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The Ancient World Goes Digital

Case Studies on Archaeology, Texts, Online Publishing, Digital Archiving, and Preservation

Edited by

Vanessa Bigot Juloux Alessandro di Ludovico Sveta Matskevich



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Editors' Note

This second volume was a real epic given the global health situation. All our colleagues and friends have generously given their time. The transmission of knowledge is a duty that we all share, regardless of the difficulties encountered in acheiving it. Therefore we are proud and happy to share the fruit of several epic months of tremendous collaborations with the authors and other actors involved in one way or another in the conception of this second volume on digital practices and computational approaches.

We think warmly of our colleagues, friends and their family members who have unfortunately left us because of this health and economic crisis. We dedicate this volume to the students who are living in critical situations as a result of this pandemic.

Note on Phonology

Consonants with diacritical marks in Akkadian, Sumerian and Ugaritic:

```
'('aleph)
                a voiced laryngeal with a glottal stop which is used with vowels /a/, /i/,
                /u/ for 'a, 'i, 'u
'('ayin)
                a voiced pharyngeal
                a voiced interdental, as th in that
d(dal)
ġ (ġain)
                a voiced velar fricative, as French r
                a velar nasal, as ng
ĝ
h (ha)
                a voiceless velar fricative as German ch
h (hota)
                a voiceless pharyngeal with a stricture of the pharynx
                a voiceless palate-alveolar fricative, as sh in shame
š (šin)
ș (tsadé)
                an emphatic sibilant, as ts
                an emphatic voiceless dental, as t
t (tet)
                a voiceless interdental, as th in thin
<u>t</u> (<u>t</u>aana)
z(zu)
                an emphatic voiced fricative dental, as ts.
```

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Abbreviations

Series, Periodicals, and Publishers

AAASAnnales archéologiques arabes syriennes

ACalc Archeologia e Calcolatori

ACL Association for Computational Linguistics ACM Association for Computing Machinery American Journal of Archaeology AIA

AmAAmerican Anthropologist

AnatS Anatolian Studies

Alter Orient und Altes Testament AOAT

Archivi Reali di Ebla Testi ARET

Bulletin of the American Schools of Oriental Research BASOR

BHSBiblia Hebraica Stuttgartensia

Biblia Hebraica Quinta BHQ

BICS Bulletin of the Institute of Classical Studies

Bibliotheca Orientalis BiOr

BZAWBeihefte zur Zeitschrift für die Alttestamentliche Wissenschaft

CADChicago Assyrian Dictionary A Concise Dictionary of Akkadian CDA

CNRS Centre National de la Recherche Scientifique

Cuneiform Texts from Nimrud CTN

Cornell University Studies in Assyriology and Sumerology CUSAS

Digital Humanities Quarterly DHQHandbuch der Orientalistik HdO Histoire épistémologie langage HELHarvard Semitic Studies

HSS

Journal of Archaeological Method and Theory JAMTJournal of the American Oriental Society JAOS

Journal of Archaeological Science JAS Journal of Cuneiform Studies JCS

Journal of Machine Learning Research JMLRJournal of Northwest Semitic Languages JNSLJournal of the Text Encoding Initiative JTEI

Materiali Epigrafici di Ebla MEENEANear Eastern Archaeology

Orientalia Lovaniensia Analecta OLA

XX ABBREVIATIONS

PEQ Palestine Exploration Quarterly

PIHANS Publications de l'Institut Historique-Archéologique Néerlandais de

Stamboul

PLOS ONE Public Library of Science One
QuadSem Quaderni di Semitistica

RA Revue d'assyriologie et d'archéologie orientale

RHR Revue de l'histoire des religions

RIMA The Royal Inscriptions of Mesopotamia, Assyrian Periods

RINAP The Royal Inscriptions of the Neo-Assyrian Period

RANT Res Antiquae
ResOr Res Orientales
RSF Rivista di studi t

RSF Rivista di studi fenici SAA State Archives of Assyria

SANER Studies in Ancient Near Eastern Records

SANTAG SANTAG. Arbeiten und Untersuchungen zur Keilschriftkunde SBL-ANEM Society of Biblical Literature-Ancient Near East Monographs

SEG Supplementum Epigraphicum Graecum

SEL Studi Epigrafici e Linguistici sul Vicino Oriente Antico

SMSR Studi e materiali di storia delle religioni

STT1 Gurney, Oliver R., and Jacob J. Finkelstein. 1957. The Sultantepe

Tablets 1. Occasional Publications of the British Institute of

Archaeology at Ankara 3. London: The British Institute of Archaeology

at Ankara.

StOrE Studia Orientalia Electronica

TEO La Trouvaille Épigraphique de l'Ougarit

UAVA Untersuchungen zur Assyriologie und Vorderasiatischen Archäologie

UF Ugarit-Forschungen WO Die Welt des Orients

ZA Zeitschrift für Assyriologie und vorderasiatische Archäologie

Additional Shortened Forms

AAT Getty Art & Architecture Thesaurus

ACAWAI-CS Annotated Corpus of Ancient West Asian Imagery: Cylinder Seals

Amgg Ancient Mesopotamian Gods and Goddesses

Archibab Archives babyloniennes (XX^e–XVII^e siècles av. J.C.)

ARI Die alt- und reichsaramäischen Inschriften

ABBREVIATIONS XXI

ARIADNE Advanced Research Infrastructure for Archaeological Dataset

Networking in Europe

Ancient Records of Middle Eastern Polities ARMEP American Society of Overseas Research ASOR Banque de données des épiclèses grecques BDEG Base de Datos de Textos Neosumerios BDTNS

British Museum вм

CNR

Computer Applications and Quantitative Methods in Archaeology CAA

Cuneiform Digital Library Initiative CDLI

СНІ Cultural Heritage Imaging

Corpus Inscriptionum Graecarum CIG

Corpus Inscriptionum Iudaeae/Palestine CIIP Corpus Inscriptionum Semiticarum CIS

Consiglio Nazionale delle Ricerche Corpus of Seal Inscriptions of the Kassite period CSIK

CTCuneiform Texts from Babylonian Tablets in the British Museum

DDD Dictionary of Deities and Demons

Diganes Digitizing and Labeling Ancient Near Eastern Seals and Sealings

Divala Archaeological Database DivArDa Deutsche Nationalbibliothek DNB **EbDA** Ebla Digital Archives project

EDCS Epigraphische Datenbank Clauss-Slaby

EDH **Epigraphic Database Heidelberg**

Epigraphic Database Roma EDR

École polytechnique fédérale de Lausanne EPFL. Electronic Text Corpus of Sumerian Literature ETCSL

Humanities, Arts, and Social Sciences HASS

HUMOT Human Mobility between Oriens and Transpadana

Institute for Museum and Library Services IMLS Institute for the Study of the Ancient World ISAW Kanaanäische und aramäische Inschriften KAI Los Angeles County Museum of Art LACMA

MIA Minneapolis Institute of Art New Revised Standard Version NRSV

Official Inscriptions of the Middle East in Antiquity OIMEA

Oracc Open Richly Annotated Cuneiform Corpus Prosopography of Anglo-Saxon England PASE

PAT Palmyrene Aramaic Texts

Prosopography of the Byzantine Empire PBE

XXII ABBREVIATIONS

PIR Prosopographia Imperii Romani

RAI Rencontre assyriologique internationale
RIAO Royal Inscriptions of Assyria online project

RÉS Répertoire d'épigraphie sémitique

RS Ras Shamra

RSTI Ras Shamra Tablet Inventory
SAAO State Archives of Assyria Online
SBL Society of Biblical Literature

SESPOA Sceaux-cylindres du Proche-Orient ancien TGN Getty Thesaurus of Geographic Names

UMR Unités mixtes de recherche UNIL Université de Lausanne

UWDC University of Wisconsin's Digital Collections

VAM Vorderasiatisches Museum Berlin WSRP West Semitic Research Project

WPAIP Wisconsin Palmyrene Aramaic Inscription Project

CyberResearch

AI Artificial Intelligence

ANN Artificial Neural Networks

API Application Programming Interface

APSS Algebraic Point Set Surface

bit binary digit

BRDF bidirectional reflectance distribution function

CFG Context-Free Grammar

CIDOC CRM Conceptual Reference Model

CMOS complementary metal-oxide semiconductor

CNN Convolutional Neural Network

CPU Central Processing Unit

DAM Digital Asset Management

DBMS Database Management System

DEM Digital Elevation Model

DP Digital Practices

DSL Domain-Specific Language
DTD Document Type Definition

FAIR Findable, Accessible, Interoperable and Reusable

FOAF Friend of a Friend

ABBREVIATIONS XXIII

FoV Field of View

FRBR-00 Functional Requirements for Bibliographic Records-Object Oriented

GIS Geographic Information System

HAC Hierarchical Agglomerative Clustering

нн Hemispherical Harmonicsнsi Hyperspectral Imaging

ID identifier

IDF Inverse Document Frequency

IR infrared

JSON JavaScript Object Notation

LCP Least Cost Path

LCPA Least Cost Path Analysis

LD Linked Data
LOD Linked Open Data

LSTO Lexham Systematic Theology Ontology

мв Megabytes

MDS Multidimensional Scaling
MLR Multi-Light Reflectance

мs multispectral

MSI Multispectral Imaging

NB narrow bands
NIR near-infrared

NLTK Natural Language Processing
NLTK Natural Language Toolkit
ODD "One Document Does it all"

онсо Ordered Hierarchy of Content Objects

OWL Web Ontology Language

PCA Principal Component Analysis

PLD Portable Light Dome
PLY Polygon File Format

PMI Pointwise Mutual Information

ppi pixels per inch

PTM Polynomial Texture Mapping

QGIS Quantum Geographic Information System
RDBMS Relational Database Management System

RDF Resource Description Framework

RDFS Resource Description Framework Schema

RGB Red, Green, and Blue

RTI Reflectance Transformation Imaging

XXIV ABBREVIATIONS

SKOS Simple Knowledge Organization System

SfM Structure from Motion

SQL Structured Query Language

SSD Solid-State Drive Sw Semantic Web

TEI Text Encoding Initiative

TF Term Frequency

TF-IDF Term Frequency and Inverse Document Frequency
TURTLE Terse Resource Description Framework Triple Language

UI User Interface

URI Universal Resource Identifier

UTF Universal Character Set Transformation Format

uv Ultraviolet

uv/Vis uv-Visible spectroscopy

VIAF Virtual International Authority File
VIL Visible-Induced Infrared Luminescence

vis Visible

WADM Web Annotation Data Model XML Extensible Markup Language

XRF X-Ray Fluorescence
XSD XML Schema Definition

XSL Extensible Stylesheet Language

XSLT Extensible Stylesheet Language Transformation

Other

ACAWAI-CS Annotated Corpus of Ancient West Asian Imagery: Cylinder Seals

BCE Before Common Era

CE Common Era

DH Digital Humanities

ERC European Research Council

нв Hebrew Bible LBA Late Bronze Age

MAP Mapping Ancient Polytheisms—Cult Epithets as an Interface between

Religious Systems and Human Agency

PACTOLS Peuples et cultures, Anthroponymes, Chronologie, Toponymes,

Œuvres, Lieux et Sujets

SIG Specific Interest Group

TGIR Très grande infrastructure de recherche

Notes on Contributors

Tero Alstola

has a Ph.D. (Leiden University, 2017) and is a postdoctoral researcher at the Centre of Excellence in Ancient Near Eastern Empires at the University of Helsinki. He is a scholar of Near Eastern cultures and languages of the first millennium BCE, interested in studying ancient history with digital methods. His previous research has focused on migration and immigrants in Babylonian society. He is currently working on a project which studies the Akkadian language using computational methods from language technology. The project aims to enhance the understanding of an ancient language and to develop methods which can be used to study other extinct and living languages with small text corpora.

Preston L. Atwood

held multiple appointments in the Department of Classical and Ancient Near Eastern Studies at the University of Wisconsin-Madison, before becoming a dissertation fellow of the George L. Mosse and Mellon-Wisconsin fellowship programs. He was the Managing Editor from 2014-2015 for the Wisconsin Palmyrene Aramaic Inscription Project (WPAIP), for which he operated as the liaison to uw-Madison's Digital Collections Department, performed metadata entry for the WPAIP website, and drafted several sections of articles which eventually would be published through KUSATU and Maarav. From 2015–2016, Preston served as the Instructor for Biblical Hebrew I–II, and from 2016–2017 he was the Project Assistant to Dr. Ronald Troxel, analyzing and describing the relation between the Greek Septuagint of Isaiah and the Syriac Peshitta of Isaiah. Preston earned his BA in Humanities from Scarborough College, his MDiv and ThM from Southwestern Baptist Theological Seminary, and his MA in Hebrew Bible and Semitic Studies from the University of Wisconsin-Madison. His dissertation explores the possible influence of the Greek Septuagint of Isaiah on the Syriac Peshitta of Isaiah through the prism of Indirect Translation (ITr), a recent theoretical development in Translation Studies. Having presented his research at many different international venues (Society of Biblical Literature; International Linguistic Association; Classical Association of the Middle West and South; National Association of Professors of Hebrew), Preston is known for his interdisciplinary approaches to the study of the Hebrew Bible.

Luigi Bambaci

is a Ph.D. student in Jewish Studies at the University of Bologna. His doctoral dissertation concerns the preparation of a digital scholarly edition of the biblical book of Qohelet. His main research interests focus on textual criticism of the Hebrew Bible, on digital and computational philology.

Andrea Bellandi

has a Ph.D. in Computer Science and Engineering. He is a researcher at the Institute for Computational Linguistics "A. Zampolli"—CNR of Pisa. He also works at the TALMUD Project. His main research interests are the development of computer-aided translation systems, the knowledge representation, the development of ontologies in the domain of literary computing.

Drayton C. Benner

studied mathematics and computer science as an undergraduate at the University of Virginia and worked in scientific software before embarking on graduate education in the humanities, for which he earned a master's degree from Regent College (Vancouver, BC, Canada) in Old Testament and a master's and Ph.D. degree in Northwest Semitic Philology from the University of Chicago's Near Eastern Languages & Civilizations Department. His research centers on computational approaches to advancing research on the Hebrew Bible. He is also founder and President of Miklal Software Solutions. Miklal brings together computational sophistication with expert-level knowledge of ancient languages to offer cutting-edge tools and services in the areas of Biblical Studies, Semitics, and Digital Humanities. In his work for Miklal, he especially focuses on the fields of natural language processing, machine learning, and information retrieval in doing work for publishers, Bible software companies, and Bible societies. He has written software for doing text alignments, interlinear glossing, concordances, and search engines. In work for clients or under the Miklal label, he has also produced the first properly-displaying Hebrew Bibles with all of the vowels and cantillation marks on iPhone, Android, and most other major mobile platforms.

$Vanessa\ Bigot\ Juloux$

holds an advanced degree in Ugaritic (École des Langues et des Civilisations de l'Orient Ancien). She is a Ph.D. candidate at the École Pratique des Hautes Études (EPHE)—Paris Sciences et Lettres (PSL), and a Researcher Associate at the Institute of Archaeology & Siegfried H. Horn Museum (Andrews University, Michigan). Her research focuses on Ugaritic narrative texts and the

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anthropology of action, especially violence in political contexts. She is involved with several committees at the American Society of Overseas Research (ASOR). Since 2016, Vanessa has been co-organizing and co-chairing sessions on violence and Digital Humanities at ASOR and CAA annual meetings, and has also co-organized and co-chaired the first ASOR/EPHE-PSL European symposium (Paris, 2018, http://ancient-worlds-symposium.eu). She has developed open access guidelines for analyzing actions in TEI-XML. She also taught TEI courses at EPHE-PSL. She is currently co-editing a volume on violence in ancient cultures, and has co-edited a first volume on digitial practices and computational approaches, *CyberResearch on the Ancient Near East and Neighboring Regions*. (DBS 2, Brill, 2018).

Sean Boisen

is the Director of Content Innovation and Senior Information Architect at Faithlife (<faithlife.com>), the leading publisher of award-winning, multilingual software for Bible study. At Faithlife, he leads the development of semantic knowledge bases for reference, search, navigation, and digital library integration, as well as other activities in text and natural language processing, data science, and digital content creation. Prior to joining Faithlife in 2007, he was a senior scientist and director in Human Language Technology at BBN Technologies, a high-tech research and development company head-quartered in Cambridge, Massachusetts. In his 19 years with BBN, Sean worked in natural language processing, text categorization and retrieval, and speech to text transcription. Sean holds a MA in computational linguistics from UCLA, and an undergraduate degree in anthropology and linguistics from Occidental College. He has taught as an adjunct professor at Nyack College and Pomona College.

Federico Boschetti

graduated in Classics at the University "Ca' Foscari" of Venice in 1998. He earned his Ph.D. in Classical Philology jointly at the University of Trento and the University of Lille III in 2005 (thesis: "Essay of computer-assisted linguistic and stylistic analyses of the Aeschylus' Persae"). He received a second Ph.D. in Cognitive and Brain Sciences—Language, Interaction and Computation at the University of Trento in 2010 (thesis: "A Corpus-based Approach to Philological Issues"). Since 2011 he has been a researcher at the Institute of Computational Linguistics "A. Zampolli" of the CNR of Pisa. His research interests are: Digital Philology, Collaborative and Cooperative Philology, Historical OCR and Distributional Semantics applied to ancient texts.

Vanessa Boschloos

received her Masters degree in Archaeology and Art Studies from the Free University of Brussels-VUB (2003) and her Ph.D. from the same university (2012) with a dissertation on Egyptian and egyptianizing scarabs in the northern Levant. Currently, she catalogs scarabs in the Department of Egyptian Art of the Metropolitan Museum of Art as an Andrew W. Mellon Curatorial Research fellow, and is associated researcher in the Department of Archaeology of Ghent University. At the Royal Museums of Art and History in Brussels (2005–2017), Vanessa has been involved in excavations in the Middle East and in research projects and exhibitions at the Departments of the Ancient Near East and Ancient Egypt. One of her most recent ventures is the Egyptian Execration Statuettes project, undertaken in collaboration with the University of Leuven. It pertained to the development of a multispectral version of the already established Portable Light Dome system.

Joachim Bretschneider

is a Professor of Near Eastern Archaeology at the Department of Archaeology at the University of Ghent (Belgium). He received his Ph.D. in Near Eastern Archaeology from the University of Münster (Germany) in 1990 and was lecturer and professor at the Near Eastern Department of the KU Leuven until 2014. In Syria, he directed the German excavations at Tell Beydar between 1993-2000. He has led the Belgian Excavation Mission at Tell Tweini (Syria) since 1999. He is the current director of the Belgian participation in the Saudi-Belgian Research Project at Al-Ghat/Saudi Arabia and in 2014 he co-initiated the Pyla-Kokkinokremos excavation on Cyprus. His main research interests focus on the transition from the Late-Bronze to the Early Iron Age in the Levant and Eastern Mediterranean; the development of early urbanism in the Near East; inter-regional contacts; and glyptics in administrative systems and ancient Near Eastern art. He has written over 100 journal articles, books, book chapters, and reviews. His most recent book (Jans G. & Bretschneider J., Seals and Sealings of Tell Beydar/Nabada) analyses the glyptic material of an Early Bronze Age official household in Northern Mesopotamia.

Jan Driessen

holds a Ph.D. from the Faculty of Arts at the University of Leuven. He was a postdoctoral researcher at the École française d'Athènes (1989–1993) and the University of Leuven (1993–1999) before being appointed Professor of Greek Archaeology at the Université Catholique de Louvain where he directs the AEGIS (Aegean Interdisciplinary Studies) research group, which brings

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together a dozen doctoral and postdoctoral researchers. Since April 2012 he has also been the acting director of the Belgian School at Athens. Driessen has broad archaeological experience with participation, direction or co-direction of excavations especially in Greece, but also in Cyprus, Turkey, and Syria. He was the co-director of the British School excavations at Palaikastro and the École française excavations at Malia. Since 2007, he has directed the Belgian excavations on Crete, at Sissi, (<www.sarpedon.be>), financed by the Institute for Aegean Prehistory, the UCL, the National Research Foundation, the Belgian School at Athens, the Brussels-Wallonia Federation, Loeb Classical Library and private sponsors. Since 2014, he has also co-directed a new excavation program at Pyla-Kokkinokremos on Cyprus, which takes place within the framework of a major interdisciplinary project (ARC) on the crisis years in the late thirteenth c. BCE Eastern Mediterranean.

Hendrik Hameeuw

is a research fellow at the University of Leuven (Research Unit Ancient History) and affiliated with the Royal Museums of Art and History, Brussels (Antiquity Department) and Ghent University (Department of Archaeology). He graduated as an archaeologist (2003) and Assyriologist (2002) and has since specialized in the use of new imaging techniques for cultural heritage artefacts and archaeological sites. He has participated in archaeological excavations in Syria, and has conducted imaging missions in Egypt, Turkey and multiple places in Europe and the U.S. Currently, Hendrik works for Advanced Imaging, at the Digitisation Lab of the University Libraries KU Leuven. In collaboration with the Department of Electrical Engineering (ESAT) at the University of Leuven, Hendrik was from the start involved in the development of the Portable Light Dome (PLD) system. He has also used RTI, µCT and SfM photogrammetry techniques on museum objects and in the field at rock art sites in Sweden and Egypt. In the past and today, he coordinates projects that develop new acquisition and processing methods with multi-light/spectral systems and work on new strategies towards sustainable consultation platforms for interactive 2D+ relightable images.

Sorin Hermon

is an Associate Professor and head of the Digital Cultural Heritage research group at STARC, the Cyprus Institute (CyI), which focuses its scientific activities on two convergent fields: 3D approaches to the study of the past and big data for knowledge repositories. He is the director of STARLAB, a mobile laboratory for Heritage Science, including instrumentation for non-invasive

chemical-physical measurements, 3D documentation, technical imaging and remote sensing. The mobile lab provides scientific expertise to archaeological excavations on Cyprus and in the region, at art museums and heritage collections. Hermon obtained competitive grants from various EU programs, the most recent ones being EMAP, ARIADNE, E-RIHS PP and GRAVITATE. He is the author of one book, editor of several books and has peer-reviewed conference proceedings and authored more than 60 scientific papers. He is currently supervising three Ph.D. students and is regularly teaching courses for the Science and Technology in Archaeology doctoral program of the Cyprus Institute. Hermon has an extensive knowledge of prehistoric and proto-historic lithic assemblages from the southeastern Mediterranean, working extensively on the typo-technological analysis of lithic material culture from various regions and periods and their contribution to the understanding of socio-economic and cultural aspects of past societies.

Elena Gritti

graduated with honors under the supervision of Prof. P. Cesaretti at the Faculty of Humanities of the University of Bergamo with a final dissertation on Roman History entitled Ravenna—Caput Italiae? Indagini recenti sulla città nel contesto dell'alto Adriatico tardo antico, where she considered the development of late ancient Ravenna not only on its own, but also in relation to other important areas, urban centers in the Mediterranean and more specifically in the Adriatic. Her final dissertation was the result of the translation and analysis of written sources and archaeological evidence. Her Ph.D. was assessed as "excellent" under the supervision of Prof. A. Buonopane at the University of Verona, Department of Historical and Anthropological Sciences, with a final dissertation on Late Ancient History entitled Eugippii Vita sancti Severini. Dal testo al territorio: il Norico tardoantico. The dissertation was a historical and cultural reconstruction of the context in the late antiquity province of Noricum, the main setting for the source's narrative. She was a Research Fellow at the University of Bergamo (until October 2019). The aim of her research is the development of a prosopographical reference work on ancient mobility, also in a digital format. Her project takes into consideration people who were born in Transpadana as well as Oriens who traveled, respectively, to the other pars Imperii between the second and seventh century CE. It is entitled Human mobility between Oriens and Transpadana: A prosopographical research (98-604) (HUMOT) (published in 2018-2019).

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Angelo Mario Del Grosso

is a computer engineer with a Ph.D. in Information Engineering; Angelo Mario is also a researcher at the Institute for Computational Linguistics "A. Zampolli"—CNR of Pisa. He has been involved in national and international projects in the domain of Digital Humanities. With others, he worked at the Clavius on the Web Project, the Saussure PRIN Project, and the Greek into Arabic ERC Project. His main research interests include object-oriented approaches for modeling Abstract Data Types applied to the DH domain; analysis, design and development of software components for linguistic and philological applications in the domain of digital scholarly editing.

Élodie Guillon

is in charge of the scientific and administrative coordination of the ERC project "Mapping Ancient Polytheisms: Cult Epithets as an Interface between Religious Systems" (MAP—741182). Since her Ph.D. in 2013 (thesis entitled "The Hinterlands of the Phoenician Cities in the Hellenistic Period (Fourth–First Century BCE): Historical and Spatial Approaches of a Geocultural Area"), she studies territory, territorial organization and networks animating space. She works on the spatial approach and new tools, such as spatial modeling, quantitative and statistical analysis that highlight Phoenician Punic sites' complexity and structuration, as well as their interactions with their environment. As part of the project, she develops workflows for the implementation of these new tools in the historical sciences and promotes the understanding of their value, benefits and limits by researchers. She also participates in the humanistic aspects of the research, especially in spatial analyses and archaeological data processing within the Semitic component of the project.

Heidi Jauhiainen

studied Egyptology where her interests lay in local and individual religion as well as everyday life. After defending her doctoral thesis on Feasts and Festivals in Deir el-Medina in 2009, she has earned a bachelor's degree in Computer Science. Since 2013, she has been working on a project identifying and harvesting pages written in Finno-Ugric languages on the Internet. She has been responsible for crawling the internet and post-processing and publishing the texts found. She has also worked with Assyriologists and Language technologists on finding semantic domains in Akkadian texts. Her main interests include corpus linguistics, especially the analysis of texts, and text mining. Currently she is working on producing machine-readable hieroglyphic texts.

Simon Jusseret

graduated in Geology from the University of Liège (*Université de Liège*, 2006) and in Archaeology from the University of Louvain (Université Catholique de Louvain, UCL, 2007), where he also earned his Ph.D. in Archaeology (2011). He has been a postdoctoral researcher in the Department of Anthropology of the University of Texas at Austin, US, and a research collaborator in the Aegean Interdisciplinary Studies research group at UCL since 2015. Since 2012, he has also acted as a guest lecturer at UCL (geoarchaeology, archaeometry). His research interests focus on geoarchaeology, environmental archaeology (phytolith studies), Cretan and Cypriot Bronze Age archaeology, earthquake archaeology, agent-based modeling, salt archaeology and the archaeology of the recent past. He is involved in several interdisciplinary research projects as a geoarchaeologist and/or archaeologist (Crete, Cyprus, France) and acts as a field director for the UCL team at Pyla-Kokkinokremos (Cyprus-Pyla Excavation Project Louvain/Ghent). He is the lead editor of the recent volume "Minoan Earthquakes: Breaking the Myth through Interdisciplinarity" (Leuven University Press, 2017).

Athanasia A. Kanta

is Hon. Director of Antiquities for the Heraklion Prefecture (Greece). She received her degree in History and Archaeology at the University of Athens and her doctoral degree at the University of London, Institute of Archaeology, specializing in Mediterranean prehistory. She was assistant professor of Archaeology at the University of Crete, associate director of the Archaeological Institute of Cretological Studies and of the Heraklion Archaeological Museum, as well as Director of Antiquities for the Heraklion Prefecture on Crete. She is active in numerous archaeological societies, assuming also important roles such as the director of the Study Center of Cretan and Mediterranean Archaeology at Monastiraki Amari and Secretary General of the Mediterranean Archaeological Society, Rethymnon. She has published 16 books and over 50 scientific articles and participated and directed in over 100 excavations in different areas of Crete, including the Anetakis plot in Knossos and the palatial center of Monastiraki Amari (Crete). She is involved in the excavation of Pyla-Kokkinokremos in Cyprus, together with Vassos Karageorghis, Jan Driessen and Joachim Bretschneider.

Anas Fahad Khan

has a Ph.D. in Computer Science and is a researcher at the Institute for Computational Linguistics "A. Zampolli"—CNR of Pisa. He revised and restructured the semantic relations between the themes and motifs of the "Memorata

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Poetis" project, in order to develop a more efficient and well-structured taxonomy. He developed (along with others) an RDF model based on the *lemon* model for representing diachronic lexico-semantic information. He is continuing to work on the publication of the Parole Simple Clips lexicon as Linked Data. He is an active participant in the Ontolex w3c community.

Anna Kurmangaliev

is currently the research assistant in the "Annotated Corpus of Ancient West Asian Imagery: Cylinder Seals" (ACAWAI-CS) project. She studied Ancient Near Eastern Archaeology, Assyriology and Egyptology in Munich, taught at the Institute of Oriental Studies in Vienna, was a doctoral fellow at the Munich Graduate School for Ancient Studies "Distant Worlds," and the assistant of Prof. Adelheid Otto at the Institute of Near Eastern Archaeology at Ludwig-Maximilians-University Munich. In her finished Ph.D. research, she analyses the iconography of the Mesopotamian Sun God, processing big amount of visual data preserved mainly on cylinder seals. Eventually, her research interests led to her participation in the "Digitizing Ancient Near Eastern Seals and Sealings" (Diganes) project and the current follow-up project ACAWAI-CS. The main goal of the ongoing project is to create an open access platform that enables semantic studies on ane seals and sealings.

Alessandro di Ludovico

(Ph.D.), cooperates as Near Eastern archaeologist with Sapienza University of Rome. He has taken part to excavation campaigns in Syria, the Levant and Oman. His main research interests deal with quantitative methods applied to archaeology and art history, perception and communication phenomena in ancient Syria and Mesopotamia, and the cultural history of the ancient Near East. In the field of quantitative methods, he used mathematical and statistical models in the investigation of ancient Near Eastern glyptic visual languages, and co-edited the volume "CyberResearch on the Ancient Near East and Neighboring Regions" (DBS 2, Brill, 2018), dedicated to digital practices in ancient Near Eastern studies. The largest part of his research on cultural history deals with the dynamics of power and communication within the reign of the Ur III Dynasty, while his main efforts in the investigation of the production and perception of visual messages have been carried out in the research on presentation scenes in glyptic and on the third millennium wall paintings from Ebla (Building FF2—still in progress). He is co-director of the monograph series in historical geography "Atlante del Vicino Oriente Antico" (AVOA-AANE, Sapienza University).

Sveta Matskevich

is an associate research fellow in the Institute of Archaeology at the Hebrew University of Jerusalem. Trained as a field archaeologist, she participated in excavation projects in Israel, Greece and Turkey, mainly as a surveyor, draught-sperson, and DBMs architect and administrator. Her research interests include archaeological data management, field methods, and history of archaeology. She is currently starting her own excavation of the site of Tel Mevorakh (Israel), as part of a regional project investigating natural environment and transportation networks in southern Phoenicia during the Middle-Late Bronze Age.

Massimo Maiocchi

has been a research fellow at the Humanities Department of Ca' Foscari University of Venice since 2017. He is an expert in the History of the Ancient Near East and Assyriology (Sumerian, Akkadian, Eblaite), with specialisation in cuneiform texts from the fourth and third millennia BCE. Previously, he was a Postdoctoral researcher and lecturer at the Department of Near Eastern Languages and Civilizations of the University of Chicago, where he expanded his research interests to include Grammatology (the comparative study of writing systems). He has published two monographs concerned with the edition of Old Akkadian cuneiform tablets from southern Mesopotamia (CUSAS 13 and 19), as well as several articles in specialized journals. His research primarily focuses on how writing affected social and urban development in early Mesopotamia, approaching ancient sources through the prism of traditional philology, textual criticism, and Digital Humanities. He is an associate editor of the Ebla Digital Archives project (http://ebda.cnr.it, under the direction of L. Milano), providing the online edition of the entire cuneiform corpus unearthed at Ebla (modern Tell Mardikh, Syria). He also took part in archaeological expeditions in Syria (Tell Mozan) and survey projects in Iraq.

Lucio Milano

is Professor of History of the Ancient Near East at Ca' Foscari University of Venice. His research activity has mainly focused on the economic and social history of Syria and Mesopotamia between the third and second millennium BCE. With reference to this field of studies, he has published a series of monographs and numerous articles with critical editions of cuneiform texts from the Royal Archives of Ebla/Tell Mardikh, as well as from other Syrian sites (Tell Mozan, Tell Leilan, Tell Beydar). He co-authored with A. Westenholz *The Shu-ilisu archive* (CDL Press 2015) which deals with the final stage of the Akkadian empire domination of Mesopotamia. He researched the history of food in

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the ancient Near East. He has written numerous essays on the subject, organized conferences, and edited publications (*Mangiare divinamente*, Firenze 2013; *Paleonutrition and Food Practices in the Ancient Near East*, Padua 2014, among others). He is the editor-in-chief of the Ebla Digital Archives project (http://ebda.cnr.it).

Gloria Mugelli

is a Ph.D. candidate in Classics and Anthropology of the Ancient World at the University of Pisa and at the Centre Anhima of the École des Hautes Études en Sciences Sociales in Paris. She is researching the form and function of rituals (sacrifice, supplication and funerary rites) in ancient Greek tragedy, focusing on the relationship between ritual and dramatic performances. Her research, based on the corpus of the surviving ancient Greek tragedies, adopts the Euporia system.

Terhi Nurmikko-Fuller

is a Senior Lecturer in Digital Humanities at the Australian National University. She focuses on interdisciplinary experimentation into ways digital technologies can support and diversify research in the Humanities, Arts, and Social Sciences, and used in the cultural heritage sector. She is a CI on two Australian Research Council projects (Nyingarn: a Platform for Primary Sources in Australian Indigenous Languages, led by University of Melbourne, and Mapping Print, Charting Enlightenment, led by University of Western Sydney). Terhi is a Research Fellow (2019–2022) of the University of Illinois Urbana-Champaign, US; a member of the Territory Records Advisory Council, Australian Capital Territory Government; and a HASS DEVL Champion (2018) at eResearch South Australia. She's a member of the Steering Committee for Linked Pasts and Chair of the Advisory Board for Conductive Music. Her book "Linked Data for the Digital Humanities" is under contract with Routledge. She's currently working on Liberal Sydney, investigating the development of liberalism in Australian politics, and will be taking up the Gale Asia-Pacific Digital Humanities Oxford Fellowship at the Bodleian Libraries at the University of Oxford, UK in early 2023.

Martina Polig

received her Bachelor's degree in archaeology and conservation of cultural heritage at the University of Ca' Foscari in Venice (Italy) and her Master Degree at Lund University in Sweden. She specialized in new technologies applied to archaeology and received extensive training in the 3D documentation and

analysis of cultural heritage. In her research, she applies different 3D acquisition methods such as Image-Based Modelling and various types of laser scanning, a set of software for the visualization and manipulation of 3D models and 3D GIS. Following her MA degree she received a research grant by the C.M. Lerici Foundation in Stockholm, which funded a research project that she carried out at Lund University. Since 2017 she has been a research assistant at the Science and Technology in Archaeology (STARC) at the Cyprus Institute in Nicosia (Cyprus). In the same year, she also became part of the scientific committee of the Cultural Heritage and New Technology (CHNT) conference as the representative of young researchers. Currently, she is enrolled in a joint Ph.D. program between the Cyprus Institute and the University of Ghent in Belgium in which she investigates finds from the Pyla-Kokkinokremos Bronze Age site in Cyprus.

Fabio Porzia

is doing post-doctoral research with ERC project "Mapping Ancient Polytheisms: Cult Epithets as an Interface between Religious Systems" (MAP—741182), in which he is responsible for Levantine epigraphic and literary sources from the first millennium BCE. He holds an MA in Biblical Exegesis from the Pontifical Biblical Institute in Rome and a doctorate in Ancient History from the University of Toulouse—Jean Jaurès. His thesis, supervised by Prof. Corinne Bonnet and Prof. Stefania Mazzoni and entitled "Ruling with the Book. A certain idea of ancient Israel," sought to reconsider how archaeologists, historians and biblical exegetes struggle with the category of "identity" and "ethnicity" applied to the study of ancient Israel. Fabio is active in archaeological and historical research in the Southern Levant, and his research interests lie particularly in the large spectrum of interactions existing among different communities in the region.

Miller Prosser

earned his Ph.D. in Northwest Semitic Philology from the Department of Near Eastern Languages and Civilizations of the University of Chicago. He works as a research database specialist at the OCHRE Data Service of the Oriental Institute of the University of Chicago. His research interests range widely from the Late Bronze Age kingdom of Ugarit to the application of digital tools to academic research questions. As co-director of the Ras Shamra Tablet Inventory project, he is working to model archaeological and philological data from Ras Shamra-Ugarit in a research database environment. This project addresses a broad spectrum of topics—including modes of socio-economic organization, prosopography, orthography, epigraphy, and grammar—and integrates various

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types of data—including digital photographs, text editions, and GIS data. In addition to his work on Ugarit, Miller consults with other research projects at the Oriental Institute and around the world, ranging in content areas from Greek coin hoards, to the Hebrew Bible, to digital tools used in archaeological excavations. In addition, Miller is an experienced academic photographer, having served as a photographer for archaeological expeditions in Turkey and Israel and as a tablet photographer for the Persepolis Fortification Archive project and the epigraphic team of the Mission de Ras Shamra.

R. Jesse Pruett

is a graduate student currently in the coursework phase of a doctoral program at the University of Wisconsin-Madison in the Department of Classical and Ancient Near Eastern Studies. During his time at the university, Jesse has been a University Fellow and a Project Assistant for the Wisconsin Palmyrene Aramaic Inscription Project, for which he served as a liaison to uw-Madison's Digital Collections Department, performed data and image entry for WPAIP's website, and assisted on photo shoots of several objects associated with the Palmyrene presence in Romania during the Roman period. Additionally, as part of his work with WPAIP, Jesse is currently drafting portions of articles providing script analysis of Palmyrene Funerary inscriptions. Prior to attending uw-Madison, Jesse earned a BA in Biblical Studies and Biblical Languages from Ouachita Baptist University, a BA in Biblical Exegesis from Wheaton College, and an MA in Jewish Studies from Hebrew Union College-Jewish Institute of Religion. In addition to his work with Palmyrene Aramaic, Jesse's interests include the historical and sociolinguistic analysis of biblical texts, especially those associated with the Deuteronomic History, a topic he hopes to pursue for dissertation research.

Elisa Roßberger

is professor for Explorative Visual Archaeology of the Ancient Near East at Freie Universität Berlin. Her research focuses on the material and visual cultures of ancient Iraq and Syria, dating to the third and second millennia BCE. She received her PhD in Near Eastern Archaeology from the University of Tübingen in 2010. In 2017, she initiated the project "Digitizing and Labeling Ancient Near Eastern Seals and Sealings" (Diganes), funded by the German Ministry of Education and Research. The follow-up project "Annotated Corpus of Ancient West Asian Imagery: Cylinder Seals" (ACAWAI-CS) was launched in October 2020 and aims to facilitate the integration of the material, visual, and textual aspects of seals and sealings. Her archaeological fieldwork experience includes sites in Syria, Lebanon, Jordan, Turkey, Iraq, and Uzbekistan.

Giusi Sorrentino

received her bachelor's degree in "Science of Cultural Heritage" at the University of Pisa (Italy) in 2013. During her studies she participated in several archaeological excavations and started to collaborate with the Applied Laser Spectroscopy Lab (Als-Lab) of ICCOM-CNR (Pisa, Italy) and with the Center for Ancient Mediterranean and Near Eastern Studies (Florence, Italy). Currently, she is enrolled in the Archaeology Master program at University of Pisa where she focuses her study in the Cypriot prehistory, Aegean and Near Eastern archaeology. Since 2015 she has worked at the Science and Technology in Archaeology Research Center (STARC) of The Cyprus Institute as a Research Assistant. Her research focuses mainly on non-destructive analysis of archaeological materials. She participated in European funded projects such as Ariadde and Gravitate where she gained experience with metadata ingestion in repositories, web and graphic design and photogrammetry.

Alexander Städtler

studied Prehistoric Archaeology at the Free University of Berlin. During his Master studies, he developed a focus on spatial analysis and GIS methods and applied that to the field of ancient Near East Archaeology. He was involved in several projects of the German Archaeological Institute in the region and is currently preparing his Ph.D. dissertation on trade routes in ancient Arabia.

Andrea Taddei

is an Associate Professor of Ancient Greek Language and Literature at the University of Pisa. He is the Scientific Secretary of the Laboratorio di Antropologia del Mondo Antico, and an associate member at the Centre Anhima-ehess in Paris. The main fields of interest of his research are ancient Greek literature of the archaic and classical period studied under an anthropological perspective, ancient Greek religion and ancient Greek law. He is also interested in didactics of ancient languages.

Athena Van der Perre

obtained a master degree in Egyptology (2008) and in Cultural Studies (2009) at KU Leuven. In 2015, she obtained her Ph.D. in Egyptology at the same university, with a dissertation on Amarna Period limestone quarries in the greater Dayr al-Barsha region (Middle Egypt). Since 2010, she has been a member of the KU Leuven Dayr al-Barsha project, participating in the excavations in Dayr al-Barsha, where she was responsible for the 3D documentation of quarry ceilings. Between 2015 and 2017, Athena was involved in the Egyptian Execration

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Statuettes project at the Royal Museums of Art and History, Brussels. In collaboration with her colleagues at the KU Leuven and the RMAH, she worked on the development and implementation of the multispectral Portable Light Dome for ancient Egyptian heritage. Currently she works as a post-doctoral researcher on the EOS project: "Pyramids & Progress: Belgian expansionism and the making of Egyptology, 1830–1952," at the KU Leuven.

Randall W. Younker

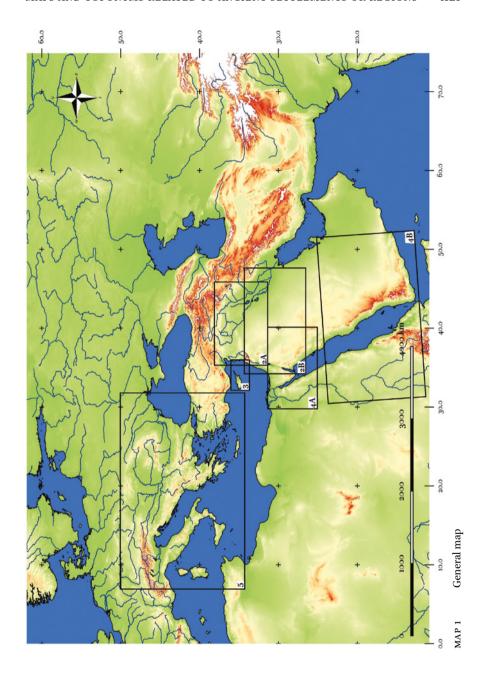
is Professor (Archaeology and History of Antiquity), Director of the Ph.D. (Biblical and Ancient Near Eastern Archaeology) Program, and Director of the Institute of Archaeology at Andrews University, Berrien Springs, Michigan. He received his MA and Ph.D. in Near Eastern Studies from the University of Arizona under Prof. William G. Dever. Randy has been a field archaeologist the last forty years working in Israel, Cyprus, Sicily, Turkey and Jordan. Currently, he is senior Project Director at Tall Jalul (Jordan) for the Madaba Plains Project and Senior Co-director for the San Miceli excavation (a paleo-Christian site) in Sicily. He has served as a trustee on the boards of the W.F. Albright Institute of Archaeological Research in Jerusalem, and the American Schools of Oriental Research (ASOR). He has co-edited nine books and published or co-published over seventy-five scholarly and professional articles. He served as chair of the ASOR Membership and Outreach Committee and it was in this capacity that he became interested in, and involved with Digital Humanities supporting Vanessa Bigot Juloux in her organizing the symposium on Digital Humanities and Violence, sponsored by ASOR and École Pratique des Hautes Études—Paris Sciences et Lettres (EPHE-PSL), with the collaboration of the Institute of Archaeology & Siegfried H. Horn Museum (Andrews University, Michigan) and in partnership with the Louvre Museum, in Paris, September 4-6, 2018.

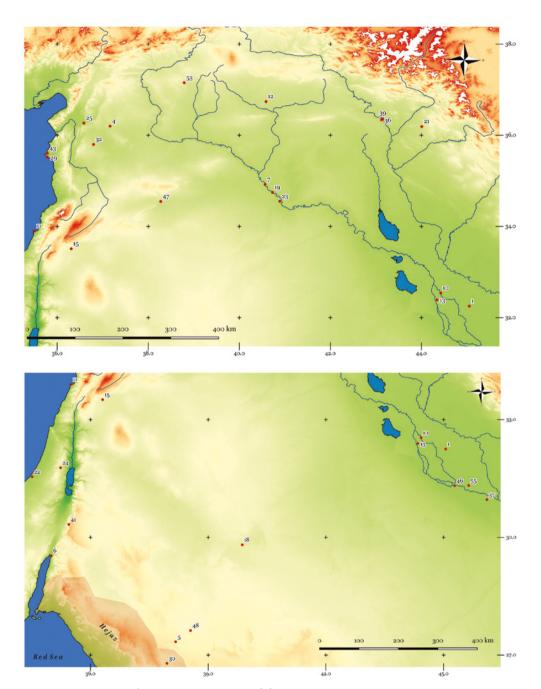
Maps and Toponyms Related to Ancient Settlements or Regions

List by toponyms (in brackets the ancient equivalent, if the correspondence is known)

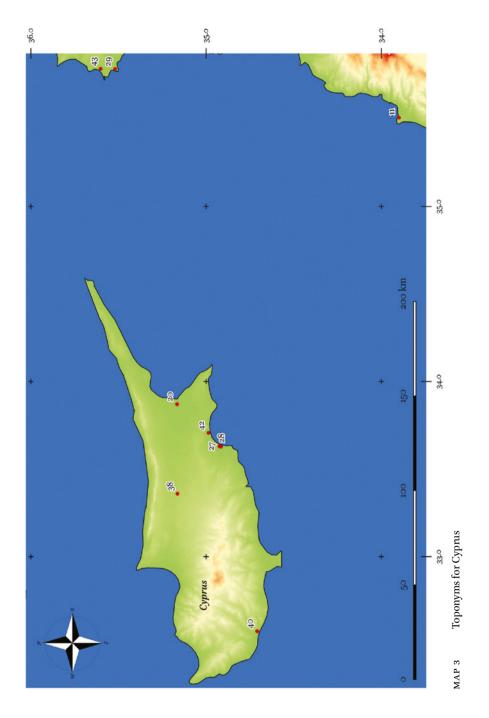
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Larnaka
     Abu Salabikh, Tell
                                         28.
1.
                        2A, 2B
                                                        3
                                               Lattakia
     Alouare
                                                        2A, 3
               4 B
                                         29.
2.
     Akmonia
                                               Mada'in Saleh (Hegra)
                                         30.
                                                                      2B, 4A
3.
                                               Madinah, al- (Iatrippa)
     Aleppo 2A
4.
                                         31.
                                                                      4B
     Antariyah, el- 2B, 4A
                                               Mardikh, Tell (Ebla) 2A
5.
                                         32.
6.
     Agaba 2B, 4A
                                               Mecca 4B
                                         33.
     Ashara, Tell (Terga)
                                               Mochura 4A, 4B
7.
                                         34.
     Athens 5
8.
                                         35.
                                               Mogayra 4A
     Ausara 4A
                                         36.
                                               Mosul 2A
9.
     Babylon 2A, 2B
                                               Muqayyar, Tell al- (Ur)
10.
                                         37.
                                               Nicosia 3
     Beirut (Bervtus) 2A, 2B, 3
                                         38.
11.
     Beydar, Tell (Nabada) 2A
                                               Nineveh 2A
12.
                                         39.
     Birs Nimrud (Borsippa) 2A, 2B
                                               Palaepaphos-Teratsoudhia 3
13.
                                         40.
     Carthage 5
                                               Petra 2B, 4A
14.
                                         41.
     Damascus 2A, 2B
                                               Pyla-Kokkinokremos
15.
                                         42.
     Dayr al-Barsha 4A
                                               Ras Shamra (Ugarit)
16.
                                                                    2A, 3
                                         43.
     Dedan 4A
                                               Rome 5
17.
                                         44.
     Dumat al-Jandal
18.
                                               Sahl al-Mattar 4A
                                         45.
     (Adummatu)
                                               Samawah 2B
                    2B, 4A
                                         46.
     Dura Europos
                                         47.
                                               Tadmor (Palmyra)
19.
                     2A
     Enkomi 3
                                         48.
                                               Tayma 2B, 4A
20.
     Erbil (Arbela)
                                               Tegea 5
21.
                                         49.
                                               Thebes 4A, 4B
22.
     Gaza 2B
                                         50.
     Hariri, Tell (Mari)
                                               Timișoara 5
23.
                                         51.
     Ierusalem
                                               Timna 4B
24.
                                         52.
     Judeideh, Tell
                                               Urfa (Edessa)
25.
                                         53.
                                                              2A
26.
     Khurayba, al-
                                               Wajj, al- 4A
                    4 A
                                         54.
                                               Warka (Uruk)
     Kition 3
27.
                                         55.
                                                             2B
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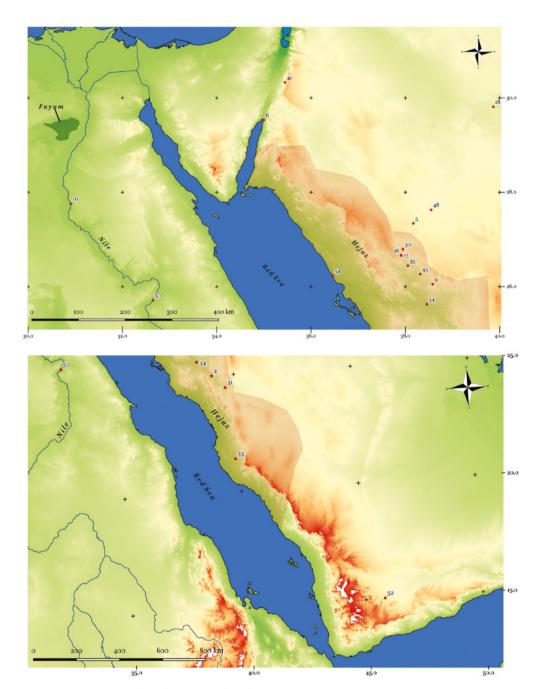
For further information on site locations, see *Ancient Locations*, http://www.ancient locations.net.



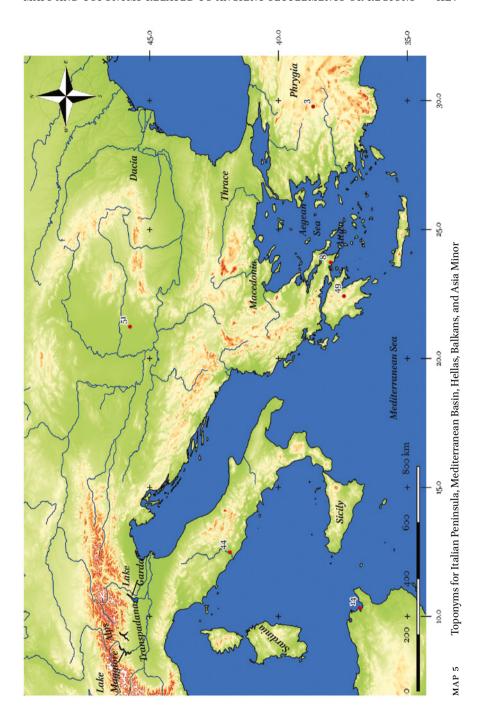


MAP 2A-B Toponyms for Mesopotamia, Syria, and the Levant





мар 4A–в Toponyms for Arabian Peninsula and Egypt



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