The Undeciphered Signs of Linear B

Decades after Michael Ventris deciphered Linear B and showed that its language was Greek, nearly one-sixth of the sound-values of its syllabic signs are still unknown. This book offers a new approach to establishing the possible values of these undeciphered signs. Analysis of Linear B's structure and usage not only establishes the most likely sound-values of these signs – providing the best possible basis for future decipherments – but also sheds light on the writing system as a whole. The undeciphered signs are also used to explore the evidence provided by palaeography for the chronology of the Linear B documents and the activities of the Mycenaean scribes. The conclusions presented in this book therefore deepen our understanding not only of the undeciphered signs but also of the Linear B writing system as a whole, the texts it was used to write and the insight these documents bring into the world of the Mycenaean palaces.

ANNA P. JUDSON is a Research Fellow in Classics at Gonville & Caius College, Cambridge. Her PhD thesis on the undeciphered signs of Linear B won the University of Cambridge's Hare Prize for the best Classics thesis. She is now researching the writing practices of the Mycenaean scribes.
CAMBRIDGE CLASSICAL STUDIES

GENERAL EDITORS

J. P. T. CLACKSON, W. M. BEARD, G. BETEGH,
R. L. HUNTER, M. J. MILLETT, S. P. OAKLEY,
R. G. OSBORNE, T. J. G. WHITMARSH
The Undeciphered Signs of Linear B

Interpretation and Scribal Practices

Anna P. Judson
Gonville & Caius College, Cambridge
Contents

List of Figures  [page viii]
List of Tables   [x]
Acknowledgements   [xi]
Citations of Texts   [xiii]
Transcription Conventions   [xv]
Notes on Images and Fonts   [xvi]
List of Abbreviations   [xvii]

1 The (Ongoing) Decipherment of Linear B   [1]
   1.1 Introduction   [1]
   1.2 The History of the Decipherment   [5]
   1.3 Writing Greek in Linear B   [12]
   1.4 Linear B’s Origins and Relationships with Other Writing Systems   [20]
      1.4.1 Linear A   [23]
      1.4.2 Cretan Hieroglyphic   [27]
      1.4.3 Cypro-Minoan and the Cypriot Syllabary   [29]
   1.5 Decipherment Methodologies since 1952   [31]

2 Identifying ‘Missing’ Values in the Linear B Syllabary   [36]
   2.1 Methodology   [36]
   2.2 Missing ‘Core’ Values   [40]
   2.3 Missing ‘Extra’ Values   [43]
      2.3.1 /hV/: $a_2 \odot = /ha/$   [44]
      2.3.2 Diphthongs   [47]
         2.3.2.1 $a_1 \odot = /a/ /i/$   [47]
         2.3.2.2 $ra_2 \odot = /ra/, /la/$   [49]
         2.3.2.3 $au \odot = /a/ /u/$   [51]
      2.3.2.4 Summary of diphthongs   [53]
      2.3.3 Aspirated stops: $pu_2 \odot = /p\#u/$   [54]
      2.3.4 CwV signs   [59]
         2.3.4.1 $dwo \odot / \odot = /y/ /a/ /\odot$   [59]
         2.3.4.2 $dwe \odot = /y/ /e/ /\odot$   [61]
         2.3.4.3 $twe \odot = /t/ /e/ /\odot$   [62]
         2.3.4.4 $two \odot = /t/ /\odot$   [66]
         2.3.4.5 $mwa \odot = /m/ /w/ /\odot$   [67]
      2.3.4.6 Summary of CwV signs   [68]
   2.3.5 CyV signs   [72]
      2.3.5.1 /RyV/: $ra_2 \odot / \odot = /ya/ > /Ra/ > /RRa/; ro_2 \odot = /yo/ > /RRo/$   [72]
Contents

2.3.5.2 /TyV/: ta, ὑ = /t(h)ya/ [75]
2.3.5.3 Summary of CyV signs [78]
2.3.6 CCV signs: pte ᛠ [82]
2.4 Other Possible Types of Values [86]
2.4.1 Greek phonemic values not otherwise distinguished by the writing system [86]
2.4.2 Other Greek consonant clusters [87]
2.4.3 Non-Greek values [89]
2.5 Conclusions [91]
2.5.1 Values of the undeciphered signs [91]
2.5.2 Linear A and Minoan [93]
2.5.3 Linear B inventions and use of signs [94]

3 The Undeciphered Signs Inherited from Linear A [96]
3.1 *65 ἆ [98]
3.2 *56 ἄ [112]
3.3 *22 ἂ [123]
3.4 *34 ἄ [128]
3.5 *47 ἄ [135]
3.6 *49 ἄ [138]
3.7 *82 ἄ [140]
3.8 *79 ἄ [145]
3.9 *86 ἄ [148]
3.10 Conclusions [150]

4 The Undeciphered Signs with no Certain Linear A Correspondences [151]
4.1 Signs with Possible Correspondences in the Earlier Cretan Writing Systems [151]
4.1.1 *18 ἆ [151]
4.1.2 *19 ἆ [155]
4.2 Signs without Possible Linear A or Cretan Hieroglyphic Correspondences [161]
4.2.1 *63 ἆ [161]
4.2.2 *64 ἆ [165]
4.2.3 *83 ἆ [169]
4.3 Conclusions [172]

5 Exploring the Potential of Palaeography with the Undeciphered Signs [175]
5.1 Introduction to Palaeographic Analysis [175]
5.2 Summary of Palaeographic Variation of the Undeciphered Signs [179]
5.3 Intra-site Palaeographic Variation [181]
5.3.1 Pylos [181]
5.3.2 Thebes [195]
Contents  vii

5.3.3 Mycenae  [198]
5.3.4 Knossos  [199]
5.4 Palaeography and Administration  [213]
5.5 Palaeography and Chronology  [215]
  5.5.1 Knossian chronology  [215]
  5.5.2 Inter-site chronological comparisons  [221]
5.6 Case-study Conclusions  [230]
5.7 Plates  [233]

Conclusions  [237]

Appendix: Corpus of Attestations of the Undeciphered Signs  [241]

*18  [243]
*19  [244]
*22/CAP  [245]
*34  [260]
*47  [263]
*49  [265]
*56  [266]
*63  [275]
*64  [277]
*65/FAR  [278]
*79  [283]
*82  [284]
*83  [286]
*86  [289]

Bibliography  [290]

Bibliographic Abbreviations  [290]

Other Bibliography  [293]

Index of Words  [332]

Index of Texts  [339]

General Index  [349]
Figures

1.1 A Linear B tablet [2]
1.2 Syllabic grid from Ventris’ Work Note 17 [9]
1.3 Detail of PY Ta 641, showing entry listing two tripods [12]
1.4 Map of finds of Linear B tablets, sealings and labels [13]
1.5 Map of Crete showing main finds of Cretan Hieroglyphic (H), Linear A (A) and Linear B (B) inscriptions [22]
2.1 Sign on bronze cauldron from Mycenae [48]
2.2 Examples of AB118 (top left), dwo (top right) and 1 (bottom) [60]
2.3 Examples of dwe [62]
2.4 Examples of AB87 (left), twe (centre) and A305 (right) [65]
3.1 Examples of *65/far (Type 1a, 1b and 1c) [99]
3.2 Examples of *65/far (Type 2) [100]
3.3 Example of *65/far (intermediate type) [100]
3.4 Examples of AB65 [101]
3.5 Examples of *22/cap with extra stroke under head [124]
3.6 Examples of *22/cap with different-shaped heads [124]
3.7 Examples of AB22 [126]
3.8 Examples of *34 [129]
3.9 Examples of AB34 [130]
3.10 Sign on KN Zf 13 (left) compared with examples of AB81 (centre, right) [130]
3.11 Examples of *47 [136]
3.12 *47 on MY Go 610.1 [137]
3.13 Examples of *49 [139]
3.14 Examples of AB49 [139]
3.15 Examples of *82 (Type 1) [141]
3.16 Examples of *82 (Type 2) [141]
3.17 Examples of *82 (intermediate forms) [142]
3.18 AB82 [142]
3.19 Examples of *79 [145]
3.20 Examples of *86 [149]
3.21 Examples of Cretan Hieroglyphic 040 [149]
4.1 Examples of *18 (Types 1a, 1b and 2) [152]
4.2 *18 on MY Ge 603.1 [152]
4.3 A333 (left) and A347 (right) [153]
4.4 Certain examples of *19 [155]
4.5 *19 on KN X 9014 (left) compared with examples of dwe (right) [156]
4.6 *19 on PY Jn 725.3 (left) compared with H2's form of za (right) [156]
4.7 . on PY Wr 1374.γ (left) compared with KN H124-R's form of za (right) [157]
4.8 *19 on PY An 427.3 and Vn 10.2.5 (left) compared with two examples of H3's form of pu (right) [157]
4.9 Examples of CH 044 [158]
4.10 Examples of *63 (Type 1) [161]
4.11 Examples of *63's intermediate form (left) and Type 2 forms (right) [162]
4.12 o-wí-o-wa, PY Vn 34.3 [163]
4.13 Examples of *64 [165]
4.14 Standardised forms of AB164. From left to right: a (with cross); a (with curves); b; c; d [166]
4.15 Asymmetric examples of *83 [169]
4.16 Symmetrical examples of *83 [169]
5.1 Map of Pylos showing key administrative areas [233]
5.2 Map showing finds of undeciphered signs at Thebes [234]
5.3 Map showing finds of undeciphered signs at Mycenae [235]
5.4 Map of Knossos showing key administrative areas [236]
Tables

1.1 Kober’s inflectional patterns [7]
1.2 Kober’s grid [8]
1.3 Example grid with sound-values in progress [10]
1.4 Example grid with sound-values completed [10]
1.5 The Linear B syllabary [15]
1.6 Mycenaean Greek phonology and the Linear B core syllabary [16]
1.7 Linear A syllabic signs and corresponding Linear B values [24]
1.8 Possible correspondences between Cretan Hieroglyphic and Linear B syllabograms [28]
1.9 Correspondences between the Aegean and Cypriot writing systems [30]
1.10 Sound-values assigned by Ventris in July 1952 [32]
2.1 The known values of the Linear B syllabary [37]
2.2 The Linear B extra signs, as currently known [43]
3.1 Recipients followed by $\mu$ in the TH Fq-series [105]
5.1 Palaeographic variants of the undeciphered signs [180]
5.2 Variation of the undeciphered signs by palaeographic class at Pylos [184]
5.3 Palaeography and connections between Pylos scribes [192]
5.4 Palaeography of the undeciphered signs at Thebes [197]
5.5 Palaeography of the undeciphered signs at Mycenae [199]
5.6 Palaeography of the undeciphered signs at Knossos [202]
5.7 Scribes’ forms of the undeciphered signs compared with $ni$ and $sa$ [210]
5.8 Summary of Linear B chronology [222]
Acknowledgements

This book was written during a Research Fellowship at Gonville & Caius College, Cambridge, and is based on a PhD thesis submitted to the University of Cambridge in April 2016. I am deeply grateful for all of the financial assistance I received to support the writing of this thesis, including an Arts and Humanities Research Council Doctoral Award (grant number AH/J50094/1, 2012–2015), the British Federation of Women Graduates’ J. Barbara Northend Scholarship (2015–2016) and a grant from the Cambridge Faculty of Classics’ Graduate Studies Fund (2015), as well as generous travel-related funding from the Faculty of Classics’ Henry Arthur Thomas Travel Awards and Pembroke College’s Graduate Student Support Fund and Scholarship Trust Fund.

My research benefited greatly from being able to study selected Linear B tablets in person: for this I am grateful to the National Archaeological Museum of Athens, the Heraklion Archaeological Museum, the Ephorate of Antiquities of Boeotia and the Ephorate of Antiquities of Khania for issuing me with permits for this purpose, and to all the museum staff who assisted me during my visits. In particular, I would like to thank Katerina Kostandi, Eleni Konstantinidi and Euridike Velalopoulou in Athens, Georgia Flouda in Heraklion, Anna Mylona in Khania and Ioannis Fappas in Thebes. I would also like to thank the British School at Athens, and especially Tania Gerousi, for their assistance with permit applications and their hospitality during my visits to Greece, and to thank Vassilis Petrakis for his helpful advice.

Especial thanks are due to my PhD supervisor, Torsten Meißner, for his constant help and support, without which my thesis could not have been written; to my examiners, John Bennet and Rupert Thompson, for their many helpful comments and a very beneficial discussion during the viva; to the Cambridge Classical Studies editors, James Clackson and Robin Osborne, for their insightful advice on preparing this manuscript for publication; and to Michael Sharp at Cambridge University Press for his assistance throughout the editorial process. For permission to include images and fonts in this book, I am grateful to Vassilis Aravantinos; the Ashmolean Museum, Oxford; Elizabeth French; Carol Henderson and
xii  Acknowledgements

the Department of Classics, University of Cincinnati; Louis Godart; John Killen; Olga Krzyszkowska and the Institute of Classical Studies, London; Juan-José Marcos; Jean-Pierre Olivier; Anna Sacconi; and Carol Stein at the American School of Classical Studies in Athens. I would also like to thank all the colleagues and friends with whom I have had many productive discussions of my work, in particular John Killen and the other members of the Mycenaean Epigraphy Group and the E Caucus in the Cambridge Faculty of Classics.

Finally, the greatest thanks go to my parents, Jenny and Lindsay, and my sister, Ellen: this book is dedicated to them, with love.
Citations of Texts

Unless otherwise indicated, readings of Cretan Hieroglyphic, Linear A and Linear B texts and other related information (e.g. scribal hand attribution) follow the main corpora and scribal publications for each writing system or site, as given below; differences of reading between corpora are discussed where relevant in the text. Major differences between the (at time of writing) very recent KT and the previous corpora for Knossos, e.g. changes to series classification or significant joins, are also indicated.

Cretan Hieroglyphic: CHIC
Linear A: GORILA
Linear B:

Ayios Vasileios: Aravantinos–Vasilogamvrou 2012
Iklaina: Shelmerdine 2012
ISJs: CIV; CIV²
Khania: Hallager 2011a
Knossos: CoMIK; KT⁶ (see also Firth–Melena 2016a, 2016b and 2016c); Olivier 1967
RCT: Driessen 2000
Midea: Demakopoulou et al. 2002: 53
Mycenae: SCM; TITHEMY; Iakovidis et al. 2012
Pylos: PTT; PoN³ (note that this is a preliminary version); Palaima 1988b (Jean-Pierre Olivier & Maurizio Del Freo (2020), The Pylos Tablets Transcribed, 2nd ed. (Padua: libreriauniversitaria.it) appeared when this volume was in production and so could not be taken into account)
Thebes: TITHEMY; Piteros et al. 1990; TFC; Aravantinos et al. 2008
Tiryns: TITHEMY

DĀMOS has frequently been used for locating examples of particular terms or sequences, in which case all results have also been checked against the relevant corpora.
Citations of Texts

Unless otherwise indicated, interpretations of Linear B terms follow *DMic* and (for phonemic interpretations of morphological elements) Bartoněk 2003. Further details relating to attestations of the Linear B undeciphered signs are given in the Appendix.
Transcription Conventions

Linear B texts are transcribed using lower-case standardised transliterations for syllabograms (e.g. pa) and the conventional abbreviated Latin terms in small caps for ideograms (e.g. ovis 'sheep', equ 'horse'). Phonemic interpretations are given between forward slashes (e.g. /pa/). Linear A texts are transcribed using the AB reference numbers assigned by GORILA and/or the values of their Linear B equivalents: the latter are capitalised to distinguish them from Linear B transcriptions (e.g. PA). Cretan Hieroglyphic texts are transcribed using the CH numbers assigned by CHIC.

In transcriptions of all three writing systems, the following conventions apply:

- Underdots indicate an uncertain reading: pə
- [.] indicates an unidentifiable sign
- ] and [ indicate texts which are incomplete at the left or right, as follows:
  - ]pa or pa[ = tablet broken immediately before/after sign
  - ] pa or pa [ = space between sign and preceding/following break
  - ]-pa or pa-[ = traces visible between sign and preceding/following break

Double square brackets indicate erased text: [[pa]]

For further details of transcription conventions, see R. Palmer 2008a and Del Freo 2019a.
Notes on Images and Fonts

All images included in the text are reproduced by kind permission of the copyright holders (the authors of the publications in which they appear or the institutions which hold the original documents) or have been drawn by the author based on published images or on photographs taken in the course of museum study visits; the source of each image is indicated in the text. The photographs of Pylos tablets which are included here courtesy of the Department of Classics, University of Cincinnati, are all available to view online via CaLIBRA. Images are not reproduced to scale.


The following specialist fonts are used in this book by kind permission of their creators:


Linear A, Cretan Hieroglyphic and Cypro-Minoan: 'Knossos', 'Petras Archives', 'Petras Seals', 'CM 1' and 'CM 2', created by Jean-Pierre Olivier.
Abbreviations

For bibliographic abbreviations, see pp. 290–3.

A Arsenal (Thebes)
AAS Agia Aikaterini Square (Khania)
AC Archives Complex (Pylos)
acc. accusative
adj. adjective
AP Apodoulou
app. appellative
ARKH Arkhanes
BCE Before Common Era
C consonant or Class (of scribes at Pylos)
CH Cretan Hieroglyphic
CIPEM Comité international permanent des études mycéniennes
CM Cypro-Minoan
CR Crete
CS Cypriot Syllabary
d. dual
dat. dative
E Odos Epameinondou (Thebes)
EL Eleusis
EM Early Minoan (chronological period)
f. feminine
gen. genitive
H Hand (designating a scribe)
HOM House of the Oil Merchant (Mycenae)
HS House of the Sphinx (Mycenae)
HT Haghia Triada
HV Ayios Vasileios
IE Indo-European
IK Iklaina
instr. instrumental
List of Abbreviations

IO   Iouktas
IOL  Iolkos (Volos)
ISJ  inscribed stirrup jar
K    velar stop (voicing/aspiration not specified)
KH   Khania
KN   Knossos
KO   Kophinas
KR   Kreusis
LA   Linear A
LH   Late Helladic (chronological period)
loc. locative
LM   Late Minoan (chronological period)
m.   masculine
MED  Medeon
MIL  Miletus
MM   Middle Minoan (chronological period)
MN   man’s name
MO   Mochlos
MY   Mycenae
n.   neuter
NEB  North Eastern Building (Pylos)
NEP  Northern Entrance Passage (Knossos)
NES  north-east slope of citadel (Mycenae)
nom. nominative
O    Odos Oidipodos (Thebes)
P    Odos Pelopidou (Thebes) or labial stop (voicing/aspiration unspecified)
PE   Petras
PH   Phaistos
PIE  Proto-Indo-European
PK   Palaikastro
PL   Platanos
pl.  plural
PN   personal name
PO   Poros
ppl. participle
PR   Prassa
PRI  Prinias
PY   Pylos
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>liquid (/r/ or /l/)</td>
</tr>
<tr>
<td>RCT</td>
<td>Room of the Chariot Tablets (Knossos)</td>
</tr>
<tr>
<td>RP</td>
<td>Room of Pithoi (Thebes)</td>
</tr>
<tr>
<td>S</td>
<td>stylus group (designating a group of tablets of similar palaeography and often content, which cannot be certainly attributed to or distinguished from the known scribal hands: used at Pylos and in the Knossos RCT)</td>
</tr>
<tr>
<td>sg.</td>
<td>singular</td>
</tr>
<tr>
<td>SI</td>
<td>Sitia</td>
</tr>
<tr>
<td>SKO</td>
<td>Skoteino Cave</td>
</tr>
<tr>
<td>SY</td>
<td>Syme</td>
</tr>
<tr>
<td>T</td>
<td>dental stop (voicing/aspiration unspecified)</td>
</tr>
<tr>
<td>TC</td>
<td>Treasure Chamber (Thebes)</td>
</tr>
<tr>
<td>TH</td>
<td>Thebes</td>
</tr>
<tr>
<td>THE</td>
<td>Thera</td>
</tr>
<tr>
<td>TI</td>
<td>Tiryns</td>
</tr>
<tr>
<td>TN</td>
<td>toponym</td>
</tr>
<tr>
<td>V</td>
<td>vowel</td>
</tr>
<tr>
<td>VRY</td>
<td>Vrysinas</td>
</tr>
<tr>
<td>WC</td>
<td>West Crete (ISJ origin)</td>
</tr>
<tr>
<td>WH</td>
<td>West House (Mycenae)</td>
</tr>
<tr>
<td>WN</td>
<td>woman's name</td>
</tr>
<tr>
<td>WW</td>
<td>West Wing (Knossos)</td>
</tr>
<tr>
<td>ZA</td>
<td>Zakros</td>
</tr>
</tbody>
</table>