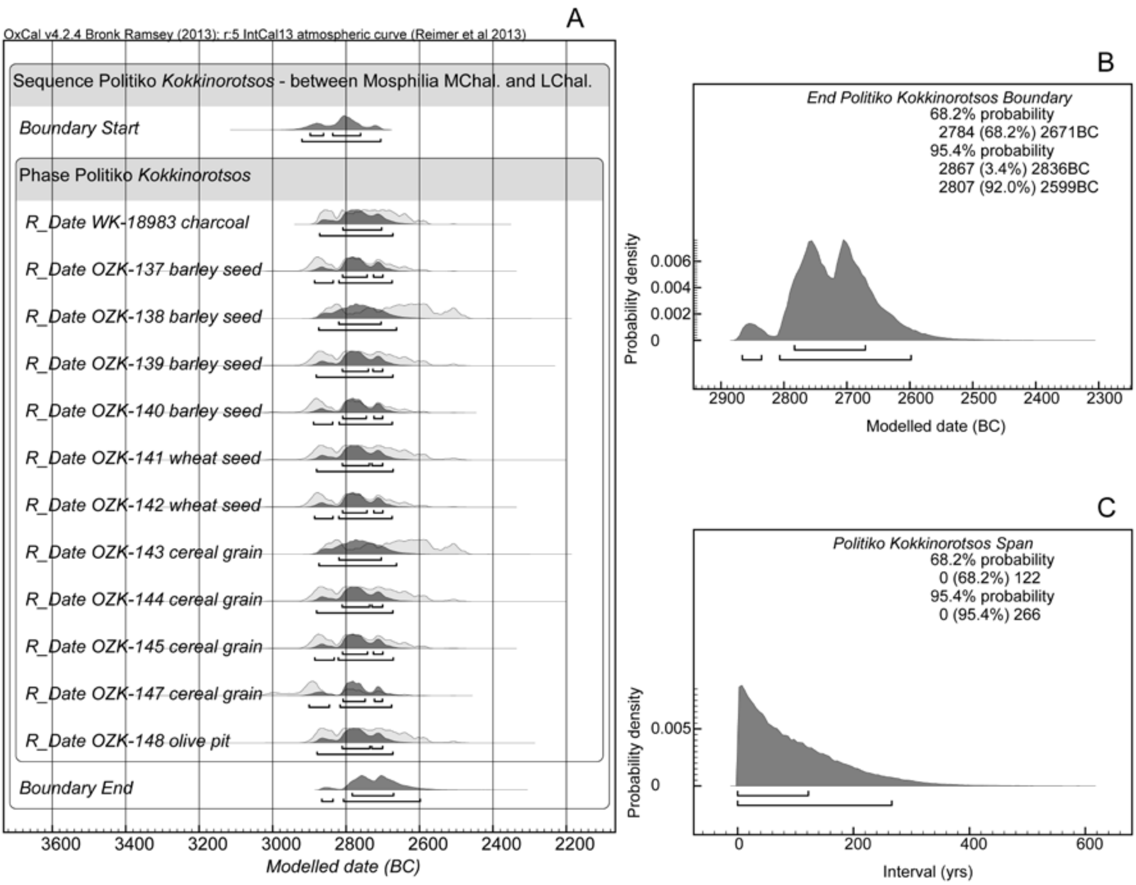

Figure 15.12. A. The 12 radiocarbon dates from Politiko *Kokkinorotsos*, Cyprus (data from Webb et al. 2009), analyzed as a Phase with the Charcoal Outlier model (Bronk Ramsey 2009b) applied to the one date on charcoal and the General Outlier model applied to the other eleven dates on short-lived samples. B. Detail of the “Boundary End” in A showing the date ranges for the end of the dated Kokkinorotsos Phase. C. The probability distribution of the length of the period of activity/use represented by the Kokkinorotsos data in calendar years. Data from OxCal (Bronk Ramsey 2009a) and IntCal13 (Reimer et al. 2013) with curve resolution set at 5

2600–2300 cal B.C.E." Since Kissonerga (*Mosphilia*) Period 4 = Late Chalcolithic, this acknowledged date is for Late Chalcolithic. Bourke tries to argue — contrary to many assessments — for a long period of overlap between Late Chalcolithic and the Philia *facies* (see above), *but*, by accepting the Kissonerga dates for Late Chalcolithic "around 2600–2300 cal B.C.E." — which appear straightforward from the available radiocarbon evidence — this in fact means Bourke is trying to conflate not only the Philia *facies* in temporal terms but also the beginning of the Early Cypriot period, since one page earlier Bourke dates the Early Cypriot I–II periods "2600–2300 cal B.C." Confusion? Confused? This state of affairs might have been almost conceivable some decades ago when one could refer to Stewart's (1962, pp. 269–70, 296–97) suggestion that the Philia assemblage was a regional contemporary of Early Cypriot (in contrast to Dikaios's view, 1962, pp. 192–203, that the former preceded the latter); however, Stewart has been shown to be incorrect on the basis of subsequent evidence, and it is now clear that the Philia *facies* precedes the Early Cypriot period (Webb and Frankel 1999). Thus Bourke's dates for Early Cypriot I–II contemporary with those he acknowledges for the Late Chalcolithic are impossible. The former dates *after* the latter (and in addition, with the Philia *facies* in between).

Bourke (2014, pp. 84–85) spends some time discussing the well-known imported jar from Vounous Tomb 164B (Ross 1994, pp. 15–21). He questions whether the associations suggested for this vessel also contradict the standard chronology, suggesting recent radiocarbon-based re-dating of Levantine contexts (e.g., raising the Early Bronze III/IV transition to around 2500 B.C.) indicates an earlier date for this jar and so — he argues — Early Cypriot I. Undoubtedly some tension may exist here, and re-examination of context and associations is in order (and beyond the scope of this appendix). But the general argument is clearly not valid. Even if the jar is older than widely thought, this does not mean the tomb in which it was eventually buried must be. Moreover, while comparisons could be drawn with contexts and objects now dated earlier, it is also the case that good Early Bronze IV comparanda also can still date around 2400–2200 B.C. and later, such as the Early Bronze IV contexts at Tell Arqa noted by Bourke (for the date range from the so-far few-published Tell Arqa Early Bronze IV radiocarbon dates, see the preliminary information in Köhler and Thalmann 2014, fig. 10 — a larger dating program is in progress, see p. 189). Thus the vessel does not have to date around 2500 B.C. or earlier as Bourke implies (later Early Bronze III or initial Early Bronze IV); rather it could just as easily derive from the period circa 2400–2200 B.C., and from somewhere in the general Early Bronze IV range (the exclusivity of its Early Bronze IV dating is in fact not demonstrated and Ross 1994, p. 18, notes some scholars, Peltenburg and Hennessy, who doubt we can be so specific and hence a post-Early Bronze IV, early Middle Bronze, date is also not impossible). In conclusion, the Vounous Jar cannot be used as evidence against a date for the beginning of the Early Cypriot period around 2200 B.C.

Overall: the arguments/claims of Bourke (2014) with regard to Cypriot chronology in the third millennium B.C. appear untenable, and are contradicted by the evidence.

Acknowledgments

I wish to thank Felix Höflmayer for the invitation, for organizing the Chicago meeting, and for his editorial work. I thank Brita Lorentzen for discussion and comments on this paper. I thank Felix, Miriam Müller, and the Oriental Institute generally for their hospitality and an enjoyable event. I thank Harvey Weiss for involving me (over rather a long time) in the remarkable chronological story of Tell Leilan. I wish to thank especially Jenny Webb, and also Bernard Knapp and David Frankel, for valuable observations, suggestions, comments, and discussion on the topic of the appendix to this paper.

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Part V

Response

16

Egypt and the Levant in the Early/Middle Bronze Age Transition

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The March 2014 Oriental Institute seminar the Early/Middle Bronze Age Transition in the Ancient Near East and the papers that resulted tackled many significant challenges regarding the late third millennium B.C. across a wide region, from Egypt to Mesopotamia and across to the Aegean. Chronology, paleoclimate, regional archaeology, and history were among the diverse disciplines brought to bear on the topic. Central to these wide-ranging contributions is the idea that across this expanse of time fundamental changes took place in all of these regions, which may or may not be related.

The observation of significant change occurring coincidentally at the same time across a large area raises the question of what explanation of change could account for it. What could have happened such that all known Early Bronze Age societies of the ancient Near East, Egypt, and the Aegean experienced dramatic change, some of which might be described as "collapse"? The assumption of coincidence across a vastness of space has narrowed the available explanations to global or near-global events — that is, climate change.

For northern Mesopotamia, evidence for a climate crisis abounds for the period between 2200 and 2000 B.C., and there is ample evidence for abandonment of settlements. Conversely, population expansion and extensive urbanization from as early as 2500 B.C. in the northern Levant/western Syria continued through this period. In Egypt, this climatic event has been connected to the collapse of the Old Kingdom and the onset of the decentralized First Intermediate Period. The same event has also been connected to the collapse of the southern Levantine urban Early Bronze III and for similar collapses in Anatolia and the Aegean (Bell 1971; Weiss et al. 1993; Wiener 2014; for a review, see Höflmayer, this volume). Paleoclimatologists, archaeologists, and historians have come to refer to this as the "4.2 ka B.P. event" and observe that the nearly two centuries that follow constitute a period of significant cultural and political change that only stabilized after 2000 B.C., in the Middle Bronze Age.

Drawing on discussions appearing in this volume and upon some new data, this paper reviews several aspects of the Early to Middle Bronze Age transition in which the interests of Egypt, the southern Levant, and the northern Levant intersect.

* I would like to thank Felix Höflmayer for the invitation to contribute to this volume, though I did not participate in the conference, and for the incredible good-humored patience with which he awaited the rushed delivery of the final manuscript.

Background

The evidence continues to mount that a global-scale climatological event occurred late in the third millennium B.C., lasting from circa 2200 B.C. to circa 2000 B.C. (see Weiss' "Multi-proxy stack," this volume; Riehl, this volume). In the Near East, the event can be characterized by a substantial reduction in annual precipitation (ca. 30–50%; Weiss, this volume and 2014). The effects of this reduction are likely to have had varying impact on local climates in different regions and human reaction to these changes would have been just as variable (Riehl, this volume). Settlements in regions whose normal annual rainfall was well over 200–300 mm, such as the coastal areas of the eastern Mediterranean and the western Levantine mountain ranges and valleys, may not have perceived much climatological change at all. Regions where normal annual rainfall was closer to 200–300 mm had the potential to be significantly impacted, depending on where the 200–300 mm isohyets moved with respect to the local geography of settlement (Wilkinson et al. 2014). With a general northward shift of these isohyets in the northern Levant and a westward shift in the eastern Levant, settlements once surviving on the minimum rainfall for dry farming of 200–250 mm in marginal areas suddenly found themselves in severe drought.

While many regions in the Near East would not have experienced the direct effects of climate change on agriculture, the abandonment of areas of settlement would have led to significant numbers of people on the move. Therefore, a larger number of people would have been affected by the secondary effects of the 4.2 ka B.P. event, in the form of demographic, economic, social, and/or political pressures.

This is dramatically attested in the Jezirah region of northern Mesopotamia, where historical and archaeological data demonstrate the retraction of Akkadian control as well as regional abandonments or severe reductions in size of major urban centers and dependent settlements (Weiss, this volume; Schwartz, this volume; Burke, this volume). Weiss identifies this transition in the Leilan Regional Survey with the abandonment of 87 percent of villages dependent on the central site at Leilan and stratigraphically at Tell Leilan with the transition from Leilan IIb1 to IIc with catastrophic drought conditions through Leilan IId (Weiss, this volume). Overall, the pattern of Leilan represents much of the northern Mesopotamia with significant settlement not returning to the area until sometime in the twentieth century B.C.

Both Weiss and Burke make cases for the migration of people displaced by this climate crisis, estimated by Weiss to be upward of 300,000 individuals, from across Syria and northern Iraq during the period from 2200 to 2000 B.C. These "Amorites" made their way southward into Mesopotamia, where Ur III texts document incursions, and westward into western Syria and the northern Levant, where even a dramatic change in annual precipitation had noticeably less impact on the regular agricultural practices of its residents. There, they contributed to the urban surge of the Early Bronze IV that had been building since ca. 2500 B.C.

In general, settlement reduction or abandonment appears to have occurred in regions in which annual rainfall was diminished below 200–300 mm unless local geological variables, such as riverine, riparian, paludal, and karstic areas, provided water resources to counterbalance the lack of rainfall. Weiss (this volume; 2014) observed that settlements in such locations tended to expand during this period as refugees poured in from the drought regions (Burke, this volume).

The Southern Levantine Chronology

The 4.2 ka B.P. event that so dramatically affected the landscape of settlement in northern Mesopotamia and Syria has also been blamed for the dissolution of the Early Bronze Age urban societies of the southern Levant, which traditionally has been dated to ca. 2200 B.C., primarily on the basis of assumed correlations with the historical dates of neighboring Egypt.

A series of recent studies of the southern Levant in the Early Bronze Age have introduced a radical new radiocarbon-based chronology in which the end of the Early Bronze III is dated to the period between 2600 and 2500 B.C. (fig. 16.1; Regev et al. 2012; Regev et al. 2014; Shai et al. 2014; Höflmayer et al. 2014). At present more than 450 new dates from more than sixty sites in Lebanon, Israel, Palestine, and Jordan support the new dating, including new samples from Megiddo, Bet Yerah, Hebron, Tell el-Hesi, Numeira, Tell el-Umeiri, Tel Yarmuth, Khirbet ez-Zeraqon, and Tell es-Safi, among others. The repercussions of the new chronology are many (see Regev et al. 2014), but three stand out with regard to the topic at hand.

1. The traditional correlations between the Early Bronze III and Old Kingdom Egypt are no longer valid (see fig. 16.1).
2. The significantly earlier date for the final dissolution of the Early Bronze urban society must be decoupled from the climatic event of 4.2 ka B.P.
3. The Intermediate Bronze Age, which was formerly understood to occupy 200 years, from 2200 to 2000 B.C., is now extended to nearly 600 years, from 2600/2500 to 2000 B.C., a fact that forces us to spread an already sparse archaeological dataset over a period more nearly three times as long.

Egypt and the Southern Levant in the Early Third Millennium

In an attempt to understand the implications of the new chronology for Egyptian–Levantine interactions of the third millennium B.C., colleagues and I reconsidered the so-called synchronisms between the two regions (Regev et al. 2014, pp. 260–62; see the simultaneous attempts by Höflmayer 2014 and in this volume). According to the traditional chronology (fig. 16.1), the Early Bronze III overlapped with the Egyptian Third to Sixth Dynasties (ca. 2700–2200 B.C.), and the dissolution of Early Bronze III urban entities in the southern Levant coincided with the collapse of the Egyptian Old Kingdom monarchy and the transition to the decentralized First Intermediate Period. Consequently, the collapse of the two has been seen as interrelated. According to the latest radiocarbon models of both regions (Regev et al. 2012; Bronk Ramsey et al. 2010; Dee et al. 2013), the Early Bronze III can now be seen to span the very late First Dynasty (Naqada IIIC2) to the middle/late Fourth Dynasty (ca. the reigns of Khafre/Shepseskaf). Therefore, the Intermediate Bronze Age would correspond with the Egyptian late Fourth Dynasty through the Old Kingdom and First Intermediate Period (fig. 16.1).

Within the traditional dating, three types of evidence have been interpreted to show Egyptian and southern Levantine interaction during the Early Bronze III. Early Bronze Levantine pottery found in Egyptian tombs of the Fourth–Sixth Dynasties has been seen as trade between the two regions (Sowada 2009, pp. 54–90) which was reciprocated by Egyptian objects found in Early Bronze III contexts in the southern Levant (Sowada 2009, table 5). A variety of evidence now shows that the ceramics found in Egyptian tombs was imported from the northern Levant (Esse 1991, pp. 109–16; Porat 1989; Greenberg and Porat 1996; Esse and

Hopke 1986; Sowada 2009; Knoblauch 2010; Thalmann and Sowada 2014), where in the Early Bronze III/IV urban society continued and even flourished for several hundred more years.

The Egyptian objects found in the Early Bronze III southern Levant have long puzzled researchers as nearly all of them have been shown to date typologically from the Naqada III

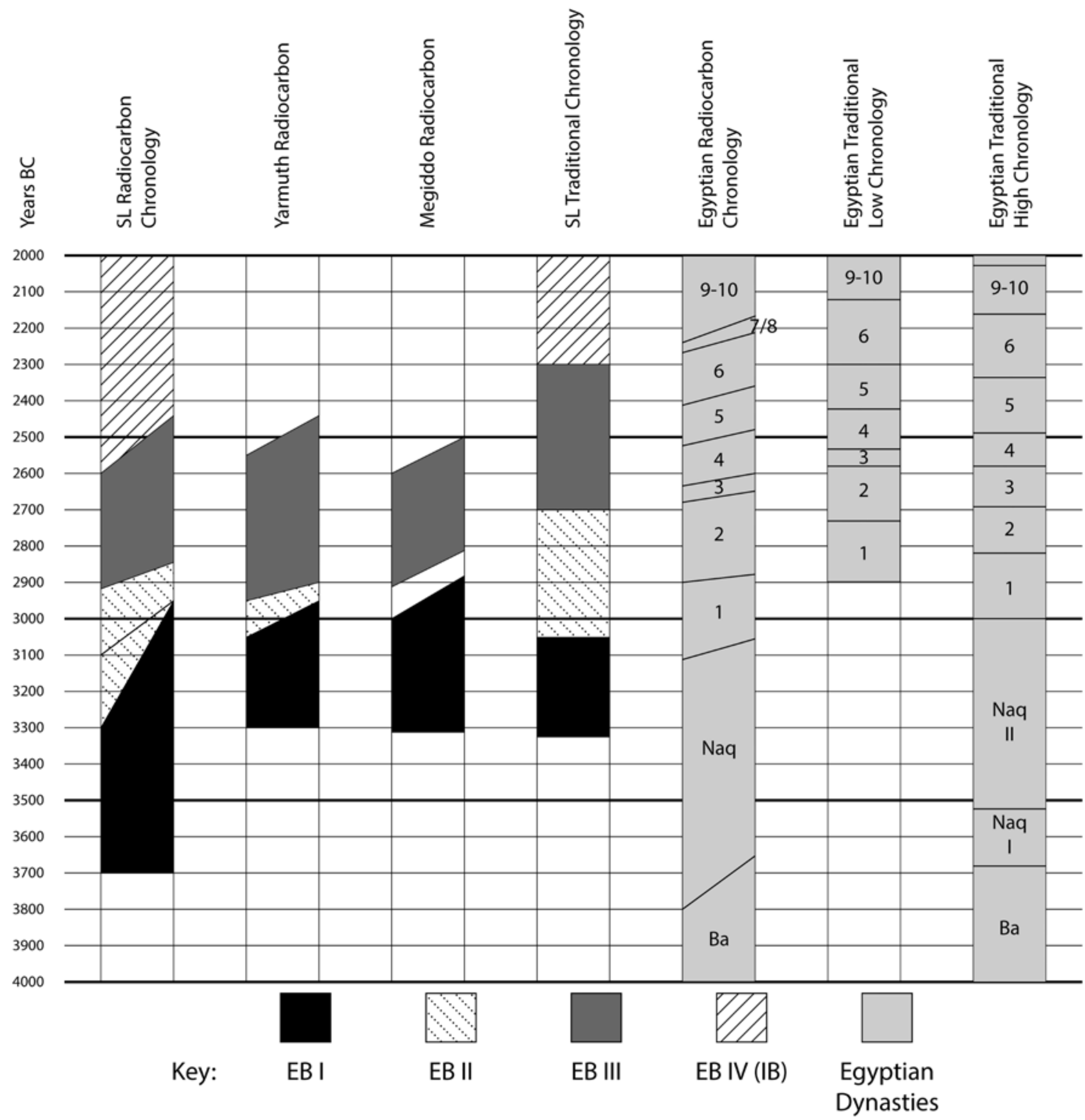

Figure 16.1. Comparative chart of the southern Levantine and Egyptian chronologies (from Regev et al. 2014). The chronologies presented in the figure are based on the following reference from left to right: SL (southern Levant) radiocarbon chronology (Regev et al. 2012), Yarmuth (Regev, de Miroschedji, and Boaretto 2012), Megiddo (Regev et al. 2014), conventional SL chronology (Mazar 1992), Egyptian radiocarbon chronology (Bronk Ramsey et al. 2010; Dee et al. 2013), Egyptian traditional low chronology (Hornung et al. 2006), Egyptian traditional high chronology (Kitchen 1991). Diagonal lines reflect the range of transitions

period through Third/Fourth Dynasties (Sowada 2009, table 5), and thus have been interpreted as Egyptian Fifth/Sixth Dynasty looting of their own cemeteries into provide heirloom goods to Early Bronze III elites (Sowada 2009, pp. 125, 230–32). With the new chronological understanding, they can now be understood to represent real-time exchange between First–Fourth Dynasty Egypt and Early Bronze II–III elites.

Finally, some Egyptian Fifth–Sixth Dynasty texts and tomb decoration indicate warfare against non-Egyptian[1] fortified towns (e.g., Weni, Pepynakht). These have often been interpreted as evidence for military action against cities in the Southern Levant (see overview in Sowada 2009, pp. 10–15). Given the fact that this period now corresponds with the Intermediate Bronze Age, a period decidedly non-urban, these descriptions and depictions either can no longer be taken at face value or must represent activity in different regions altogether (see Höflmayer 2014 for similar conclusion).

In a revised understanding of Egypt and Levantine relations in the third millennium B.C., then, the southern Levantine Early Bronze III had minimal interaction with Egypt of the late First to Fourth Dynasties, the result of which is a particularly small assemblage of minor Egyptian objects, reflecting an extremely weak interest on behalf of the Egyptian monarchy to engage its nearest Asiatic neighbors.

They heyday of Egypt-southern Levantine interaction was in the past, during the late Early Bronze IB and II. In the Early Bronze IB, the early Egyptian state (Naqada IIIC1; early First Dynasty) established settlements in the southern coastal plain and interacted directly with the local inhabitants (de Miroschedji 2002; Yekutieli 2007 and references). This situation was short-lived and near the beginning of the Early Bronze II (ca. 3000 B.C.), the Egyptian settlements were abandoned.[2] For the short-lived Early Bronze II, Egypt maintained contact primarily with two indigenous urban centers (as far as the evidence allows), Beth Yerah and Arad, but without being resident in the region. By the Early Bronze II–III transition, the copper trade with Egypt through the northern Negev upon which Arad was based ended.

With the transition to the Early Bronze III, however, Egypt appears to have completely lost interest — only a small handful of Egyptian prestige objects, such as stone vessels, maceheads, and palettes, made their way in to the region, and none of these can be firmly indicative of direct exchange. By the time the Early Bronze III urban entities were in the final stages of dissolving, between 2600 and 2500 B.C., the Egyptian state was reaching the height of its hierarchical development, and mobilizing a tremendous workforce for the construction of the massive pyramids at Giza.

[1] These are normally identified as non-Egyptian because of the method of representation of the enemies in the scenes — primarily with facial and head hair characteristics normally reserved for representing Asiatics (texts accompanying some of the scenes do, in fact, mention Asiatics). Since no images exist (to my knowledge) of battle scenes depicting Egyptians against Egyptians, one wonders if the default representation of any enemy, Asiatic or Egyptian, might be in the "Asiatic" style. This is speculative, to be sure, but the Narmer Palette comes to mind — who are the bearded enemies? Egyptians or Asiatics?

[2] The synchronization of the chronologies of the Egyptian settlements in the southern coastal plain and the onset of the local Early Bronze II urban expansion in the region will be studied elsewhere, but see already notes by the author in Regev et al. 2014, pp. 258, 261.

The Southern Levantine Early Bronze III / Intermediate Bronze Age Transition

If the long-standing explanation for the dissolution of Early Bronze III urban communities of climate change can no longer be relied upon, how, then, can we understand this process when it does occur in 2500 B.C. Here, our focus may be too much on specific dates. The date 2500 B.C. is probably less significant as a moment in time than it is as a date that saw the final closure on a process that had been going on for some time.

The range of dates for the abandonment of the major Early Bronze III sites spans from circa 2600 to 2500 B.C. However, Greenberg (this volume) observes that many Early Bronze III sites were abandoned early in the period as well (ca. 2900–2600 B.C.; e.g., Khirbet ez-Zeraqon, Khirbet el-Batrawy; Höflmayer, this volume). When one examines the map of Early Bronze III settlements over the course of the period, one does not find the densely occupied multi-tiered hierarchical urban landscape described by past scholars (see Greenberg, this volume, fig. 2.1). Rather, Greenberg sees a "discontinuous landscape of heavily fortified polities with few villages between them." And so, he concludes (and one cannot help but agree) that it was the Early Bronze II that was the cohesive urban society exhibiting monumental architecture and fortifications, settlement planning, widespread networks of interaction, and cultural and material uniformity. The Early Bronze III, however, was the long drawn-out and choppy dissolution of the Early Bronze II urban society.

The fate of the southern Levantine population in this long transition from 2900 to 2500 B.C. and where they ultimately ended up are difficult to ascertain. The late Early Bronze I is characterized by extensive landscape of settlement and the Early Bronze II by nucleation of these settlements into urban centers. However, when considering the emerging picture of a sparsely inhabited countryside and few urban centers in the Early Bronze III, we must hypothesize a considerable demographic change over the course of the Early Bronze III, an exodus from the Early Bronze cities (to use Greenberg's words), such that by 2500 B.C. urban society in the region was defunct.

The default explanation for what happened to people when they left cities is that these agriculturalist urbanites went off to engage in pastoral nomadism. As Burke (this volume) observes, the hypothesis of long-term cycles of pastoral nomadism taken up by Levantine inhabitants in times of stress has not been substantiated unequivocally, and depends heavily on the idea that pastoral nomads rarely leave archaeological traces (a twist on an absence of evidence argument). Certainly, pastoral nomads were a notable component of ancient Near Eastern societies, and quite possibly some urbanites actually did throw in the towel and take up the pastoral nomadic mantel. But to what extent could the environment support the transition of a large percentage of the Early Bronze IB/II population transitioning to this type of subsistence strategy? Lest we think that such a decision was choosing the "simple life," it might do us all well to re-enroll in Herd Management Strategies 101.

Even if the transition to pastoral nomadic lifestyle was something that some Early Bronze III urbanites did as time went on, such a lifestyle actually does not support the settlement pattern evidence as we see it in the Intermediate Bronze Age. The pastoral nomadic lifestyle was probably only common in marginal areas, and not an accurate label for a majority of the Intermediate Bronze Age population. Increasingly, surveys and excavations are identifying new Intermediate Bronze Age village sites, particularly since the 1990s. In the Jezreel Valley, for example, Intermediate Bronze Age sites now exceed the number of known Early Bronze II–III sites (Finkelstein et al. 2006; Finkelstein and Langgut 2014, table 3). The emerging interpretation of the subsistence strategies in use in the Intermediate Bronze Age is far more complex than previously assumed, with great regional variability and probably based on agro-pastoralism in the wetter areas in the western and northern regions and including the investment in the cultivation of orchards (Prag 2014; Langgut, Adams, and Finkelstein 2016), with the largest number of villages in the fertile valleys of the Jezreel and Hula.[3]

Recent studies of high-resolution palynological cores from the Dead Sea and Sea of Galilee as proxies for the southern Levant also shed interesting light on horticultural practices during this period (Langgut et al. 2011; Langgut, Adams, and Finkelstein 2016). The relative percentages of arboreal pollen and olive pollen indicate that there was no substantial change in the quantity of olive pollen from the Early Bronze III to the Intermediate Bronze Age, and therefore no change in the number of actively managed olive orchards. Since olive orchards must be maintained regularly or they will cease to release pollen (Langgut, Lev-Yadun, and Finkelstein 2014), it is clear that a notable settled population was present in the Intermediate Bronze Age. Whatever changes might have occurred in urban dissolution, then, had no effect on the maintenance of olive orchards during the Intermediate Bronze Age.

The Southern Levantine experience was very different from what happened in the northern Levant around 2500 B.C.

The Northern Levantine Early Bronze III/IV Transition

The northern Levantine Early Bronze III to IV transition is characterized by both abandonment of sites and by intensive urban expansion across the Early Bronze IV. The former occurred primarily in central and eastern Syria and in other marginal areas, as well as in central and southern Lebanon, where societies tend to fit into the southern Levantine milieu. The urban expansion occurred generally on the coast and interior valleys of northern Lebanon and western Syria (see the contributions by Schwartz and Genz in this volume).

In contrast to the Early Bronze II–III of the southern Levant, social complexity and urbanism on a broad scale[4] do not begin until near the transition to the Early Bronze IV with the beginning of the Ebla Palace G period in roughly 2500 B.C. However, increasing evidence indicates that the processes were already taking place in the late Early Bronze III (Schwartz, this volume). Relatively recent radiocarbon dates from the Lebanese coastal sites of Tell Arqa and Tell Fadous-Kfarabida also indicate the beginning of the Early Bronze IV at circa 2500

[3] And so, the old debate over whether the adventure of the Egyptian Sinuhe might reflect accurate descriptions of horticulture is settled (Redford 1992, pp. 82–86).

[4] It may be counter-productive to speak comparatively of the urbanism in the Early Bronze III south and the Early Bronze III–IV north without numerous caveats, but I do so here only in an urban versus non-urban dichotomy to make an observation.

B.C. (Höflmayer et al. 2014; Genz, this volume). In the northern Levant, the Early Bronze IV period sees the floruit of Syrian urban civilization, before its final transition into the Middle Bronze Age, circa 2000 B.C.

In general, we may observe that the phenomenon of urban development in the third millennium B.C. Levant exhibits a flip-flop effect from south to north right around 2500 B.C. In the early part of the third millennium B.C., the southern Levant makes an ill-fated stab at urbanism that quickly fizzles but drags on through the Early Bronze III until about 2500 B.C. At roughly that moment, an urban surge occurs in the northern Levant while the south returns to a village-level society in the Intermediate Bronze Age.

The line between the north and the south is difficult to pin down, but appears to be somewhere around 34° latitude between Beirut and Byblos. While sites on the southern coast of Lebanon follow the southern Levantine pattern, those in the north, including Arqa and Byblos, follow the northern pattern, showing urban developments in the Early Bronze III, but reaching their florescence in the Early Bronze IV after circa 2500 B.C. (Genz, this volume). That Arqa and Byblos and other sites in the region are connected to both Ur III Mesopotamia and Old Kingdom Egypt might be a notable factor (or result). More speculative might be that the geographical boundary of the Orontes/Litani River watershed is significant, separating the regions with direct connections to Hama, Ebla, and Mesopotamia from those with indirect access.

Egypt and the Northern Levant in the Later Third Millennium B.C.

Egypt's retraction from the southern coastal plain and, thereafter, the cessation of copper trade in the northern Negev occurred in the Early Bronze II. Despite evidence for some sporadic goods still arriving from Egypt during the Early Bronze III (see above), Egypt's interest in the region was effectively dead. Egypt instead turned to the north to supply Levantine products such as wood (*Cedrus libani*), oils and resins, wine, ceramics (e.g., Levantine Combed Ware; Thalmann and Sowada 2014), and, of course, bears (Sowada 2009, p. 160).

Most Egyptian material in the north has been excavated at Byblos, and, taken together with evidence from textual sources in Egypt, scholars have understood Byblos to be Egypt's primary partner in northern Levantine exchange, though Egyptian objects certainly made it to other northern Levantine cities, including Ebla's Palace G (Sowada 2009, pp. 128–53). While Early Dynastic Egyptian material is known from Byblos, quantities of material from the site and evidence of Levantine products in Egypt[5] suggest that the reign of Snefru/Khufu was a period in which the connection between the two was escalated. Intensification continued and interaction appears to have reached a point of regularity for the Fifth–Sixth Dynasties (Sowada 2009), that is, during the absolute dates of circa 2500–2200 B.C. (Bronk Ramsey et al. 2010 and supplement), the northern Levantine Early Bronze IV.

Inscribed Egyptian material from Byblos and Levantine material in dated contexts from Egypt indicate that the interaction continued into the reign of Pepi II (e.g., combed material

[5] There is now good evidence for northern Levantine imports from Arqa into Egypt in the Early Dynastic period (Köhler and Thalmann 2014).

from Giza tomb G 2381; Sowada 2009, p. 68), but not thereafter. It thus appears that the cessation of relations with the northern Levant coincided with the collapse of the Old Kingdom and, thus, was discontinued by the Egyptians for internal reasons, not due to any events on the Levantine side.

North and South in the Early Bronze IV/ Intermediate Bronze Age

What is the significance of the chronological hinge of 2500 B.C. at which the southern Levant experiences urban dissolution and the northern Levant experiences urban florescence? Greenberg and Schloen (this volume) both argue that new economies developing in the context of northern urban expansion provided opportunities that rendered the southern Early Bronze III political organization obsolete. Schloen, in particular, argues that the southern societies adapted from urbanism to pastoralism to meet head on the economic opportunities presented by an urbanized north, and that one significant economic priority was the supply of wool to northern textile producers. In this model, southern elites converted their capital from urban-based agriculture to pastoral nomadic–based sheep flocks.

One criticism of Schloen's argument is the dependence on understanding the Intermediate Bronze Age as a sheep rearing pastoral-nomadic society, something that has not been well demonstrated.[6] The Intermediate Bronze Age is typically characterized as pastoral-nomadic because of the overshadowing lack of the same "urban" form as the Early Bronze II–III and because so many of the first excavated sites were cemeteries. Is this really the best way to describe Intermediate Bronze Age society? Burke (this volume) questions the practicality of pastoral-nomadic assumptions in general. To what extent was the Early Bronze III/Intermediate Bronze Age environment of the southern Levant suitable for large-scale pastoralism? Wilkinson et al. (2014), whom Schloen even cites, argue that the southern Levant did not have ideal or sufficient territory for sheep rearing. Overall, the evidence for most of the southern Levant suggests decentralized sedentary village-based settlement patterns subsisting on agro-pastoralism (see above), with pastoral groups in the marginal areas.

That there is a flow of goods, ideas, and probably people from the northern Levant into the southern Levant in the Early Bronze IV/Intermediate Bronze Age is well known. Schloen (this volume) is right to point out that the raising of the southern Levantine chronology brings the evidence into better alignment. Take, for example, Caliciform Ware ceramic tradition that is a marker for western inland Syrian Early Bronze IV (Welton and Cooper 2014) and is found in Intermediate Bronze Age contexts in the southern Levant (these are locally produced, not imports) at the major coastal sites of Lebanon and the inland valleys of northern Israel, particularly in significant quantities at Hazor in the Hula Valley of Israel and at Megiddo and the Jezreel Valley (Bechar 2013; Guy 1938; Bunimovitz and Greenberg 2004; Covello-Paran 2009). According to the traditional chronology, there was a two-hundred-year time lag between Caliciform Ware's florescence in the northern Levant (Early Bronze IVA; Ebla Palace G period; ca. 2500–2300 B.C.) and its appearance in the south in the Intermediate

[6] While reports on faunal assemblages from Intermediate Bronze Age sites are not particularly numerous, those that do exist show little evidence for pastoral-nomadic strategies in any way focused on wool production.

Bronze Age at 2300/2200 B.C. With the Intermediate Bronze Age beginning already in 2500 B.C., the northern innovation of and the southern distribution of Caliciform Ware comes into sync.

Further influence from the northern Levant can be seen in other components of Intermediate Bronze Age society, including town planning, domestic architecture, drinking practices, and burial practices (Prag 2009; Prag 2014). Overall, while there is demonstrable cultural continuity from the Early Bronze III to the Intermediate Bronze Age, there is also clear influence from the northern Levant in the form of *habitus* concerning eating and drinking, laying out settlements, and mortuary practices. Rather than looking for an economic model for the northern influence on the south, which sees these connections as emulation of an admired northern elite, these influences on various components of lifestyle suggest that there are real populations on the move. These populations are in small enough quantities to not plant their northern culture wholesale, but large enough that their integration with the local population creates a hybrid between the two. In many ways, this seems to presage the Middle Bronze Age, in which northern influence is more pronounced. I prefer to see a model of migrational waves such as the refugee model Burke (this volume) applies at a larger scale to the depopulation of northern Mesopotamia. Such a model adapted for the southern Levantine Intermediate Bronze Age might work in two directions — an exodus of some Early Bronze III urbanites to the north and some waves of northerners into the south. Whereas in western Syria this model contributed to urbanizing processes, in the southern Levant this appears to have occurred on a much smaller scale, with small kin-based groups immigrating (perhaps in *waves*) and establishing *vintages* within existing local agricultural communities.

The Three Temples *in antis* at Megiddo

Above, I reviewed some of the evidence for an Early Bronze III to IV/Intermediate Bronze Age transition in the northern and southern parts of the Levant. I reviewed the latest chronologies of both regions and observed a flip-flop of urban development around 2500 B.C., at which point we saw the final dissolution of the urban south and the florescence of the urban north. Into this we observed Egyptian interactions, in the Early Bronze III before 2500 B.C. primarily with the south and in the Early Bronze IV/Intermediate Bronze Age after 2500 B.C. primarily with the north, perhaps chasing this flip in the fortunes of the Levant. Egyptian contact ceased with the collapse of the Old Kingdom in the reign of Pepi II, circa 2200 B.C. We also saw that during the Early Bronze IV/Intermediate Bronze Age, materials, ideas, and people from the northern Levant migrated into the southern Levant and became part of the tapestry of Intermediate Bronze Age cultures in the region.

We now turn to Megiddo in the Jezreel Valley to illustrate these broader trends and to explain the presence of a northern Levantine temple *in antis* founded with an Egyptian-style foundation deposit in the Intermediate Bronze Age.

The Oriental Institute of the University of Chicago expedition to Megiddo in the 1920s and 1930s revealed the complete stratification of the tell in Area BB, including four major strata that they dated to the Early Bronze Age (fig. 16.2; Strata XIX–XVI; Loud 1948). From 1992 to 2010, the Tel Aviv University Megiddo Expedition conducted renewed excavations in the area as Area J, refining much of the stratigraphic determinations made by Loud (Finkelstein and Ussishkin 2000; Finkelstein, Ussishkin, and Peersman 2006; Adams 2013a, b; Adams, Finkelstein, and Ussishkin 2014; Regev et al. 2014; Adams forthcoming a, b).

The Early Bronze III Strata XVII–XVI (Level J-5–6a; fig. 16.3, table 16.1) comprise three phases dating from ca. 2850–2600/2500 B.C. (Regev et al. 2014). Overall, Early Bronze III Megiddo represents a large, well-planned city. The eastern terrace supported a palatial building (3177), while the western portion was constructed on an orthogonal grid with streets. The buildings here were probably a mixture of public edifices (e.g., Altar 4017; Temple 5221; Adams 2013a, p. 117) and elite residences. In addition to the original planning in Level J-5, the universal paving of the streets with flagstones indicates centralized organization of public works projects. Evidence of broad elite connections to Egypt and the central/northern Levant are evident in the discovery of an Egyptian cylinder seal and mace-heads as well as imported red-slipped reserved burnished jars with parallels from the Lebanese coast, including Byblos (Greenberg 2006, p. 165; Adams 2013a; Adams 2013b, pp. 324–27).

At the end of the Level J-6a phase, a dramatic reconfiguration of the site took place in which the palatial and urban architecture was dismantled to make room for the construction

Figure 16.2. Aerial photograph of Megiddo Area J and the triple temples *in antis* (courtesy of the Megiddo Expedition)

Table 16.1. Current Early Bronze to Middle Bronze I stratigraphy of Megiddo Area BB/TAU Area J (after Adams 2013a). Absolute dates only included if known from radiocarbon samples from the site (n.b. maximum ranges are given, hence the apparent chronological overlap of some phases; Regev et al. 2014)

Level	*Loud 1948 Stratum*	*Description*	*Absolute Dates*	*Period*
J-10	XIIIA/B	Domestic area with proto-palace		MB I
J-9	XIVA	Domestic area with repurposed Temple 4040		MB I
J-8	XIVB	Domestic area with repurposed Temple 4040		MB I
J-7	XV	Triple temples in antis (4040, 5192, and 5269)		IB
J-6a	XVI	Palace Compound and Palace 3177	2700–2600/2500 B.C.	EB III
J-6b	XVII	Palace Compound and Palace 3177	2800–2700 B.C.	EB III
J-5	XVII	Palace Compound and Palace 3177	2850–2800 B.C.	EB III
J-4a		Sporadic activity within the otherwise abandoned Great Temple	3020–2850 B.C.	EB II
J-4	XVIII	Great Temple complex	3090–2920 B.C.	EB Ib
J-3	XIX	Temple 4050		EB Ib
J-2		Temple beneath 4050 and Picture Pavement		EB Ib
J-1	XX+	Carved bedrock and associated structures		EB I

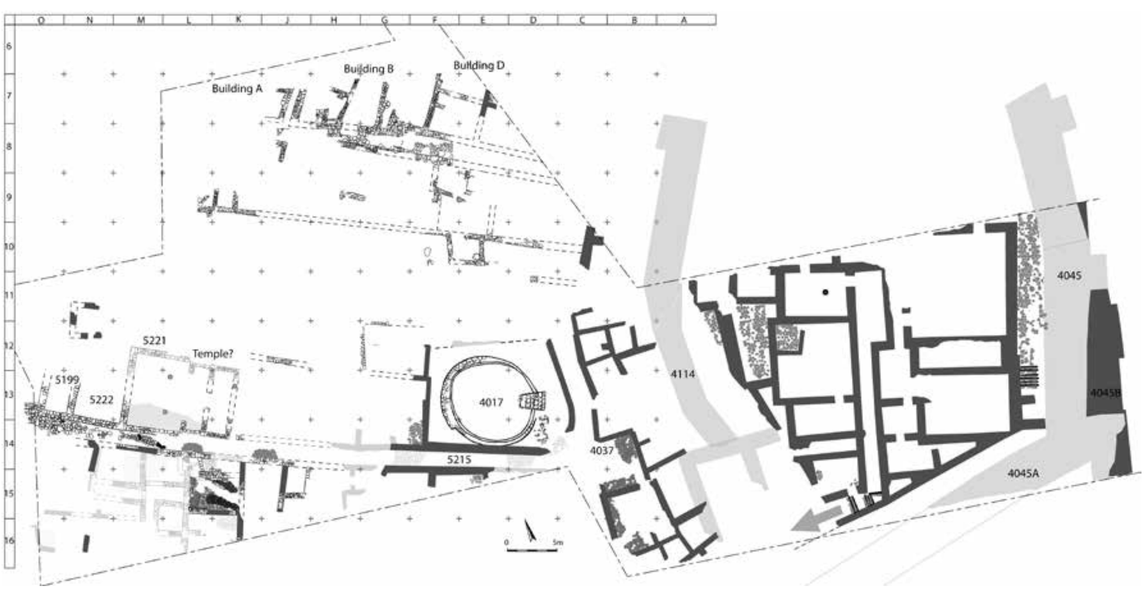

Figure 16.3. Plan of Early Bronze III Megiddo in Phase J-6b/a (Adams 2013a, fig. 2.73). Dark gray indicates walls excavated by the University of Chicago team as Stratum XVI. Lightest gray indicates underlying Stratum XVII. Note also in light gray Walls 4114 and 4045, which continued in use as terrace walls from Level J-4

of the three temples *in antis* of Stratum XV/J-7 connected to a large monumental staircase on the eastern terrace (fig. 16.4; Loud 1948, fig. 394; Adams 2013a, pp. 95–100, 117–18).[7] The relative dating of this phase has been the subject of much dispute. Loud dated these temples to the Intermediate Bronze Age (his "Middle Bronze Age I"; Loud 1948, p. 5). Later commentators approached the dating of this stratum from a preconception of the Intermediate Bronze Age as a pastoral-nomadic society incapable of monumental architecture and therefore concluded that they must date to the late Early Bronze III (Dunayevsky and Kempinksi 1973; Esse 1991; Finkelstein 2013, pp. 1332–33; see Greenberg, this volume).

Ussishkin and Adams, however, have recently championed the re-dating of this stratum to the Intermediate Bronze Age (Ussishkin 2013, p. 1324; Adams 2013a, 2013b) with a

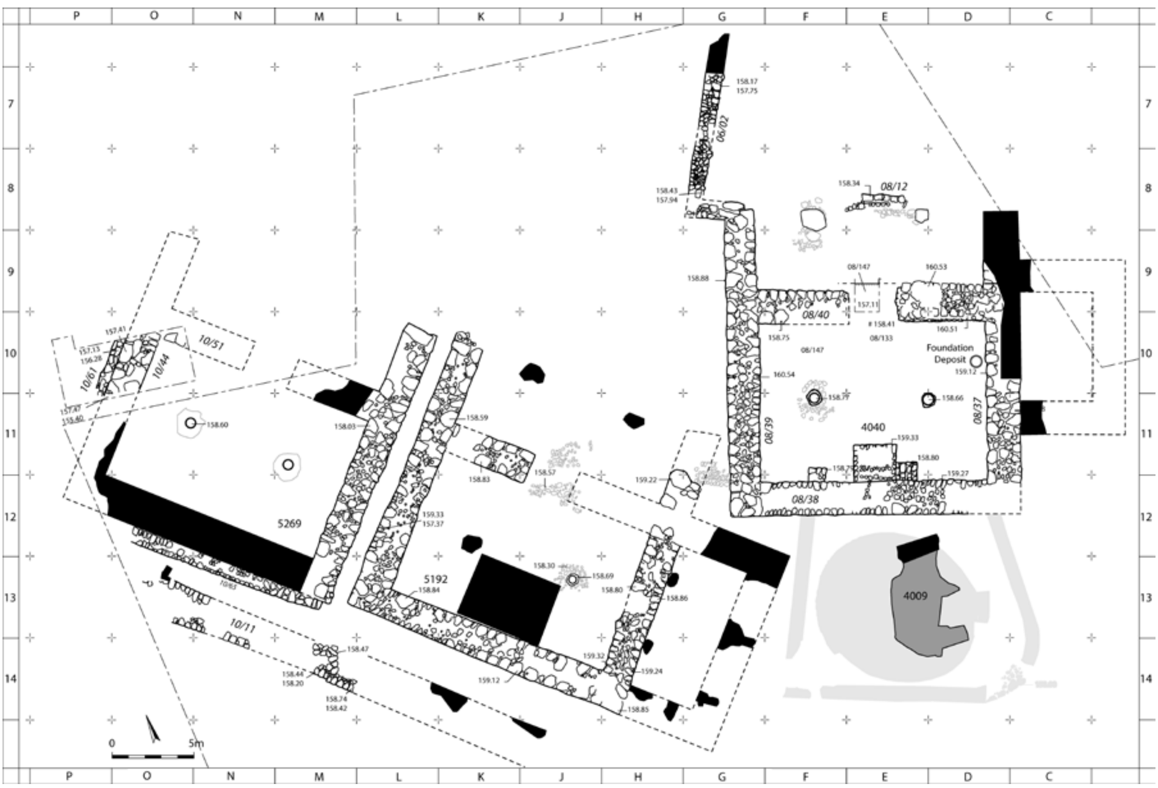

Figure 16.4. Megiddo Stratum XV Temples *in antis* (after Adams 2013a, fig. 2.56, modified according to Adams forthcoming b)

[7] In my recent assessment of the Stratum XV/J-7 based on excavations in 2010 and a stratigraphic assessment of the southern architecture of Area BB/Area J (Adams forthcoming b), I make the argument that the circular Altar 4017 does not, in fact, continue in use from Level J-6. Rather, the Pavement 4009, otherwise appearing on the plan for Stratum XIIIB (Loud 1948, fig. 396), appears to have been the contemporary surface behind Temple 4040 in Stratum XV/Level J-7 (Adams forthcoming b). The pottery and finds recovered from 4009 are all of Intermediate Bronze Age types (Loud 1948, p. 176).

re-investigation of the published reports and acquisition of new data support this conclusion (Adams forthcoming a, b). Among the new data supporting an Intermediate Bronze Age date for the temples is Intermediate Bronze Age pottery found in the foundation trenches of Temple 4040 sealed by the plaster floor of the temple (Adams 2013a, pp. 96–99; Adams 2013b, pp. 328–30).

In the 1996 excavations, a cache of pottery was discovered in a pit just before the threshold to the eastern chamber of Temple 4040, which I interpret as a foundation deposit for the temple (Adams forthcoming a, b). The deposit consisted of sixteen locally made vessels of Egyptian technology and form (fig. 16.5; Joffe 2000, pp. 170–74). The cache was discovered in the early stages of the Tel Aviv University's renewed excavations before final stratigraphic attributions were made. At the time of discovery, their stratigraphic affiliation and date were debated among the excavators and specialists (Finkelstein and Ussishkin 2000 and 2003; Joffe 2000). In terms of stratigraphy, the early reports debated between an Early Bronze I (Level J-4) and an Early Bronze III (Level J-6) date. The studies of both Joffe (2000) and Ilan and Goren (2003) arrived at a late Predynastic/Early Dynastic date for the cache on the basis of comparative typology with known Egyptian pottery. While Joffe appears to have searched far and wide throughout the third millennium B.C. for parallels, even entertaining an Old Kingdom date for the vessels, Ilan and Goren concentrated primarily on the late Predynastic and Early Dynastic periods in parallel to the excavators settling on an Early Bronze I context (Finkelstein and Ussishkin 2003).

Adams reinvestigated the circumstances of the cache's discovery finding compelling evidence that the cache sat at the bottom of a pit, missed during excavation, that cut through

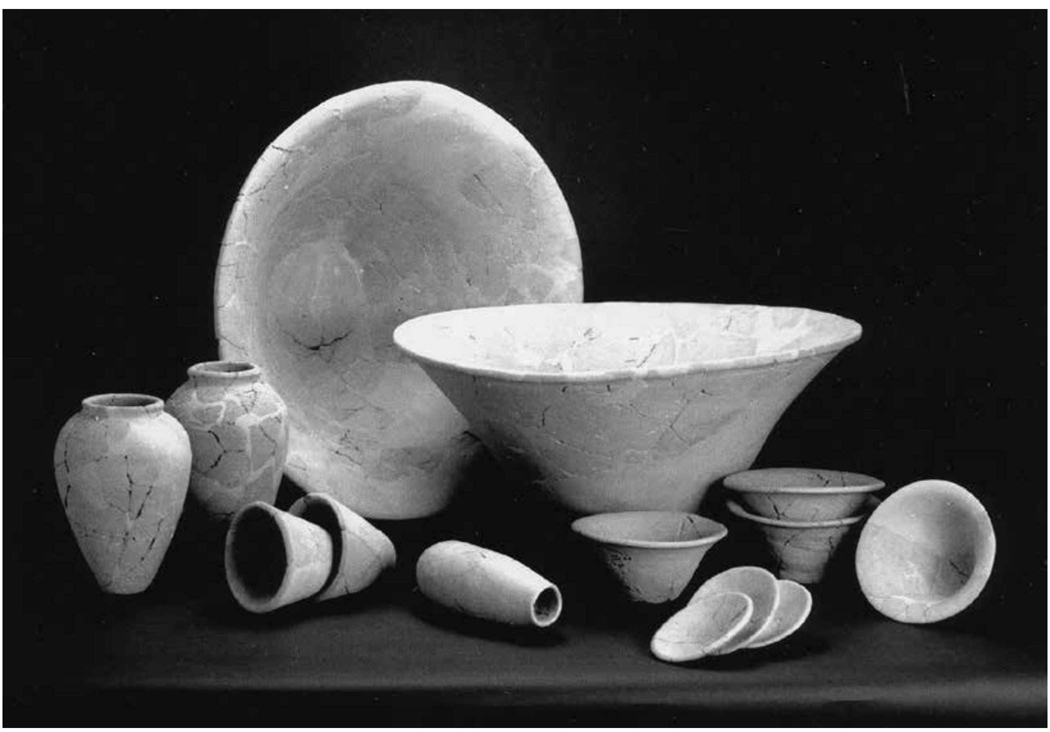

Figure 16.5. The cache of Egyptianized vessels from Megiddo (courtesy of the Megiddo Expedition)

the Early Bronze III strata but was sealed by the plaster floor of Temple 4040 (see detailed assessment in Adams forthcoming a). With a later third millennium B.C. date for the cache more likely, Adams sought Egyptian typological parallels in the Egyptian Old Kingdom and First Intermediate Period. The best parallel for both the individual forms of the vessels and for the assemblage as a whole was found in the foundation deposits of Montuhotep (Eleventh Dynasty) at Deir el-Bahari (fig. 16.6; Arnold 1979, pp. 49–57; pls. 28–32).

The significance of the Montuhotep foundation deposits is that they give a *terminus ante quem* for the Megiddo cache. During the reign of Montuhotep, foundation deposits underwent a typological change that can be documented within the development of the Deir el-Bahari complex itself (Arnold 1979; Weinstein 1973). In the later architectural developments of the complex, a new type of deposit was introduced that included a wider variety of objects including plaques with the ruler's name, a feature that would become standard for foundation deposits to the end of the Pharaonic period. The parallels to the Megiddo cache, however, fit into the earlier deposits at Deir el-Bahari, which typify foundation deposits from the late Old Kingdom such as those from Hierakonpolis (Weinstein 1973, p. 32). Foundation deposits from the earlier Old Kingdom (i.e., Fourth Dynasty and earlier) are typologically different from those of the later Old Kingdom (Weinstein 1973, p. 30), and not parallel to the Megiddo cache.

The Temple 4040 foundation deposit and its parallels with deposits in Egypt indicate that the cache fits a date from the late Old Kingdom (Sixth Dynasty) to the late First Intermediate Period (Eleventh Dynasty) — that is, circa 2400–2050 B.C. (Bronk Ramsey et al. 2010), within

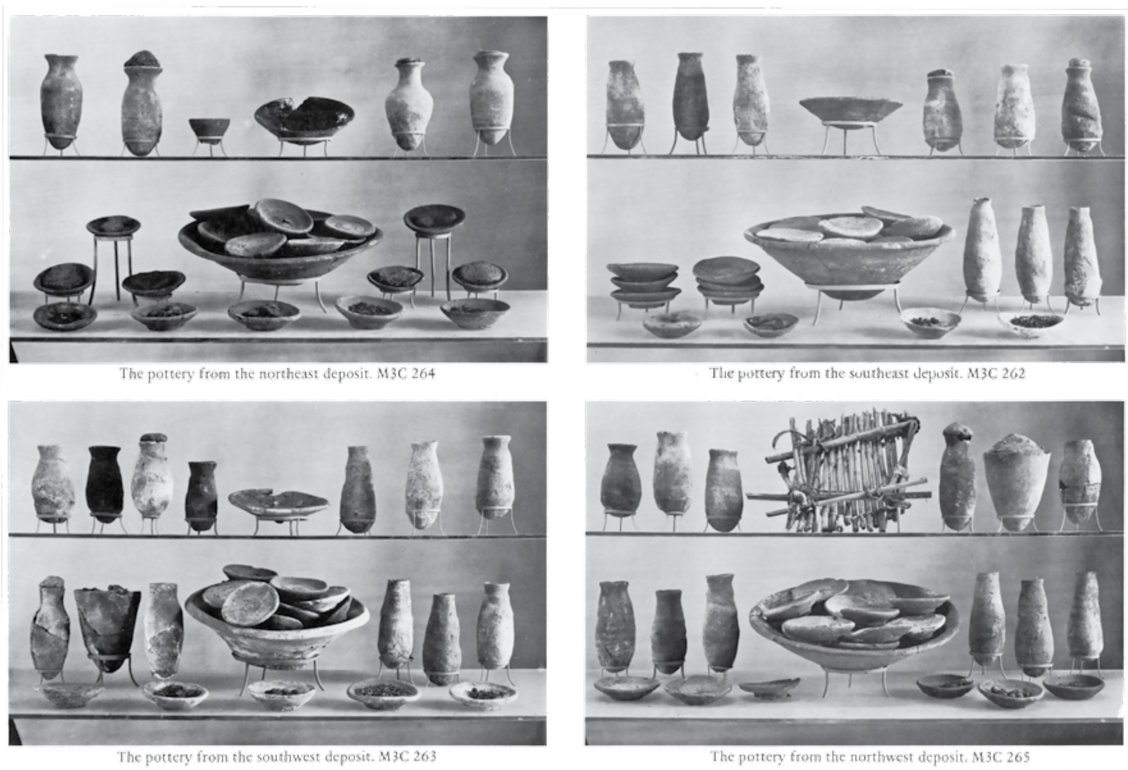

Figure 16.6. Eleventh Dynasty foundation deposits from the tomb of Montuhotep II at Deir el-Bahari (from Arnold 1979, pl. 32)

the period of the Intermediate Bronze Age of the southern Levant as established by the new radiocarbon chronology (Regev et al. 2012).

To this Megiddo Intermediate Bronze Age connection to Egypt, we can add the observation that the triple temple complex is of northern Levantine design, being the southernmost examples of Syrian temples *in antis*. Many are known from Syrian sites such as Tell Bi'a, Tell Chuera, Tell Rawda, Tell Halawa A and B, Tell Kabir, Ebla, and so on (see Castel 2008; Castel 2010; Cooper 2006). An Early Bronze IV example from Byblos comes in triplicate like the Megiddo temples (Lauffray 2008, p. 331).[8] The Syrian temples all date to the Early Bronze IV, that is, after 2500 B.C. (Castel 2010).

The intersection of northern Levantine Early Bronze IV monumental architecture and Egyptian Old Kingdom/First Intermediate Period foundation deposit in a southern Levantine Intermediate Bronze Age setting is, thus far, a unique intersection of these interests in this dynamic period. Megiddo appears to have been an outlier within the Intermediate Bronze Age societies of the southern Levant, temporarily connected into the northern milieu of coastal and inland Lebanon and Syria, for at least some of the Early Bronze IV. Intermediate Bronze Age material culture found at Megiddo is more extensive than it is generally given credit for, though it was all excavated in the 1920s and 1930s and has not been systematically studied; unfortunately, few Intermediate Bronze Age contexts have been identified in the renewed excavations. More than fifty tombs from the Intermediate Bronze Age were excavated on the east slope (Guy 1938, pp. 148–49), many of which contained pottery connected with northern traditions, especially large quantities of Caliciform pottery (see above) — Megiddo appears to be the southernmost large site within its distribution range (Welton and Cooper 2014, fig. 1; Bechar 2013).[9]

The occupation of Stratum XV appears to have been relatively short-lived. The temple complex was never completed, the westernmost having never received its floor and altar (Loud 1948; Adams 2013a), and the site was abandoned. Megiddo was reoccupied in Stratum XIV (Levels J-8 and 9), which was the first of four Middle Bronze I strata at the site (Adams and Bos 2013). The new Middle Bronze settlers established houses in the ruins of the two twin temples, but recognized the sanctity of Temple 4040, remaking it into a smaller cult space (Loud 1948, p. 84, fig. 395; Adams and Bos 2013, pp. 119–25).

9. Conclusions

The Megiddo temples *in antis* of Stratum XV provide a unique window into the transition from the Early Bronze Age to the Middle Bronze Age and the broader processes of interaction of Egypt, the northern Levant, and the southern Levant. While specific questions of agency

[8] Special thanks to Eliot Braun, who noticed this parallel and shared it with me some years ago.

[9] It is also worth noting that the settlement patterns in Megiddo's Jezreel Valley also expand in the transition from the Early Bronze III to the Intermediate Bronze Age, from fifteen to twenty, according to the 1990s Megiddo Hinterland Survey (Finkelstein et al. 2006, p. 760), though since then a number of new Intermediate Bronze Age sites have been identified and excavated in the valley. Ultimately, it appears as though, generally speaking, the distribution of settlements in the Intermediate Bronze Age returns to a small-to-medium village-based pattern (not unlike the Early Bronze I), with at least one large site — Megiddo — as central. However, since the Intermediate Bronze Age has become a nearly 600-year period with the new radiocarbon chronology, one should use single-map representations of such a long period with caution (see the note of caution by Greenberg, this volume, for the Early Bronze III). Much work remains to be done to elucidate the sub-phases of the Intermediate Bronze Age.

and the circumstances under which a set of Syrian temples was constructed at Megiddo with Egyptian-style foundation deposits cannot yet be answered, we can begin to understand the process in light of new understandings of the Early Bronze to Middle Bronze transition in the ancient Near East, some of which is presented by other contributors to this volume.

Beginning already in the Early Bronze II, Egyptian interest in the polities of the southern Levant began to subside. Evidence from the northern Levant (including from Byblos and Arqa) indicates that by the end of the Early Dynastic period, Egypt was focused on international exchange with the polities of that region, at the expense of those in the south. With the final dissolution of southern Early Bronze III urban centers around 2500 B.C., Egypt's ties with the north intensified and Byblos emerged as its premier trading partner. At the same time, urban centers in Syrian and northern Lebanon began to expand in the northern Early Bronze IV, and by 2200 B.C. refugees from northern Mesopotamia were moving westward and contributing to the urban expansion of these northern cities.

With new high-resolution radiocarbon dates contributing to the study of the third millennium B.C. and contributing to the synchronization of cultures, the period around 2500 B.C. emerges as a pivotal time for the ancient Near East. For some regions like the northern Levant and Egypt, this ushers in a period of great expansion and prosperity. For the southern Levant, however, this period signifies the final dissolution of the Early Bronze III urban society. And, yet, the Intermediate Bronze Age in this region should not be viewed as a social regression. The Intermediate Bronze Age is a period of increased regionalism and diversity of subsistence strategies, with pastoral-based systems in the marginal areas in the east and south, and a proliferation of agro-pastoral villages in the northern valleys. What makes these villages particularly distinct from the cities of the Early Bronze III is that the former appear to be much more connected to the world of the north than the later ever were. Locally made Syrian-style Caliciform Ware, abundant at many sites such as Megiddo and Hazor, is not just emulated according to what was seen in use in the north. Rather, the specialized technology used to create these vessels was imported and the northern traditions related to drinking and mortuary practices came along as well (Bunimovitz and Greenberg 2004; Prag 2009; Prag 2014). This is more than emulation — this is immigration. And yet, the endurance of many other aspects of Early Bronze II society into the Intermediate Bronze Age demonstrates significant demographic continuity. This absorption of northern traditions seems best explained by an influx of small groups of northerners in waves who became well integrated in and transformed local Early Bronze III societies into hybrid communities.

While a majority of northern Levantine influences on Intermediate Bronze Age society can be explained by these small-scale migrations and the absorption of these northerners into indigenous communities, something more dramatic must underlie the Megiddo Stratum XV temple event. Construction of temples *in antis* was the prerogative of Syrian urban elite, found in the hearts of the major cities of Early Bronze IV Syria and Lebanon. Representing a complete break from the earlier Early Bronze III and emerging fully formed, the Megiddo temple complex can only be understood as a political and territorial thrust from the north. Since the temples appear not to have been completed, we must assume that this attempt at territorial expansion into the southern Levant failed.

By whom this bold move was made is not clear, but the Egyptianized foundation deposit suggests that it was an entity that had close ties to Egypt. The closest parallel to the Megiddo temples is the triple temple complex from Byblos, the center with the most intensive contact with Egypt during the Early Bronze IV/Old Kingdom. While it would be going too far at this point to reconstruct a historical scenario in which a Byblite dynasty attempted a southern expansion with Egyptian blessings, it appears most likely that the agency for this event derived from the Lebanese and Syrian coastal regions that had the most direct interaction with the Egyptian state.

With the expansion of the date range from 2500 to 2000 B.C. for the Intermediate Bronze Age according to the new chronology, fitting the Megiddo temple event into that period is a daunting task. However, the Egyptianizing pottery does seem to help narrow the time period somewhat. Given that in the period from Pepi II to Montuhotep II (2200–2050 B.C.), no connections are in evidence between Egypt and the Levant, we might rule this period out. Typologically speaking, the foundation deposit is unlikely to date earlier than the Fifth Dynasty and its first king, Userkaf (accession ca. 2530–2489 B.C.; 68%), or later than the reign of Montuhotep II (accession ca. 2057–2040 B.C.; 68%; Bronk Ramsey et al. 2010). Therefore, these data considered, we appear logically restricted to a Fifth–Sixth Dynasty date (2500–2200 B.C.) or to a later period within the reign Montuhotep II after his reunification of Egypt in his fourteenth regnal year (ca. 2050–2000 B.C.).

For the later, there is data to indicate that Montuhotep II engaged in exploits far from Egypt, including in the far-off region of the Egyptian-Libyan-Sudanese border (Schneider 2010). There are also textual sources indicating military and commercial activity involving Asiatics and cedar (Redford 1992, pp. 69–70; Cohen 2002, pp. 34–35). However, the possibility of the Megiddo temples aside, the earliest datable Egyptian material found in the Levant in the Middle Bronze are fragments of Egyptian vessels from Middle Bronze I Tel Ifshar dating from after the reign of Senwosret I (Marcus et al. 2008).

Considering the association of Intermediate Bronze Age pottery with Stratum XV Megiddo and related tombs, however, the most likely period into which the Megiddo temple event might fit is in the late Old Kingdom of Egypt and the Early Bronze IVA of the northern Levant, when both regions are at the top of their game.

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