

# Time's Up!

## Dating the Minoan eruption of Santorini

Acts of the Minoan Eruption Chronology Workshop,

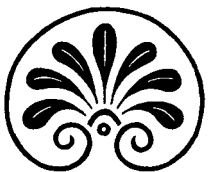
Sandbjerg November 2007

initiated by

*Jan Heinemeier & Walter L. Friedrich*

Edited by

*David A. Warburton*



Monographs of the Danish Institute at Athens  
Volume 10

© Copyright The Danish Institute at Athens, Athens 2009

Time's Up! Dating the Minoan Eruption of Santorini

Monographs of the Danish Institute at Athens  
Volume 10

General Editor: Erik Hallager  
Graphic design: Erik Hallager  
Printed at Naryana

Printed in Denmark on permanent paper  
conforming to ANSI Z 39.48-1992

The publication was sponsored by:  
The Faculty of Science, University of Aarhus  
Aarhus University Research Foundation

ISBN: 978-87-7934-024-4

Distributed by:  
AARHUS UNIVERSITY PRESS  
Langelandsgade 177  
DK-8200 Århus N  
www.unipress.dk

Gazelle Book Services Ltd.  
White Cross Mills, Hightown  
Lancaster LA1 4XS, England  
www.gazellebooks.co

The David Brown Book Company (DBBC)  
P.O. Box 511  
Oakville, CT. 06779, USA  
www.davidbrownbookco.uk

Cover illustration: drawing vulcanic eruption, © Walter Friedrich  
Front cover:  
Stone vase NM 592, © National Museum, Athens  
Olive branch from Thera eruption, © Walter Friedrich

# Contents

- 9 Scientific & technical organizing committee
- 10 List of contributors
- 13 Editor's preface  
*David A. Warburton*
- 15 Bibliography
- 53 General introduction  
*David A. Warburton*
- 56 The Minoan eruption of Santorini radiocarbon dated to  $1613 \pm 13$  BC  
*Walter L. Friedrich & Jan Heinemeier*
- 65 Part I: Evidence, geology, archaeology & chronology
- 67 Volcanic chronology of Santorini  
*Alexander R. McBirney*
- 73 The eruption within the debate about the date  
*Floyd W. McCoy*
- 91 The effects of the Minoan eruption  
*Walter L. Friedrich & Nikolaos Sigalas*
- 101 Evidence from Pseira for the Santorini eruption  
*Philip P. Betancourt*
- 107 The impact of the Minoan eruption of Santorini on Mochlos  
*Jeffrey S. Soles*
- 117 Papadiokambos: new evidence for the impact of the Theran eruption  
*Thomas M. Brogan & Chrysa Sofianou*
- 125 The basis for the Egyptian dates  
*Rolf Krauss & David A. Warburton*
- 145 How uncertain is Mesopotamian chronology?  
*Hermann Hunger*

- 153 Part II: Debate: typology, chronology, methodology
- 154 Thera, Hatshepsut, and the Keftiu: crisis and response  
*J. Alexander MacGillivray*
- 171 The Thera eruption and Egypt: pumice, texts and chronology  
*Karen Polinger Foster, Johannes H. Sterba, Georg Steinhauser & Max Bichler*
- 181 The date of the Late Bronze Age eruption of Santorini  
*Peter Warren*
- 187 Aegean-Egyptian synchronisms and radiocarbon chronology  
*Felix Höflmayer*
- 197 The state of the debate about the date of the Thera eruption  
*Malcolm H. Wiener*
- 207 Beyond the Santorini eruption  
*Sturt W. Manning*
- 227 The dating of the earlier Late Minoan IA period  
*Sturt W. Manning & Christopher Bronk Ramsey*
- 247 Chronological conundrums: Cypriot and Levantine imports from Thera  
*Robert Merrillees*
- 253 The chronology of Tell el-<sup>c</sup>Ajjul, Gaza  
*Peter M. Fischer*
- 267 An update on the chronological value of Minoica in the Levant and Cyprus  
*Annette Højen Sørensen*
- 275 <sup>14</sup>C and <sup>10</sup>Be around 1650 cal BC  
*Raimund Muscheler*
- 285 The Minoan eruption of Santorini radiocarbon dated  
*Jan Heinemeier, Walter L. Friedrich, Bernd Kromer & Christopher Bronk Ramsey*
- 295 Epilogue  
*David A. Warburton*

1290	Ramesses II	1308-1242	LM IIIB	
1300				
1310	Sety I	1319-1308	— — — —	
1320	Ramesses I	1321-1319	<i>Late</i>	
1330	<hr/>			Ulu Burun wreck 1327
1340	Horemheb	1351-1321		<sup>14</sup> C Amarna c.1350
1350	Aya	1355-1351	LM IIIA2	
1360	Tutankhamun	1364-1355		
1370	Semenkhare	1365-1364		
1380	Akhenaten	1382-1365		Ugarit quake c.1370
1390			<i>Early</i>	
1400	Amenhotep III	1411-1382		Sellopoulo T.4
1410				
1420	Thutmose IV	1421-1411	LM IIIA1	
1430				<sup>14</sup> C MUM 1448 +-43
1440	Amenhotep II	1452-1421		<sup>14</sup> C Israel 1450-30
1450	-----		LM IB/LM II	<sup>14</sup> C Rhodes c.1450
1460				Mochlos LM IB
1470	Thutmose III	1504-1450	LM IB	Myrtos-Pyrgos
1480				
1490			<i>Final</i>	
1500	Hatshepsut	1500-1483	<i>Mature</i>	Thera VDL 1500
1510	Thutmose II	1517-1504		
1520	Thutmose I	1525-1517		
1530		LM IA		
1540	Amenhotep I	1546-1525		
1550				
1560	Ahmosé	1572-1546		
1570			<i>Early</i>	
1580	Kamose	1575-1572	MM IIIB	? Thera SDL
1590				

Table 1.

# Thera, Hatshepsut, and the Keftiu: crisis and response in Egypt and the Aegean in the mid-second millennium BC

*J. Alexander MacGillivray*

## Introduction

Nearly half a century ago, R. W. “Squire” Hutchinson wrote in his synthesis *Prehistoric Crete*:

The Late Minoan IA period ... was the time when Queen Hatshepsut ruled Egypt and developed peaceful trade with her neighbours. The tomb paintings of her chief architect Senmut depicted foreigners [labeled Keftiu] in Minoan costume bringing tribute to Egypt in the form of vases, fillers [by which he meant rhytons], and various gifts so accurately portrayed that we can confidently assign them to the Late Minoan IA period.<sup>1</sup>

Hutchinson was restating the opinion prevalent since Sir Arthur Evans, founder of Minoan archaeology, assigned the Minoan envoys to Hatshepsut’s court late in the LM IA period “a decade or more before the beginning of the fifteenth century B.C.”<sup>2</sup> (Cf. Table 1 for the absolute chronology used in this article).

Hutchinson also favoured Spyridon Marinatos’s theory that the Minoan eruption of Santorini had serious consequences for Crete’s harbour towns,<sup>3</sup> which, Hutchinson concluded, “were destroyed at the same time or shortly afterwards by the tidal waves and earthquakes” that accompanied the eruption.<sup>4</sup> Frederich Matz made the same LM I – Keftiu connection and linked it to the Thera eruption in his seminal historical synthesis in the *Cambridge Ancient History*.<sup>5</sup> Sinclair Hood, dean of Minoan studies, placed this LM IA eruption in approximately 1500 BC early in Hatshepsut’s co-regency with her nephew Thutmose III, which began in 1504 BC in the Egyptian chronology prevalent during much of

the twentieth century,<sup>6</sup> and still preferred by *The Oxford Encyclopedia of Ancient Egypt*.<sup>7</sup> But, major changes in historical dating were suggested after Libby earned the Nobel Prize in Chemistry for his discovery of radiocarbon dating in 1960. The radiocarbon revolution that Libby incited added new precision to the historical framework, mostly in agreement with archaeological chronology, but sought to overthrow the established view of eastern Mediterranean cultural relations cited above by proposing that the Minoans in the mature stages of the LM IA period were contemporaries of the “Foreign Princes” of Egypt’s Hyksos period, a century earlier than Hatshepsut’s reign in the historical chronology.<sup>8</sup>

For more than two centuries archaeologists have refined the Bronze Age Mediterranean historical framework by observing the relative order of superimposed levels on a series of sites. Next, they established inter-site relationships based on common cultural characteristics – primarily in ceramics, art and architecture. Nothing has changed. This is still how we verify our relative chronology. And Evans’s relative position of LM IA has only been bolstered

---

<sup>1</sup> Hutchinson 1962, 106.

<sup>2</sup> Evans 1928, 648.

<sup>3</sup> Marinatos 1939.

<sup>4</sup> Hutchinson 1962, 302.

<sup>5</sup> Matz 1973.

<sup>6</sup> Hood 1971, 10, 54; 1978, 24.

<sup>7</sup> Redford 2001.

<sup>8</sup> Manning 1999; Manning *et al.* 2006a; Rehak & Younger 1998, 97–100.

and better illustrated by much recent evidence and numerous detailed studies by his successors. Meanwhile, the plethora of radiocarbon samples linked to the Thera eruption show roughly contemporary readings in <sup>14</sup>C years prior to calibration and, as there is close agreement between historical and calibrated <sup>14</sup>C dates before 1650 and after 1500 BC, the divergence between radiocarbon and historical dates for the Thera eruption likely lies in the calibration of <sup>14</sup>C dates in the sixteenth and seventeenth centuries BC.<sup>9</sup>

This paper reviews the LM IA period's relative chronology, which, when considered with the Minoan Thera eruption's enormity, its wider climatic effects, and Egyptian records, supports a precise date early in Hatshepsut's reign that conforms closely to the current Egyptian high chronology and calibrated radiocarbon dates in the 15<sup>th</sup> century BC. It also provides answers to some outstanding historical questions, such as why Hatshepsut was forced to assume divine Egyptian authority instead of remaining co-regent with Thutmose III, and why Mycenae rose so suddenly to prominence in LH I-IIA.

## Relative date

Late Minoan IA is a period and not a pottery style. Like all fashion, changes in ceramic technology and artistic trends in wares, forms and styles may be charted through time. Again, like fashion, these changes do not occur at the same time everywhere; they must be located both in time and space.

Marisa Marthari presented the evidence for two Late Cycladic I phases at Akrotiri in Thera.<sup>10</sup> The first is the Seismic Destruction Level (SDL) comprised of deposits created during a powerful earthquake. The imported Minoan pottery is predominantly of the Tortoise-shell Ripple Group of the Dark-on-light ware characteristic of a seismic "blow", as Evans put it, that "fell at Knossos" at the end of the MM IIIB period.<sup>11</sup> The damage was widespread at Knossos, and comparable deposits at Malia and Palaikastro may indicate that the same earthquake shook East Crete.<sup>12</sup> Further East, the excavators at Trianda in Rhodes and the Seraglio

in Kos postulate an earthquake that necessitated a large-scale rebuilding programme described as "having a Minoan character" early in LM IA.<sup>13</sup> If these events were related, it would indicate one or more very severe seismic shocks at the close of the MM IIIB period contemporary with Thera's SDL.

Alongside the Tortoise-shell Ripple Group pottery are numerous examples of Light-on-dark ware of the Open Spiral Group, which may be seen to continue a fashion started approximately two centuries earlier in Kamares ware.<sup>14</sup> But there is also a small proportion of pots in Dark-on-light ware and the floral styles that became more prevalent in later LM IA deposits.<sup>15</sup> Thus, it seems that the first experiments in this direction, often combining ripple with floral motifs, took place before the earthquake at the end of the MM IIIB period.

The second LC I phase at Thera is the volcanic destruction level (VDL), after which Akrotiri was buried in tephra. The imported pottery from this VDL includes a number of LH I imports,<sup>16</sup> Levantine stone vases,<sup>17</sup> and a Late Cypriot IA:2 White Slip I bowl.<sup>18</sup> Most conspicuous, however, among the VDL pottery are imitations and imports of Minoan wares.<sup>19</sup> These include Light-on-dark wares that continue to appear throughout LM IA and survive even into the LM IB period in Crete, much the same way that Attic Black-figure pottery continued in production for at least another fifty years after the Red-figure technique appeared in 530 BC, and some potters, the so-called "Bilinguists", combined both techniques. This is certainly the case with examples of the Open Representational, Crowded, and Abstract-banded styles inspired by wall paintings, tapestries, and metal vessels, and which occasionally combine both Light-on-dark

<sup>9</sup> Wiener 2006a.

<sup>10</sup> Marthari 1984; 1990.

<sup>11</sup> Evans 1928, 286–7; Hatzaki 2007, 158–72.

<sup>12</sup> Knappett & Cunningham 2003; Hatzaki 2007, 171.

<sup>13</sup> Marketou 1990.

<sup>14</sup> MacGillivray 1998.

<sup>15</sup> Warren 1999; Knappett & Cunningham 2003.

<sup>16</sup> Lolos 1990.

<sup>17</sup> Devetzi 2000.

<sup>18</sup> Manning 1999.

<sup>19</sup> Niemeier 1980.

and its opposite technique. These styles are characteristic of a mature stage of the LM IA period in Cretan deposits probably formed by earthquake and/or tsunami there, discussed below.

Minoan pottery of this Mature LM IA phase differed from western to central and eastern sites. Reed patterns are characteristic of Knossos,<sup>20</sup> whereas Alternating Foliate Scrolls in both Light-on-dark and Dark-on-light wares were most popular in the east.<sup>21</sup> But all regions enjoyed variations of Dark-on-light and Bi-chrome Ware and retorted spiral patterns with added white dots.<sup>22</sup>

Deposits with LM IA pottery styles after the Minoan eruption of Santorini at Phylakopi,<sup>23</sup> Knossos,<sup>24</sup> Palaikastro,<sup>25</sup> and Kos<sup>26</sup> have been called “sub” LM IA.<sup>27</sup> The designation Final LM IA is proposed here for these deposits that post-date the Thera eruption, but pre-date those with characteristic LM IB pottery styles.

Thera’s latest wall paintings are comparable to those of Mature LM IA at Amnisos and the House of the Frescoes at Knossos, the former scattered by tsunami and the latter apparently dislodged and deposited by a major earthquake.<sup>28</sup> Similar Mature LM IA destruction deposits have been discovered at a number of sites throughout Crete, many with Thera tephra: pumice in the west and centre, and both pumice and ash in the east. There is little doubt that these destructions are exactly contemporary with Thera’s VDL.<sup>29</sup> The Aegean style wall paintings executed during Hatshepsut’s reign at the Nile delta port of Avaris, perhaps ancient Peru-nefer, the royal shipyards, are comparable to the mature LM IA frescoes of Thera and mature LM IA and LM IB frescoes at Knossos, thus placing them near the time of the Minoan eruption.<sup>30</sup>

Imported Late Cypriot IA:2 White Slip II ware is found at Katsambas, the port of Knossos, near a LM IA tsunami deposit with Thera tephra,<sup>31</sup> and similar Late Cypriot IA:2 pottery appears in Egypt, Tell el-Dab’a phases C/3-2, and in Palestine, Tell el-<sup>c</sup>Ajjul Horizon 5 with pumice from the Thera eruption.<sup>32</sup> A further confirmation that these periods are contemporaneous is the LM IA pottery found in LC IA levels in Cyprus.<sup>33</sup>

The Tell el-Dab’a paintings, Cypriot imports in Egypt (with tephra from the Minoan eruption) and

the Aegean, Minoan imports in Cyprus, and the LM IA vessels born by the Keftiu in Senenmut’s tomb, discussed below, leave little doubt that the Mature LM IA eruption took place during Hatshepsut and Thutmose III’s co-regency; the view most archaeologists held before radiocarbon dating introduced an alternative chronology.

## Timing and effects

Half a century of dedicated Thera volcanology has produced the following sequence of events during the Minoan (VDL) eruption:

1. Major earthquake, strong enough to rattle many dwellings at Akrotiri, but not to topple the well-built town houses. There was enough time, perhaps days, for survivors to move broken furnishings into the streets and begin repairs before the next eruption phase.

This earthquake may be linked to the seismic destruction of the Knossos palace (*e.g.* Magazine of the Lily Vases) and several surrounding buildings, including the House of the Frescoes, in LM IA. The damage at Knossos was severe enough to necessitate the palace’s complete re-building in fine ashlar masonry during the subsequent LM IB period.<sup>34</sup>

2. Soon after the earthquake, a tephra plume ejected from a vent opening near the Kamini islands near the caldera’s centre was carried by south-

---

<sup>20</sup> Hatzaki 2007, 175–80.

<sup>21</sup> Knappett & Cunningham 2003.

<sup>22</sup> Hatzaki 2007, 175–81.

<sup>23</sup> Davis & Cherry 1984.

<sup>24</sup> Warren 1999; 2007.

<sup>25</sup> MacGillivray & Sackett *forth.*

<sup>26</sup> Furumark 1950.

<sup>27</sup> Mountjoy 2003.

<sup>28</sup> Evans 1928, 435–7; Chapin & Shaw 2006.

<sup>29</sup> Driessen & MacGillivray *forth.*

<sup>30</sup> Bietak, Marinatos & Palivou 2007.

<sup>31</sup> Warren 1991a, 32; Driessen & Macdonald 1997, 133.

<sup>32</sup> Eriksson 1992; 2001b; 2003; 2007b; Bietak 1998; 2005b, 85.

<sup>33</sup> Eriksson 1992, 170–3.

<sup>34</sup> Macdonald 1990; 1996; 2005.



east to south-southeast winds and deposited approximately 0.08 m of ash, fine pumice and lithics in four distinct layers on Thera's south side, including Akrotiri, without pause. There may have been a short interval during which the inhabitants collected their valuables and fled the city, perhaps time enough to sail to Crete and other nearby islands, before the first major eruption phase began.

3. The eruption proper began with the ejection of several cubic kilometres of pumice and ash straight up in a dark column between 36 to 38 kilometres into the stratosphere where lighter particles and aerosols were carried around the Earth's Northern Hemisphere. Seven metres of tephra covered Akrotiri and effectively ended the town's occupation. This first major, Plinian, phase may have lasted as much as eight hours, during which the wind blew southeast, as demonstrated by the tephra distribution on Thera and in deep-sea cores in the Aegean. This is further confirmed by Plinian phase ash in LM IA levels at Mochlos<sup>35</sup> and Palaikastro.<sup>36</sup>

4. During the second, base surge, phase, the volcano's feeding vent widened and cracks in the wall allowed the sea to enter and mix with the fluid magma, some of which formed huge lava boulders ejected around the volcano and into the upper storeys of Akrotiri's abandoned buildings. Approximately two cubic kilometres of pumice were deposited on Thera during this phase.

5. The third eruption phase saw the continued ejection of ash and older debris with massive pyroclastic flows until the collapse of the weakened caldera, which may have produced a landslide type of tsunami characterized by the sudden and rapid dispersal of water.

This sequence is confirmed thus far by the presence of Plinian phase Thera ash intraclasts reworked into multimodal chaotic layers interpreted as tsunami deposits on the coast at Palaikastro.<sup>37</sup> This indicates that the tsunami arrived during the eruption before the ash could be dispersed by wind and rain.

The tsunami wave's height has been modelled on the basis of the Palaikastro evidence to a minimum +35 -15 m at source with a crest length of 15 kilometres.<sup>38</sup> This lethal wave reached Crete's north coast within twenty minutes. It likely destroyed all Crete's harbours, as well as coastal settlements and

farmlands as it wrapped around the island; the inland city of Knossos would have been the only major population centre to survive inundation. The tsunami hit the Nile delta one hour after devastating harbours and coastal settlements throughout the Eastern Mediterranean. Subsequent reverberating waves likely caused further damage to the already beleaguered coastal communities.

6. Deposits attributable to the eruption's fourth major phase show that activity continued without pause from the previous phase. Great mudflows deposited the last of the tephra over much of Thera, and could well have caused further tsunami.

There is general agreement that, apart from the possibility of short intervals between the earthquake, precursor eruption, and the first major, Plinian, phase, the major eruption was a single event lasting approximately four days.

David Sewell, modelling the wind patterns at Thera throughout the year, has demonstrated that it would take several days of changing wind directions to account for the ash distribution noted in the eastern Mediterranean. Sewell's model also demonstrates that prevailing winter winds do not match the ash distribution pattern, as these usually blow due east. He finds that summer winds are more likely to shift from Southeast to East, and so conform to the observed tephra distribution.<sup>39</sup>

This summer wind tephra distribution pattern fits well with archaeobotanist Anaya Sarpaki's observation that the pantries at Akrotiri were low when their owners fled. This could mean that the agricultural produce was either still in the fields, or being processed elsewhere before being transported to the urban residences. A number of insect eggs were noted amid these depleted stores. Insects are particularly sensitive chronological indicators because they follow well-established seasonal cycles. Un-hatched eggs could indicate either that these pulses had been baked to kill the insect larvae before storage, or that these larvae had not

<sup>35</sup> Soles & Davaras 1990.

<sup>36</sup> MacGillivray *et al.* 1998; Bruins *et al.* 2008.

<sup>37</sup> Bruins *et al.* 2008.

<sup>38</sup> Bruins *et al.* 2008.

<sup>39</sup> Sewell 2001.

yet reached maturity, which they do at the end of Spring; insect eggs generally hatch in May-June. The wind patterns, the empty stores, and the possibility that the insect eggs were not intentionally baked when considered together suggest that the town was abandoned and the volcano erupted in early summer. This timing is quite relevant to the Egyptian documentary evidence considered below.

A palynological core taken in a coastal marsh by the Delphinos river west of Rethymnon revealed clear evidence for both climatic and social change above a thirty-one centimetre thick layer of Thera pumice, thought to have been washed into the marsh by the sea.<sup>40</sup> The increase in *vitis* pollen suggests that the region's vineyards were abandoned and grew wild. The olive and cereal types evident before the eruption declined to such an extent that cultivation, and thus human populations, are thought to have moved elsewhere. But, Driessen and Macdonald believe that the archaeological evidence throughout Crete suggests a general population reduction in LM IB due to the eruption and its effects.<sup>41</sup> Thus, this reduced cultivation could have been due to the tsunami that would have both salted the coastal fields and groves rendering them uncultivable for approximately one generation, and simultaneously eliminated much of the human population living at the coast.

Most relevant to the present discussion is the sudden appearance of *Tilia* above the pumice layer after a two thousand year absence. *Tilia*, the deciduous linden or lime tree that grows only in temperate zones, indicates a wet climate following immediately after the Thera eruption.<sup>42</sup> Similar results obtained from pollen cores in modern Turkey contribute to the picture of a widespread climatic change immediately after the Thera eruption.

## Absolute chronology

Malcolm Wiener, in his search for the global climatic effects of the Thera eruption, notes narrow growth rings that may be due to lower than average temperatures in bristlecone pines at high altitudes in California and Nevada in the years 1524, 1520, 1499 and 1486 BC that could accommodate

the proposed historical dates of approximately 1530 to 1500 BC for the "climate-forcing" event.<sup>43</sup> These narrow rings have been interpreted as either volcanic or drought induced. Similar reduced growth rings are observed at 1527, 1524, 1510, 1498 and 1495 BC in Ireland. Within this spectrum, Wiener chooses 1524 BC as the most likely absolute date for the Thera eruption's effects because it comes within the 1620-1520 BC interval during which radiocarbon years (currently averaging 3350 BP) are approximately the same. The later the calibrated date after 1520 BC, Wiener observes,<sup>44</sup> the less likely it is to fall into that range of radiocarbon years for which there are problems on the calibration curve. 1525±4 BC also shows an acidity concentration peak in the DYE3 Greenland ice core, but it is one of many and currently thought to represent an eruption that barely reached the stratosphere.

Egyptian texts may give a clue to the absolute date and time of year. One of Hatshepsut's best-known dedications was the rock-cut temple to the lioness-goddess Pakhet, near Beni Hasan in Middle Egypt.<sup>45</sup> The later Greeks likened Pakhet to their wild huntress goddess Artemis and called this her cave temple, or Speos Artemidos. Here, Hatshepsut carved a very revealing account of herself and her deeds in that region over the architrave in what has become known as the "Great Speos Artemidos inscription". This was executed sometime after her accession to the throne, currently approximated to between her second and seventh regnal years. James Allen reads the text as a record of her deeds, particularly in the Beni Hasan region, set in stone toward the end of her life.<sup>46</sup> But, Hans Goedicke sees something more; he reads the text as Hatshepsut sending braziers to her subjects driven by raging storms and total darkness into the temples. Tephra from the Minoan eruption found at several sites in the Nile delta and along the Levantine coast sup-

<sup>40</sup> Bottema & Sarpaki 2003.

<sup>41</sup> Driessen & Macdonald 1997.

<sup>42</sup> Moody 2005, 460-3.

<sup>43</sup> Wiener 2006a, 320, 323; 2006b.

<sup>44</sup> Wiener 2006b.

<sup>45</sup> Gardiner 1946; Allen 2002a; Goedicke 2004.

<sup>46</sup> Allen 2002a.

ports Goedicke's theory that this darkness was due to the Thera volcano's ash cloud during the first major (Plinian) phase.<sup>47</sup> Goedicke proposes that this inscription be considered together with a second text: the Ptolemaic period, third-second centuries BC, text on the el-Arish shrine at the northeast Egyptian frontier on the Levantine coast.<sup>48</sup> This el-Arish text, referring to an event during Thutmose III's reign, records that "there was no exit from the palace by the space of nine days. Now these days were in violence and tempest: none, whether god or man, could see the face of his fellow". This nine-day period reads suspiciously like an Egyptian multiple of three, which meant "a long time", and so refers to a lengthy period of storms and darkness.

Hatshepsut's next deed recorded in the Speos Artemidos inscription, as read by Goedicke, was to care for refugees who swarmed into Middle Egypt from the Nile delta because of an incursion of the sea there. But, by that time her status had changed from regent to pharaoh with the throne name *Maatkare*, meaning truth, justice, or harmony in the sun's *ka* – translated roughly as soul. Next, she praises the gods for sparing her country, *i.e.* the south, from the black cloud's ravages and Pakhet in particular for diverting the ensuing inundation into the Red Sea.

The recent discovery of Theran pumice near the Thutmoside fortress at Tharo, near El-Qantara, where the Nile delta meets the Sinai peninsula, strongly suggests that the pumice found there was transported inland by one or more tsunami of great magnitude, perhaps the inundation that Hatshepsut referred to.

Relevant here is the mention by Manetho, the high priest at Heliopolis, in his *Egyptiaca/History of Egypt* dedicated to Ptolemy II, that the great event known as "Deucalion's flood" occurred during Thutmose III's reign. The classical Greeks believed that Deucalion and Pyrrha, king and queen of Thessaly, escaped the flood their sky god Zeus sent to wipe out the Greek Bronze generation in the Greek equivalent to the Biblical Noah's ark tale and, as the only pair to survive the deluge, became the ancestors of the Hellenic heroes who built great Mycenae and fought the Trojan War. We shall revisit their Thessalian origin below.

Also interesting here is molecular biologist Siro Trevisanato's reading of the Dyn. XVIII London Medical Papyrus, which contains various burn remedies, as advice to survivors of Theran ash fall-out.<sup>49</sup>

Manetho wrote his *Egyptiaca* in approximately 280 BC but drew on much earlier sources to set out the framework of the thirty-one Egyptian dynasties with absolute calendar years based on the lengths of pharaonic reigns checked by documents and events dated to each king's regnal years and correlated with astronomical records. His framework remains basic.

There is one quite reliable astronomical date during Thutmose III's reign – the record of the New Moon in his regnal year 23 on I *šmw* 21 (9 May) – the battle of Megiddo, where Thutmose III fought a coalition of rebellious Canaanite princes in the spring after Hatshepsut's death.<sup>50</sup> The "Middle" Egyptian chronology opts for 1457 BC.<sup>51</sup> But, as the moon is new on the same date every twenty-five years, the "High" chronology prefers 1482 BC,<sup>52</sup> and an even higher 1507 BC date is possible. The latter date would suit Wiener's proposed 1525 BC eruption date well because it would place Thutmose III's accession in 1529 BC and the eruption, thus, would have occurred in his and Hatshepsut's fourth regnal year. But, such a high accession date for Thutmose III would create a new "Ultra-high" chronology that would take us too far from the harmony evident in radiocarbon and historical dates after the Thera eruption, discussed below. If Megiddo were in 1457 BC, as the middle chronology prefers, the Thera eruption, if linked to Hatshepsut's rise to the throne, would have been between 1477 and 1472 BC, far too low for the radiocarbon dates after 1500 BC.

The greatest agreement between radiocarbon and Egyptian historical dates comes when we consider the May 1482 BC date, preferred by Egypt-

<sup>47</sup> Francaviglia 1990.

<sup>48</sup> Goedicke 1992.

<sup>49</sup> Trevisanato 2006.

<sup>50</sup> Der Manuelian 2006.

<sup>51</sup> Kitchen 1996; 2002.

<sup>52</sup> Wells 1992; 2002; Spalinger 1992.

tologists for much of the twentieth century and still used by many, for the battle of Megiddo.<sup>53</sup> This places Thutmose III and Hatshepsut's accession to the throne in 1504 BC and Thera, if responsible for the reduced growth rings in California and Nevada in 1499 BC and in Ireland in 1498 BC, would have erupted in their fifth year, 1500 BC.

Goedicke cites later epigraphical evidence from Saft el-Henna that the disaster in Thutmose III's reign occurred on the anniversary of Thutmose II's death on (I *šmw* 4) 30 April.<sup>54</sup> This early summer date for the eruption sequence conforms to the meteorological and archaeo-botanical evidence cited above. The emergency brought on by the Thera ash cloud over the southeast Mediterranean, effectively obscuring the sun, may have been a catalyst for Hatshepsut's bold accession, which went firmly against the Egyptian tradition that regards the king as "His Incarnation" – Horus's physical incarnation – and thus male. It also meant that she would rule until her death because she became the god, a process that could not be reversed. The Theban Amun priests may have agreed because they realized that the nation required absolute leadership to cope with the crisis and, as Thutmose III was too young at the time, assisted Hatshepsut to take full control as Egypt's divine intermediary.

This suggests that the Thera eruption began just before 30 April 1500 BC at the outset of Hatshepsut and Thutmose III's fifth regnal year. The ash cloud may have created a crisis that forced Hatshepsut to take the unusual step of acceding immediately to the throne. Then, the tsunami hit the Nile delta and Sinai within a few days of the eruption's start.

How would this possible 1500 BC eruption date at the start of Hatshepsut and Thutmose III's fifth regnal year affect Egyptian New Kingdom absolute dates? It fits very well with the high chronology.

Thutmose II, Hatshepsut's brother and husband, and Thutmose III's father with another wife, certainly ruled for one year. Manetho assigns him thirteen years. Some suggest that this could be due to a common scribal error and propose three, but Manetho's duration fits well here, given Amenhotep I's astronomical date, discussed below, so we allot him from 1517 to 1504 BC. Hatshepsut's father, Thutmose I, is attested certainly in his third year,

giving him a minimum of four regnal years. His predecessor Amenhotep I's twenty-one year rule is firmly established because his latest recorded date is in his twentieth year and the astronomer Amenemhet records that his own career spanned Ahmose's last ten years, twenty-one years of Amenhotep I, and Thutmose I's Nubia expedition.

The Sothic date in Amenhotep I's ninth year recorded in the Papyrus Ebers has been calculated to either 1537 BC, if observed in Memphis or Heliopolis, Egypt's centre of astronomy and theology, or 1517 BC, if seen from Thebes, the capitol. This variance is due to the four-year difference for each degree of latitude from north to south and accounts for the twenty-year disagreement between the "High" and "Middle" chronologies. Neither date can be calculated with absolute confidence unless we know exactly: 1) the point of observation, 2) the arc of visibility (the angle at which Sothis is still visible before it melts into the dawn light), 3) whether you begin the day with sunrise or with Sothis, and 4) whether or not the record is of a predicted date, or an actual observation.<sup>55</sup> Nonetheless, the high chronology 1537 BC date, which accepts that the High Priest at Heliopolis, also known as the "Chief of observers", made the observation in Amenhotep I's ninth year, works well here and suggests that the pharaoh reigned from 1546 to 1525 BC. This means that his successor Thutmose I, who has four certain regnal years, would have ruled the eight years from 1525 to 1517 BC.

Amenhotep I's father, Ahmose, certainly ruled for twenty-two years and, as Manetho records twenty-five years and four months, there is general agreement that he ruled for twenty-five years, from 1572 to 1546 BC, if we accept 1482 BC as the date for the battle of Megiddo. He ascended the throne as child under his mother Ahhotep's guidance, and died at approximately thirty years of age.

This proposed 1572 BC date for the start of Egypt's New Kingdom approaches that preferred by proponents of the high Egyptian chronology. It

---

<sup>53</sup> Redford 1967; 2001; Lipinska 2001.

<sup>54</sup> Goedicke 1992, 61.

<sup>55</sup> Müller 2007.

also may provide a date for the beginning of the LM IA period. Warren and Hankey place this MM IIIB to LM IA change in approximately 1600,<sup>56</sup> but we may now be more precise. There was an inundation in the Nile delta at the very beginning of Ahmose's reign, most likely linked to the deluge described in the Storm Stele he erected.<sup>57</sup> The "storm" caused the Nile to overflow its banks and sweep away temples and people. The Theban priests read this as a divine portent and knew that bold steps were needed to both calm the people and secure pharaoh's new position. Weakness would have led to chaos. Ahmose, though a youth at the time, is credited with rebuilding Egypt's temples and helping drive the "Foreign Princes" from the Nile delta where they had taken up residence. Although he may not have been mature enough to lead Egypt's forces until approximately ten years after the deluge, the Hyksos may have been recovering still when he launched his attacks. Thus, Ahmose took credit for re-uniting Upper and Lower Egypt at the outset of the New Kingdom. If the inundation at the start of Ahmose's reign was a tsunami generated by the severe seismic activity witnessed in the eastern Aegean at the end of the MM IIIB period, cited above, it would place the beginning of LM IA in 1572 BC.

There is no debate regarding Thutmose III's death in his fifty-fourth year, which comes out as 1450 BC in the high chronology. His son, Amenhotep II succeeded him, perhaps after a two-year and four months co-regency.<sup>58</sup> The debut of Amenhotep II's sole reign was marked by the need to quell the insurrections that arose after his father's death, but this was followed by relative peace. Manetho records that he ruled for thirty years and ten months, which agrees with a record in his thirtieth year, so his thirty-one year rule would have been from 1452 to 1421 BC in the high chronology.

The autopsy of Amenhotep II's son Thutmose IV showed that he died in his mid-twenties.<sup>59</sup> This accords well with Manetho's nine years and eight months rule, supported by a record in his eighth year. Thus, most Egyptologists give him ten years, which would be 1421 to 1411 BC here. There are disputed records of an eighteenth and a twentieth

year plus two jubilee festivals, the first normally celebrated after thirty regnal years and the second after a further three. Thus, Wentz and van Siclen give him thirty-three regnal years, but this goes against the autopsy results.<sup>60</sup>

The highest attested date for Thutmose IV's son Amenhotep III is in his thirty-eighth year, which gives him approximately thirty-nine years on the throne, from 1411 to 1382 BC in the present scheme. His son Amenhotep IV, better known as Akhenaten, certainly ruled for seventeen years, which would be from 1382 to 1365 BC here.

Akhenaten was succeeded briefly, perhaps for one year, by the enigmatic Semenkhare before his youthful son Tutankhamun took the throne and ruled for nine years, from approximately 1364 to 1355 BC. Next came Tutankhamun's Grand Vizier, Aya, who married his widow to take the throne, which he occupied, according to Manetho, for four years and one month, that is, from 1355 to 1351 BC here.

Aya was succeeded by Tutankhamun's Commander-in-Chief of the Army, Horemheb, who initiated a domestic reform programme and set about eradicating all references to the Amarna heresy, which is why Akhenaten and his successors are absent from official Egyptian history; Manetho skips from Amenhotep III to Aya. The careers of these deleted pharaohs have been restored through centuries of painstaking archaeological research, which continues to provide refinements and could also bring more surprises.

There is no doubt that Horemheb's reign was long because of his many accomplishments, but the record of a case initiated in his fifty-ninth year likely refers to the inclusion of the reigns of his expunged predecessors because Horemhab dated the years of his reign from the death of Amenhotep III, thus incorporating the reigns of Akhenaten, Semenkhare, Tutankhamun, and Aya. The second to

---

<sup>56</sup> Warren & Hankey 1989, 137, 169.

<sup>57</sup> Goedicke 1992, 60–1; see also Wiener & Allen 1998; also Foster *et al.* this volume.

<sup>58</sup> Der Manuelian 2006, 421–2.

<sup>59</sup> Davis 1904, xliii.

<sup>60</sup> Wentz & Van Siclen 1976.

last available record is in Horemhab's twenty-seventh year. Thus historians generally allot him thirty years, which would be from 1351 to 1321 BC here.

This proposed date for Horemheb's death and the close of Dyn. XVIII takes us back to the dawn of Egyptian astral chronology. Pioneering Egyptologist and chronographer Eduard Meyer proposed July 19, 1321 BC for the accession of Ramesses I, Horemhab's adopted successor who founded the nineteenth dynasty. Meyer believed that mathematician and astronomer Theon of Alexandria, last custodian of the great Library of Alexandria destroyed by religious zealots in AD 391, meant Menpehre, Ramesses I's throne name, when he wrote that the Sothic cycle of 1,460 years ending in AD 139 was the "epoch of Menophres". Ramesses I acceded at an advanced age and co-ruled with his son Sety I for approximately two years before his son succeeded him. Sety I's accession was, William Hayes tells us, "hailed in official texts of his time as the dawn of a new era called a 'Repeating of Births' and the years of his reign were sometimes numbered by reference to this Renaissance".<sup>61</sup> Sety I's co-regency with his father began at the outset of Dyn. XIX, which could be why Manetho erroneously lists him as that dynasty's first ruler. Thus, later references to this "epoch of Menophres" could well refer to the conscious renaissance that Sety I initiated by commissioning historical texts, such as the list of royal ancestors in his Abydos temple.

Generations of historians followed Meyer's lead until conflicting chronologies for Dyn. XVIII arose due to the uncertainties regarding regnal years and where the astral observation during Amenhotep I's ninth regnal year, mentioned above, was made. But, the 1321 BC date for the end of Dyn. XVIII remains a possibility and requires fresh re-examination in the light of the present review.

The dates currently preferred by most Egyptologists following the middle chronology, 1479-1425 BC for Thutmose III, would place the cataclysmic events in his and Hatshepsut's second to seventh years, when she acceded the throne, between 1477 and 1472 BC, and thus unlikely to be related to the Minoan eruption of Santorini. But, this would leave the problem of explaining the Thera tephra

and LC IA pottery deposited in Egypt and Palestine during their reign.

Calibrated <sup>14</sup>C dates from burnt destruction deposits marking the end of the LM IB period at a number of Cretan sites cluster between 1460 and 1440 BC,<sup>62</sup> which, in the present scheme, is from the time of Thutmose III's campaigns in Syria and his fifth *Sed* festival in 1462 BC, when he initiated Hatshepsut's proscription, discussed below, to early in Amenhotep II's reign. Also, samples from a site occupied from late Thutmose III into early Amenhotep II in Israel gave calibrated dates of 1450-1430 BC and so early in Amenhotep's 1452 to 1421 BC reign, as proposed here.<sup>63</sup> Charred barley seeds from a LM II burnt deposit at the Knossos Unexplored Mansion are calibrated to 1448 ± 43 BC, which puts them in Amenhotep II's reign, but within the range of dates from LM IB destructions elsewhere.<sup>64</sup> This supports the ceramic evidence for the overlap between LM II at Knossos and LM IB elsewhere in Crete, discussed below.

Placing Akhenaten's reign from 1382 to 1365 BC suits one <sup>14</sup>C Amarna date, a bone sample calibrated to 1377 ± 53 BC, his year 5 when construction began at Amarna. But the majority of samples gave calibrated average dates of 1340 ± 10 BC,<sup>65</sup> which fall early in Horemheb's reign. The wood, charcoal, hide, and horn samples that Martha Bell collected in the main quarry in 1982 could well belong to the period when Horemheb returned to Amarna early in his reign to destroy Akhenaten's city and to quarry it for building materials. Reliable samples to date the Amarna period must be short-lived and carefully selected from levels known to belong exclusively to Akhenaten's reign and not to the subsequent squalid re-occupation and wanton destruction.

Akhenaten's reign must also be calibrated with Assyrian, Babylonian and Hittite history as the Amarna correspondence shows that Amenhotep III and his son Akhenaten were contemporaries of

<sup>61</sup> Hayes 1970, 190.

<sup>62</sup> Soles 2004b, 147-8; Wiener 2006b.

<sup>63</sup> Wiener 2006b.

<sup>64</sup> Manning & Wenginger 1992, 650-1.

<sup>65</sup> Switzur 1984; Wenginger 1990, 223-4.

known monarchs in those regions.<sup>66</sup> Letters from Assyrian king Ashur-Uballit I, who is believed currently to have ruled for 36 years from approximately 1365–1330 BC, may indicate that his rule overlapped with the end of Akhenaten's 1382–1365 BC reign, as proposed here. The Kassite kings Kadashman-Enlil I and Burna-Buriash II of Babylon and Suppiluliumas I of the Hittite Empire also corresponded with Akhenaten. Later, Tutankhamun's widow asked the latter to send her one of his sons to marry, presumably after her husband's death in 1355 BC. These correspondences fit well with Suppiluliumas I's estimated reign from approximately 1380 to 1334 BC, which spans those of Akhenaten and Tutankhamun as given here.<sup>67</sup> But, despite these tantalizing chronological correspondences, the arguments regarding Egyptian and Southwest Asian chronology are still largely co-dependent.

On the whole, the Thera eruption linked to the climate-forcing event in 1499–8 BC fits well both the radiocarbon dates after the event, and the Egyptian historical chronology prevalent for much of the twentieth century AD. It also allows us to explore and propose answers to outstanding historical questions.

## Keftiu in Egypt

Visual and textual records of foreign leaders bearing *jnw*, literally “that which is brought” for which we should understand “gifts”, to the Egyptian pharaoh began in the reign of Hatshepsut's father Thutmose I.<sup>68</sup> These gifts were reciprocal, the Pharaonic end of a system of diplomatic gift exchange irrespective of taxes, which were collected from subject states abroad.<sup>69</sup> These gifts represented an agreement reached between the Pharaoh personally and the foreign chiefs; the modern concept of the state did not exist in Egypt, which was run more like a grand household with pharaoh holding absolute power at the head. The gifts were presented to pharaoh on festive occasions – coronation and *Sed* (jubilee) festivals in particular – attended only by the most privileged members of his court. The Keftiu first joined the subdued Syro-Palestinians and Nubians, and the diplomatically allied Hittites, Mitanni,

along with the people of Punt bearing gifts early in Hatshepsut's reign.<sup>70</sup> These Keftiu are generally taken to be Cretans because of their costume even though the metal ware cups that they bear are in the niello technique, which was employed in the Peloponnese in LH I and LH II for the drinking cups and weapons, recovered from elite early Mycenaean burials, but so far not found in Crete.<sup>71</sup> The absence of Cretan examples is problematic, but may be explained by the lack of intact elite LM I burials.

Hatshepsut's reign was characterized by great devotion. She restored and founded temples both in Egypt and abroad; a good example of the latter is the Hathor temple for the miners at Serabit el Khadim in the Sinai. This could be one reason why she was the first Egyptian monarch that the Keftiu approached for “the breath of life”, an Egyptian expression for vassalage – the acceptance of the Egyptian king as overlord. These Keftiu, portrayed with long wavy hair and sporting the loincloth and codpiece well-known from representations of themselves in Crete, first appeared bearing gifts in Hatshepsut's chief steward Senenmut's tomb started two years after her accession. If Thera erupted in her fifth year, as suggested above, these Keftiu may have been the survivors of a beleaguered administration, perhaps centered at Knossos, the only major urban site not fully inundated, paying homage to the new pharaoh, on the occasion of her coronation.<sup>72</sup> While requesting allegiance they may have been also seeking vital aid from the most powerful, in both secular and divine terms, ruler in the region. Without substantial assistance, the Cretan leadership could not have hoped to restore order after the tsunami devastated their coastal cities, harbours and navy, and salted their coastal plains. There was also the matter of faith. The Cretans may have needed to appease their divinities by re-building their temples in the wake of such a clear sign of disapproval.

<sup>66</sup> Moran 1992, xxiv–xxxix; Müller 2007, 213 fig. 3.

<sup>67</sup> Macqueen 1986, 47.

<sup>68</sup> Bleiberg 1996.

<sup>69</sup> Panagiotopoulos 2001; 2006.

<sup>70</sup> Wachsmann 1987.

<sup>71</sup> Xenaki-Sakellariou & Chatziliou 1989.

<sup>72</sup> Macdonald 2001, 529.

One indication that the pharaoh responded favourably is shown by the reference to Keftiu ships being built at the royal dockyard of *Peru-nefer* – “good departure” – perhaps Tell el-Dab<sup>a</sup>, at this time.<sup>73</sup> Thus, the pharaoh both sponsored and supervised the rebuilding of the Minoan navy. She may also have decided to assist with the rebuilding of Crete’s sacred monuments; the “palaces” – now regarded as ritual centres – at Knossos, Gournia and Kato Zakros were entirely rebuilt using lavish ashlar masonry during the LM IB period. This same architectural style was used for expensive religious structures at Palaikastro, Petras, Mochlos, Pseira and Khania. Archives in the Minoan Linear A script show remarkable unity at this time, perhaps indicating central authority, most likely at Knossos. The required manpower for such widespread building activity and control may have included the Africans, perhaps Nubian slaves and/or mercenaries, who appeared in Minoan art at this time.<sup>74</sup>

In return for essential aid, the Minoans may have supplied finished goods such as the stone vases, metal ware and textiles (linen, woollen, and perhaps silk) they carry in the Theban tomb paintings of Hatshepsut and Thutmose III’s officials. Minoan, or Aegean, textile patterns, probably copied from originals, appeared frequently in painted tomb ceilings from Hatshepsut and Thutmose III’s reign, including that of Senenmut, and adorned the cabin of one of Hatshepsut’s ships.<sup>75</sup> The frequency of loom-weights in Minoan buildings supports the notion that textiles were produced on a large scale, perhaps in a centrally organized cottage industry, much as tweed is produced currently in Harris. Fragments of finely carved wooden and engraved leather articles decorated with Aegean spirals from the tombs of Hatshepsut and Amenhotep II are examples of other luxury goods the Minoans crafted and brought to Egypt at that time. But, the tannins derived from Cretan oaks were an essential ingredient in the “resin” required in the Egyptian mummification process, as Ipuwer’s well known “lament” documents.

Palace F at Tell el-Dab<sup>a</sup> was established and decorated with frescoes similar in style and technique to those of Mature LM IA Thera and LM IA and LM IB Knossos during Hatshepsut’s reign.<sup>76</sup>

Most striking is the bull-leaper fresco with the bulls and acrobats set on the meander “labyrinth” pattern. The latter is known from Middle Kingdom tomb ceilings in Egypt, but the border contains the characteristic half-rosette pattern that adorned the Knossos “Grandstand” fresco, generally dated to LM I slightly later than the Thera frescoes,<sup>77</sup> and thus part of the reconstructed LM IB Knossos palace and exactly contemporary with the Tell el-Dab<sup>a</sup> paintings.

Palace F could have been erected as a Keftiu post in Egypt’s royal shipyards contemporary with Final LM IA and LM IB Crete. This would explain why the Keftiu were next reported as coming from the “Great Green”, a designation for the Nile delta, in the tomb of Useramun, Tuthmose III’s vizier appointed in his twenty-first regnal year.<sup>78</sup> As Useramun’s tomb was probably decorated after Hatshepsut’s death,<sup>79</sup> this second ambassadorial group may have appeared at the Theban court to pay tribute on the occasion of Thutmose III’s coronation ceremony in his twenty-second year.<sup>80</sup> Their gifts are LM IB in style; one bears a bovine head vase, probably an Aegean style of stone or metal head-shaped rhyton quite similar to some of the great icons of the LM IA<sup>81</sup> and LH I<sup>82</sup> periods, but also found in LM IB,<sup>83</sup> and later contexts.<sup>84</sup>

Besides their luxury goods and essential products, Minoans themselves must have gone to Egypt in such numbers that scribal students had to learn how “to make names of Keftiu”, as an exercise tablet from this time preserves.<sup>85</sup>

This close association continued for a time under Thutmose III’s sole rule, as the inscription that

<sup>73</sup> Bietak 2005a, 80.

<sup>74</sup> Spalinger 2006; Evans 1928, 755–7.

<sup>75</sup> Kantor 1947.

<sup>76</sup> Bietak, Marinatos & Palivou 2007.

<sup>77</sup> Hood 2005, 63–4.

<sup>78</sup> Duhoux 2003.

<sup>79</sup> Dorman 2006, 45–6.

<sup>80</sup> Koehl 2006, 345 Table 22.

<sup>81</sup> Hatzakis, 2005, 198 SF1; Koehl 2006, no. 307.

<sup>82</sup> Koehl 2006, no. 294.

<sup>83</sup> Koehl 2006, nos. 295–6.

<sup>84</sup> Koehl 2006, no. 298–300.

<sup>85</sup> Peet 1927.



accompanies the Keftiu portrayed in the tomb of Rekhmire, vizier to both Thutmose III and his son Amenhotep II, most likely describing the Keftiu emissaries at Thutmose III's second *Sed* festival in 1472 BC, reads:

The coming in peace by Keftiu chiefs and the chiefs of the islands of the sea, humbly, bowing their heads down because of His Majesty's might, the king Menkheperre [Thutmose III] – given life forever! When they heard his achievements in every foreign land, their gifts were on their backs, requesting the breath [of life], wanting to be loyal to His Majesty, so that His Majesty's might will protect them.<sup>86</sup>

The appearance of a LM IB/LH IIA jar in a collapsed cave, perhaps used as a cistern at Tell Ta'anek, near Megiddo, in the LB I period, along with masses of burned mud brick debris from a nearby wall and many other vases comparable to Megiddo IX, the period of Thutmose III's first Palestinian campaign, demonstrates that LM IB/LH IIA pottery styles were in production by Thutmose III's twenty-third year, 1482 BC here.<sup>87</sup>

The Ta'anek jar is one of the extremely high quality vases produced at a number of centres in the Peloponnese, Attica and Crete that are so similar they are regarded as the products of highly skilled itinerant potters.<sup>88</sup> They are not found in the Final LM IA deposits that follow the Thera eruption and tsunami at Knossos and Palaikastro but first appear in burnt LM IB destruction deposits throughout Crete. But, as they are based on painting and metal working styles prevalent at the time of the Minoan eruption, they are unlikely to be more than a generation removed. This short interval for the LM IB period is further demonstrated by the fact that the signet ring used to impress a clay sealing discovered in Thera's LM IA VDL impressed similar clay sealings found in burnt LM IB destruction deposits at Hagia Triada and Sklavokambos.<sup>89</sup> Unless such signets signified an office and not an individual, which we have no way of knowing at present, we could argue that the ring-bearer's official duties began before the Thera eruption and continued to the time of the LM IB destructions of Sklavokambos and Hagia Triada and that all three events, the eruption and

both burnt destructions, took place during the course of one official's career.

Much of Thutmose III's sole rule coincided with the Minoan "renaissance" of the LMIB period, when Minoan art and architecture was at its finest. The palaces at Knossos, Gournia, Kato Zakros, and perhaps Khania were rebuilt in their grandest forms in fine ashlar masonry, and numerous other expensive monuments were built at Hagia Triada, Mochlos, Pseira and Palaikastro. Some of the most characteristic Minoan creations belong to this time: the relief decorated stone vases, Marine and Floral Style pottery in the Special Palatial tradition,<sup>90</sup> and the sumptuous chryselephantine statuary including "the Palaikastro Kouros".<sup>91</sup> Peter Warren estimates that the volume of Egyptian finds in LM IB Crete increased four-fold from what it was in LM IA.<sup>92</sup> Glass first appeared in Crete at this time, no doubt coincident with its sudden popularity in Thutmose III's reign in Egypt. But, this "Minoan Indian summer", as Nicolas Coldstream and George Huxley see it,<sup>93</sup> ended late in the pharaoh's career.

## Achaean/Danaans in Crete

The depiction of Keftiu envoys in the tomb of Useramun's nephew and successor Rekhmire, which was sealed after Thutmose III's death, may have first represented a tributary court visit during Thutmose III's reign, perhaps for his second *Sed* festival in his regnal year 33, 1472 BC, the year that he drove the Mittani from the Mediterranean coast back across the Euphrates a decade after the battle of Megiddo. This was also when Rekhmire became Thutmose III's vizier. But, the costumes in the painting were altered before the tomb was sealed during Amenhotep II's reign. The Keftiu loincloth and codpiece was painted over with Myc-

<sup>86</sup> Panagiotopoulos 2001, 263–4.

<sup>87</sup> Lapp 1967, 14–15 fig. 8, 33–4, Fig 23.

<sup>88</sup> Mountjoy 2004.

<sup>89</sup> CMS VS.3, 391.

<sup>90</sup> Müller 1997.

<sup>91</sup> MacGillivray *et al.* 2000.

<sup>92</sup> Warren 1995.

<sup>93</sup> Coldstream & Huxley 1984.

enaean style kilts, perhaps to record the new look of the Keftiu envoys at Amenhotep's coronation celebrations.<sup>94</sup> This costume change is taken to reflect the political change from Minoan to Mycenaean in Crete after Rekhmire became vizier in 1472 BC and before Amenhotep's accession in 1450 BC.<sup>95</sup>

The archaeological record contains strong evidence of demographic change in Crete beginning in the later part of the LM IB period. Most telling is the new funerary practice in LM II, dubbed "warrior graves" by Sinclair Hood primarily because they contain inhumations of tall and sturdy males often accompanied by luxury goods and weapons.<sup>96</sup> These represent a significant change from the previous Minoan funerary practices, which did not include single inhumations.<sup>97</sup> These warrior graves first appeared at Khania and Knossos with pottery styles clearly derived from the Peloponnese, which may indicate that their occupants were part of the vanguard of newcomers who took control of those two strategic Cretan centres, the former by force, if Sinclair Hood is correct in his theory that the fiery LM IB destructions represent aggressive invasion,<sup>98</sup> the latter with little violence. The strategic port at Kommos on the south coast also appears to have been occupied in LM II without resistance, as there are no signs of fiery destruction in LM IB there.

The earliest records in the Linear B script, adapted from Minoan Linear A to suit the Greek language, belong to the end of this LM II period. They make it clear that Knossos at that time was the centre of a large territory now ruled by a *wanax* (lord) in his *wanaktoron* (palace) who collected taxes on agricultural products.<sup>99</sup> Thus, these warriors are generally regarded as Mycenaean Greeks. Their stature recalls the males in the shaft graves at Mycenae, which span the Thera eruption period. The origin of their Ephyraean style pottery, named for its abundance at ancient Ephyra, modern Korakou, on the Corinthian gulf, was certainly in LH IIA Greece,<sup>100</sup> as were new LM II pottery forms,<sup>101</sup> and LM II sponge pattern decoration, which originated in the Corinthia where it was quite popular in LH IIB.<sup>102</sup>

If Homer's geography as set out in the *Iliad's* Catalogue of Ships may be applied to the Late Bronze Age,<sup>103</sup> the southern shores of the Corinthian gulf

were controlled from Mycenae by Achaean king Agamemnon.<sup>104</sup> Although his citadel overlooked the Argive plain, his harbours were in the Corinthian gulf at sites like ancient Ephyra, west of modern Corinth, well connected to Mycenae by three major built roads.<sup>105</sup> The Achaean navy based in the well-protected Corinthian gulf would have been one of the few fleets in the eastern Mediterranean to survive the tsunami's ravages, and the Achaean army, derived from the towns in the Mycenaean territory, also would have survived largely unscathed. Another harbour that may have suffered relatively minor damage then because of its situation in the well-protected Gulf of Pagasae is Iolkos in Thessaly, home of the mythical king Deucalion whom legend records survived the deluge Zeus sent to wipe out the Bronze Age Greeks. There is little evidence for Mycenaean pottery and its imitation at Iolkos until after the Thera eruption.<sup>106</sup>

This historical reconstruction would remain largely speculative were it not for the results of recent DNA studies that demonstrate an influx of Peloponnesians and Thessalians into the Cretan population in the Late Bronze Age.<sup>107</sup>

One warrior grave, at Katsambas near Knossos, contained a number of Egyptian alabaster vessels, one of which was inscribed with the cartouche of Thutmose III.<sup>108</sup> These Egyptian vessels may have been reciprocal gifts in exchange for tribute. Thus, their owner may have accompanied the tributaries to Thutmose III's Theban court, perhaps on the occasion of the pharaoh's fifth *Sed* festival in his forty-second regnal year, 1463 BC, when the

<sup>94</sup> Koehl 2006, 344.

<sup>95</sup> Wachsmann 1987.

<sup>96</sup> Hood 1956; Preston 2004; Andreadaki-Vlasaki 1997, 2000.

<sup>97</sup> MacGillivray 2003, 65; Alberti 2004.

<sup>98</sup> Hood 1971; 1985.

<sup>99</sup> Dickinson 1994, 305.

<sup>100</sup> Mountjoy 1983; 1999, 57–8, 200.

<sup>101</sup> Alberti 2004.

<sup>102</sup> Mountjoy 1999, 200.

<sup>103</sup> *Iliad* 2.494–759.

<sup>104</sup> French 2002, 17.

<sup>105</sup> French 2002, 15 fig. 3.

<sup>106</sup> Mountjoy 1999, 823.

<sup>107</sup> King *et al.* 2008.

“Chief of Keftiu”, as he is titled, appeared dressed in the Mycenaean Greek kilt on the tomb walls of Menkheperreseneb (Theban tomb 86).

Menkheperreseneb was appointed First Prophet of Amun in Thutmose III’s forty-second regnal year, during pharaoh’s fifth *Sed* festival in 1463 BC. The Mycenaean “Keftiu Chief” in his tomb is depicted bearing a bovine-head vase decorated with quatrefoil patterns exactly similar to those on the bovine-head vase found with what Warren calls “the superlative group” of Egyptian alabaster vessels in the LM II Royal Tomb at Isopata at Knossos.<sup>109</sup> Could the Isopata tomb’s owner have kept one of a pair of quatrefoil-patterned bovine head rhyta for himself and given the other to Thutmose III? If so, it could indicate that the opulent Isopata tomb was the final resting place of the same Mycenaean Keftiu Chief portrayed in the Egyptian painting. He may have been one of the first Achaean *wanakēs* of the Mycenaean Greek Knossian palace. The correspondence is striking and would push Eric Cline’s suggestion that formal ruler-to-ruler relations between the pharaoh and the Aegean rulers, which he postulates for Amenhotep III, back to Thutmose III and the very beginning of Mycenaean rule at Knossos in 1463 BC.<sup>110</sup>

This first appearance of the Mycenaean Keftiu coincides exactly with the start of Thutmose III’s erasing Hatshepsut’s names and destroying her images at Karnak and Thebes in his year 42, 1463 BC, the year of his fifth *Sed* festival, when he began to distinguish himself overtly from Hatshepsut.<sup>111</sup> In that same year, Thutmose III received tribute including a silver vessel of Keftiu workmanship and other valuable gifts from the Prince of “Tanaja”. Egyptian *Tanaja* is generally linked to Homer’s Danaans, descendants of mythical King Danaos of Argos in the Greek Peloponnese near Mycenae. In Homer, Danaans is another name for the Achaeans, also sometimes called Argives.<sup>112</sup> But, curiously, there was nothing for Thutmose III listed from the Keftiu.<sup>113</sup> This may indicate that the Mycenaean had superseded the Minoans in Aegean supremacy by 1463 BC. Whatever agreement the Minoans had with Hatshepsut ended with her death in 1483 BC. But, they continued to pay tribute to Thutmose III, as portrayed in Useramon’s and Rekhmire’s tombs,

until the start of Hatshepsut’s proscription in 1463, when they were replaced by the Mycenaean. This dates the Peloponnesian and Thessalian Greeks seizure of Crete, beginning with Knossos, to judge from the earliest LM II Mycenaean warrior graves there, to approximately 1463 BC, less than forty years after the Thera eruption. Calibrated radiocarbon dates from LM IB conflagration deposits generally taken to mark the Greek conquest cluster at exactly this time: 1460–1440 BC.<sup>114</sup>

The Keftiu’s altered status at the close of Thutmose III’s reign, 1450 BC here, is best illustrated in two texts. The Karnak “Hymn of Praise” lists the lands Thutmose III “smited” on behalf of his principal god Amun. The list begins with the princes of Zahi in the highlands of Phoenicia and Syria, then the Asiatics of Retenu [Lebanon], in Syria, and the eastern lands. He then turns to “the western land”, where “Keftiu and Cyprus are in terror; I have made them see thy majesty as a young bull, firm of heart, ready-horned and unstoppable”. These are followed by the Mitanni who were made to “tremble under fear”, then “those who are in their isles in the midst of the great sea”, followed by the Libyans, and ending with the sand-dwellers of North Africa.<sup>115</sup> In the inscription he commissioned at Gebel Barkal Thutmose III declares, “I have gathered together the Nine Bows [Egypt’s traditional enemies], the islands in the midst of the ocean, the [Aegean] isles, and the rebellious foreign lands”.<sup>116</sup>

In these we read that the Keftiu were beholding to the most powerful man in the region. The Keftius’ subdued status is confirmed further by their appearance alongside the Syrians and oasis dwellers paying tax in the tomb of Intef, Thutmose III’s chief steward.<sup>117</sup> This placed the Minoans clearly

<sup>108</sup> Alexiou 1967.

<sup>109</sup> Warren 1995, 8.

<sup>110</sup> Cline 1991.

<sup>111</sup> Laboury 2006, 280–2; O’Conner 2006, 8.

<sup>112</sup> Kirk 1985, 58.

<sup>113</sup> Panagiotopoulos 2006, 373, 394; Redford 2006, 336–7.

<sup>114</sup> Soles 2004b.

<sup>115</sup> Breasted [1906] 1962, 318–9.

<sup>116</sup> Der Manuelian 2006, 414.

under the pharaoh's mantle, which required tribute, perhaps collected by the Mycenaeans, allied with pharaoh. But, this allegiance lasted only as long as pharaoh did. His death in 1450 BC may have left the Mycenaean lords in Crete vulnerable. This could account for the violence attested by burnt LM II destruction deposits in the palace at Knossos and in the nearby Unexplored Mansion, which gave calibrated <sup>14</sup>C dates of 1448 ± 43 BC.<sup>118</sup> This violence at Knossos could be the work of a Minoan population that continued to resist Mycenaean Greek rule and took the opportunity of Egypt's inter-regnum to rebel. This Minoan population, particularly in the east, where the Mycenaean Greek language is not attested, continued to produce pottery in the LM IB styles until they were subjugated.

The Knossian warrior graves often contained precious objects produced in the preceding LH I/LM I period, for example the gold cup with arcade and spiral decoration from a grave at Ayios Ioannis.<sup>119</sup> This decoration is well attested on a LH I jug from Mycenae and is copied in LM IB/LH IIA ceramics, which were exported to Egypt and Southwest Asia during the reign of Thutmose III, as we saw with the Ta'anneck jar. Given the strong evidence for Greek newcomers to Crete, the gold cup, like the jug from Mycenae and much of the LH IIA pottery that copies them, may have been made in the Argolid and deposited with its Mycenaean owner who died at Knossos. The gold cup may have been acquired early in its owner's life, if he fell during the initial stages of the conquest of Knossos in 1463 BC, thirty-seven years after the Thera eruption.

The LM II period at Knossos overlaps with LM IB elsewhere, notably at Mochlos and Palaikastro.<sup>120</sup> The transition from Minoan LM IB to Mycenaean LM II-III A1, therefore, may have been comparable to the change from MB to LB in the Levant, which took place during Thutmose III's conquests spanning thirty-two years. Once the Mycenaean Greeks established themselves at Knossos in 1463 BC, they set out to dominate the rest of the island beginning with Khania, as the fiery destruction deposits with LM IB pottery there suggest. The variety of dates for the end of LM IB across Crete is indicated both

by the variance in LM IB archaeo-magnetic dating,<sup>121</sup> and by the range of <sup>14</sup>C calibrated dates for LM IB destruction deposits.<sup>122</sup>

A LM III A1 warrior grave at Knossos, Sellopoulo Tomb 4, produced an Egyptian type scarab carved by a foreigner with the cartouche of Amenhotep III on a necklace worn by the grave's third and last occupant.<sup>123</sup> The scarab's excellent condition precludes its interpretation as an heirloom and suggests that it was acquired soon before its owner's demise. Amenhotep III acceded to the throne thirty-nine years after Thutmose III and ruled from 1411 to 1382 BC in the high chronology. This indicates that the LM III A1 period must have started by his reign. The subsequent LM III A2 period is linked firmly to the reign of Akhenaten, 1382-1365 BC here, so the change from LM III A1 to LM III A2 must be placed in the reign of Amenhotep III, perhaps during the later part, *c.* 1390 BC, in order to allow for the acquisition and deposition of the Sellopoulo scarab.<sup>124</sup>

The change from Minoan to Mycenaean throughout Crete appears to have been completed during the LM III A1 period. This gives us approximately seventy-three years, more than two generations, from 1463 to *c.* 1390 BC, for the violent transition from Minoan to Mycenaean Greek throughout Crete.

## Absolute dates

If we accept that the Thera eruption occurred at the outset of Hatshepsut and Thutmose III's fifth regnal year, the following dates combining the high Egyptian chronology and calibrated <sup>14</sup>C dates for the fifteenth century BC may be proposed:

---

<sup>117</sup> Bryan 2006, 90-1.

<sup>118</sup> Manning & Weninger 1992, 650-1.

<sup>119</sup> Hood 1956.

<sup>120</sup> MacGillivray 1997; Barnard & Brogan 2003, 107-9.

<sup>121</sup> Downey & Tarling 1984.

<sup>122</sup> Soles 2004b.

<sup>123</sup> Popham *et al.* 1974.

<sup>124</sup> Warren & Hankey 1989, 148-9.

- 1572 -beginning of LM IA
- 1500 -Thera eruption in Mature LM IA
- c.1495 -start of LM IB
- 1483 -Hatshepsut's death
- 1482 -Battle of Megiddo
- 1463 -Hatshepsut's proscription begins;  
- Mycenaean conquest of Knossos and  
start of LM II there
- 1450 -death of Thutmose III
- 1448 -revolt at Knossos; start of LM IIIA1 there.
- c.1390 -beginning of LM IIIA2 in Crete

## Epilogue

The intensity of the Minoan eruption of Santorini and the magnitude of the tsunami it generated allow us to draw a horizontal bar across our chronological charts for the eastern Aegean at the transition from Mature to Final LM IA when LH I and LC IA:2 pottery wares and styles were popular, early in Thutmose III and Hatshepsut's reign. This may have been in their fifth regnal year – 1500 BC in the high Egyptian chronology – when she assumed the pharaonic titles and took full control of Egypt to deal with the crisis. The history of those pre- and post-diluvian periods may now be considered more fully. The sudden and short-lived appearance of the Keftiu during Hatshepsut and Thutmose III's early years may now be interpreted as an appeal by the last of the Minoans to the most powerful leader of their day. The response was positive, to judge by the renaissance in art and architecture in LM IB Crete, when the Keftiu, some based in the Nile delta, may have enjoyed the benefits of their loyalty. The Keftiu continued to pay tribute on festive oc-

casions after Hatshepsut's death, but were replaced by the Danaans/Achaean at the start of her proscription in 1463 BC.

These dates, 1500 BC for the Thera eruption and 1463 BC for the beginning of the Greek conquest of Crete, are quite close to those proposed by prominent Aegean archaeologists like Sinclair Hood before the calibrated <sup>14</sup>C dates introduced uncertainty in the case of the former.<sup>125</sup> I trust that closer scrutiny and re-calibration of those samples with dates averaging at approximately 3350 BP will remove that uncertainty and allow us to return to our task of writing this important chapter of early European, Egyptian and Southwest Asian history with the confidence that scholars displayed before the <sup>14</sup>C dispute.

## Acknowledgements

I am most grateful to the organisers, David Warburton in particular, for inviting my participation, and to Tom Brogan, who kindly read the paper at the meeting, which I could not attend. I am happy to acknowledge Felix Höflmayer and Vera Müller for advance copies of their work and Tim Cunningham, Jonathan Hall, Sinclair Hood, Bobby Koehl, Colin Macdonald, Donald Redford, Catharine Roehrig, Tony Spalinger, Peter Warren and Malcolm Wiener for their very valuable comments on earlier versions

---

<sup>125</sup> Hood 1971, 54–5; 1978, 24.

# Bibliography

- Aitken, M.J. 1990  
*Science-based dating in archaeology*,  
London.
- Akkermans, P.M.M.G. & G. M. Schwartz 2003  
*The archaeology of Syria: from complex hunter-gatherers to early urban societies*,  
Cambridge.
- Albarede, F., B. Luais, G. Fitton, M. Semet, E. Kaminski, B.G.J. Upton, P. Bachelery, & J.-L. Cheminée 1997  
‘The geochemical regimes of Pito de la Fournaise Volcano (Réunion) during the last 530 years’, *Journal of Petrology* 38, 171–201.
- Alberti, L. 2004  
‘The LM II-III A1 Warrior Graves at Knossos: the burial assemblages’, in Cadogan, Hatzaki & Vasilikis 2004, 126–36.
- Alexiou, S. 1967  
Υστερομινωικοί τάφοι λιμένας Κνωσού (Κατσαμπά), Athens.
- Allen, J.P. 2002a  
‘The Speos Artemidos inscription of Hatshepsut’, *Bulletin of the Egyptian Seminar* 16, 1–17.
- Allen, J.P. 2002b  
*The Heqanakht Papyri*, New York
- Allen, P., S. Feiner, A. Troccoli, H. Benko, E. Ishak, B. Smith, 2004  
‘Seeing into the past: creating a 3D modeling pipeline for archaeological visualization’, *3D data processing, visualization and transmission, 2004. 3DPVT 2004*: 751–8, 6–9 Sept. 2004.
- Al-Maqdissi, M. 2008  
‘Ras Shamra au Bronze Moyen. Travaux 1929–1974 (Ire–XXXVe campagnes de fouilles)’, in *Ras Shamra-Ougarit au Bronze Moyen et au Bronze Récent* (Travaux de la Maison de l’Orient 47), Lyon, 51–71.
- Al-Maqdissi, M. & D.M. Bonacossi 2005  
*The Metropolis of the Orontes*,  
Damascus.
- Anastaskis, G. 2007  
‘The anatomy and provenance of thick volcanoclastic flows in the Cretan basin, south Aegean Sea’, *Marine Geology* 240, 113–35.
- Andreadaki-Vlasaki, M. 1997  
‘La necropole du Minoen Recent III de la ville de La Canée’, in Driessen & Farnoux 1997, 487–509.
- Andreadaki-Vlasaki, M. 2000  
*The county of Chania through its monuments* (2), Athens.
- Angelier, J., N. Lyberis, X. Le Pichon, E. Barrier & P. Huchon 1982  
‘The tectonic development of the Hellenic arc and the sea of Crete’, *Tectonophysics* 86, 159–96.
- Arteca, R.N., B.W. Poovaia & O.E. Smith 1979  
‘Changes in carbon fixation, tuberization, and growth induced by CO<sub>2</sub> applications to the root zone of potato plants’, *Science* 205, 1279–80.
- Ascough, P.L., G.T. Cook, A.J. Dugmore, & E.M. Scott 2007  
‘The North Atlantic marine reservoir effect in the early Holocene: implications for defining and understanding MRE values’, *Nuclear Instruments and Methods B259*, 438–47.
- Assmann, J. 1970  
*Der König als Sonnenpriester* (Abhandlungen des Deutschen Archäologischen Instituts Kairo: Ägyptologische Reihe 7), Glückstadt.
- Aston, B.G. 1994  
*Ancient Egyptian stone vessels. Materials and forms* (Studien zur Archäologie und Geschichte Altägyptens, 5), Heidelberg.
- Aston, D.A. 2003  
‘New Kingdom pottery phases as revealed through well-dated tomb contexts’, in Bietak 2003a, 135–62.
- Aston, D.A. 2004  
*Tell el-Dab<sup>a</sup> XII. A corpus of Late Middle Kingdom and Second Intermediate Period pottery*, Vienna.
- Aston, D.A. 2007  
‘Kom Rabi<sup>a</sup>, Ezbet Helmi, and Saqqara NK 3507. A study in cross-dating’, in Bietak & Czerny 2007, 207–48.
- Åström, P. 1961–1962  
‘Remarks on Middle Minoan chronology’, *Πεπραγμένα του Α’ Διεθνούς Κρητηλογικού Συνεδριού Diethnous Kritologikou Sinedriou 1. Κρητικά Χρονικά ΙΕ’ – ΙΣΤ’ Τευχός Ι 15–16*, 137–50.

- Åström, P. 1971  
‘Three Tell el Yahudiyeh juglets in the Thera Museum’, in *Acta of the 1st international scientific congress on the volcano of Thera held in Greece, 15th – 23rd September 1969*, Athens, 415–21.
- Åström, P. 1972a  
*The Swedish Cyprus Expedition*. Vol. IV. Part 1B, Lund
- Åström, P. 1972b  
*The Swedish Cyprus Expedition* Vol. IV. Parts IC, ID, Lund.
- Åström, P. 1979  
‘The find contexts of some Minoan objects in Cyprus’, in Karageorghis 1979, 56–62.
- Åström, P. (ed.) 1987a  
*High, middle or low? Acts of an international colloquium on absolute chronology held at the University of Gothenburg 20th-22nd August 1987* (Studies In Mediterranean Archaeology – Paper Back 56), Gothenburg,
- Åström, P. 1987b  
‘The chronology of the Middle Cypriote period’, in Åström 1987a, 57–66.
- Åström, P. 2000  
‘Cyprus’, in Bietak 2000a, 150–3.
- Åström, P. (ed.) 2001a  
*The chronology of Base-Ring and Bichrome Wheel-made Ware. Proceedings of a colloquium held in the Royal Academy of Letters, History and Antiquities, Stockholm, May 18–19 2000* (KVHAA Konferenser 54), Stockholm.
- Åström, P. 2001b  
‘The relative and absolute chronology of Proto White Slip ware’, in Karageorghis 2001, 49–50.
- Bagh, T. 2000  
*The beginning of the Middle Bronze Age in Egypt and the Levant*, Ph.D. dissertation, University of Copenhagen, Copenhagen.
- Bagh, T. 2002  
‘Painted pottery at the beginning of the Middle Bronze Age: Levantine Painted ware’, in Bietak 2002a, 89–101.
- Baillie, M.G.L. 1990  
‘Irish tree-rings and an event in 1628 BC’ in Hardy & Renfrew 1990, 160–6.
- Baillie, M.G.L. & M.A.R. Munro 1988  
‘Irish tree-rings, Santorini and volcanic dust veils’, *Nature* 332, 344–6.
- Baines, P.G, Morgan, T.J., Sparks, R.S.J. -2008  
‘The variation for large-magnitude volcanic ash cloud formation with source latitude’, *Journal of Geophysical Research* 113, D21204 doi:10.1029/2007/JD009568.
- Balmuth, M.S. & R.H. Tykot (eds.) 1998  
*Sardinian and Aegean chronology: towards the resolution of relative and absolute dating in the Mediterranean*, Oxford, 323–31.
- Banou, E.S. 1998  
‘The pottery, Building AC,’ in Betancourt & Davaras 1998a, 13–26, 133–6.
- Barber, R.L.N. 1987  
*The Cyclades in the Bronze Age*, London.
- Barberi, F. & M.L. Carapezza 1994  
‘Helium and CO<sub>2</sub> soil gas emission from Santorini (Greece)’, *Bulletin of Volcanology* 56, 335–42.
- Barnard, K.A & T.M. Brogan 2003  
*Mochlos IB Period III. Neopalatial settlement on the coast: The Artisan’s Quarter and the farmhouse at Chalinomouri. The Neopalatial pottery* (Prehistory Monographs 8), Philadelphia.
- Barnard, K.A. & T.M. Brogan forth.  
‘The Late Minoan IB pottery from Mochlos’, Brogan & Hallager forthcoming
- Bass, G.F, C. Pulak, D. Collon & J. Weinstein 1989  
‘The Bronze Age shipwreck at Ulu Burun: 1986 campaign’, *American Journal of Archaeology* 93, 1–29.
- Baumgartner, S., J. Beer, G. Wagner, P.W. Kubik, M. Suter, G.M. Raisbeck, & F. Yiou 1997  
‘<sup>10</sup>Be and dust’, *Nuclear Instruments and Methods* B123, 296–301.
- Baxter, P.J. 2000  
‘Impacts of eruptions on human health’, in Sigurdsson 2000, 1035–43.
- Baxter, P.J. 2001  
‘Human impacts of volcanoes’, in *Volcanoes and the environment*, J. Marti & C.G. Ernst (eds.), Cambridge, 273–303.
- Baxter, P.J. & M. Kapila 1989  
‘Acute health impact of the gas release at Lake Nyos, Cameroon, 1986’, *Journal of Volcanology and Geothermal Research* 39, 265–75.
- Beckerath, J. von 1997  
*Chronologie des Pharaonischen Ägypten. Die Zeitbestimmung der ägyptischen Geschichte von der Vorzeit bis 332 v. Chr.* (Münchner Ägyptologische Studien 46), Mainz.
- Beckman, G. B. 2005  
‘The limits of credulity’, *Journal of the American Oriental Society* 125, 343–52.

- Beer, J., A. Blinov, G. Bonani, R.C. Finkel, H. J. Hofmann, B. Lehmann, H. Oeschger, A. Sigg, J. Schwander, T. Staffelbach, B. Stauffer, M. Suter & W. Wölfli 1990  
‘Use of <sup>10</sup>Be in polar ice to trace the 11-year cycle of solar activity’, *Nature* 347, 164–6.
- Beget, J. 2000  
‘Volcanic tsunamis’, in Sigurdsson 2000, 1005–13.
- Bennett, Ch. 2006  
‘Genealogy and the chronology of the Second Intermediate Period’, *Ägypten & Levante* 16, 231–43.
- Bennett, C. 2008  
Review of Hornung *et al.* 2006, *Bibliotheca Orientalis* 65, 114–22.
- Bent, J.T. 1965 (1885)  
*The Cyclades, or life among the insular Greeks*, Chicago, London.
- Ben-Tor, A. 1982  
‘The relations between Egypt and the Land of Canaan during the third millennium B.C.’, *Journal of Jewish Studies* 33 (1–2), 3–18.
- Ben-Tor, A. 2008  
‘Hazor and chronology’, *Ägypten & Levante* XV, 45–67.
- Ben-Tor, D. 2004  
‘Second Intermediate Period Scarabs from Egypt and Palestine: historical and chronological implications’, in *Scarabs of the Second Millennium BC from Egypt, Nubia, Crete and the Levant: chronological and historical implications*, M. Bietak & E. Czerny (eds.), Vienna, 27–42.
- Bergoffen, C.J. 1990  
*A comparative study of the regional distribution of Cypriote pottery in Canaan and Egypt in the Late Bronze Age*, Ph.D. thesis, New York University.
- Bergoffen, C. 2001  
‘The Proto White Slip and White Slip I pottery from Tell el-Ajjul’, in Karageorghis 2001, 145–55.
- Betancourt, P.P. 1985  
*The history of Minoan pottery*, Princeton.
- Betancourt, P.P. 1987  
‘Dating the Aegean Late Bronze Age with radiocarbon’, *Archaeometry* 29, 45–9.
- Betancourt, P.P. 1998  
‘The chronology of the Aegean Late Bronze Age: unanswered questions’, in Balmuth & Tykot 1998, 291–6.
- Betancourt, P.P. 2007  
*Introduction to Aegean art*, Philadelphia.
- Betancourt, P.P. & C. Davaras (eds.) 1995  
*Pseira I: The Minoan buildings on the west side of area A* (University Museum Monograph 90), Philadelphia.
- Betancourt, P.P. & C. Davaras, (eds.) 1998a  
*Pseira II: Building AC (the ‘Shrine’) and other buildings in area A* (University Museum Monograph 94), Philadelphia.
- Betancourt, P.P. & C. Davaras (eds.) 1998b  
*Pseira III: The plateia building* (University Museum Monograph 102), by Cheryl R. Floyd, Philadelphia.
- Betancourt, P.P. & C. Davaras, (eds.) 1999  
*Pseira IV: Minoan buildings in areas B, C, D, and F* (University Museum Monograph 105), Philadelphia.
- Betancourt, P.P. & C. Davaras, (eds.) 2001  
*Pseira V: The architecture of Pseira* (University Museum Monograph 109), Philadelphia.
- Betancourt, P.P. & C. Davaras, (eds.) 2002  
*Pseira VI: The Pseira cemetery 1: the cemetery survey* (Prehistory Monographs 5), Philadelphia.
- Betancourt, P.P. & C. Davaras, (eds.) 2003  
*Pseira VII: The Pseira cemetery 2: excavation of the tombs* (Prehistory Monographs 6), Philadelphia.
- Betancourt, P.P., C. Davaras & R. Hope Simpson, (eds.) 2004  
*Pseira VIII: The archaeological survey of Pseira island part 1* (Prehistory Monographs 11), Philadelphia.
- Betancourt, P.P. C. Davaras & R. Hope Simpson, (eds.) 2005  
*Pseira IX: The archaeological survey of Pseira island part 2* (Prehistory Monographs 12), Philadelphia.
- Betancourt, P.P., P. Goldberg, R. Hope Simpson & C.J. Vitaliano 1990  
‘Excavations at Pseira: The evidence for the Theran eruption’, in Hardy & Renfrew 1990, London, 96–9.
- Betancourt, P.P., V. Karageorghis, R. Laffineur & W.-D. Niemeier (eds.) 1999  
*Meletemata: studies in Aegean archaeology presented to Malcolm H. Wiener as he enters his 65th year*, (Aegeum 20), Liège.
- Betancourt, P.P. & G.A. Weinstein 1976  
‘Carbon 14 and the beginning of the Late Bronze Age in the Aegean’, *American Journal of Archaeology* 80, 329–48.



- Bevan, A. 2007  
*Stone vessels and values in the Bronze Age Mediterranean*, Cambridge.
- Bichler, M., K. Breitenecker, G. Steinhäuser & J. Sterba 2006  
‘Zur Identifikation von Bimssteinfindungen aus Grabungen in Tel Megadim und Aegina Kolonna’, in Czerny *et al.* 2006, 253–9.
- Bichler, M., H. Egger, A. Preisinger, D. Ritter & P. Stastny 1997  
‘NAA of the “Minoan Pumice” at Thera and comparison of alluvial pumice deposits in the Eastern Mediterranean region’, *Journal of Radioanalytical and Nuclear Chemistry* 224, 7–14.
- Bichler, M., M. Exler, C. Peltz & S. Saminger 2003  
‘Thera ashes’, in Bietak 2003a, 11–21.
- Bichler, M., H. Huber & P. Warren 2007  
‘Project Thera ashes – pumice sample from Knossos’, in Bietak & Czerny 2007, 1–6.
- Bichler, M., C. Peltz, S. Saminger & M. Exler 2002  
‘Aegean tephra – an analytical approach to a controversy about chronology’, *Ägypten & Levante* 12, 55–70.
- Bietak, M. 1987  
‘The Middle Bronze Age of the Levant – a new approach to relative and absolute chronology’, in Åström 1987a, 78–120.
- Bietak, M. 1994  
‘Die Wandmalereien aus Tell el-Dab<sup>a</sup>/Ezbet Helmi Erste Eindrücke’, *Ägypten & Levante* 4, 44–80.
- Bietak, M. 1996a  
*Avaris, the capital of the Hyksos*, London.
- Bietak, M. 1996b  
‘Le Début de la XVIIIe Dynastie et les Minoens à Avaris’, *Bulletin de la Société Française d’Égyptologie* 135, 5–29.
- Bietak, M. 1998  
‘The Late Cypriot White Slip I-ware as an obstacle to the high Aegean chronology’ in Balmuth & Tykot 1998, 321–2.
- Bietak, M. (ed.) 2000a  
*The synchronisation of civilizations in the Eastern Mediterranean in the second millennium B.C. Proceedings of an international symposium at Schloß Haindorf, 15th – 17th of November 1996 and at the Austrian Academy, Vienna, 11th – 12th of May 1998*, Vienna.
- Bietak, M. 2000b  
“‘Rich beyond the dreams of Avaris: Tell el-Dab<sup>a</sup> and the Aegean World: a guide for the perplexed.’ A response to Eric H. Cline”, *Annual of the British School at Athens* 95, 185–205.
- Bietak, M. 2001  
‘Towards a chronology of Bichrome Ware? Some material from ‘Ezbet Helmi and Tell el-Dab<sup>a</sup>’, in Åström 2001a, 175–201.
- Bietak, M. (ed.) 2002a  
*The Middle Bronze Age in the Levant. Proceedings of an international conference on MB IIA ceramic material, Vienna, 24th- 26th of January 2001*, Vienna, 29–42.
- Bietak, M. 2002b  
‘Relative and absolute chronology of the Middle Bronze Age: comments on the present state of research’, in Bietak 2002a, 29–42.
- Bietak, M. (ed.) 2003a  
*The synchronisation of civilisations in the Eastern Mediterranean in the Second Millennium B.C. II. Proceedings of the SCIEM* 2000-EuroConference, Haindorf, 2-7 May 2001 (Contributions to the chronology of the Eastern Mediterranean 4), Vienna.
- Bietak, M. 2003b  
‘Science versus archaeology: problems and consequences of high Aegean chronology’, in Bietak 2003a, 23–33.
- Bietak, M. 2004  
Review of *A test of time* (= Manning 1999), *Bibliotheca Orientalis* 61, 199–222.
- Bietak, M. 2005a  
‘Egypt and the Aegean. Cultural convergence in a Thutmoseid palace at Avaris’, in Roehrig *et al.* 2005, 75–81.
- Bietak, M. 2005b  
‘The setting of the Minoan wall paintings at Avaris’, in Morgan 2005, 83–90.
- Bietak, M. 2007  
‘Bronze Age paintings in the Levant: chronological and cultural considerations’, in Bietak & Czerny 2007, 269–300.
- Bietak, M. & E. Czerny (eds.) 2007  
*The synchronization of civilisations in the Eastern Mediterranean in the Second Millennium B.C. III. Proceedings of the SCIEM 2000-2nd EuroConference, Vienna, 28th of May-1st of June 2003* (Contributions to the chronology of the Eastern Mediterranean 9), Vienna.
- Bietak, M., J. Dorner & P. Jánosi 2001  
‘Ausgrabungen in dem Palastbezirk von Avaris. Vorbericht Tell el-Dab<sup>a</sup>/‘Ezbet Helmi 1993–2000 mit einem Beitrag von Angela von den Driesch und Joris Peters’, *Ägypten & Levante* 11, 27–119.

- Bietak, M. & I. Hein 2001  
‘The context of White Slip wares in the stratigraphy of Tell el-Dab<sup>a</sup> and some conclusions on Aegean chronology’, in Karageorghis 2001, 171–94.
- Bietak, M. & F. Höflmayer 2007  
‘Introduction: high and low chronology’, in Bietak & Czerny 2007, 13–23.
- Bietak, M. & N. Marinatos 1995  
‘The Minoan wall paintings from Avaris’, *Ägypten & Levante* 5, 49–62.
- Bietak, M. & N. Marinatos 2000  
‘Avaris (Tell el-Dab<sup>a</sup>) and the Minoan World’, in *Κρήνη-Αίγυπτος Πολιτισμικοί δεσμοί τριών χιλιετιών*, Athens, 40–4.
- Bietak M., N. Marinatos & C. Palivou 2007  
*Taureador scenes in Tell el-Dab<sup>a</sup> (Avaris) and Knossos* (Untersuchungen der Zweigstelle Kairo des Österreichischen Archäologischen Institutes 27), Vienna.
- Bietak, M., K. Kopetzky, L.E. Stager & R. Voss 2009  
‘Synchronisation of stratigraphies: Ashkelon and Tell el-Dab<sup>a</sup>’, *Ägypten & Levante* 18, 49–60.
- Biro, M. 1985  
‘Les chroniques “Assyriennes” de Mari’, *MARI* 4, 219–42.
- Blackwell P.G., C.E. Buck & P.J. Reimer 2006  
‘Important features of the new radiocarbon calibration curves’, *Quaternary Science Reviews* 25, 408–13.
- Bleiberg, E. 1996  
*The official gift in ancient Egypt*, Norman.
- Blitzer, H. 2004  
‘Agriculture and subsistence in the late Ottoman and post-Ottoman Mesara’, in *The plain of Phaistos: cycles of social complexity in the Mesara region of Crete*, L.V. Watrous, D. Hadzi-Vallianou & H. Blitzer (eds.), Los Angeles, 111–21.
- Blitzer, H. forth.  
‘Olive domestication and cultivation in the Aegean’, *Hesperia*, forthcoming.
- Blong, R.J. 1982  
*The time of darkness: local legends and volcanic reality in Papua New Guinea*, Canberra.
- Boese, J. 2008  
‘„Harbašipak“, „Tiptakzi“ und die Chronologie der älteren Kassitenzeit,’ *Zeitschrift für Assyriologie* 98, 201–10.
- Bonacossi, D.M., M. Al-Maqdissi, P. Pfälzner & M. Luciani 2006  
‘Qatna. Storia di una Metropoli’, *Archeo*, No. 256 (giugno 2006), 44–57.
- Bond, A. & R.S.J. Sparks 1976  
‘The Minoan eruption of Santorini, Greece’, *Journal of the Geological Society of London* 132, 1–16.
- Bottema, S. & A. Sarpaki 2003  
‘Environmental change in Crete: a 9000-year record of Holocene vegetation history and the effect of the Santorini eruption’, *The Holocene* 13, 733–49.
- Bourriau, J. 1981a  
*Umm el-Ga’ab: pottery from the Nile Valley before the Arab conquest*, Cambridge.
- Bourriau, J. 1981b  
‘Nubians in Egypt during the Second Intermediate Period: an interpretation based on the Egyptian ceramic evidence’, in *Studien zur Altägyptischen Keramik*, Do. Arnold (ed.), Mainz, 25–41.
- Bourriau, J. 1991  
‘Relations between Egypt and Kerma during the Middle and New Kingdoms’, in *Egypt and Africa: Nubia from Prehistory to Islam*, W.V. Davies (ed.), London, 129–44.
- Bourriau, J. 2000  
‘The Second Intermediate Period (c. 1650–1550 BC)’, in *The Oxford History of Ancient Egypt*, I. Shaw (ed.), Oxford, 185–217.
- Bourriau, J. & A. Millard 1971  
‘The excavation of Sawâma in 1914 by G.A. Wainwright and T. Whittemore’, *Journal of Egyptian Archaeology* 57, 28–57.
- Bourriau, J. & K.O. Eriksson 1997  
‘A Late Minoan sherd from an early 18th Dynasty context at Kom Rabi<sup>a</sup>, Memphis’, in *Ancient Egypt, the Aegean, and the Near East. Studies in honour of Martha Rhoads Bell*, J. Phillips, L. Bell, B.B. William, J. Hoch & R.J. Leprohon (eds.), San Antonio TX, 95–120.
- Bradfer-Burdet, I., B. Detournay, & R. Laffineur (eds.) 2005  
*KRHS TEXNITHS. L’artisan crétois* (Aegeum 26), Liège.
- Branigan, K. 1968  
*Copper and bronze working in Early Bronze Age Crete* (Studies in Mediterranean Archaeology 19), Lund.
- Breasted, J. H. [1906] 1962  
*Ancient records of Egypt. Historical documents*, Vol. 2, *The Eighteenth Dynasty*, Chicago.
- Briggs, M.J., C.E. Synolakis, G.S. Harkin & D.R. Green 1995  
‘Laboratory experiments of

- tsunami runup on a circular island', *Pure and Applied Geophysics* 144, 569–93.
- Brinkman, J. A. 1968  
*A political history of Post-Kassite Babylonia*, Rome.
- Brinkman, J. A. 1976<sup>2</sup>  
'Mesopotamian chronology of the historical period', in *Ancient Mesopotamia* by A.L. Oppenheim, Chicago, 335–48.
- Brogan, T.M. & E. Hallager (eds.) forth.  
*LMIB pottery: relative chronology and regional differences*, Athens (forthcoming)
- Bronk Ramsey, C. 1995  
'Radiocarbon calibration and analysis of stratigraphy: The OxCal program', *Radiocarbon* 37, 425–30.
- Bronk Ramsey, C. 2001  
'Development of the radiocarbon calibration program OxCal', *Radiocarbon* 43, 355–63.
- Bronk Ramsey, C. 2008a  
'Deposition models for chronological records', *Quaternary Science Reviews* 27, 42–60.
- Bronk Ramsey, C. 2008b  
'Radiocarbon dating: revolutions in understanding', *Archaeometry* 50, 249–75.
- Bronk Ramsey, C. 2009  
'Bayesian analysis of radiocarbon dates', *Radiocarbon* (in press).
- Bronk Ramsey, C., C.E. Buck, S.W. Manning, P. Reimer & H. van der Plicht 2006  
'Developments in radiocarbon calibration for archaeology', *Antiquity* 80, 783–98.
- Bronk Ramsey, C., T. Higham & P. Leach 2004b  
'Towards high-precision AMS: progress and limitations', *Radiocarbon*, 46, 17–24
- Bronk Ramsey, C., S.W. Manning & M. Galimberti 2004a  
'Dating the volcanic eruption at Thera', *Radiocarbon* 46, 325–44.
- Bronk Ramsey C., van der Plicht, J. and Weninger, B. 2001  
'Wiggle matching' radiocarbon dates', *Radiocarbon* 43, 381–9.
- Brook, M., C.B. Moore, & T. Sigurdsson 1974  
'Lightning in volcanic clouds', *Journal of Geophysical Research* 79, 472–5.
- Bruins, H.J., J.A. MacGillivray, C.E. Synolakis, C. Benjamini, J. Keller, H.J. Kisch, A. Klügel & J. van der Plicht 2008  
'Geoarchaeological tsunami deposits at Palaikastro (Crete) and the Late Minoan IA eruption of Santorini', *Journal of Archaeological Science* 35, 191–212.
- Bruns, M., I. Levin, K.O. Münnich, H.W. Hubberten & S. Fillipakis 1980  
'Regional sources of volcanic carbon dioxide and their influence on <sup>14</sup>C content of present-day plant material', *Radiocarbon* 22, 532–6.
- Brunton, G. & R. Engelbach 1927  
*Gurob* (British School of Archaeology in Egypt and Egyptian research account twenty-fourth year, 1918), London.
- Brunton, G. & W.M.F. Petrie 1924  
*Sedment*, London.
- Bruyere, B. 1937  
*Rapport sur les fouilles de Deir el Médineh (1934-1935). Deuxième partie: la nécropole de l'est* (Fouilles de l'Institut Français d'Archéologie Orientale 15), Cairo.
- Bryan, B. 2006  
'Administration in the reign of Thutmose III', in Cline & O'Connor 2006, 69–122.
- Bryan, S.E., A. Cook, J.P. Evans, P.W. Colls, M.G. Wells, M.G. Lawrence, J.S. Jell, A. Greig & R. Leslie 2004  
'Pumice rafting and faunal dispersion during 2001–2002 in the southwest Pacific: record of a dacitic submarine eruption from Tonga', *Earth and Planetary Science Letters* 227, 135–54.
- Buchholz, H.-G. 1974  
'Ägäische Funde und Kultur-einflüsse in den Randgebieten des Mittelmeeres. Forschungsbericht über Ausgrabungen und Neufunde, 1960–1970', *Archäologische Anzeiger* 1974, 325–462.
- Buchholz, H.-G. 1999  
*Ugarit, Zypern und Ägäis: Kulturbeziehungen im zweiten Jahrtausend v. Chr.* (Alter Orient und Altes Testament 261), Münster.
- Buck, C.E., W.G. Cavanagh & C.D. Litton 1996  
*Bayesian approach to interpreting archaeological data*, Chichester.
- Buck C.E. & P.G. Blackwell 2004  
'Formal statistical models for estimating radiocarbon calibration curves', *Radiocarbon* 46, 1093–102.
- Buck, C., T. Higham & D. Lowe 2003  
'Bayesian tools for tephrochronology', *The Holocene* 13, 639–47.
- Bull, I.D., P.P. Betancourt & R. Evershed 1999  
'Chemical evidence for a structured manuring regime on the island of Pseira, Crete during the Minoan period,' in Betancourt *et al.* 1999, 69–73.

- Cadogan, G. 1978  
‘Dating the Aegean Bronze Age without radiocarbon’, *Archaeometry* 20, 209–14.
- Cadogan, G. 1979  
‘Cyprus and Crete c. 2000–1400 B.C.’, in Karageorghis 1979, 63–8.
- Cadogan, G. 1983  
‘Early Minoan and Middle Minoan Chronology’, *American Journal of Archaeology* 87, 507–18.
- Cadogan, G., R.K. Harrison & G. E. Strong 1972  
‘Volcanic glass shards in Late Minoan I Crete’, *Antiquity* 46, 110–5.
- Cadogan, G. & R. K. Harrison 1978  
‘Evidence of tephra in soil samples from Pyrgos, Crete’, in Doumas 1978, 225–55.
- Cadaogan, G., E. Hatzaki & A. Vasilakis (eds.) 2004.  
*Knossos: palace, city, state* (British School at Athens Studies 12), London.
- Cadogan, G., E. Herscher, P. Russell & S.W. Manning 2001  
‘Maroni-Vournes: a long White Slip sequence and its chronology’, in Karageorghis 2001, 75–88.
- Calder, E.S., S.R. Young, R.S.J. Sparks, J. Barclay, B. Voight, R.A. Herd, R. Luckett, G.E. Norton, L. Pollard, L. Ritchie, E.A. Robertson & MVO Staff 1998  
‘The boxing day collapse’, *Montserrat Volcano Observatory Special Report 06*.
- Carapezza M.L., B. Badalamenti, L. Cavarra, & A. Scalzo 2003  
‘Gas hazard assessment in a densely populated area of Colli Albani volcano (Cava dei Selci, Roma)’, *Journal of Volcanology and Geothermal Research* 123:,81–94.
- Cardellini, C., G. Chiadini, F. Frondini, S. Giaquinto, S. Caliro & F. Parello 2003  
‘Input of deeply derived carbon dioxide in southern Apennine regional aquifers (Italy)’, *Geophysical Research Abstracts* 5 (<http://www.cosis.net/abstracts/EAE03/09927/EAE03-J-09927.pdf>).
- Carey, S., D. Morelli, H. Sigurdsson & S. Bronto 2001  
‘Tsunami deposits from major explosive eruptions: an example from the 1883 eruption of Krakatau’, *Geology* 29, 347–50.
- Carey, S., H. Sigurdsson, C. Mandeville & S. Bronto 1996  
‘Pyroclastic flows and surges over water: an example from the 1883 Krakatau eruption’, *Bulletin of Volcanology* 57, 493–511.
- Carey, S., H. Sigurdsson, C. Mandeville & S. Bronto 2000  
‘Volcanic hazards from pyroclastic flow discharge into the sea: examples from the 1883 eruption of Krakatau, Indonesia’, in McCoy & Heiken 2000b, 1–14.
- Carnarvon, Earl & H. Carter 1912  
*Five years’ explorations at Thebes. A record of work done 1907–1911*. Oxford.
- Carter, H. 1916  
‘Report on the tomb of Zeser-Ka-Ra Amenhetep I, discovered by the earl of Carnarvon in 1914’, *Journal of Egyptian Archaeology* 3, 147–54.
- Catling, H.W. & V. Karageorghis 1960  
‘Minoika in Cyprus’, *Annual of the British School at Athens* 55, 109–27.
- Castro, J.M., & J.E. Gardner 2008  
‘Did magma ascent rate control the explosive–effusive transition at the Inyo volcanic chain, California?’, *Geology* 36, 279–82.
- Catling, H.W. & J.A. MacGillivray 1983  
‘An early Cypriot III vase from the palace of Knossos’, *Annual of the British School at Athens* 78, 1–8.
- Chapin, A.P. & M.C. Shaw 2006  
‘The frescoes from the House of the Frescoes at Knossos: a reconsideration of their architectural context and a new reconstruction of the crocus panel’, *Annual of the British School at Athens* 101, 57–88.
- Charpin, D. & N. Ziegler 2003  
*Mari et le Proche-Orient à l’époque amorrite*, Paris.
- Chiadini, G., C. Cardellini, A. Amato, E. Boschi, S. Caliro, F. Frondini & G. Ventura 2004  
‘Carbon dioxide earth degassing and seismogenesis in central and southern Italy’, *Journal of Geophysical Research* 31, L07615.
- Chiadini, G., F. Frondini, D.M. Kerrick, J. Rogie, F. Parello, L. Peruzzi & A.R. Zanzari 1999  
‘Quantification of deep CO<sub>2</sub> fluxes from central Italy. Examples of carbon balance for regional aquifers and of soil diffuse degassing’, *Chemical Geology* 159, 205–22.
- Christen, J.A. 1994  
‘Summarizing a set of radiocarbon determinations: a robust approach’, *Applied Statistics* 43, 489–503.
- Christen, J.A. & C.E. Buck 1998  
‘Sample selection in radiocarbon dating’, *Applied Statistics* 47, 543–57.
- Cioni, R., L. Gurioli, A. Sbrana & G. Vougioukalakis 2000  
‘Precursory phenomena and destructive events related to the Late Bronze Age Minoan (Thera, Greece) and AD 79 (Vesuvius, Italy) Plinian eruptions;

- inferences from the stratigraphy in the archaeological sites,' in *The archaeology of geological catastrophes*, McGuire, W.G. Griffiths, D.R. Hancock, P.L. Stewart, I.S. (eds.), (Geological Society London Special Publication 171), 123–41.
- Cita, M.B., A. Camerlenghi, K. A. Kastens & F. W. McCoy 1984 'New findings of Bronze Age homogenites in the Ionian Sea: geodynamic implications for the Mediterranean', *Marine Geology* 55, 47–62.
- Clark, J.A. 2004 'Soils and land use at Pseira', in Betancourt, Davaras & Simpson 2004, 27–53.
- Clausen, H.B., C.U. Hammer C.S. Hvidberg, D. Dahl-Jensen, J.P. Steffensen, J. Kipfstuhl, & M. Legrand 1997 A comparison of the volcanic records over the past 4000 years from the Greenland Ice Core Project and Dye 3 Greenland ice cores. *Journal of Geophysical Research* 102(C12), 26,707–26,723.
- Cline, E. 1991 'Contact and trade or colonization? Egypt and the Aegean in the 14th–13th centuries BC', *Minos* 25–6, 7–36.
- Cline, E.H. 1994 *Sailing the wine-dark sea. International trade and the Late Bronze Age Aegean* (British Archaeological Reports International Series 591), Oxford.
- Cline, E.H. & D. Harris-Cline (eds.) 1998 *The Aegean and the Orient in the Second Millennium* (Aegaeum 18), Liège.
- Cline, E.H. & D. O'Connor (eds.) 2006 *Thutmose III. A new biography*, Ann Arbor.
- Coldstream, J.N. & G.L. Huxley (eds.) 1972 *Kythera. Excavations and studies conducted by the University of Pennsylvania Museum and the British School at Athens*, London
- Coldstream, J.N. & G.N. Huxley 1984 'The Minoans of Kythera', in *The Minoan Thalassocracy: myth and reality: Proceedings of the 3rd international symposium at the Swedish Institute in Athens 31 May–5 June 1982* (Skrifter utgivna av Svenska Institutet i Athen 4°), R. Hägg & N. Marinatos (eds.), Stockholm, 89–92.
- Cole, D.P. 1984 *Shechem I. The Middle Bronze Age IIB pottery*, Winona Lake.
- Coleman, J. 1992 'Greece, the Aegean, and Cyprus Part 2', in *Chronologies in Old World Archaeology*, R.W. Ehrich (ed.) Third Edition, Chicago, 222–9.
- Collon, D. 2000 'Implications of introducing a low Mesopotamian Chronology', *British Society for Middle Eastern Archaeology Newsletter* 13, 6–9.
- Connor, C.B., A.R. McBirney & C.A. Furlan 2006 'What is the probability of explosive eruptions at a long-dormant volcano?', in *Statistics in volcanology*, H.M. Mader, S.G. Coles, C.B. Connor & L.J. Connor (eds.), London, 39–46.
- Cook, R.J., J.C. Barron, R.I. Papendick & G.J. Williams III 1981 'Impact on agriculture of the Mount St. Helens eruptions', *Science* 211, 16–8.
- Courtois, J.-C. 1979 'Vestiges minoens á Enkomi', in Karageorghis 1979, 158–77.
- Courtois, J.C & L. 1978 'Corpus Céramique de Ras-Shamra-Ugarit, niveaux historique. Deuxième partie', *Ugaritica* 7, 191–370.
- Cramer, M.D. 2002 'Inorganic carbon utilization by root systems', in *Plant roots: the hidden half*, Y. Waisel, A. Eshel & U. Kafkafi (eds.), New York, 699–714.
- Cramer, M.D. & M.B. Richards 1999 'The effect of rhizosphere dissolved inorganic carbon on gas exchange characteristics and growth rates of tomato seedlings', *Journal of Experimental Botany* 50, 79–87.
- Crewe, L. 2004 *Social complexity and ceramic technology on Late Bronze Age Cyprus: new evidence from Enkomi* Ph.D. dissertation, University of Edinburgh, Edinburgh.
- Crowley, J.L. 1989 *The Aegean and the East*, Jonsered.
- Czerny, E., I. Hein, H. Hunger, D. Melman & A. Schwab (eds.) 2006 *Timelines: studies in honour of Manfred Bietak*, 3 vols. (Orientalia Lovaniensia Analecta 149), Leuven.
- Dale, R.L. 1994 *Kings of the Hyksos. Tell el-ʿAjjul in the Bichrome Ware period: A comparative stratigraphic analysis*, Ph.D. thesis, University of Utah.
- Dale, V.H., J. Delgado-Acevedo & J. MacMahon 2005 'Effects of modern volcanic eruptions on vegetation', in

- Volcanoes and the environment*, J. Marti & C.G. Ernst (eds.), Cambridge, 227–49.
- Damon, P.E., & C.P. Sonett 1991 ‘Solar and terrestrial components of the atmospheric C-14 variation spectrum’. in *The sun in time*, C.P. Sonett, M.S., Giampapa, & M.S. Matthews (eds.), Tucson, 360–88.
- Dansgaard, W., S. J. Johnsen, H. B. Clausen, D. Dahl-Jensen, N.S. Gundestrup, C.U. Hammer, C.S. Hvidberg, J.P. Steffensen, A.E. Sveinbjörnsdottir, J. Jouzel & G. Bond 1993 ‘Evidence for general instability of past climate from a 250-kyr ice-core record’, *Nature* 364, 218–20.
- Daressy, M.G. 1902 *Catalogue général des antiquités égyptiennes du musée du Caire. Nos 24001–24990. Fouilles de la vallée des rois (1898–1899)*, Cairo.
- Darnell, J.C. 2004 *The enigmatic Netherworld Books of the Solar-Osirian unity: cryptographic compositions in the tombs of Tutankhamun, Ramesses VI and Ramesses IX*, Freiburg.
- Davies, B.G. 1995 *Egyptian historical records of the later Eighteenth Dynasty*, fascicle VI, Warminster.
- Davis, E.N. 1977 *The Vaphio Cups and Aegean gold and silver ware*, New York.
- Davis, T.M. 1904 (2002) *The Tomb of Thoutmosis IV*, London.
- Day, P.M., L. Joyner & M. Relaki 2003 ‘A petrographic analysis of the Neopalatial pottery’, in Barnard & Brogan 2003, 13–31.
- Decker, R. 1990 ‘How often does a Minoan eruption occur?’, in Hardy *et al.* 1990b, 444–52.
- Delworth, T., S. Manabe & R.J. Stouffer 1993 ‘Interdecadal variations of the thermohaline circulation in a coupled ocean-atmosphere model’, *Journal of Climate* 6, 1993–2011.
- Denton, J.S. & N.J.G. Pearce 2008 ‘Comment on “A synchronized dating of three Greenland ice cores throughout the Holocene” by B. M. Vinther *et al.*: No Minoan tephra in the 1642 B.C. layer of the GRIP ice core’, *Journal of Geophysical Research-Atmospheres* 113, D04303.
- Der Manuelian P. 2006 ‘The end of the reign and the accession of Amenhotep II’, in Cline & O’Connor 2006, 413–29.
- deSilva, S., J. Alzueta & G. Salas 2000 ‘The socioeconomic consequences of the A.D. 1600 eruption of Huaynaputina, southern Peru’, in McCoy & Heiken 2000b, 15–24.
- Dever, W.G. 1992 ‘The chronology of Syria – Palestine in the Second Millennium B.C.E.: a review of current issues’, *Bulletin of the American Schools of Oriental Research* 288, 1–25.
- Devetzi, A. 2000 ‘The imported stone vessels at Akrotiri, Thera: a new approach to the material’, *Annual of the British School at Athens* 95, 121–39.
- Dickenson, O.T.P.K. 1994 *The Aegean Bronze Age*, Cambridge.
- Dietz, S. 1991 *The Argolid at the transition to the Mycenaean Age. Studies in the chronology and cultural development in the Shaft Grave period*, Copenhagen.
- Dikaios, P. 1940 ‘The excavations at Vounous-Bellapais in Cyprus, 1931–32’, *Archaeologia* 88, 1–174.
- Dikaios, P. 1969–71. *Enkomi. Excavations I-III*, Mainz.
- Dingwell, D.B. 1996 ‘Volcanic dilemma: flow or blow’, *Science* 273, 1054–5.
- Doerr, M., D.Plexousakis, K. Kopaka & C.Bekiaris 2004 ‘Supporting chronological reasoning in archaeology’, *Proceedings of Computer Applications and Quantitative Methods in Archaeology 2004*.
- Dominey-Howes, D.T.M. 2004, ‘A re-analysis of the Late Bronze Age eruption and tsunami of Santorini, Greece, and the implications for the volcano-tsunami hazard’, *Journal of Volcanology and Geothermal Research* 130, 107–32.
- Dorman, P.F. 1991 *The Tombs of Senenmut. The architecture and decoration of tombs 71 and 353*, New York.
- Dorman, P. F. 2006 ‘The early reign of Thutmose III: an unorthodox mantle of coregency’, in Cline & O’Connor 2006, 39–68.
- Dornemann, R.H. 1981 ‘The Late Bronze Age pottery tradition at Tell Hadidi, Syria’, *Bulletin of the American Schools of Oriental Research* 241, 29–47.
- Dothan, T., S. Zuckerman & Y. Goren 2000 ‘Kamares ware at Hazor’, *Israel Exploration Journal* 50, 1–15.

- Doumas, C.G. 1974  
‘The Minoan eruption of the Santorini volcano’, *Antiquity* 48, 110–5.
- Doumas, C.G. (ed.) 1978.  
*Thera and the Aegean World I*, London.
- Doumas, C.G. (ed.) 1980  
*Thera and the Aegean World II*, London.
- Doumas, C.G. 1983  
*Thera. Pompeii of the ancient Aegean*, London.
- Doumas, C.G. 1990  
‘Archaeological observations at Akrotiri relating to the volcanic destruction,’ in *Thera and the Aegean World II*, 3 *Chronology*, Doumas, C. (ed.), London, 48–50.
- Doumas, C.G. 1998  
‘Aegeans in the Levant: myth and reality’, in *Mediterranean Peoples in Transition. Thirteenth to Early Tenth Centuries BCE*, S. Gitin, A. Mazar & E. Stern (eds.), Jerusalem, 129–37.
- Doumas, Ch. 2003  
Ξεθάβοντας μια νεκρή πολιτεία στο Αρχαϊκό Θήρας, «ΑΛΣ», Τεύχος 1, Athens, 21–41.
- Doumet-Serhal, C. 2003  
‘Sidon – British Museum Excavations 1998–2003’, *Archaeology and history in Lebanon* 18, 2–19.
- Doumet-Serhal, C. 2004  
‘Sidon British Museum Excavations 1998–2003’, in Doumet-Serhal, Rabate & Resek 2004, 102–23
- Doumet-Serhal, C. 2008  
‘The British Museum Excavation at Sidon: markers for the chronology of the Early and Middle Bronze Age in Lebanon’, in *The Bronze Age in the Lebanon*, M. Bietak & E. Czerny (eds.), Wien, 11–44.
- Doumet-Serhal, C., A. Rabate & A. Resek (eds.) 2004  
*Decade: a decade of archaeology and history in the Lebanon*, Beirut.
- Downey, W. S. & D. H. Tarling 1984  
‘Archaeomagnetic dating of Santorini volcanic eruptions and fired destruction levels of Late Minoan civilization’ *Nature* 309, 519–23.
- Dreyer, G. 1998  
*Umm el-Qaab I. Das Prädynastische Königsgrab U-j und seine frühen Schriftzeugnisse* (Deutsches Archäologisches Institut Archäologische Veröffentlichungen 86), Mainz.
- Driessen, J. M. & A. Farnoux (eds.) 1997  
*La Crète Mycénienne (Bulletin de la Correspondence Hellenique Supplement 30)*, Paris.
- Driessen, J. & C. Langohr 2007<sup>2</sup>  
‘Rallying ‘around a “Minoan Past”: the legitimation of power at Knossos during the late Bronze Age’, in *Rethinking Mycenaean palaces II*, M.L. Galaty & W.A. Parkinson (eds.), Los Angeles, 178–89.
- Driessen, J. & C. Macdonald 1997  
*The troubled island: Minoan Crete before and after the Santorini eruption* (Aegaeum 17), Liège.
- Driessen J. M. & J. A. MacGillivray forth.  
‘Swept away in LM IA? Explaining debris deposition in coastal Neopalatial Crete’ in *Proceedings of the tenth international Cretological congress*, Khania 2006, forthcoming.
- Druitt, T.H., L. Edwards, R.M. Mellors, D.M Pyle, R.S.J. Sparks, M. Lanphere, M. Davies & B. Barriero 1999  
*Santorini volcano* (Geological Society Memoirs 19), London.
- Druitt, T.H. & V. Francaviglia 1990  
‘An ancient caldera cliff line at Phira, and its significance for the topography and geology of Pre-Minoan Santorini’ in Hardy *et al.* 1990b, 362–9.
- Druitt, T.H., R.A. Mellors, D.M. Pyle, & R.S.J. Sparks 1989  
‘Explosive volcanism on Santorini, Greece’, *Geological Magazine* 126, 95–126.
- Dufek, J. & G.W. Bergantz 2007  
‘Dynamics and deposits generated by the Kos Plateau Tuff eruption: controls on basal particle loss on pyroclastic flow transport’, *Geochemistry Geophysics Geosystems* 8(12).
- Duhoux, Y. 2003  
*Des Minoens en Égypte? ‘Keftiou’ et ‘les îles au milieu du Grand Vert’* (Publications de l’Institut Orientaliste de Louvain 52), Louvain.
- Dunand, M. 1927  
‘La Cinquième Campagne des Fouilles de Byblos’, *Syria* 8, 93–104.
- Dunand, M. 1937–1939  
*Fouilles de Byblos 1926-1932, I, Texte – Atlas*, Paris.
- Dunand, M. 1939b  
‘Chronique’, *Bulletin du Musée de Beyrouth* 3, 77–85.
- Dunand, M. 1950–1958  
*Fouilles de Byblos 1933-1938, II, Texte – Atlas*, Paris.
- Dunn, S. 2002  
*The chronology of the Aegean Late*

- Bronze Age with special reference to the 'Minoan' eruption of Thera. PhD thesis, University of Durham, Durham.
- Eastwood, W.J., N.J.G. Pearce & W.T. Perkins 1998  
'Recognition of Santorini (Minoan) tephra in lake sediments from Gölhisar Gölü in southwest Turkey by laser ablation ICP-MS', *Journal of Archaeological Science* 25, 677–87.
- Eastwood, W. J., N.J. Pearce, J.A. Westgate, S.G. Preece & W.T. Perkins 2004  
'Tephra geochronology confirms the caldera-forming eruption of Aniakchak, not Santorini, at 1645 BC', *PAGES News* 12(3), 12–4.
- Eddy, J.A. 1977  
'Climate and the changing sun', *Climatic Change* 1, 173–90.
- Edwards, J.S. 2005  
'Animals and volcanoes: survival and revival', in *Volcanoes and the environment*, J. Marti & C.G. Ernst (eds.), Cambridge, 250–72.
- El-Khouli, A. A. H. 1993  
'Stone vessels', in *Stone vessels, pottery and sealings from the Tomb of Tutankhamun*, J. Baines (ed.), Oxford, 1–35.
- Enoch, H.Z. & J.M. Olesen 1993  
'Tansley review no. 54, plant response to irrigation with water enriched with carbon dioxide', *New Phytologist* 125, 249–58.
- Eriksen, U., W.L. Friedrich, H. Tauber, B. Buchardt & M.S. Thomsen 1990  
'The Stronghyle caldera: geological, palaeontological and stable isotope evidence from radiocarbon dated stromatolites from Santorini, in Hardy *et al.* 1990b, 139–50.
- Eriksson, K.O. 1991  
'Red Lustrous Wheelmade Ware: a product of Late Bronze Age Cyprus', in *Cypriot ceramics: reading the Prehistoric record*, J.A. Barlow, D.L. Bolger & B. Kling (eds.), Philadelphia, 8–96.
- Eriksson, K.O. 1992  
'Late Cypriot I and Thera: relative chronology in the Eastern Mediterranean' in *Acta Cypria. Acts of an international congress on Cypriote archaeology held in Göteborg on 22-24 August 1991. Part 3*, Paul Åström (ed.) (*Studies in Mediterranean Archaeology and Literature. Pocketbook* 120), 152–223.
- Eriksson, K.O. 1993  
*Red Lustrous Wheel-Made Ware* (*Studies in Mediterranean Archaeology* 103), Jonsered.
- Eriksson, K.O. 2001a  
'Cypriot ceramics in Egypt during the reign of Thutmosis III: the evidence of trade for synchronizing the Late Cypriot cultural sequence with Egypt at the beginning of the Late Bronze Age', in Åström 2001a, 51–68.
- Eriksson, K.O. 2001b  
'Cypriote Proto White Slip and White Slip I: chronological beacons on relations between Late Cypriote I Cyprus and contemporary societies of the Eastern Mediterranean', in Karageorghis 2001, 51–64.
- Eriksson, K.O. 2003  
'A preliminary synthesis of recent chronological observations on the relations between Cyprus and other Eastern Mediterranean societies during the Late Middle Bronze – Late Bronze II periods', in Bietak 2003a, 411–29.
- Eriksson, K.O. 2007a  
'Using Cypriot Red Lustrous Wheel-made Ware to establish cultural and chronological synchronisms during the Late Bronze Age', in Hein 2007, 51–60.
- Eriksson, K.O. 2007b  
*The creative independence of Late Bronze Age Cyprus. An account of the archaeological importance of White Slip ware* (Contributions to the chronology of the Eastern Mediterranean 10), Vienna.
- Evans, A. 1906  
*The prehistoric tombs of Knossos*, London.
- Evans, A.J. 1928  
*The Palace of Minos at Knossos, II*, Oxford.
- Evans, A.J. 1935  
*The Palace of Minos at Knossos, IV*, London.
- Farrand, W.R., & C.H. Stearns 2004  
'The bedrock geology of Pseira', in Betancourt, Davaras & Hope Simpson 2004, 13–25.
- Fimmen, D. 1924  
*Die Kretisch-Mykenische Kultur*, Leipzig.
- Firth, C.M. & B. Gunn 1926  
*Excavations at Saqqara. Teti Pyramid Cemeteries I–II*, Cairo.
- Fischer, P.M. 2001  
'Cypriote Bichrome Wheel-made Ware and Base-Ring Ware from the new excavations at Tell el-‘Ajjul: synchronism and dating', in Åström 2001a, 221–30.
- Fischer, P. M. 2003  
'The preliminary chronology in Tell el-‘Ajjul: results of the renewed excavations in 1999 and 2000', in Bietak 2003a, 263–94.
- Fischer, P.M. 2004  
'Coast contra inland: Tell el-‘Ajjul



- and Tell Abu al-Kharaz during the late Middle and Late Bronze Ages', *Levant* 14, 249–63.
- Fischer, P.M. 2006a  
*Tell Abu al-Kharaz in the Jordan Valley. Volume II: The Middle and Late Bronze Ages*, Vienna.
- Fischer, P.M. (ed.) 2006b  
*The chronology of the Jordan Valley during the Middle and Late Bronze Ages: Pella, Tell Abu al-Kharaz and Tell Deir 'Alla*, Vienna.
- Fischer, P.M. 2007  
'A note on the Lustrous Wheel-made Wares from Tell el-'Ajjul', in Hein 2007, 71–8.
- Fischer, P.M. & M. Sadeq 2000  
'Tell el-'Ajjul 1999. A joint Palestinian-Swedish field project: First season preliminary report', *Ägypten & Levante* 10, 211–26.
- Fischer, P.M. & M. Sadeq 2002  
'Tell el-'Ajjul 2000. Second season preliminary report', *Ägypten & Levante* 12, 109–53.
- Fischer, P.M. & M.J. Whitehouse 2004  
'Quantitative SIMS (IMS1270) of particles from the GRIP Greenland ice core and Thera', paper presented at 'Ashes & Ice: SCIEM 2000 workshop on tephra analyses and ice core dating, Vienna, 8–10 July 2004'.
- Flemming, N.C. & C.O. Webb 1986  
'Tectonic and eustatic coastal changes during the last 10,000 years derived from archaeological data', *Zeitschrift für Geomorphologie* 62, 1–29.
- Ford, C.R., N. Wurzbürger, R.L. Hendrick & R.O. Teskey 2007  
'Soil DIC uptake and fixation in *Pinus taeda* seedlings and its C contribution to plant tissues and ectomycorrhizal fungi', *Tree Physiology* 27, 375–83.
- Foster, K. P. 2005  
'Volcanic echoes in ancient Near Eastern texts', in *Cultural responses to the volcanic landscape: the Mediterranean and beyond*, M. S. Balmuth, D. K. Chester, & P. A. Johnson, (eds.), Boston, 279–96.
- Foster, K. P. & M. Bichler 2003  
'Theran pumice from Egyptian graves?', in Foster & Laffineur 2003, 431–9.
- Foster, K.P. & R. Laffineur (eds.) 2003  
*Metron: measuring the Aegean Bronze Age. Proceedings of the 9th international Aegean conference/9e Rencontre égéenne internationale. New Haven, Yale University, 18-21 April 2002 (Aegaeum 24)*, Liège.
- Foster, K. P. & R.K. Ritner 1996  
'Texts, storms, and the Thera eruption', *Journal of Near Eastern Studies* 55, 1–14.
- Fouqué, F. 1879  
*Santorin et ses Éruptions*, Paris.
- Fouqué, F.A. 1998  
*Santorini and its eruptions* (= Fouqué 1879, translation by A. McBirney), Baltimore.
- Francalanci, L., G. E. Vougioukalakis & M. Fytikas 2007  
'Petrology and volcanology of Kimolos and Polyegos volcanoes within the context of the south Aegean arc, Greece', in *Cenozoic Volcanism in the Mediterranean Area* (Geological Society of America Special Paper 418), L. Beccaluva, G. Bianchini & M. Wilson (eds.), 33–65.
- Francaviglia, V. 1990  
'Sea-borne pumice deposits of archaeological interest on Aegean and Eastern Mediterranean beaches', in Hardy & Renfrew 1990, 127–34.
- French E. 2002  
*Mycenae. Agamemnon's capital*, Stroud.
- Friedrich, W.L. 2000  
*Fire in the sea. The Santorini volcano: natural history and the legend of Atlantis*, Cambridge.
- Friedrich, W.L., U. Eriksen, H. Tauber, J. Heinemeier, N. Rud, M.S. Thomsen & B. Buchardt, 1988  
'Existence of a water-filled caldera prior to The Minoan eruption of Santorini, Greece', *Naturwissenschaften* 75, 567–9.
- Friedrich, W.L. & J. Heinemeier 2006  
'New research in science: date of the largest volcanic eruption in the Bronze Age finally pinpointed', Aarhus University media release (<http://www.nat.au.dk/default.asp?id=11296&la=UK>).
- Friedrich, W.L., B. Kromer, M. Friedrich, J. Heinemeier, T. Pfeiffer & S. Talamo 2006  
'Santorini eruption radiocarbon dated to 1627–1600 BC', *Science* 312, 548.
- Friedrich, W.L., B. Kromer, M. Friedrich, J. Heinemeier, T. Pfeiffer & S. Talamo 2009  
'Santorini eruption radiocarbon dated to 1627–1600 BC: further discussion', in Manning & Bruce 2009 (in press).
- Friedrich, M., Remmele, S., Kromer, B., Hofmann, J. Spurk, M., Kaiser, K. F., Orsel, C., & Küpper, M. 2004  
'The 12,460-Year Hohenheim oak and pine tree-ring chronology from central Europe – a unique annual record for radiocarbon calibration and paleoenvironment

- reconstructions'. *Radiocarbon* 46, 1111–22.
- Friedrich, W.L., P. Wagner & H. Tauber 1990  
 'Radiocarbon dated plant remains from the Akrotiri excavation on Santorini, Greece', in Hardy & Renfrew 1990, 188–96.
- Frisia, S., S. Badertscher, A. Borsato, J. Susini, O.M. Göktürk, H. Cheng, R.L. Edwards, J. Kramers, O. Tüysüz and D. Fleitmann 2008  
 'The use of stalagmite geochemistry to detect past volcanic eruptions and their environmental impacts', *PAGES News* 16(3), 25–6.
- Frost, H. 2004  
 'Byblos and the sea', in Doumet-Serhal *et al.* 2004, 316–47.
- Furumark, A. 1941  
*The chronology of Mycenaean pottery*, Stockholm.
- Furumark, A. 1950  
 'The settlement at Ialysos and Aegean history, c. 1550–1400 B.C.', *Opuscula Atheniensia* 6, 150–271.
- Fuscaldo, P. 2000  
*The palace district of Avaris. The pottery of the Hyksos period and New Kingdom. Part I: Locust 66* (Untersuchungen der Zweigstelle Kairo des Österreichischen Archäologischen Institutes 16 = Tell el-Daba'a 10), Vienna.
- Fytikas, M. O. Guliani, F. Innocenti, G. Marinelli & R. Mazzuoli 1976  
 'Geochronological data on recent magmatism of the Aegean Sea,' *Tectonophysics* 31, 29–34.
- Fytikas, M., N. Kolios, & G. Vougioukalis 1990  
 'Post-Minoan volcanic activity of the Santorini volcano. Volcanic hazard and risk, forecasting possibilities', in Hardy & Renfrew 1990, 183–98.
- Galimberti, M., C. Bronk Ramsey & S.W. Manning 2004  
 'Wiggle-match dating of tree-ring sequences', *Radiocarbon* 46 (2), 917–24.
- Gabolde L. 1998.  
*Le « Grand Château d'Amon » de Sésostris Ier à Karnak* (Mémoires de l'Académie des Inscriptions et Belles Lettres, N. S. 17), Paris.
- Galanaki, I., H. Tomas, Y. Galanakis & L. Laffineur 2007  
*Between the Aegean and Baltic Seas. Prehistory across borders* (Aegaeum 27), Liège.
- Gambardella, B., C. Cardellini, G. Chiodini, F. Frondini, L. Marini, G. Ottonello & M.V. Zuccolini 2004  
 'Fluxes of deep CO<sub>2</sub> in volcanic areas of central-southern Italy', *Journal of Volcanology and Geothermal Research* 136, 31–52.
- Gardiner, A. H. 1906  
 'Four papyri of the 18th Dynasty from Kahun', *Zeitschrift für ägyptische Sprache* 43, 27–47.
- Gardiner, A. H. 1946  
 'Davies's copy of the Great Speos Artemidos inscription,' *Journal of Egyptian Archaeology* 32, 43–56.
- Gardiner, A. H. 1948  
*Rameside Administrative documents*, Oxford.
- Gardiner A. H. 1961  
*Egypt of the Pharaohs*, Oxford.
- Gasche, H. 2003  
 'La fin de la première dynastie de Babylone: une chute difficile', *Akkadica* 124, 205–20.
- Gasche, H., J.A. Armstrong, S.W. Cole & V.G. Gurzadyan 1998  
*Dating the fall of Babylon: A reappraisal of Second-Millennium chronology* (Mesopotamian History and Environment II: IV), Ghent.
- Gates, M.-H. 2000  
 'Kinet Höyük (Hatay, Turkey) and MB Levantine chronology', *Akkadica* 119–20, 77–101.
- Gestermann, L. 2008  
 'Die Datierung der Nomarchen von Hermopolis', *Zeitschrift für Ägyptische Sprache* 135, 1–15.
- Giddy, L.L. 1999  
*The survey of Memphis II. Kom Rabi'a. The New Kingdom and Post New Kingdom objects* (EES Excavation Memoirs 64), London.
- Gilbert, J.S. & S.J. Lane 2008  
 'The consequences of fluid motion in volcanic conduits,' in *Fluid motions in volcanic conduits: a source for seismic and acoustic signals*, Lane, S.J. Gilbert, J.S. (eds.), (London Geological Society Special Publication 307), 1–10.
- Girella, L. 2007  
 'Towards a definition of the MM III ceramic sequence in south-central Crete: returning to the traditional MM IIIA and MM IIIB division?' in *Middle Helladic pottery and synchronisms*, F. Felten, W. Gauss and R. Smetana (eds.), (Agina-Kolonna Forschungen und Ergebnisse I), Vienna, 233–55.
- Goedicke, H. 1988  
 'The northeastern Delta and the Mediterranean', in *The archaeology of the Nile Delta: problems and priorities*, E.C.M. van den Brink (ed.), Amsterdam, 165–75.
- Goedicke, H. 1992  
 'The chronology of the Thera/Santorin explosion', *Ägypten & Levante* 3, 57–62.

- Goedicke, H. 1995  
*Studies about Kamose and Ahmose*, Baltimore.
- Goedicke, H. 2004  
*The Speos Artemidos inscription of Hatshepsut and related discussions*, Oakville, CT.
- Goldberg, P. 2005  
'Micromorphology report on site G 2,' in Betancourt, Davaras & Hope Simpson 2005, 252–3.
- Goodchild, M.F. 2008  
'What does Google Earth mean for the social sciences?', in *Geographic visualization: concepts, tools and applications*, M. Dodge, M. McDerby & M. Turner (eds), Chichester.
- Grace, V.R. 1940  
'A Cypriote tomb and Minoan evidence for its date', *American Journal of Archaeology* 44, 10–52.
- Grattan, J.P. & Gilbertson, D.D. 2000  
'Prehistoric "settlement crisis," environmental changes in the British Isles, and volcanic eruptions in Iceland: an exploration of plausible linkages', in McCoy & Heiken 2000b, 33–42.
- Grayson, A. K. 1983  
'Königslisten und Chroniken B. Akkadisch', *Reallexikon der Assyriologie und vorderasiatischen Archäologie* 6, 86–135.
- Grayson, A. K. 1975  
*Assyrian and Babylonian chronicles*, Locust Valley, NY.
- Grove, A.T. & O. Rackham 2003  
*The nature of Mediterranean Europe: an ecological history*, New Haven.
- Guidi, A., V. Whitehouse & R. Whitehouse 1996  
'A radiocarbon chronology for the Bronze Age: the Italian situation', *Acta Archaeologica* 67, 271–82.
- Guidoboni, E., 1994  
*Catalogue of ancient earthquakes in the Mediterranean area up to the 10th century*, Rome.
- Guidoboni, E. & A. Comastri 2005  
*Catalogue of earthquakes and tsunamis in the Mediterranean area from the 11th to the 15th century*, Rome.
- Gurioli, L., E. Zanella, M.T. Pareschi, & R. Lanza 2007  
'Influences of urban fabric on pyroclastic density currents at Pompeii (Italy): 1. Flow direction and deposition', *Journal of Geophysical Research* 112 (B05213)
- Gurrieri, S., M. Liuzzo, & G., Giudice 2008  
'Continuous monitoring of soil CO<sub>2</sub> flux at Mt. Etna: The 2004–2005 eruption and the role of regional tectonics and volcano tectonics,' *Journal of Geophysical Research* 113, B09206, doi: 10.1029/2007JB005003.
- Gurzadyan, V. 2000  
'On the astronomical records and Babylonian chronology', *Akkadica* 119–20, 177–86.
- Gurzadyan, V. 2003  
'The Venus Tablet and refraction', *Akkadica* 124, 13–7.
- Hall, H.R. 1928a  
'Minoan fayence in Mesopotamia', *Journal of Hellenic Studies* 48, 64–74.
- Hall, H.R. 1928b  
*The civilization of Greece in the Bronze Age*, London.
- Hallager, E. 1977  
*The Mycenaean Palace at Knossos* (The Museum of Mediterranean and Near Eastern Antiquities Memoir 1), Stockholm.
- Hallager, E. 1988  
'Final palatial Crete. An essay in Minoan chronology', in *Studies in ancient history and numismatics presented to Rudi Thomsen*, A. Damsgaard-Madsen, E. Christiansen & E. Hallager (eds.), Aarhus, 11–21.
- Hammer, C.U. 2000  
'What can Greenland ice core data say about the Thera eruption in the 2nd millennium BC?', in Bietak 2000a, 35–7.
- Hammer, C., H.B. Clausen, & W. Dansgaard 1980  
Greenland ice sheet evidence of post-glacial volcanism and its climate impact. *Nature* 288, 230–35.
- Hammer, C.U., G. Kurat, P. Hoppe & H.B. Clausen 2001  
'Recent ice core analysis strengthen[s] the argument for a mid 17th century BC eruption of Thera', extended abstract presented at 'SCIEM 2000-EuroConference, Haindorf, 2–7 May 2001'.
- Hammer, C.U., G. Kurat, P. Hoppe, W. Grum & H.B. Clausen 2003  
'Thera eruption date 1645 BC confirmed by new ice core data?', in Bietak 2003a, 87–94.
- Hammer, C.U., H.B. Clausen, W.L. Friedrich & H. Tauber 1987  
'The Minoan eruption of Santorini in Greece dated to 1645 BC?', *Nature* 328, 517–9.
- Hankey, V. 1967  
'Mycenaean pottery in the Middle East: notes on finds since 1951', *Annual of the British School at Athens* 62, 107–47.
- Hankey, V. 1973  
'Late Minoan finds in the south-Eastern Mediterranean', *Πεπραγμένα του Γ' διεθνούς*

- Κρητολογικό Συνέδριου, Τόμος Α, 104–10.
- Hankey, V. 1981  
‘Imported vessels of the Late Bronze Age at high places’, in *Temples and high places in Biblical Times*, A. Biran (ed.), Jerusalem, 108–17.
- Hankey, V. 1987  
‘The chronology of the Aegean Late Bronze Age’, in Åström 1987a, 39–59.
- Hankey, V. 1993  
‘Pottery as evidence for trade: The Levant from the mouth of the river Orontes to the Egyptian border’, in *Wace and Blegen: Pottery as evidence for trade in the Aegean Bronze Age*, C. Zerner, P. Zerner & J. Winder (eds.), Amsterdam, 101–8.
- Hankey, V. & O. Tufnell 1973  
‘The tomb of Maket and its Mycenaean import’, *Annual of the British School at Athens* 68, 103–11.
- Hankey, V. & P. Warren 1974  
‘The absolute chronology of the Aegean Late Bronze Age’, *Bulletin of the Institute of Classical Studies* 21, 142–52.
- Hankey, V. & A. Leonard 1992  
‘Ägypten und die Levante: Ägäische Importe des 2. Jahrtausends v. Chr.’ (*Tübinger Atlas des Vorderen Orients*, B III, map 4/5), Wiesbaden.
- Hankey, V. & A. Leonard 1998  
‘Aegean LB I-II pottery in the East: who is the potter, pray, and who the pot?’, in Cline & Harris-Cline 1998, 29–37.
- Hardy, D.A., C.G. Doumas, J.A. Sakellarakis & P.M. Warren (eds.) 1990a  
*Thera and the Aegean World III*. Vol. 1: *Archaeology*, London.
- Hardy, D.A., J. Keller, V.P. Galanopoulos, N.C. Flemming & T.H. Druitt (eds.) 1990b  
*Thera and the Aegean World III*. Vol. 2: *Earth sciences*, London.
- Hardy, D.A. & C. Renfrew (eds.) 1990  
*Thera and the Aegean World III*. Vol. 3: *Chronology*, London.
- Harris, J. 1968  
‘How long was the reign of Horemheb?’, *Journal of Egyptian Archaeology* 54, 95–106.
- Hassan, F.A. & S.W. Robinson 1987  
‘High-precision radiocarbon chronometry of ancient Egypt, and comparisons with Nubia, Palestine and Mesopotamia’, *Antiquity* 61, 119–35.
- Hassler, A. & F. Höflmayer 2008  
‘Motagedda 1874 and Gurob 23: some notes on recent radiocarbon dates’, *Ägypten & Levante* 18, 145–55.
- Hatzaki, Eleni M. 2005  
*Knossos. The Little Palace* (British School at Athens Supplement 38), Oxford.
- Hatzaki, Eleni M. 2007  
‘Neopalatial (MMIIIB-LM IB)’, in *Knossos pottery handbook. Neolithic and Bronze Age*, N. Momigliano (ed.) (*British School at Athens Studies* 14), London, 151–96.
- Hawes, H.B., E. Williams, R.B. Seager & E.H. Hall 1908  
*Gournia, Vasiliki, and other sites on the isthmus of Ierapetra, Crete*, Philadelphia.
- Hayes, W.C. 1970  
‘Egypt – to the end of the twentieth dynasty’, *Cambridge Ancient History* 3 1/1, 173–93.
- Hédervári, P. 1978  
‘Geonomic notes on the Bronze Age eruption of Santorini’, in Doumas 1978, 153–61.
- Hédervári, P. 1990  
‘Geonomic notes on the Bronze Age eruption of Santorini’, in *Thera and the Aegean World I*, C. Doumas, (ed.), London, 153–161.
- Hedges, R.E.M., R.A. Housley, C. Bronk Ramsey & G.J. van Klinken 1990  
‘Radiocarbon dates from the Oxford AMS system: archaeometry datelist 11’, *Archaeometry* 32, 211–37.
- Heiken, G. & F. McCoy 1984  
‘Caldera development during the Minoan eruption, Thera, Cyclades, Greece’, *Journal of Geophysical Research* 89, 8441–62.
- Heiken, G. & F. McCoy 1990  
‘Precursory activity to the Minoan eruption, Thira, Greece’, in Hardy *et al.* 1990b, 79–88.
- Heiken, G., F. McCoy & M. Sheridan 1990  
‘Palaeotopographic and palaeogeologic reconstruction of Minoan Thera’, Hardy *et al.* 1990b 370–6.
- Hein, I. 1994  
‘Erste Beobachtungen zur Keramik aus ‘Ezbet Helmi’, *Ägypten & Levante* 4, 39–43.
- Hein, I. 1998  
‘‘Ezbet Helmi – Tell el Dab‘a: chronological aspects of pottery’, in *Proceedings of the seventh international congress of egyptologists*, C. Eyre (ed.) (*Orientalia Lovaniensia Analecta* 82), Leiden, 547–54.
- Hein, I. 2001a  
‘Untersuchungen und vorläufige Bilanz zur Keramik aus ‘Ezbet

- Helmi, speziell Areal H/V', *Ägypten & Levante* 11, 121–47.
- Hein, I. 2001b  
‘On Bichrome and Base Ring Ware from several excavation areas at ‘Ezbet Helmi’, in Åström 2001a, 231–47.
- Hein, I. (ed.) 2007  
*The Lustrous Wares of Late Bronze Age Cyprus and the Eastern Mediterranean*, Vienna.
- Heinz, M. 1992  
*Tell Atchana / Alalakh. Die Schichten VII–XVII* (Alter Orient und Altes Testament 41), Neukirchen-Vluyn.
- Helck, W. 1987  
‘Was kann die Ägyptologie wirklich zum Problem der absoluten Chronologie in der Bronzezeit beitragen? Chronologische Annäherungswerte in der 18. Dynastie’, in Åström 1987a, 18–26.
- Helck, W. 1992  
‘Zur Chronologiediskussion über das Neue Reich’, *Ägypten & Levante* 3, 63–7.
- Heltzer, M. 1989  
‘The trade of Crete and Cyprus with Syria and Mesopotamia and their eastern Tin-sources in the XVIII–XVII century B.C.’, *Minos* 24, 7–27.
- Herbert, D. & F. Bardossi 1968  
*Kilauea: case history of a volcano*, New York.
- Hieke, W. 2000  
‘Transparent layers in seismic reflection records from the central Ionian sea (Mediterranean)– evidence from repeated catastrophic turbidite sedimentation during Quaternary’, *Sedimentary Geology* 135, 89–98.
- Hill, L.L. 2006  
*Georeferencing: The geographic associations of information*. Cambridge, MA: MIT Press.
- Höckmann, O. 1974  
‘Die Katastrophe von Thera: Archäologische Gesichtspunkte’, *Jahrbuch des Römisch- Germanischen Zentralmuseums* 21, 46–92.
- Höflmayer, F. 2007  
‘Ägyptische Skarabäen auf Kreta und ihre Bedeutung für die absolute Chronologie der minoischen Altpalastzeit (MM IB–MM IIB)’, *Ägypten & Levante* 17, 107–25.
- Hohneck, H. 2006  
‘Hatte Thutmosis I. wirklich einen Sohn Namens Amenmose?’, *Göttinger Miscellen* 210, 59–68.
- Hood, M.S.F. 1956  
‘Another warrior-grave at Ayios Ioannis near Knossos’, *Annual of the British School at Athens* 51, 81–99.
- Hood, M.S.F. 1962a  
‘Stratigraphic excavations at Knossos, 1957–61’, *Proceedings of the first international Cretological congress*, 92–8.
- Hood, M.S.F. 1962b  
‘Sir Arthur Evans vindicated: a remarkable discovery of Late Minoan IB vases from beside the Royal Road at Knossos’, *Illustrated London News* Feb.17, 259–61.
- Hood, M.S.F. 1971  
*The Minoans. Crete in the Bronze Age*, London.
- Hood, M.S.F. 1978  
*The arts in Prehistoric Greece*, Harmondsworth.
- Hood, M.S.F. 1990  
‘Traces of the eruption outside Thera’, in Hardy *et al.* 1990a, 681–90.
- Hood, M.S.F. 1985  
‘Warlike destruction in Crete c. 1450 B.C.’ *Proceedings of the fifth international Cretological congress*, 170–8.
- Hood, M.S.F. 1996  
‘Back to basics with Middle Minoan IIIB’, in *Minotaur and centaur. Studies in the archaeology of Crete and Euboea presented to Mervyn Popham* (BAR International Series 638), D. Evely, I.S. Lemos & S. Sherratt (eds.), Oxford, 10–6.
- Hood, M.S.F. 2000  
‘Cretan fresco dates’ in *The wall paintings of Thera: proceedings of the first international symposium, Petros M. Nomikos Conference Centre, Thera, Hellas, 30 August–4 September 1997*, S. Sherratt (ed.), Athens, 191–207.
- Hood, M.S.F. 2005  
‘Dating the Knossos frescoes’ in Morgan 2005, 45–81.
- Hope Simpson, R. 2005  
‘The excavation of Site G 2,’ and ‘The excavation of Site Q 21,’ in Betancourt, Davaras & Hope Simpson 2005, 251–2, 254–5.
- Hornung, E. 1971  
*Das Grab des Haremhab im Tal der Könige*. Bern.
- Hornung, E. 1987  
‘Lang oder kurz? – das Mittlere und Neue Reich Ägyptens als Prüfstein’, in Åström 1987a, 27–36.
- Hornung, E., R. Krauss & D.A. Warburton (eds.) 2006  
*Ancient Egyptian chronology*. (Handbook of Oriental Studies I: 83), Leiden.
- Horwell, C.J., I. Fenoglio, K. Vala Ragnarsdottir, R.S.J. Sparks & B. Fubini 2003  
‘Surface reactivity of volcanic ash

- from the eruption of Soufriere Hills volcano, Montserrat, West Indies with implications for health hazards', *Environmental Research* 93, 202–15.
- Horwell, C.J., R.S.J. Sparks, T.S. Brewer, E.W. Llewellyn & B.J. Williamson 2003  
 'Characterization of respirable volcanic ash from the Soufriere Hills volcano, Montserrat, with implications for human health hazards', *Bulletin of Volcanology* 65, 346–62.
- Housley, R.A., R.E.M. Hedges, I.A. Law & C. Bronk Ramsey 1990  
 'Radiocarbon dating by AMS of the destruction of Akrotiri', in Hardy & Renfrew 1990, 207–15.
- Housley, R.A., S.W. Manning, G. Cadogan, R.E. Jones & R.E.M. Hedges 1999  
 'Radiocarbon, calibration, and the chronology of the Late Minoan IB Phase', *Journal of Archaeological Science* 26, 159–71.
- Huber, H., M. Bichler & A. Musilek 2003  
 'Identification of pumice and volcanic ash from archaeological sites in the Eastern Mediterranean region using chemical fingerprinting', *Ägypten & Levante* 13, 83–105.
- Huber, P. 2000a  
 'Astronomical dating of Ur III and Akkad', *Archiv für Orientforschung* 46/47, 50–79.
- Huber, P. 2000b  
 Review of Gasche *et al.* 1998, *Archiv für Orientforschung* 46/47, 287–90.
- Huguen, C., N. Chamot-Rooke, B. Loubrieu, & J. Mascle 2006  
 'Morphology of a pre-collisional, salt-bearing, accretionary complex: The Mediterranean ridge (Eastern Mediterranean)', *Marine Geophysical Researches* 27:61–75.
- Hunger, H. 2000  
 'Uses of Enūma Anu Enlil for chronology', *Akkadica* 119–20, 155–8.
- Hunger, H. 2006  
*Lunar and planetary texts. Astronomical diaries and related texts from Babylonia* vol. V, (Österreichische Akademie der Wissenschaften Philosophisch-Historische Klasse Denkschriften, vol. 299), Vienna.
- Hutchinson, R. W. 1954  
 'Minoan chronology reviewed', *Antiquity* 28, 155–64.
- Hutchinson, R. W. 1962  
*Prehistoric Crete*, Harmondsworth.
- Imamura, F., E. Gica, T. Takahashi, & N. Shuto 1995  
 'Numerical simulation of the 1992 Flores tsunami: interpretation of tsunami phenomena in northeastern Flores island and damage at Babi island', *Pure and Applied Physics* 144, 555–68.
- Imamura, M., H. Ozaki, T. Mitsutani, E. Niu & S. Itoh 2007  
 'Radiocarbon wiggle-matching of Japanese historical materials with a possible systematic age offset', *Radiocarbon* 49, 331–7.
- Jánosi, P. 1994  
 'Tell el-Dab'a – 'Ezbet Helmi: Vorbericht über den Grabungsplatz H/I (1989–92)', *Ägypten & Levante* 4, 20–38.
- Janssen, J.J. 1984  
 'A curious error', *Bulletin de l'Institut Français d'Archéologie Orientale* 84, 303–6.
- Jeffreys, D.G. 1985  
*Survey of Memphis. Part one: the archaeological report* (Egypt Exploration Society Occasional Publications 3), London.
- Jeffreys, D.G. 2003  
 'All in the family? Heirlooms in Ancient Egypt', in Tait 2003, 197–211.
- Jeffreys, D.G. 2006  
*Survey of Memphis V. Kom Rabia: The New Kingdom settlement (Levels II–V)* (Egypt Exploration Society Excavation Memoir 79), London.
- Jidejian, N. 1977  
*Byblos through the ages*, Beirut.
- Jolivet, L. & M. Patriat 1999  
 'Ductile extension and the formation of the Aegean Sea', in *The Mediterranean Basins: Tertiary extension within the Alpine Orogen* (Geological Society Special Publication 15), B. Durand, L. Jolivet, F. Horvath & M. Seranne (eds.), London, 427–56.
- Kampp, F. 1996  
*Die Thebanische Nekropole. Zum Wandel des Grabgedankens von der XVIII. bis zur XX. Dynastie*, (Theben 13), Mainz.
- Kanta, A. 1998  
 'Introduction 16th–11th cent. B.C.', in *Eastern Mediterranean – Cyprus – Dodecanese – Crete 16th – 6th cent. B.C.*, N. Chr. Stampolidis, A. Karetsou & A. Kanta (eds.), Heraklion, 29–66.
- Kantor, H. 1947  
 'The Aegean and the Orient in the Second Millennium B.C.', *American Journal of Archaeology* 51, 1–103.
- Kaplan, M.F. 1980  
*The origin and distribution of Tell el Yahudiyeh Ware* (Studies in Mediterranean Archaeology 42) Gothenburg.

- Karageorghis, V. (ed.) 1979  
*Acts of the international archaeological symposium «The relations between Cyprus and Crete, ca. 2000–500 B.C.»*, Nicosia.
- Karageorghis, V. 1990  
*Tombs at Palaepaphos, 1. Teratsoudhia 2. Eliomylia*, Nicosia.
- Karageorghis, V. 1991  
*Les anciens chypriotes. Entre Orient et Occident*, Paris.
- Karageorghis, V. (ed.) 2001  
*The White Slip ware of Late Bronze Age Cyprus. Proceedings of an international conference organized by the Anastasios G. Leventis Foundation, Nicosia in honour of Malcolm Wiener, Nicosia 29th–30th October 1998*, (Contributions to the chronology of the Eastern Mediterranean 2), Vienna.
- Karageorghis, V. 2006  
*Aspects of everyday life in ancient Cyprus*. Nicosia.
- Karo, G. 1930–33  
*Die Schachtgräber von Mykenai I–II*, Munich.
- Kastens, K.A. & M.B. Cita 1981  
‘Tsunamis-induced sediment transport in the Abyssal Mediterranean Sea’, *Geological Society of America Bulletin* 92, 845–57.
- Keel, O. 1997  
*Corpus der Stempelsiegel-Amulette aus Palästina/Israel. Katalog, Band I* (Orbis Biblicus et Orientalis, Series Archaeologica 13), Freiburg.
- Keenan, D.J. 2002  
‘Why early-historical radiocarbon dates downwind from the Mediterranean are too early’, *Radiocarbon* 44, 225–37.
- Keenan, D.J. 2003  
‘Volcanic ash retrieved from the GRIP ice core is not from Thera’, *Geochemistry, Geophysics, Geosystems* 4.11, 1097, doi: 10.1029/2003G000608. <http://www.informath.org/pubs/G%5E303a.pdf>.
- Keenan, D.J. 2004  
‘Radiocarbon dates from Iron Age Gordion are confounded’, *Ancient West and East* 3, 100–3.
- Kemp, B.J. & R.S. Merrillees 1980  
*Minoan pottery in Second Millennium Egypt*, Mainz.
- Kempinski, A. 1974  
‘Tell el-‘Ajjul – Beth-Aglayim or Sharuhent?’, *Israel Exploration Journal* 24, 145–51.
- Kempinski, A. 1993  
‘The Middle Bronze Age in northern Israel, local and external synchronisms’, *Ägypten & Levante* 3, 69–73.
- Kempinski, A. 1997  
‘The Hyksos: a view from the northern Canaan and Syria’, in Oren 1997, 327–30.
- Kempinski, A. (ed.) 2002  
*Tel Kabri: The 1986–1993 excavations seasons*, N. Scheftelowitz & R. Oren (eds.), Tel Aviv.
- Kempinski, A., L. Gershuny & N. Scheftelowitz 2002  
‘Pottery. III. Middle Bronze Age’, in Kempinski 2002, 109–75.
- Kempinski, A. & W.-D. Niemeier 1991  
‘Tel Kabri 1989–90’, *Israel Exploration Journal* 41, 188–94.
- Keswani, P.F.S. 2005  
‘Death, prestige, and copper in Bronze Age Cyprus’, *American Journal of Archaeology* 109, 341–401.
- King, R. J., S. S. Özcan, T. Carter, E. Kalfoglu, S. Atasoy, C. Triantaphyllidis, A. Kouvatsi, A. A. Lin, C.-E. T. Chow, L. A. Zhivotovsky, M. Michalodimitrakis, P. A. Underhill, 2008  
‘Differential Y-chromosome Anatolian influences on the Greek and Cretan neolithic’, *Annals of Human Genetics* 72, 205–14.
- Kirk, G. S. 1985  
*The Iliad: a commentary, Volume I: books 1–4*, Cambridge.
- Kitchen, K.A. 1987  
‘The basics of Egyptian chronology in relation to the Bronze Age’, in Åström 1987a, 37–55.
- Kitchen K. A. 1996  
‘The historical chronology of ancient Egypt: a current assessment’, *Acta Archaeologica* 67, 1–13.
- Kitchen, K.A. 2000  
‘Regnal and genealogical data of ancient Egypt (Absolute chronology I): The historical chronology of ancient Egypt, a current assessment’, in Bietak 2000a, 39–52.
- Kitchen K. A. 2002  
‘Ancient Egyptian chronology for Aegeanists’, *Mediterranean Archaeology and Archaeometry* 2, 5–12.
- Kitchen, K. A. 2007  
‘Egyptian and related chronologies – look, no sciences, no pots!’, in Bietak & Czerny 2007, 163–71.
- Klengel, H. 1992  
*Syria 3000–300 BC*, Berlin.
- Klug, A. 2002  
*Königliche Stelen in der Zeit von Ahmose bis Amenophis III* (Monumenta aegyptiaca 8), Brussels.

- Knappett, C. & T. F. Cunningham 2003  
‘Three Neopalatial deposits from Palaikastro, east Crete’, *Annual of the British School at Athens* 98, 107–87.
- Koch, J. 1998  
‘Neues von den Ur III-Mondeklipsen’, *Nouvelles Assyriologiques Brèves et Utilitaires* (=NABU) 1998(4,132), 126–9.
- Koehl, R. 2000  
‘Minoan rhyta in Egypt’, in *Κρήνη-Αίγυπτος, Πολιτισμικοί δεσμοί τριών χιλιετιών*, A. Karetsou (ed.), Athens, 94–100.
- Koehl, R. B. 2006  
*Aegean Bronze Age rhyta* (Prehistory Monographs 19), Philadelphia.
- Kopetzky, K. 2002  
‘The dipper juglets of Tell el-Dab<sup>a</sup>. A typological and chronological approach’, in Bietak 2002a, 227–44.
- Kooij, van der G. 2006  
‘Tell Deir ‘Alla. The Middle and Late Bronze Age chronology’, in Fischer 2006a, 199–226.
- Krauss, R. 1985  
*Sothis- und Monddaten* (Hildesheimer Ägyptologische Beiträge 20), Hildesheim.
- Krauss, R. 2007  
‘An Egyptian chronology for Dynasties XIII to XXV’, in Bietak & Czerny 2007, 173–89.
- Krauss, R. & H.G. Wiedemann 1998  
‘Das Schwarze in Nofretetes Auge’, *Jahrbuch Stiftung Preussischer Kulturbesitz* 34, 211–22.
- Kromer, B., M. Rhein, M. Bruns, H. Schochfischer, K.O. Münnich, M. Stuiver & B. Becker 1986  
‘Radiocarbon calibration data for the 6th to the 8th millennia BC’, *Radiocarbon* 28(2B), 954–60.
- Kromer, B., S.W. Manning, P.I. Kuniholm, M.W. Newton, M. Spurk & I. Levin 2001  
‘Regional <sup>14</sup>CO<sub>2</sub> offsets in the troposphere: magnitude, mechanisms, and consequences’, *Science* 294, 2529–32.
- Kugler, F.X. 1910  
‘Die ältesten Venus-Tafeln und das Alter der I. Dynastie von Babel’, in *Sternkunde und Sterndienst in Babel*, Münster, II: 257–306.
- Kuniholm, P.I. 1990  
‘Overview and assessment of the evidence for the date of the eruption of Thera’, in Hardy & Renfrew 1990, 13–8.
- Kuniholm, P.I., B. Kromer, S.W. Manning, M. Newton, C.E. Latini & M.J. Bruce 1996  
‘Anatolian tree rings and the absolute chronology of the Eastern Mediterranean, 2220–718 BC’, *Nature* 381, 780–3.
- Laboury, D. 2006  
‘Royal portrait and ideology: evolution and significance of the statuary of Thutmose III’, in Cline & O’Connor 2006, 260–91.
- Laffineur, R. L. & L. Basch (eds.) 1991  
*THALASSA. L’Egée Préhistorique et la Mer* (Aegaeum 7), Liège.
- Laffineur, R. & P.P. Betancourt (eds.) 1997  
*TEXNH. Craftsmen, craftswomen and craftsmanship in the Aegean Bronze Age. Proceedings of the sixth international Aegean conference/60 Rencontre égéenne internationale, Philadelphia, Temple University, 18–21 April 1996* (Aegaeum 16), Liège.
- Laffineur, R. & E. Greco (eds.) 2005  
*EMPORIA. Aegeans in the central and Eastern Mediterranean* (Aegaeum 25), Liège.
- Lal, D. & B. Peters 1967  
‘Cosmic Ray Produced Radioactivity on the earth’, in *Handbuch für Physik*, S. Flügge, (ed.), Berlin, 551–612.
- Lamarchand, N. & J.-R. Grasso 2007  
‘Interactions between earthquakes and volcano activity’, *Geophysical Research Letters* 34 (L24303).
- LaMarche, V.C. & K.K. Hirschboeck 1984  
‘Frost rings in trees as records of major volcanic eruptions’, *Nature* 307, 121–6.
- Lambrou-Phillipson, C. 1990  
*Hellenorientalia plus Orientalia. A catalogue of Egyptian, Mesopotamian, Mitannian, Syro-Palestinian, Cypriot and Asia Minor objects from the Bronze Age Aegean* (Studies in Mediterranean Archaeology Pocketbook 95), Gothenburg.
- Landsberger, B. 1954  
‘Assyrische Königsliste und “dunkles Zeitalter”’, *Journal of Cuneiform Studies* 8, 31–73, 106–33.
- Lapp, P. W. 1967  
‘The 1966 Excavations at Tell Ta’annek’, *Bulletin of the American Schools of Oriental Research* 185, 2–39.
- Larsen, M.T. 1976  
*The Old Assyrian city-state and its colonies*, Copenhagen.
- Larsen, L.B., B.M. Vinther, K.R. Briffa, T.M. Melvin, H.B. Clausen, P.D. Jones, M.-L. Siggaard-Andersen, C.U. Hammer, M. Eronen, H. Grudd, B.E.



- Gunnarson, R.M. Hantemirov, M.M. Naurzbaev & K. Nicolussi 2008  
‘New ice core evidence for a volcanic cause of the A.D. 536 dust veil’, *Geophysical Research Letters* 35 (L04708).
- Lasley, K.R., M.R. Manning & B.J. O’Brien 1990  
‘An overview of oceanic radiocarbon’, *Reviews in Aquatic Sciences* 3, 117–46.
- Latter, J. H. 1981  
‘Tsunamis of volcanic origin: summary of cases, with particular reference to Krakatoa, 1883’, *Bulletin Volcanologique* 44, 467–90.
- Le Pichon, X. & J. Angelier 1979  
‘The Hellenic arc and trench system: a key to the neotectonic evolution of the Eastern Mediterranean Sea’, *Tectonophysics* 60, 1–42.
- Leatham, J. & S. Hood 1958/1959  
‘Sub-marine exploration in Crete, 1955’, *Annual of the British School at Athens* 53–54, 263–80.
- Leonard, A. 1994  
*An index to the Late Bronze Age Aegean pottery from Syria-Palestine* (Studies in Mediterranean Archaeology 114), Jonsered.
- Lepsius, C.R. 1849–1859  
*Denkmäler aus Ägypten und Äthiopien*, Leipzig.
- Lilyquist, C. 1988  
‘The gold bowl naming general Djehuty: a study of objects and early egyptology’, *Metropolitan Museum Journal* 23, 5–62.
- Lilyquist, C. 1994  
‘Objects attributable to Kamid el-Loz and comments on the date of some objects in the ‘Schatzhaus’, in *Das ‘Schatzhaus‘ im Palastbereich: Die Befunde des Königsgrabes*, W. Adler (Saarbrücker Beiträge zur Altertumskunde 47 = Kamid el-Loz 11), Bonn, 207–20.
- Lilyquist, C. 1995  
*Egyptian stone vessels. Khian through Tuthmosis IV*, New York.
- Lilyquist, C. 1996  
‘Stone vessels at Kāmid el-Lōz, Lebanon: Egyptian, egyptianizing, or non-Egyptian? A question at sites from the Sudan to Iraq to the Greek Mainland’, in ‘Schatzhaus‘-Studien, R. Hachmann (ed.) (Saarbrücker Beiträge zur Altertumskunde 59 = Kāmid el-Lōz 16), Bonn, 133–73.
- Lilyquist, C. 1997  
‘Egyptian stone vases? Comments on Peter Warren’s paper’, in *TEXNH: Craftsmen, craftswomen and craftsmanship in the Aegean Bronze Age. Proceedings of the 6th international Aegean conference, Philadelphia, Temple University, 18-21 April 1996*, R. Laffineur & P.P. Betancourt (eds.) (AEGAEUM 16), Liège, 225–8.
- Lilyquist, C. 2003  
*The tomb of Three Foreign Wives of Tuthmosis III*, New York.
- Limburg, E.M. & J.C. Varekamp 1991  
‘Young pumice deposits on Nisyros, Greece’, *Bulletin of Volcanology* 54, 68–77.
- Lipinska, J. 2001  
‘Tuthmosis III’, in Redford 2001, 401–3.
- Liverani, M. 1973  
‘Memorandum on the approach to historiographic texts’, *Orientalia* 42, 178–94.
- Lolos, Y. G. 1990  
‘On the Late Helladic I of Akrotiri, Thera’, in Hardy & Renfrew 1990, 51–6.
- Luce, J.V 1976  
‘Thera and the devastation of Minoan Crete: a new interpretation of the evidence’, *American Journal of Archaeology* 80, 9–18.
- Macdonald, C. F. 2001  
‘Chronologies of the Thera eruption’ (= Review of Manning 1999), *American Journal of Archaeology* 105, 527–32.
- Macdonald, C.F. 1990  
‘Destruction and construction in the palace at Knossos: LM IA-B’, in Hardy & Renfrew 1990, 82–8.
- Macdonald, C.F. 1996  
‘Notes on some Late Minoan IA contexts from the Palace of Minos and its immediate vicinity’, in *Minotaur and centaur. Studies in the archaeology of Crete and Euboea presented to Mervyn Popham* (British Archaeological Reports International Series 638), D. Evely, I. S. Lemos & S. Sherratt (eds.), Oxford, 17–26.
- Macdonald, C.F. 2005  
*Knossos*, London.
- Macedonio, G., M. T. Pareschi & R. Santacroce 1990  
‘Renewal of activity at Vesuvius: models for the expected tephra fallout’, *Journal of Volcanology and Geothermal Research* 40, 327–42.
- MacGillivray, J.A. 1984  
‘Cycladic jars from Middle Minoan III contexts at Knossos’, in *The Minoan Thalassocracy: Myth or reality*, R. Hägg & N. Marinatos (eds.), Stockholm, 152–8.
- MacGillivray, J.A. 1995  
‘A Minoan cup at Tell el-Dab‘a’, *Ägypten & Levante* 5, 81–4.
- MacGillivray, J.A. 1997  
‘The re-occupation of eastern Crete in the Late Minoan II-

- IIIA1/2 periods', in Driessen & Farnoux 1997, 275–9.
- MacGillivray, J.A. 1998  
*Knossos: pottery groups of the Old Palace Period* (British School at Athens Studies 5), London.
- MacGillivray, J.A. 2003  
'Return to the Labyrinth: a clew to the function of the Minoan palaces', *Athena Review* 3, 63–6.
- MacGillivray, J.A. 2004  
'A Middle Minoan cup from Sidon', in Doumet-Serhal, Rabate & Resek 2004, 124–38.
- MacGillivray, J.A. 2008  
'The Minoan Sidon cup', in *The Bronze Age in the Lebanon*, M. Bietak & E. Czerny (eds.), Wien, 45–50.
- MacGillivray, J.A. forth.  
'Absolute MM III – the bigger picture. Early Neopalatial Crete's relations with the ancient Orient in the mid-second millennium BC', in *Intermezzo. intermediacy and regeneration in Middle Minoan III Crete*, C. Macdonald, C. Knappett & E. Banou, (eds.), forthcoming.
- MacGillivray, J.A., J.M. Driessen & L.H. Sackett (eds.) 2000  
*The Palaikastro Kouros* (British School at Athens Studies 6), London.
- MacGillivray J.A., L.H. Sackett & J.M. Driessen 1998  
'Excavations at Palaikastro, 1994 and 1996', *Annual of the British School at Athens* 93, 221–68.
- MacGillivray J.A. & L.H. Sackett forth.  
*Palaikastro: Building 1. Sacred space in transition* (British School at Athens Supplementary Volume), forthcoming.
- Mackay, E.J.H. & M.A. Murray 1952  
*Ancient Gaza, Vol. 5* (British School of Egyptian Archaeology 64), London.
- Mackenzie, D. 1978  
'Active tectonics of the Alpine-Himalayan belt: the Aegean Sea and surrounding regions', *Geophysical Journal of the Royal Astronomical Society*, 55, 217–54.
- Macqueen, J. G. 1986  
*The Hittites and their contemporaries in Asia Minor*, New York.
- Maeir, A.M. 2007  
'The Middle Bronze Age II pottery', in *Excavations at Beth-Shean 1989-1996, Vol II, The Middle and Late Bronze Age strata in Area R*, A. Mazar & R.A. Mullins (eds.), Jerusalem, 242–390.
- Maguire, L.C. 1995  
'Tell el Dab<sup>a</sup>: The Cypriot connexion', in *Egypt, the Aegean and the Levant: Interconnections in the Second Millennium BC*, W.V. Davies & L. Schofield (eds.), London, 54–65.
- Mallet, J. 2002  
'Ras Shamra-Ougarit (Syrie), 62e campagne, 2002. L'exploration des niveaux du Bronze moyen II (1er moitié du IIe millénaire av. J.-C.) sous le Palais Nord', *Ugarit Forschungen* 34, 527–50.
- Manassa, C. 2003  
*The Great Karnak Inscription of Merneptah: grand strategy in the 13th century BC*. (Yale Egyptological Studies 5), New Haven.
- Manning, S.W. 1988  
'The Bronze Age eruption of Thera: absolute dating, Aegean chronology and Mediterranean cultural interrelations', *Journal of Mediterranean Archaeology* 1, 17–82.
- Manning, S.W. 1992  
'Thera, sulphur, and climatic anomalies', *Oxford Journal of Archaeology* 11, 245–53.
- Manning, S.W. 1995  
*The absolute chronology of the Aegean Early Bronze Age*, Sheffield.
- Manning, S.W. 1996  
'Dating the Aegean Bronze Age: without, with, and beyond, radiocarbon', *ActaArch* 67, 15–37.
- Manning, S.W. 1999  
*A test of time: the volcano of Thera and the chronology and history of the Aegean and East Mediterranean in the mid Second Millennium BC*, Oxford.
- Manning, S.W. 2001  
'The chronology and foreign connections of the Late Cypriot I period: times they are a'changin'', in Åström 2001a, 68–94.
- Manning, S.W. 2005  
'Simulation and the Thera eruption: outlining what we do and do not know from radiocarbon', in *Autochthon: papers presented to O.T.P.K. Dickinson on the occasion of his retirement*, A. Dakouri-Hild & S. Sherratt (eds.) (BAR International Series 1432) Oxford, 97–114.
- Manning, S.W. 2007  
'Clarifying the 'high' v. 'low' Aegean/Cypriot chronology for the mid second millennium BC: assessing the evidence, interpretive frameworks, and current state of the debate', in Bietak & Czerny 2007, 101–37.
- Manning, S.W., C. Bronk Ramsey, C. Doumas, T. Marketou, G. Cadogan & C.L. Pearson 2002  
'New evidence for an early date for the Aegean Late Bronze Age and Thera eruption', *Antiquity* 76, 733–44.

- Manning, S.W. & C. Bronk Ramsey 2003  
‘A Late Minoan I-II absolute chronology for the Aegean – combining archaeology with radiocarbon’, in Bietak 2003a, 111–33.
- Manning, S. W., C. Bronk Ramsey, W. Kutschera, T. Higham, B. Kromer, P. Steir & E. M. Wild 2006a  
‘Chronology for the Aegean Late Bronze Age 1700–1400 B.C.’, *Science* 312, 565–9.
- Manning, S.W., C. Bronk Ramsey, W. Kutschera, T. Higham, B. Kromer, P. Steier & E.M. Wild 2006b  
‘Supporting online material for chronology for the Aegean Late Bronze Age 1700–1400 B.C.’, *Science* 312, 565. [www.sciencemag.org/cgi/content/full/312/5773/565/DC1](http://www.sciencemag.org/cgi/content/full/312/5773/565/DC1).
- Manning, S.W., C. Bronk Ramsey, W. Kutschera, T. Higham, B. Kromer, P. Steier and E. Wild 2009  
‘Dating the Santorini/Thera eruption by radiocarbon: further discussion (AD 2006–2007)’, in Manning & Bruce 2009 (in press).
- Manning, S.W. & M.J. Bruce (eds.) 2009 (in press)  
*Tree-rings, kings, and Old World archaeology and environment: papers presented in honor of Peter Ian Kuniholm*, Oxford.
- Manning, S.W., L. Crewe & D.A. Sewell 2006c  
‘Further light on early LCI connections at Maroni’, in Czerny *et al.* 2006, 471–88.
- Manning, S.W., B. Kromer, P.I. Kuniholm & M.W. Newton 2001  
‘Anatolian tree-rings and a new chronology for the east Mediterranean Bronze–Iron Ages’, *Science* 294, 2532–5.
- Manning, S.W., S.J. Monks, G. Nakou, & F.A. De Mita jr. 1994  
‘The fatal shore, the long years and the geographical unconscious. Considerations of iconography, chronology, and trade in response to Negbi’s “The “Libyan landscape” from Thera: a review of Aegean enterprises overseas in the Late Minoan IA period’, *Journal of Mediterranean Archaeology* 7, 219–35.
- Manning, S.W., Sewell, D.A., & E. Herscher 2002  
‘Late Cypriot I A maritime trade in action: underwater survey at Maroni *Tsaroukkas* and the contemporary east Mediterranean trading system’, *Annual of the British School at Athens* 97, 97–162.
- Manning, S.W. & B. Weninger 1992  
‘A light in the dark: archaeological wiggle matching and the absolute chronology of the close of the Aegean Late Bronze Age’, *Antiquity* 66, 636–63.
- Marchal, O., Stocker, T.F. & R. Muscheler 2001  
‘Atmospheric radiocarbon during the Younger Dryas: production, ventilation, or both?’, *Earth and Planetary Science Letters* 185, 383–95.
- Marcus, E., E.M. Wild, D. Arnold, C. Bronk Ramsey, T. Higham, W. Kutschera, P. Steier & U. Thanheiser forth.  
‘Radiocarbon confirms historical date of Egyptian Queen/Pharaoh Hatshepsut’, n.d..
- Marinatos, N. 1984  
*Art and religion in Thera: reconstructing a Bronze Age society*, Athens.
- Marinatos, N. 1986  
‘On the ceremonial function of the Minoan polythyron’, *Opuscula Atheniensi* 16, 57–73.
- Marinatos, N. 1998  
‘The Tell el-Dab’a paintings: a study in pictorial tradition’, *Ägypten & Levante* 8, 83–99.
- Marinatos, S. 1939  
‘The volcanic destruction of Minoan Crete’, *Antiquity* 13, 425–39.
- Marinatos, S. 1967–76  
*Excavations at Thera I–VII*, Athens.
- Marketou, T. 1990  
‘Santorini tephra from Rhodes and Kos: some chronological remarks based on the stratigraphy’, in Hardy & Renfrew 1990, 100–13.
- Marketou, T., Y. Facorellis & Y. Maniatis 2001  
‘New Late Bronze Age chronology from the Ialysos Region, Rhodes’, *Mediterranean Archaeology and Archaeometry* 1, 19–29.
- Marsan, D. & O. Lengline 2008  
‘Extending earthquakes’ reach through cascading,” *Science* 319, 1076–9.
- Marthari, M. 1984  
‘The destruction of the town at Akrotiri, Thera, at the beginning of LC I: definition and chronology’ in *The Prehistoric Cyclades. Contributions to a workshop on Cycladic chronology*, J. A. MacGillivray & R.L.N. Barber (eds.), Edinburgh, 119–33.
- Marthari, M. 1990  
‘The chronology of the last phases of occupation at Akrotiri in the light of the evidence from the West House pottery groups’, in Hardy & Renfrew 1990, 57–70.

- Marthari, M. 1993  
‘The ceramic evidence for contacts between Thera and the Greek mainland’, in *Proceedings of the international conference Wace and Blegen. Pottery as evidence for trade in the Aegean Bronze Age, 1939 – 1989, held at the American School of Classical Studies at Athens, Athens, December 2 – 3, 1989*, C. Zerner (ed.), Amsterdam, 249–56.
- Martin, V.M., D.J. Morgan, D.A. Jerram, M.J. Caddick, D.J. Prior & J.P. Davidson 2008  
‘Bang! month-scale eruption triggering at Santorini volcano,’ *Science* 321, 1178.
- Marzocchi, W., E. Casarotti & A. Piersanti 2002  
‘Modeling the stress variations induced by great earthquakes on the largest volcanic eruptions of the 20th century’, *Journal of Geophysical Research* 107(B11), 2320.
- Masarik, J. & J. Beer 1999  
‘Simulation of particle fluxes and cosmogenic nuclide production in the earth’s atmosphere’, *Journal of Geophysical Research* 104, 12,099–111.
- Masclé, J., C. Huguen, J. Benkhelil, N. Chamot-Rooke, N. Chaumillon, J.P. Foucher, R. Griboulard, & A. Kopf, A. 1999  
‘Images may show start of European-African plate collision,’ *Eos Transactions American Geophysical Union* 80, doi:10.1029/99EO00308.
- Mason, B.G., D.M. Pyle & C. Oppenheimer 2004  
‘The size and frequency of the largest explosive eruptions on earth’, *Bulletin of Volcanology* 66, 735–48.
- Matthäus, H. 1995  
‘Representations of Keftiu in Egyptian tombs and the absolute chronology of the Aegean Late Bronze Age’, *Bulletin of the Institute of Classical Studies* 40, 177–94.
- Matthäus, H. 1996  
‘Die absolute Chronologie der Periode SM II/SH II B’, in *Atti e memorie del secondo congresso internazionale di micenologia. Roma-Napoli, 14-20 ottobre 1991*. Volume terzo: *Archeologia*, E. DeMiro, L. Godart & A. Sacconi (eds.) (Incunabula Graeca 98), Rome, 1457–70.
- Matz, F. 1973  
‘The zenith of Minoan civilization’ *Cambridge Ancient History* (3), II, part I, 557–81.
- McClelland, E. & R. Thomas 1990  
‘A paleomagnetic study of Minoan tephra from Thera’, in Hardy *et al.* 1990b, 129–38.
- McCoy, F.W. 1980a  
‘The upper Thera (Minoan) ash in deep-sea sediments: distribution and comparison with other ash layers’, in Doumas 1980, 57–72.
- McCoy, F.W. 1980b  
Climate change in the Eastern Mediterranean area during the past 240,000 Years,’ in *Thera and the Aegean World II*, Doumas, C., ed. v. 2; London, 79–100.
- McCoy, F.W. 1981  
‘Areal distribution, redeposition, and mixing of tephra within deep-sea sediments of the Eastern Mediterranean sea,” in *Tephra studies*, S. Self, & R.S.J. Sparks, (eds.), Hingham, D. Reidel: 245–54.
- McCoy, F.W. 2003  
‘Blending Archaeology and geology – reconstructing Thera (Santorini, Greece) before the Late Bronze Age eruption’, (abstract), *Geological Soc. Am., Abstracts with Programs* 35 (6): 99.
- McCoy, F.W. 2005  
‘Reconstructing a lost island – Thera before the Late Bronze Age eruption,’ in *Proceedings of the international conference on the Atlantis Hypothesis: searching for a lost land*, Papamarinopoulos, S.P. (ed.), Athens, 309–26.
- McCoy, F.W. & S. Dunn 2002  
‘Modelling the climatic effects of the LBA eruption of Thera: new calculations of tephra volumes may suggest a significantly larger eruption than previously reported’, *Chapman conference on volcanism and the earth’s atmosphere, Thera, Greece: American Geophysical Union*.
- McCoy, F.W. & S.E. Dunn 2004  
‘The LBA eruption of Thera: new finds of tephra and calculations of tephra volumes suggest a significantly larger eruption than previously reported’, (abstract), *Archaeological Institute of America, 105th Annual Meeting*, San Francisco.
- McCoy, F.W. & G. Heiken 2000a  
‘The Late-Bronze Age explosive eruption of Thera (Santorini), Greece: regional and local effects’, in McCoy & Heiken 2000b, 43–70.
- McCoy, F.W. & G. Heiken (eds.) 2000b  
*Volcanic hazards and disasters in human antiquity*, Boulder (Geological Society of America Special Paper 345).
- McCoy, F.W. & G. Heiken 2000c  
‘Tsunami generated by the Late Bronze Age eruption of Thera (Santorini), Greece’, *Pure and Applied Geophysics* 157, 1227–56.

- McCoy, F.W., C. Synolakis & G. Papadopoulos 2000  
‘Tsunami generated by the LBA eruption of Thera – Evidence from modelling and sedimentary deposits’ (abstract), *EOS Transactions, American Geophysical Union* 81(48): F1224.
- McDonald, A. & N. C. Wilkie, (eds.) 1992  
*Excavations at Nichoria in southwest Greece. Vol II: The Bronze Age occupation*, Minneapolis.
- McGee, K.A. & T.M. Gerlach 1998  
‘Annual cycle of magmatic CO<sub>2</sub> in a tree-kill soil at Mammoth Mountain, California: implications for soil acidification,’ *Geology* 26, 463–6.
- McHargue, L. R. & P. E. Damon 1991  
‘The global beryllium 10 cycle’, *Reviews of Geophysics* 29, 141–58.
- McKenzie, D.P. 1972  
‘Active tectonics of the Mediterranean region’, *Geophysical Journal of the Royal Astronomical Society* 30, 109–85.
- McNutt, S.R. 2000  
‘Seismic monitoring,’ in Sigurdsson 2000, 1095–119.
- McNutt, S.R., H. Rymer & J. Stix, 2000  
‘Synthesis of volcano monitoring,’ in Sigurdsson 2000, 1165–83.
- Meier, T., M. Rische, B. Endrun, A. Vafidis & H.-P. Harjes 2004  
‘Seismicity of the Hellenic subduction zone in the area of western and central Crete observed by temporary local seismic networks’, *Tectonophysics* 383, 149–69.
- Merrillees, R.S. 1968  
*The Cypriote Bronze Age pottery found in Egypt* (Studies in Mediterranean Archaeology 18), Lund.
- Merrillees, R.S. 1970  
‘Evidence for the Bichrome Wheel-made Ware in Egypt’, *The Australian Journal of Biblical Archaeology* 1, 3–27.
- Merrillees, R.S. 1974  
‘Appendix III. Tell el-‘Ajjul fine and imported wares’, in *Tell el-‘Ajjul. The Middle Bronze Age remains*, J.R. Stewart (ed.) (Studies in Mediterranean Archaeology 38), Gothenburg, 86–111.
- Merrillees, R.S. 1992  
‘The absolute chronology of the Bronze Age in Cyprus: a revision’, *Bulletin of the American Schools of Oriental Research* 288, 47–52.
- Merrillees, R.S. 2001  
‘Some Cypriote White Slip pottery from the Aegean’, in Karageorghis 2001, 89–100.
- Merrillees, R.S. 2002  
‘The relative and absolute chronology of the Cypriote White Painted Pendant Line Style’, *Bulletin of the American Schools of Oriental Research* 326, 1–9.
- Merrillees, R.S. 2003  
‘The first appearances of Kamares ware in the Levant’, *Ägypten & Levante* 13, 127–42.
- Merrillees, R.S. 2007  
‘The ethnic implications of Tell el-Yahudiyeh Ware for the history of the Middle to Late Bronze Age in Cyprus’, *Cahier du Centre d’Études Chypriotes* 37, 87–96.
- Merrillees, R.S. & J. Winter 1972  
‘Bronze Age trade between the Aegean and Egypt: Minoan and Mycenaean pottery from Egypt in the Brooklyn Museum’, *Miscellanea Wilbouriana* 1, 101–33.
- Michael, H.N. 1976  
‘Radiocarbon dates from Akrotiri on Thera’, *Temple University Aegean Symposium* 1: 7–9.
- Michel, C. & P. Rocher 2000  
‘La chronologie du IIe millénaire, revue à l’ombre d’une éclipse de soleil’, *Jaarbericht Ex Oriente Lux* 35–36, 111–26.
- Michel, C. 2002  
‘Nouvelles données pour la chronologie du IIe millénaire’, *Nouvelles Assyriologiques Brèves et Utilitaires* (=NABU) 2002(1,20), 17–8.
- Michel, C. 2007  
Review of Veenhof 2003, *Archiv für Orientforschung* 51, 321–4.
- Millard, A.R. 1994  
*The eponyms of the Assyrian Empire 910–612 BC*, Helsinki.
- Miller, J.L. 2007  
‘Amarna age chronology and the identity of Nibururiya in the light of a newly reconstructed Hittite text’, *Altorientalische Forschungen* 34, 252–93.
- Minissale, A., G. Magro, O. Vaselli, C. Verrucchi & I. Perticone 1997  
‘Geochemistry of water and gas discharges from the Mt. Amiata silicic complex and surrounding areas (central Italy)’, *Journal of Volcanology and Geothermal Research* 79, 223–51.
- Minoura, K., F. Imamura, U. Kuran, T. Nakamura, G. Papadopoulos, T. Takahashi, & A. Yalciner 2000  
‘Discovery of Minoan tsunami deposits’, *Geology* 28, 59–62.
- Minoura, K., F. Imamura, T. Takahashi & N. Shuto 1997  
‘Sequence of sedimentation processes caused by the 1992

- Flores tsunami: evidence from Babi island,' *Geology* 25, 523–6.
- Miron, R. 1990  
*Das 'Schatzhaus' im Palastbereich. Die Funde* (Saarbrücker Beiträge zur Altertumskunde 46 = Kamid el-Loz. 10), Bonn.
- Mitrousis, A. 2008  
'The search for Atlantis in the marine region westwards of Santorini island – program Atlantis 2003 – preliminary results,' (Abstract), *Proceedings, Atlantis 2008 The Atlantis Hypothesis*, Athens, 48–9.
- Mizrachy, Y. 2002  
'Glyptic finds. I. Scarabs and seals' in Kempinski 2002, 319–39.
- Mlinar, C. 2002  
'Appendix 4: The scarabs from the excavations of 1999 and 2000 at Tell el-<sup>c</sup>Ajjul', *Ägypten & Levante* 12, 143–51.
- Monges Soares, A.M. 1993  
'<sup>14</sup>C content of marine shells: evidence for variability in coastal upwelling off Portugal during the Holocene', in *The international symposium on applications of isotope techniques in studying past and current environmental changes in the hydrosphere and the atmosphere*, Vienna, Austria, 04/19223/93, IAEA-SM-329/49, Vienna, 471–85.
- Montet, P. 1921–22  
'Les Égyptiens à Byblos', *Monuments et mémoires. Fondation E. Piot* XXV, Paris, 237–72.
- Montet, P. 1928  
*Byblos et l'Égypte, Texte*, Paris.
- Montet, P. 1929  
*Byblos et l'Égypte, Atlas*, Paris.
- Moody, J. 2005  
'Unravelling the threads: climate changes in the Late Bronze III Aegean', in *Ariadne's threads: Connections between Crete and the Greek Mainland in Late Minoan III (LM IIIA2 to LM IIIC)*, A.–L. D'Agata & J. Moody (eds.) (Tripodes 3, Scuola Archeologica Italiana di Atene), Athens, 443–70.
- Moody, J., O. Rackham, & G. Rapp 1996  
'Paleoenvironment studies of the prehistoric Akrotiri peninsula, Crete,' *Journal of Field Archaeology* 23, 273–97.
- Moore, J. G. 1966  
'The 1965 eruption of Taal Volcano', *Science* 151. 955–60.
- Moran, W. L. 1992  
*The Amarna letters*, Baltimore.
- Morgan, L. (ed.) 2005  
*Aegean wall paintings: a tribute to Mark Cameron* (British School at Athens Studies 13), London.
- Morgan, L. 2006  
'Art and international relations: the hunt frieze at Tell el-Dab'a', in Czerny *et al.* 2006, 249–58.
- Mörner, N.-A. & G. Etiope 2002  
'Carbon degassing from the lithosphere', *Global and Planetary Change* 33, 185–203.
- Mountjoy, P.A. 1983  
'The Ephyraean goblet reviewed', *Annual of the British School at Athens* 78, 265–71.
- Mountjoy, P.A. 1986  
*Mycenaean decorated pottery: a guide to identification* (Studies in Mediterranean Archaeology 73), Gothenburg.
- Mountjoy, P.A. 1999  
*Regional Mycenaean decorated pottery*, Rahden.
- Mountjoy, P. A. 2004  
'Knossos and the Cyclades in Late Minoan IB', in Cadogan, Hatzaki & Vasilakis 2004, 399–404.
- Müller, V. 2007  
'Wie gut fixiert ist die Chronologie des Neuen Reiches wirklich?,' *Ägypten & Levante* 16, 203–30.
- Müller, W. 1997  
*Kretische Tongefässe mit Meeresdekor. Entwicklung und Stellung innerhalb der Feinen Keramik von Spätminoisch I B auf Kreta* (Archäologische Forschungen 19), Berlin.
- Murray, J.B.. H. Rymer, & C.A. Locke 2000  
'Ground deformation, gravity, and magnetics,' in Sigurdsson 2000, 1121–63.
- Muscheler, R., J. Beer, G. Wagner & R.C. Finkel 2000  
'Changes in deep-water formation during the Younger Dryas cold period inferred from a comparison of <sup>10</sup>Be and <sup>14</sup>C records', *Nature* 408, 567–70.
- Muscheler, R., J. Beer, G. Wagner, C. Laj, C. Kissel, G.M. Raisbeck, F. Yiou & P. W. Kubik 2004  
'Changes in the carbon cycle during the last deglaciation as indicated by the comparison of <sup>10</sup>Be and <sup>14</sup>C records', *Earth and Planetary Science Letters* 219, 325–40.
- Nafplioti, A. 2008  
"Mycenaean" political domination of Knossos following the Late Minoan IB destructions on Crete: negative evidence from strontium isotope ratio analysis (87Sr/86Sr)', *Journal of Archaeological Science* 35: 2307–17.
- Newhall, C. G. & S. Self 1982  
'The volcanic explosivity index (VEI): an estimate of explosive

- magnitude for historical volcanism', *Journal of Geophysical Research* 87, 1231–8.
- Newton, M.W., S. Talamo, C. Pulak, B. Kromer & P. Kuniholm 2005  
 'Die Datierung des Schiffswracks von Uluburun', in Yalçın, Pulak & Slotta 2005, 115–6.
- Nicholls, G.K. & M.D. Jones 2001  
 'Radiocarbon dating with temporal order constraints', *Journal of the Royal Statistical Society: Series C (Applied Statistics)* 50, 503–21.
- Niemeier, B. & W.-D. Niemeier 2002  
 'The frescoes in the Middle Bronze Age palace', in Kempinski 2002, 254–85.
- Niemeier, W.-D. 1980  
 'Die Katastrophe von Thera und die spätminoische Chronologie', *Jahrbuch des Deutschen Archäologischen Instituts* 95, 1–76.
- Niemeier, W.-D. 1990a  
 'New archaeological evidence for a 17th century date of the "Minoan Eruption" from Israel (Tel Kabri western Galilee)', in Hardy & Renfrew 1990, 120–6.
- Niemeier, W.-D. 1990b  
 'Area D: the painted plaster floor in Room 611: technical, stylistic, iconographic and chronological implications', in *Excavations at Kabri, preliminary report of 1989 season*, A. Kempinski & W.-D. Niemeier (eds.), Tel Aviv, XVI–XXI.
- Niemeier, W.-D. 1991  
 'Minoan artisans travelling overseas: the Alalakh frescoes and the painted plaster floor at Tel Kabri (western Galilee)', in Laffineur & Basch 1991, 189–208.
- Niemeier, W.-D. 1993  
 'Tel Kabri: Cretan fresco paintings in a Canaanite Palace', *American Journal of Archaeology* 97, 332–3.
- Niemeier, W.-D. 1995a  
 'Minoans in Canaan', in Πεπραγμένα του Ζ' διεθνους Κρητολογικού Συνεδριου, Τόμος Α2, Rethymnon, 675–9.
- Niemeier, W.-D. 1995b  
 'Tel Kabri: Aegean fresco painting in a Canaanite palace', in *Recent excavations in Israel: A view to the west*, S. Gitin (ed.) (Archaeological Institute of America Colloquia and Conference Papers No. 1), Dubque OH, 1–15.
- Niemeier, W.-D. 2005  
 'Minoans, Mycenaeans, Hittites and Ionians in western Asia Minor: new excavations in Bronze Age Miletus–Millawanda', in *The Greeks in the East*, A. Villing (ed.), London, 1–36.
- Niemeier, W.-D. & B. Niemeier 1998  
 'Minoan frescoes in the Eastern Mediterranean', in Cline & Harris-Cline 1998, 69–100.
- Niemeier, W.-D. & B. Niemeier 2000  
 'Aegean frescoes in Syria–Palestine: Alalakh and Tel Kabri', in *Proceedings of the first international symposium 1997: The wall paintings of Thera*, S. Sherratt (ed.), Athens, II: 763–802.
- Ninkovich, D. & B.C. Heezen 1965  
 'Santorini tephra', in *Submarine geology and geophysics*, W.F. Whittard & R. Bradshaw (eds.) (*Proceedings of the 17th Symposium of the Colston Research Society*), London, 413–53.
- Ninkovich, D. & B.C. Heezen 1967  
 'Physical and chemical properties of volcanic glass shards from pozzuolana ash, Thera island, and from upper and lower ash layers in Eastern Mediterranean deep sea sediments', *Nature* 213, 582–4.
- Nixon, I.G. 1985  
 'The volcanic eruption of Thera and its effect on the Mycenaean and Minoan civilizations', *Journal of Archaeological Science* 12, 9–24.
- Novák, M. & P. Pfälzner 2002  
 'Ausgrabungen in Tall Mišrife–Qatna 2001. Vorbericht der deutschen Komponente des internationalen Kooperationsprojektes', *Mitteilungen der Deutschen Orient-Gesellschaft* 134, 226–31.
- Nur, A. & E.H. Cline 2000  
 'Poseidon's horses: plate tectonics and earthquake storms in the Late Bronze Age Aegean and Eastern Mediterranean', *Journal of Archaeological Sciences* 27, 43–63.
- Nyst, M. & W. Thatcher 2004  
 'New constraints on the active tectonic deformation of the Aegean', *Journal of Geophysical Research* 109, B11406.
- O'Conner, D. 2006  
 'Thutmose III: an enigmatic pharaoh', in Cline & O'Connor 2006, 1–38.
- Oppenheimer, C. 2003  
 'Climatic, environmental and human consequences of the largest known historic eruption: Tambora volcano (Indonesia) 1815', *Progress in Physical Geography* 27, 230–59.
- Oren, E.D. (ed.) 1997  
*The Hyksos: new historical and archaeological perspectives*, (University Museum Symposium Series 8), Philadelphia.
- Oren, E.D. 2001  
 'Early White Slip pottery in

- Canaan: spatial and chronological perspectives', in Karageorghis 2001, 127–44.
- Oskarsson, N. 1980  
 'The interaction between volcanic gasses and tephra: fluorine adhering to tephra of the 1970 Hekla eruption', *Journal of Volcanology and Geothermal Research* 8, 251–66.
- Ozaki, H., M. Imamura, H. Matsuzaki & T. Mitsutani 2007  
 'Radiocarbon in 9th to 5th century BC tree-ring samples from the Ouban 1 archaeological site, Hiroshima, Japan', *Radiocarbon* 49, 473–9.
- Page, D.L. 1970  
*The Santorini volcano and the desolation of Minoan Crete*, London.
- Page, D. 1980  
 'The volcano at Santorini and the devastation of Minoan Crete: an introduction to the historical and archaeological problem,' in Doumas 1980 II, 371–6.
- Pain, S. 1999  
 'Vents de Milos', *New Scientist* 2197, 38–41.
- Palumbo, A. 1998  
 'Long-term forecasting of the extreme eruptions of Etna', *Journal of Volcanology and Geothermal Research* 83, 167–71.
- Palyvou, C. 2005  
*Akrotiri Thera: an architecture of affluence 3,500 years old*, Philadelphia.
- Panagiotaki, M. 2007  
 'The impact of the eruption of Thera in the central palace sanctuary at Knossos, Crete,' *Mediterranean Archaeology and Archaeometry* 7, 3–18.
- Panagiotopoulos, D. 2001  
 'Keftiu in context: Theban tomb-paintings as a historical source' *Oxford Journal of Archaeology* 20, 263–83.
- Panagiotopoulos, D. 2006  
 'Foreigners in Egypt in the time of Hatshepsut and Thutmose III', in Cline & O'Connor 2006, 370–412.
- Papadopoulos, G.A. & B. J. Chalkis 1984  
 'Tsunamis observed in Greece and the surrounding area from antiquity up to the present times', *Marine Geology* 56, 309–17
- Papadopoulos, G.A., T. Novikova, F.W. McCoy & A. Fokaefs 2008  
 'Sources of Sumatra-type tsunamis in the Mediterranean Sea' (abstract), *European Union of geophysics, annual meeting*, Vienna.
- Papazachos, B.C. 1990  
 'Seismicity of the Aegean and surrounding area', *Tectonophysics* 178, 287–308.
- Pareishi, M., M. Favalli & E. Boshi 2006  
 'Impact of the Minoan tsunami of Santorini: simulated scenarios in the Eastern Mediterranean', *Geophysical Research Letters* 33, 1–6.
- Payraudeau, F. 2008  
 'De nouvelles annales sacerdotales de Siamon, Psousennès II et Osorkon Ier', *Bulletin de l'Institut français d'archéologie orientale au Caire* 108, 293–308.
- Pearce, N.J.G., J.A. Westgate, S.J. Preece, W.J. Eastwood & W.T. Perkins 2004  
 'Identification of Aniakchak (Alaska) tephra in Greenland ice core challenges the 1645 BC date for Minoan eruption of Santorini', *Geochemistry, Geophysics, Geosystems* 5.3.
- Pearce, N.J.G., J.A. Westgate, S.J. Preece, W.J. Eastwood, W.T. Perkins & J.S. Hart 2007  
 'Reinterpretation of Greenland ice-core data recognises the presence of the late Holocene Aniakchak tephra (Alaska), not the Minoan (Santorini), at 1645 BC', in Bietak & Czerny 2007, 139–47.
- Pearson, G.W. & M. Stuvier 1986  
 'High-precision calibration of the radiocarbon time scale, 500–2500 BC' *Radiocarbon* 28(2B):839–62.
- Pearson, G.W., J.R. Pilcher, M.G. L. Baillie, D.M. Corbett & F. Qu 1986  
 'High-precision <sup>14</sup>C measurement of Irish oaks to show the natural <sup>14</sup>C variations from AD 1840 to 5210 BC', *Radiocarbon* 28(2B), 911–34.
- Pearson, C.L., Dale, D.S., Brewer, P.W., Kuniholm, P.I., Lipton, J. & Manning, S.W. 2009.  
 'Dendrochemical analysis of a tree-ring growth anomaly associated with the Late Bronze Age eruption of Thera', *Journal of Archaeological Science* 36, 1206–14.
- Peet, T.E. 1927  
 'The Egyptian writing-board B. M. 5647, bearing Keftiu names', in *Essays in Aegean archaeology*, L.T. Farnell (ed.), Oxford.
- Pelinovsky, E., N. Zahibo, P. Dunkley, M. Edmonds, R. Herd, T. Talipova, A. Kozelkov & I. Nikolkina. 2004  
 'Tsunami generated by the volcano eruption on July 12–13, 2003 at Montserrat, Lesser Antilles', *Science of Tsunami Hazards* 22, 44–57.
- Peltz, C., P. Schmid & M. Bichler M. 1999  
 'INAA of Aegean pumices for



- the classification of archaeological findings', *Journal of Radioanalytical and Nuclear Chemistry*, 242/2, 361–77.
- Peltz, C., & M. Bichler 2001 'Classification of archaeologically stratified pumice by INAA,' *Journal of Radioanalytical and Nuclear Chemistry*, 248/1, 81–7.
- Pendlebury, J.D.S. 1930 *Aegyptiaca. A catalogue of Egyptian objects in the Aegean area*, Cambridge.
- Pendlebury, J.D.S. 1939 *The archaeology of Crete*, London.
- Pe-Piper, G., D.J.W. Piper, & C. Perissoratis 2005 'Neotectonics of the Kos plateau tuff eruption of 161 ka, south Aegean sea," *Journal of Volcanology and Geothermal Research* 139, 315–38.
- Pe-Piper, G. & D.J.W. Piper 2007 'Neogene backarc volcanism of the Aegean: new insights into the relationship between magmatism and tectonics', in *Cenozoic Volcanism in the Mediterranean Area*, L. Beccaluva, G. Bianchini and M. Wilson (eds.) (Geological Society of America Special Paper 418), 17–31.
- Perrota, A., & C. Scarpato 2002 'Volume partition between the Plinian and co-ignimbrite air fall deposits of the campaniani ignimbrite eruption," *Mineralogy and Petrology* 79, 67–78.
- Perrot, G. & C. Chipiez 1894 *Histoire de l'art dans l'antiquité*. Tome VI. *La Grèce primitive. L'art mycénien*, Paris.
- Petrie, W.M.F. 1891 *Illahun, Kahun and Gurob 1889–90*, London.
- Petrie, F. 1931–34 *Ancient Gaza: Tell el Ajjul I-IV* (Publications of the Egyptian Research Account and British School of Archaeology in Egypt 53–56), London.
- Petrie, W.M.F. & G. Brunton 1924 *Sediment I–II* (British School of Archaeology in Egypt and Egyptian Research Account Twenty-seventh Year 1921), London.
- Pfeiffer, T. 2003 *Two catastrophic volcanic eruptions in the Mediterranean – Santorini 1645 B.C. and Vesuvius 79 A.D.*, Ph.D. dissertation, University of Aarhus, Aarhus.
- Phillips, J.S. 1991 *The impact and implications of the Egyptian and 'egyptianizing' material found on Bronze Age Crete, ca. 3000 – ca. 1100 BC*, Ph.D. dissertation, University of Toronto, Toronto.
- Phillips, J.S. 2003 'An unconsidered trifle', in Bietak 2003a, 545–50.
- Phillips, J.S. 2008 *Aegyptiaca on the island of Crete in their chronological context: a critical review*. Volume I-II (Contributions to the chronology of the Eastern Mediterranean 18), Vienna
- Pichler, H. & S. Kussmaul 1980 'Comments on the geological map of the Santorini islands', in Doumas 1980, 413–27.
- Pichler, H. & W. Friedrich 1976 'Radiocarbon dates of Santorini volcanics', *Nature* 262, 373–4.
- Pichler, H. & W. Friedrich, 1980 'Mechanism of the Minoan eruption of Santorini', in Doumas 1980, 15–30.
- Pichler, H. & W. Schiering 1977 'The Thera eruption and Late Minoan-IB destructions on Crete,' *Nature* 267, 819–22.
- Pichler, H. & W. Schiering 1980 'Der spätbronzezeitliche Ausbruch des Thera-Vulkans und seine Auswirkungen auf Kreta', *Archäologischer Anzeiger* 1980, 1–37.
- Pirazzoli, P. 1986 'The Early Byzantine tectonic paroxysm,' *Zeitung für Geomorphologie, Neue Folge* (Supplement) 62, 31–49.
- Platon, L. 1997 'The Minoan "villa" in east Crete. Rizza, Akhkladia and Profetes Elias, Praissos: two different specimens of one category?', in Hägg 1997, 187–202.
- Popham, M. 1967 'Late Minoan pottery, a summary', *Annual of the British School at Athens* 62, 337–51.
- Popham, M. R. 1970 'Late Minoan chronology', *American Journal of Archaeology* 74, 226–8.
- Popham, M.R. 1984 *The Minoan Unexplored Mansion at Knossos*, London.
- Popham, M.R. 1990 'Pottery styles and chronology', in Hardy & Renfrew 1990, 27–8.
- Popham, M. R., E.A. Catling & H.W. Catling 1974 'Sellopoulo Tombs 3 and 4. Two Late Minoan graves near Knossos', *Annual of the British School at Athens* 69, 195–257.
- Portugali, Y. & A.B. Knapp 1985 'Cyprus and the Aegean: a spatial analysis of interaction in the 17th–14th centuries B.C.', in *Prehistoric production and exchange. The Aegean*

- and Eastern Mediterranean, A.B. Knapp & T. Stech (eds.), Los Angeles, 44–78.
- Posener, G. 1965  
‘Sur l’orientation et l’ordre des points cardinaux chez les Égyptiens’, *Nachrichten der Akademie der Wissenschaften in Göttingen, Philologisch-Historische Klasse*, 69–78.
- Pottier, E. 1922  
‘Observations sur quelques objets trouvés dans le sarcophage de Byblos’, *Syria* 3, 298–306.
- Preston, L. 1999  
‘Mortuary practices and the negotiation of social identities at LM II Knossos’, *Annual of the British School at Athens* 94, 131–43.
- Preston L. 2004a  
‘A mortuary perspective on elites in Final and Post-palatial Crete’, *American Journal of Archaeology* 108, 321–48.
- Preston, L. 2004b  
‘Final Palatial Knossos and Postpalatial Crete: a mortuary perspective on political dynamics’, in Cadogan *et al.* 2004, 137–45.
- Pruzsinszky, R. 2007  
‘Šamši-Adads I. “neue” Regierungsdaten und assyrische Distanzangaben’, in Bietak & Czerny 2007, 73–9.
- Pulak, C. 2005a  
‘Who were the Mycenaean aboard the Uluburun ship?’, in Laffineur & Greco 2005, 295–310.
- Pulak, C. 2005b  
‘Das Schiffswrack von Uluburun’, in Yalçın, Pulak & Slotta 2005, 55–102.
- Pyle, D.M. 1997  
‘The global impact of the Minoan eruption of Santorini, Greece’, *Environmental Geology* 30, 59–61.
- Pyle, D.M. 2000  
‘Sizes of volcanic eruptions’, in Sigurdsson 2000, 263–9.
- Rackham, O. 1965–1966  
*Transpiration, assimilation and the aerial environment*, Ph.D. dissertation, Cambridge University, Cambridge.
- Rackham, O. 2002  
‘Observations on the historical ecology of Laconia,’ in *The Laconia survey: continuity and change in a Greek rural landscape*, Vol. 1, *Methodology and interpretation*, W. Cavanagh, J. Crouwel, R. W.V. Catling & G. Shipley (eds.), London, 73–119.
- Rackham, O. 2003  
*The nature of Mediterranean Europe*, New Haven.
- Rackham, O. 2006  
*Woodlands*, New York.
- Rackham, O., & J.A. Clark 2004  
‘On the historical ecology of Pseira,’ in Betancourt *et al.* 2004, 55–60.
- Rackham, O. & J. Moody 1997  
*The making of the Cretan landscape*, Manchester.
- Raisbeck, G. M., F. Yiou, M. Fruneau, J. M. Loiseaux, M. Lieuvin & J. C. Ravel 1981  
‘Cosmogenic <sup>10</sup>Be/<sup>7</sup>Be as a probe of atmospheric transport processes’, *Geophysical. Research Letters* 8, 1015–8.
- Rapp, G. Jr., S. R. B. Cooke & E. Henrickson 1973  
‘Pumice from Thera (Santorini) identified from a Greek mainland archaeological excavation’, *Science* 179, 471–3.
- Rapp, G.R. & C.L. Hill 2006  
*Geoarchaeology: the earth-science approach to archaeological interpretation*, New Haven.
- Raymond, A. 2005a  
‘Importing culture at Miletus: Minoans and Anatolians at Middle Bronze Age Miletus’, in *EMPORIA. Aegeans in the central and Eastern Mediterranean*, R. Laffineur & E. Greco (eds.) (Aegaeum 25), 185–91.
- Raymond, A. 2005b  
*Miletus in the Middle Bronze Age and Minoan presence in the eastern Aegean*, Ph.D. dissertation, University of Toronto, Toronto.
- Reck, H. 1936  
*Santorini: Der Werdegang eines Inselvulkans und sein Ausbruch 1925-1928 I-III*, Berlin.
- Redford, D.B. 1967  
*History and chronology of the Egyptian Eighteenth Dynasty: seven studies*, Toronto.
- Redford, D.B. 1986  
*Pharaonic King-Lists, annals and day-books: a contribution to the study of the Egyptian sense of history*, Mississauga, ON.
- Redford, D.B. 1992  
*Egypt, Canaan and Israel in ancient times*, Princeton.
- Redford, D.B. 1997  
‘Textual sources for the Hyksos period’, in Oren 1997, 1–44.
- Redford, D.B. (ed.) 2001  
*The Oxford encyclopedia of ancient Egypt*, New York.
- Redford, D.B. 2006  
‘The northern wars of Thutmose III’, in Cline & O’Connor 2006, 325–43.

- Reeves, C.N. 1990  
*Valley of the Kings. The decline of a royal necropolis*, London.
- Rehak, P. 1996  
'Aegean breechcloths, kilts, and the Keftiu paintings', *American Journal of Archaeology* 100, 35–51.
- Rehak, P. & J.G. Younger 1998  
'Review of Aegean prehistory VII: Neopalatial, Final Palatial, and Postpalatial Crete', *American Journal of Archaeology* 102, 91–173.
- Reimer, P. J., M.G.L. Baillie, E. Bard, A. Bayliss, J.W. Beck, C.J.H. Bertrand, P.G. Blackwell, C.E. Buck, G.S. Burr, K.B. Cutler, P.E. Damon, R.L. Edwards, R.G. Fairbanks, M. Friedrich, T. Guilderson, A.G. Hogg, K.A. Hughen, B. Kromer, G. McCormac, S.W. Manning, C. Bronk Ramsey, R.W. Reimer, S. Remmele, J. Southon, M. Stuiver, S. Talamo, F.W. Taylor, J. van der Plicht & C. E. Weyhenmeyer 2004  
'INTCAL04 terrestrial radiocarbon age calibration, 0–26 CAL KYR BP', *Radiocarbon* 46, 1029–58.
- Reimer, P.J. & G. McCormac 2002  
'Marine radiocarbon reservoir corrections for the Mediterranean and Aegean Seas', *Radiocarbon* 44, 159–66.
- Reiner, E. & D. Pingree 1975  
*Enuma Anu Enlil Tablet 63: the Venus Tablet of Ammissaduqa*, Malibu.
- Renan, E. 1862  
*Catalogue des objets provenant de la mission de Phénicie*, Paris.
- Renfrew, C. 1973  
*Before civilization: the radiocarbon revolution and prehistoric Europe*, London.
- Robertson, B.M. 1999  
*The chronology of the Middle Bronze age tombs at Tell el-Ajjul*, Ph.D. thesis, University of Utah.
- Robock, A. & M.P. Free 1995  
'Ice cores as an index of global volcanism from 1850 to the present', *Journal of Geophysical Research* 100, 11549–67.
- Robock, A. 2000  
'Volcanic eruptions and climate', *Reviews of Geophysics* 38, 191–219.
- Roehrig, C.H. 2005  
'The Tomb of Maiherperi in the Valley of the Kings', in Roehrig *et. al.* 2005, 70–72.
- Roehrig, C.H., R. Dreyfus & C.A. Keller (eds.) 2005  
*Hatshepsut from queen to pharaoh*, New Haven-London.
- Rogie, J.D. 1996  
'Lethal Italian carbon dioxide springs key to atmospheric CO<sub>2</sub> levels', *Penn State Earth and Environmental Systems Institute. News and events: news archives* ([http://www.eesi.psu.edu/news\\_events/archives/Lethal.shtml](http://www.eesi.psu.edu/news_events/archives/Lethal.shtml)).
- Rogie, J.D., D.M. Kerrick, G. Chiodini & F. Frondini 2000  
'Flux measurements of nonvolcanic CO<sub>2</sub> emission from some vents in central Italy', *Journal of Geophysical Research* 105.B4, 8435–45.
- Rutter, J.B. 2006  
'Neopalatial and later Minoan pottery', in Kommos V. *The monumental Minoan buildings at Kommos*. J.W. Shaw & M.C. Shaw (eds.), Princeton, 377–630, 694–710, 1115–87.
- Rutter, J.B. forth.  
'Late Minoan IB at Kommos: a sequence of at least three distinct stages', in Brogan & Hallager, forthcoming.
- Roussakis, G., A.P. Karageorgos, & N. Conispoliatis 2004  
'Last glacial-holocene sediment sequences in N. Aegean basins: structure, accumulation rates and clay mineral distribution', *Geo-Marine Letters* 24, 97–111.
- Russell, J.K. & M.V. Stasiuk, M.V. 2000  
'Ground penetrating radar mapping of Minoan volcanic deposits and the Late Bronze Age palaeotopography. Thera, Greece,' in *The archaeology of geological catastrophes*, W.G. McGuire, D.R. Griffiths, P.L. Hancock, & I.S. Stewart (eds.), (Geological Society London Special Publication 171) London, 105–22.
- Ryholt, K.S.B. 1997  
*The political situation in Egypt during the Second Intermediate Period c. 1800-1550 B.C.* (Carsten Niebuhr Institute Publications 20), Copenhagen.
- Ryholt, K.S.B. 2004  
'The Turin King-List,' *Ägypten & Levante* 14, 135–55.
- Sagan, C. 1979  
*Broca's brain: reflections on the romance of science*, New York.
- Sakellariou, D., M. Alexandri, G. Roussakis, P. Nomikou, P. Georgiou, D. Ballas, H. Sigurdsson & S. Carey in press  
'Active tectonics in the Hellenic volcanic arc: the Kolumbo submarine volcanic zone', *Bulletin Geological Society Greece*, in press.
- Saleska, S.R., K. Didan, A.R. Huete & H.R. da Rocha 2007  
'Amazon forests green-up during 2005 drought', *Science* 318, 612.
- Saltz, D.L. 1977  
'The chronology of the Middle Cypriote period', *Report*

- Department of Antiquities Cyprus 1977, 51–70.
- Salzer, M.W. & M.K. Hughes 2007 'Bristlecone pine tree rings and volcanic eruptions over the last 5000 yr.', *Quaternary Research* 67, 57–68.
- Sassmannshausen, L. 2006 'Zur mesopotamischen Chronologie des 2. Jahrtausends', *Baghdader Mitteilungen* 37, 157–77.
- Scaillet, B., M. Pichavant & R. Cioni, R. 2008 'Upward migration of Vesuvius magma chamber over the past 20,000 years,' *Nature* 455, 2186–219.
- Schaeffer, C.F.A. 1938 'De quelques problèmes que soulèvent les découvertes de Tell Atchana', *Syria* 19, 30–7.
- Schaeffer, C.F.A. 1939a 'Les fouilles de Ras Shamra – Ugarit', *Syria* 20, 277–92.
- Schaeffer, C.F.A. 1939b *Ugaritica* I, Paris.
- Schaeffer, C.F.A. 1948 *Stratigraphie comparée*, Oxford.
- Schaeffer, C.F.A. 1949 *Ugaritica* II, Paris.
- Schaeffer, C.F.A. 1962 *Ugaritica* IV, Paris.
- Schneider, Th. 2008 'Das Ende der Kurzen Chronologie: eine kritische Bilanz der Debatte', *Ägypten & Levante* 18, 273–313.
- Scott, E.M. 2000 'Bayesian methods: what can we gain and at what cost?', *Radiocarbon* 42, 181.
- Seager, R.B. 1909 'Excavations on the island of Mochlos, Crete, in 1908', *American Journal of Archaeology* 13, 273–303.
- Seager, R.B. 1910 *Excavations on the island of Pseira*, Philadelphia.
- Seal, Th. 2001 Review of Gasche *et al.* 1998, *Bibliotheca Orientalis* 58, 163–73.
- Self, S. & M. Rampino 1981 'The 1883 eruption of Krakatau', *Nature* 294, 699–704.
- Sewell, D. A. 2001 *Earth, air, fire and water. An elemental analysis of the Minoan eruption of the Santorini volcano in the Late Bronze Age*, Ph.D. dissertation, University of Reading, Reading.
- Shaw, J.W. 1986 'Excavations at Kommos (Crete) during 1984–1985', *Hesperia* 55, 219–69.
- Shaw, J.W. & M.C. Shaw (eds.) 2006 *Kommos V. The monumental Minoan buildings at Kommos*, Princeton.
- Shaw, M. 1996 'The bull-leaping fresco from below the Ramp House at Mycenae: a study in iconography and artistic transmission', *Annual of the British School at Athens* 91, 167–90.
- Shaw, M.C. 1998 'The painted plaster reliefs from Pseira,' in Betancourt & Davaras 1998a, 55–76.
- Shaw, M.C. & J.G. Younger 2009 Review of Bietak *et al.* 2007, *American Journal of Archaeology* 113 (in press).
- Siegenthaler, U. 1983 'Uptake of excess CO<sub>2</sub> by an outcrop-diffusion model ocean', *Journal of Geophysical Research* 88, 3599–608.
- Sigurdsson, H. (ed.) 2000 *Encyclopedia of volcanoes*, New York.
- Sigurdsson, H., S. Carey, M. Alexandri, G. Vougioukalakis, K. Croff, C. Roman, D. Sakellariou, C. Anagnostou, G. Rousakis, C. Ioakim, A. Gogou, D. Ballas, T. Misaridis & P. Nomikou, 2006 'Marine investigations of Greece's Santorini volcanic field,' *Eos: Transactions of the American Geophysical Union* 87(34), 337–48.
- Sigurdsson, H., S. Carey & J.D. Devine 1990 'Assessment of mass, dynamics and environmental effects of the Minoan eruption of Santorini volcano', in Hardy *et al.* 1990b, 100–2.
- Siklósy, Z., A. Demény, T.W. Vennemann, S. Pilet, J. Kramers, S. Leél-Össy, M. Bondár, C.-C. Chuan-Chou Shen & E. Hegner 2009 'Bronze Age volcanic event recorded in stalagmites by combined isotope and trace element studies', *Rapid Communications in Mass Spectrometry* 23, 801–8.
- Simkin, T. & R.S. Fiske 1983 *Krakatau 1883: the volcanic eruption and its effects*, Washington, DC.
- Simkin, T. & L. Siebert 2000 'Earth's volcanoes and eruptions: an overview,' in Sigurdsson 2000, 249–62.
- Simkin, T., L. Siebert, L. McClelland, D. Bridge, C. Newhall & J. H. Latter 1981 *Volcanoes of the world: a regional directory, gazetteer, and chronology of volcanism during the last 10,000 years*, Stroudsburg PA.

- Simkin, T. & L. Siebert 1994<sup>2</sup>  
*Volcanoes of the World*, Tuscon.
- Simpson, W. K. (ed.) 1972  
*The literature of ancient Egypt: an anthology of stories, instructions, and poetry*, New Haven.
- Skok, J., W. Chorney & W.S. Broecker 1962  
'Uptake of CO<sub>2</sub> by roots of xanthium plants', *Botanical Gazette* 124, 118–20.
- Soles, J.S. 1983  
'A Bronze Age quarry in eastern Crete', *Journal of Field Archaeology* 10, 33–46.
- Soles J.S. 1991  
'The Gournia palace', *American Journal of Archaeology* 95, 17–78.
- Soles J.S. 2003  
*Mochlos IA. Period III. Neopalatial settlement on the coast: the Artisans' Quarter and the farmhouse at Chalinomouri*, Philadelphia.
- Soles, J.S. 2004a  
'New construction at Mochlos in the LM IB period' in *Crete beyond the palaces*, L. P. Day, M. S. Mook & J. D. Muhly (eds.) (Prehistory Monographs 10), Philadelphia, 153–62.
- Soles, J.S. 2004b  
Appendix A. 'Radiocarbon results,' in *Mochlos IC. Period III. Neopalatial settlement on the coast: The Artisans' Quarter and the farmhouse at Chalinomouri: the small finds*, J.S Soles & C. Davaras (eds.) (Prehistory Monographs 9), Philadelphia, 145–9.
- Soles J. S. & C. Davaras 1990  
'Theran ash in Minoan Crete: new excavations on Mochlos', in Hardy & Renfrew 1990, 89–95.
- Soles, J.S. & C. Davaras 1992  
'Excavations at Mochlos, 1989', *Hesperia* 61, 413–45.
- Soles, J.S. & C. Davaras 1994  
'Excavations at Mochlos, 1990–1991', *Hesperia* 63, 391–436.
- Soles, J.S. & C. Davaras 1995  
'Some stratigraphic observations at Mochlos', *Proceedings of the 7th Cretological Congress*, 1991, 881–6.
- Soles, J.S. & C. Davaras 1996  
'Excavations at Mochlos, 1992–1993', *Hesperia* 65, 175–230.
- Soles, J.S. & C. Davaras 2000  
'Mochlos', in *Crete 2000. A Centennial celebration of American archaeological work on Crete*, J.D. Muhly & E. Sikla (eds.), Athens, 22–37.
- Soles, J.S., S.R. Taylor & C. Vitaliano 1995  
'Tephra samples from Mochlos and their chronological implications for Neopalatial Crete', *Archaeometry* 37, 385–93.
- Soles, J.S. et al. 2004  
*Mochlos IC. Period III. Neopalatial settlement on the coast: the Artisans' Quarter and the farmhouse at Chalinomouri, the small finds*, Philadelphia.
- Sørensen, A.H. 2008  
'The Cypriot connection: aspects of Cretan contacts with Cyprus during the MB-LB I periods', in *Island dialogues: Proceedings of the postgraduate Cypriot archaeology conference (POCA), 2006*, A. McCarthy (ed.) (University of Edinburgh Occasional Papers no. 21), Edinburgh, 154–83; <http://www.shc.ed.ac.uk/archaeology/publications/poca2006/documents/11.Hojen-Sorensen.pdf>.
- Sørensen, A.H. forth.  
'Approaching Levantine shores. Aspects of Cretan contacts with the Levant during the MM-LMI periods', *Proceedings of the Danish Institute at Athens* 6, forthcoming.
- Spalinger, A.J. (ed.) 1992  
*Revolutions in time: studies in Ancient Egyptian calendrics*, San Antonio.
- Spalinger, A. J. 2006  
'Covetous eyes south: the background to Egypt's domination over Nubia by the reign of Thutmose III', in Cline & O'Connor 2006, 344–69.
- Sparks, R.S.J. 1978  
'The dynamics of bubble formation and growth in magmas: A review and analysis', *Journal of Volcanology and Geothermal Research* 3, 1–37.
- Sparks, R.S.J. 1986  
'The volcanic eruption of Thera and its effect on the Mycenaean and Minoan civilizations: Comment', *Journal of Archaeological Science* 13, 289–90.
- Sparks, R.T. 2007  
*Stone vessels in the Levant*, Leeds.
- Sparks, R.S.J. & C.J.N. Wilson, 1990  
'The Minoan deposits: a review of their characteristics and interpretation', in Hardy et al. 1990b, 89–99.
- Splittstoesser, W.E. 1966  
'Dark CO<sub>2</sub> fixation and its role in the growth of plant tissue', *Plant Physiology* 41, 755–9.
- Stager, L.E. 2002  
'The MB IIA ceramic sequence at Tel Ashkelon and its implications for the 'port power' model of trade', in Bietak 2002a, 353–62.

- Stager, L.E., J.D. Schloen, D.M. Master 2008  
*Ashkelon 1. Introduction and overview (1985–2006)*, Winona Lake.
- Stamatopoulos, A. & P. Kotzias 1990  
‘Volcanic ash in ancient and modern construction’, in Hardy *et al.* 1990a, 491–501.
- Stampolidis, N. Chr. & V. Karageorghis (eds.) 2003  
*Sea routes ... interconnections in the Mediterranean 16th – 6th c BC. Proceedings of the international symposium held at Rethymnon, Crete in September 29th – October 2nd 2002*, Athens.
- Stanley, D.J. & H. Sheng 1986  
‘Volcanic shards from Santorini (Upper Minoan Ash) in the Nile Delta, Egypt’, *Nature* 320, 733–5.
- Steinhauser, G., J. H. Sterba, M. Bichler, & H. Huber 2006  
‘Neutron activation analysis of Mediterranean volcanic rocks: an analytical database for archaeological stratigraphy’, *Applied Geochemistry* 21, 1362–75.
- Sterba, J.H., K.P. Foster, G. Steinhauser & M. Bichler 2009  
‘New light on old pumice: the origins of Mediterranean volcanic material from ancient Egypt’, *Journal of Archaeological Science* 36/8, 1738–44.
- Stewart, J. 1962  
‘The tomb of the Seafarer at Karmi in Cyprus’, *Opuscula Atheniensia* 4, 197–204.
- Stewart, J. 1974  
*Tell el-'Ajjul: the Middle Bronze remains (Studies in Mediterranean Archaeology 38)*, Gothenburg.
- Stiros, S.C. 2001  
‘The AD 365 Crete earthquake and possible seismic clustering during the fourth to sixth centuries AD in the Eastern Mediterranean: a review of historical and archaeological data’, *Journal of Structural Geology* 23, 545–62.
- Stix, J. & H. Gaonac’h 2000  
‘Gas, plume, and thermal monitoring,’ in *Encyclopedia of Volcanoes*, H. Sigurdsson (ed.), New York, 1141–63.
- Stolwijk, J.A.J. & K.V. Thimann 1957  
‘On the uptake of carbon dioxide and bicarbonate by roots and its influence on growth’, *Plant Physiology* 32, 513–20.
- Stommel, H. & E. Stommel 1983  
*Volcano weather: the story of 1816, the year without a summer*, Newport RI.
- Stothers, R. B. 1984  
‘The great Tambora eruption in 1815 and its aftermath’, *Science* 224, 1191–8.
- Stothers, R.B. 1996  
‘The great dry fog of 1783’, *Climate Change* 32, 79–89.
- Strøm, I. 1982  
*Grækenlands forhistoriske kulturer II*, Copenhagen.
- Stubbings, F.H. 1951  
*Mycenaean pottery from the Levant*, Cambridge.
- Stuiver, M. & T.F. Braziunas 1993  
‘Sun, ocean, climate and atmospheric  $^{14}\text{CO}_2$ : an evaluation of causal and spectral relationships’, *The Holocene* 3.4, 289–305.
- Stuiver, M. & H.A. Polach 1977  
‘Discussion: reporting of  $^{14}\text{C}$  data’, *Radiocarbon* 19, 355–63.
- Stuiver, M., G.W. Pearson & T.F. Braziunas 1986  
‘Radiocarbon age calibration of marine samples back to 9000 cal yr BP’, *Radiocarbon* 28(2B), 980–1021.
- Stuiver, M., P.J. Reimer, E. Bard, J.W. Beck, G.S. Burr, K.A. Hughen, B. Kromer, G. McCormac, J. van der Plicht, J. & M. Spurk 1998  
‘INTCAL98 radiocarbon age calibration, 24,000–0 cal BP’, *Radiocarbon* 40, 1041–83
- Switsur, V.R. 1984  
‘Radiocarbon date calibration using historically dated specimens from Egypt and new radiocarbon determinations for El-Amarna’, in *Amarna Reports I*, B.J. Kemp (ed.), London, 178–88.
- Tait, J. (ed.) 2003  
‘“Never had the like occurred”’: *Egypt’s view of its past*, London.
- Tartaron, T. F. 2008  
‘Aegean prehistory as world archaeology: recent trends in the archaeology of Bronze Age Greece’, *Journal of Archaeological Research* 16, 83–161.
- Taylor, J.H. 1989  
*Egyptian coffins (Shire Egyptology 11)*, Aylesbury.
- ten Veen, J.H. & K.L. Kleinspehn 2003  
‘Incipient continental collision and plate-boundary curvature: late Pliocene–Holocene transtensional Hellenic forearc, Crete, Greece’, *Journal of the Geological Society* 160, 161–81.
- Teskey, R.O. & M.A. McGuire 2007  
‘Measurement of stem respiration of sycamore (*Platanus occidentalis* L.) trees involves internal and external fluxes of  $\text{CO}_2$  and possible transport of  $\text{CO}_2$  from roots’, *Plant, Cell and Environment* 30, 570–9.

- Thomas, R.J., P.R. Krehbiel, W. Rison, H.E. Edens, G.D. Aulich, W.P. Winn, S.R. McNutt, G. Tygat & E. Clark 2007  
'Electrical activity during the 2006 Mount St. Augustine volcanic eruptions', *Science* 315, 1097.
- Tinti, S. & C. Vannini 1995  
'Tsunami trapping near circular islands', *Pure and Applied Physics* 144, 595–619.
- Trevisanato S.I. 2006  
'Treatments for burns in the London Medical Papyrus show the first seven biblical plagues of Egypt are coherent with Santorini's volcanic fallout', *Medical Hypotheses* 66 (1), 193–6.
- Tsipopoulou, M. 1991  
'Recenti scoperte di epoca minoica nel golfo di Sitia', *Seminari Centro Nazionale delle Ricerche* 1990, Rome, 105–21.
- Tsipopoulou, M. 2002  
'Petras, Siteia: the palace, the town, the hinterland and the Protopalatial background', in *Monuments of Minos: rethinking the Minoan palaces*, J. Driessen, I. Schoep & R. Laffineur (eds.) (Aegaeum 23), Liège, 133–44.
- Tsipopoulou, M. & A. Papacostopoulou 1997  
'"Villas" and villages in the hinterland of Petras, Siteia', in Hägg 1997, 203–14.
- Tuffen, H., R. Smith & P.R. Sammonds 2008  
'Evidence for seismogenic fracture of silicic magma', *Nature* 453(7194), 511–4.
- Turfa, J.M. 2006  
Review of *Oriente e Occidente: metodi e discipline a confronto. Riflessioni sulla cronologia dell'età del ferro in Italia* by G. Bartolini and F. Delpino, *Bryn Mawr Classical Review* 2006.08.10 (<http://ccat.sas.upenn.edu/bmcr/2006/2006-08-10.html>).
- Tyldesley, J. 1996  
*Hatchepsut. The female pharaoh*, London.
- Tzachili, I. 1999  
'Before sailing: the making of sails in the second millennium B.C.', in Betancourt *et al.* 1999, 857–62.
- Van Dijk, J. 2008  
'New evidence on the length of the reign of Horemheb', in *Tenth international congress of egyptologists: abstracts of papers*, P. Kousoulis (ed.), Rhodes, 253–4.
- Van de Moortel, A. 1997  
*The transition from the Protopalatial to the Neopalatial society in south-central Crete: A ceramic perspective*, Ph.D. dissertation, Bryn Mawr College, Bryn Mawr.
- Veenhof, K. R. 2003  
*The Old Assyrian list of year eponyms from Karum Kanish and its chronological implications*, Ankara.
- Veenhof, K. R. 2007  
'The Old Assyrian list of year eponyms. Corrections, additions and chronology', *Nouvelles Assyriologiques Brèves et Utilitaires* (=NABU) 2007/49.
- Velasco, A.A., S. Hernandez, T. Parsons & K. Pankow 2008  
'Global ubiquity of dynamic earthquake triggering', *Nature Geoscience* 1, 375–9.
- Vermeule, E. & F. Wolsky 1978  
'New Aegean relations with Cyprus: The Minoan and Mycenaean pottery from Toumba Tou Skourou, Morphou', *Proceedings of the American Philosophical Society* 122.5, 294–313.
- Vermeule, E. & F. Wolsky 1990  
*Toumba tou Skourou. A Bronze Age potters quarter*, Harvard.
- Verosub, K.L. & J. Lippman 2008  
'Global impacts of the 1600 eruption of Peru's Huaynaputina volcano', *Eos, Transactions of the American Geophysical Union* 89(15), 141–8.
- Vespa, M., J. Keller & R. Gertisser 2006  
'Interplinian explosive activity of Santorini volcano (Greece) during the past 150,000 years,' *Journal of Volcanology and Geothermal Research* 153, 262–86.
- Vinther, B. M., H. B. Clausen, S. J. Johnsen, S. O. Rasmussen, K. K. Andersen, S. L. Buchardt, D. Dahl-Jensen, K. Seierstad, M.-L. Siggaard-Andersen, J. P. Steffensen & A. Svensson 2006  
'A synchronized dating of three Greenland ice cores throughout the Holocene', *Journal of Geophysical Research*, 111, D6 D06102.
- Vinther, B.M., H.B. Clausen, S.J. Johnsen, S.O. Rasmussen, J.P. Steffensen, K.K. Andersen, S.L. Buchardt, D. Dahl-Jensen, I.K. Seierstad, A.M. Svensson, M.-L. Siggaard-Andersen, J. Olsen & J. Heinemeier 2008  
'Reply to comment by J. S. Denton and N. J. G. Pearce on "A synchronized dating of three Greenland ice cores throughout the Holocene"', *Journal of Geophysical Research* 113, D12306.
- Virolleaud, C. 1922  
'Découverte a Byblos d'un Hypogée de la douzième dynastie Égyptienne', *Syria* 3, 273–90.
- Vitaliano, C.J., J.S. Fout, D.B. Vitaliano 1978  
'Petrochemical study of the tephra sequence exposed in the Phira

- Quarry, Thera', in Dumas 1978, 203–15
- Vitaliano, C.J., S.R. Taylor, M.D. Norman, M.T. McCulloch & I.A. Nicholls 1990  
'Ash layers of the Thera volcanic series: stratigraphy, petrology and geochemistry', in Hardy *et al.* 1990b, 53–78.
- Vitaliano, J., & D.B. Vitaliano 1998  
'Volcanic ash and pumice studies', Betancourt & Davaras 1998, 43–6.
- Vogel, J.S., W. Cornell, D.E. Nelson & J.R. Southon 1990  
'Vesuvius/Avellino, one possible source of seventeenth century B.C. climatic disturbances', *Nature* 344, 534–7.
- Voutsaki, S., A.J. Nijboer & C. Zerner 2009  
'Middle Helladic Lerna: relative and absolute chronologies,' in Manning & Bruce 2009 (in press).
- Vuorinen, A.H. & W.M. Kaiser 1997  
'Dark CO<sub>2</sub> fixation by roots of willow and barley in media with a high level of inorganic carbon', *Journal of Plant Physiology* 151, 405–8.
- Wace, A.J.B. & C.W. Blegen 1939  
'Pottery as evidence for trade and colonisation in the Aegean Bronze Age', *Klio* 32, 131–47.
- Wachsmann, S. 1987  
*Aegeans in the Theban tombs* (Orientalia Lovaniensia Analecta 20), Louvain.
- Wadge, G., G.P.L. Walker, & J.E. Guest, 1975  
'The output of the Etna volcano', *Nature* 255, 385–7.
- Walberg, G. 1987  
'Middle Minoan chronology: relative and absolute', in Åström 1987a, 67–73.
- Walberg, G. 1992  
'The finds from Tell el-Dab'a and Middle Minoan chronology', *Ägypten & Levante* 3, 157–9.
- Walter, T.R. & F. Amelung 2007  
'Volcanic eruptions following M>9 megathrust earthquakes: Implications for the Sumatra-Andaman volcanoes', *Geology* 35(6), 539–42.
- Walter, T.R., R. Wang, B.-G. Luehr, J. Wassermann, Y. Behr, S. Parolai, A. Anggraini, E. Gunther, M. Sobiesiak, H. Grosser, H.-U. Wetzel, C. Milkereit, P.J.K. Sri Brotopuspito, P. Harjadi & J. Zschau, 2008  
'The 28 May 2006 magnitude 6.4 Yogyakarta earthquake south of Mt. Merapi volcano: Did lahar deposits amplify ground shaking and thus lead to the disaster?', *Geochemistry Geophysics Geosystems* 9 (Q05006)
- Warburton, D.A. 2000a  
'Stratigraphy: methodology and terminology', *Proceedings of the first international congress on the archaeology of the Near East*, P. Matthiae *et al.* (eds.), Rome, II: 1731–50.
- Warburton, D.A. 2000b  
'Synchronizing the chronology of Bronze Age western Asia with Egypt', *Akkadica* 119–120, 33–76.
- Warburton, D.A. 2000c  
'Dating the fall of Babylon once again', *Akkadica* 116, 1–5.
- Warburton, D.A. 2002  
'Eclipses, Venus-cycles & chronology', *Akkadica* 123, 108–14.
- Warburton, D. 2003  
*Archaeological stratigraphy: a Near Eastern approach*, Neuchatel.
- Warburton, D. 2004  
'Shamshi-Adad and the eclipses', in *Assyria and beyond. Studies presented to Mogens Trolle Larsen*, J. G. Dercksen (ed.), Leiden, 583–98.
- Warburton, D. 2008  
'Stratigraphic analysis', in *Encyclopedia of Archaeology*, D. Pearsall (ed.), New York, III: 2101–11.
- Ward, G.K. & S.R. Wilson 1978  
'Procedures for comparing and combining radiocarbon age determinations: a critique.' *Archaeometry* 20, 19–31.
- Ward, W.A. 1971  
*Egypt and the east Mediterranean world 2200–1900*, Beirut.
- Warren, P.M. 1969  
*Minoan stone vases*, Cambridge.
- Warren, P.M. 1979  
'The stone vessels from the Bronze Age settlement at Akrotiri, Thera', *Archaiologiki Ephemeris*, 82 – 113.
- Warren, P.M. 1984  
'Absolute dating of the Bronze Age eruption of Thera (Santorini)', *Nature* 308, 492–3.
- Warren, P.M. 1985  
'Minoan Pottery from Egyptian Sites', *Classical Review* 1985, 147–51.
- Warren, P. 1987  
'Absolute dating of the Aegean Late Bronze Age', *Archaeometry* 29, 205–11.
- Warren, P.M. 1991a  
'The Minoan civilization of Crete and the volcano of Thera', *Journal of the Ancient Chronology Forum* 4, 29–39.
- Warren, P. M. 1991b  
'A new Minoan deposit from Knossos, c. 1600 BC and its wider



- implications', *Annual of the British School at Athens* 86, 319–40.
- Warren, P.M. 1995  
‘Minoan Crete and Pharaonic Egypt. Interconnections in the second millennium BC’, in *Egypt, the Aegean and the Levant: interconnections in the second millennium BC*, W.V. Davies & L. Schofield (eds.), London, 1–18.
- Warren, P.M. 1996  
‘The Aegean and the limits of radiocarbon dating’, in *Absolute chronology: archaeological Europe 2500–500 BC*, K. Randsborg (ed.), Copenhagen, 283–90.
- Warren, P.M. 1997  
‘The lapidary art – Minoan adaptations of Egyptian stone vessels’, in Laffineur & Betancourt 1997, 209–23.
- Warren, P.M. 1998  
‘Aegean Late Bronze 1—2 Absolute chronology: some new contributions’, in Balmuth & Tykot 1998. 323–31.
- Warren, P.M. 1999  
‘LM IA: Knossos, Thera, Gournia’, in Betancourt *et al.* 1999, 893–903.
- Warren, P.M. 2000  
‘Crete and Egypt: the transmission of relationships’, in *Κρητη – Αιγυπτος. Πολιτισμικοί δεσμοί τριών χιλιετιών*, [Crete – Egypt: Three Millennia of Cultural Connections], A. Karetsou (ed.), Athens, 24–8.
- Warren, P. 2001  
Review of Driessen & Macdonald 1997, *American Journal of Archaeology* 105, 115–8.
- Warren, P. M. 2004  
‘Terra cognita? The territory and boundaries of the early Neopalatial Knossian state’, in Cadogan, Hatzaki & Vasilakis 2004.
- Warren, P.M. 2006  
‘The date of the Thera eruption in relation to Aegean-Egyptian interconnections and the Egyptian historical chronology’, in Czerny *et al.* 2006, II: 305–21.
- Warren, P.M. 2007  
‘A new pumice analysis from Knossos and the end of Late Minoan I A’, in Bietak & Czerny 2007, 495–9.
- Warren, P.M. & V. Hankey 1989  
*Aegean Bronze Age chronology*, Bristol.
- Watkins, N.D., R.S.J.Sparks, H. Sigurdsson, T.C. Huang, A. Federman, S. Carey & D. Ninkovich 1978  
‘Volume and extent of the Minoan tephra from Santorini volcano: new evidence from deep-sea sediment cores’, *Nature* 271, 122–6.
- Weidner, E. F. 1935/36  
‘Aus den Tagen eines assyrischen Schattenkönigs’, *Archiv für Orientforschung* 10, 1–48.
- Weinstein, J. 1993  
Review of Z. Herzog, G. Rapp, Jr. & O. Negbi, *Excavations at Tel Michal, Israel, Tel Aviv 1989*, *Journal of the American Oriental Society* 113, 109–10.
- Weinstein, J. 1992  
‘The chronology of Palestine in the early second millennium B.C.E.’, *Bulletin of the American Schools of Oriental Research* 288, 27–46.
- Weinstein, J. 1996  
‘A wolf in sheep’s clothing: how the high chronology became the middle chronology’, *Bulletin of the American Schools of Oriental Research* 304, 55–63.
- Wells, R.A. 1992  
‘Re and the calendars’, in Spalinger 1992, 1–37.
- Wells, R.A. 2002  
‘The role of astronomical techniques in ancient Egyptian chronology: the use of lunar month lengths in absolute dating’, in *Under one sky: astronomy and mathematics in the ancient Near East*, J.M. Steele & A. Imhausen (eds.), Munster, 459–72.
- Weninger, B. 1990  
‘Theoretical radiocarbon discrepancies’, in Hardy & Renfrew 1990, 216–31.
- Wente, E.F. & C.C Van Siclen III 1976  
‘A chronology of the New Kingdom’, in *Studies in Honor of George R. Hughes*, J.H. Johnson & E.F. Wente (eds.), Chicago, 217–61.
- Westervelt, J. 2002  
‘Geographic information systems and agent-based modeling’, in *Integrating geographic information systems and agent-based modeling techniques for simulating social and ecological processes*, H. R. Gimblett (ed.) (Santa Fe Institute Studies in the Sciences of Complexity), Oxford, 83–104.
- Whitham, A.G., & R.S.J. Sparks 1986  
‘Pumice’, *Bulletin of Volcanology* 48, 209–23.
- Wiener, M.H. 2001  
‘The White Slip I of Tell el-Dab<sup>a</sup> and Thera: critical challenge for the Aegean long chronology’, in Karageorghis 2001, 195–202.
- Wiener, M.H. 2003a  
‘Time out: the current impasse in Bronze Age archaeological dating’, in Foster & Laffineur 2003, 363–99.
- Wiener, M.H. 2003b  
‘The absolute chronology of Late Helladic III A2 revisited’, *Annual*

- of the British School at Athens 98, 239–50.
- Wiener, M.H. 2006a  
‘Chronology going forward (with a query about 1525/4 B.C.)’, in Czerny *et al.* 2006, 317–28.
- Wiener, M.H. 2006b  
‘Egypt & time’, *Ägypten & Levante* 16, 325–39.
- Wiener, M.H. 2007  
‘Times change: the current state of the debate in Old World Chronology’, in Bietak & Czerny 2007, 25–47.
- Wiener, M.H. 2009.  
‘Cold fusion: the uneasy alliance of history and science’, in Manning & Bruce 2009 (in press).
- Wiener, M.H. & J.P. Allen 1998  
‘Separate lives: the Ahmose Tempest Stela and the Theran eruption’, *Journal of Near Eastern Studies* 57, 1–28.
- Wijngaarden, G.J. 2003  
*Use and appreciation of Mycenaean pottery in the Levant, Cyprus and Italy (ca. 1600–1200 BC)*, Amsterdam.
- Wilford, J.N. 1989  
‘Minoan culture survived ancient volcano’, *The New York Times* (11/28/89) C1, C11.
- Williams, H. 1942  
*The geology of Crater Lake National Park, Oregon, with a reconnaissance of the cascade range southward to Mt. Shasta* (Carnegie Institute Publication 540), Washington, D.C.
- Woolley, L. 1955  
*Alalakh: an account of the excavations at Tell Atchana in the Hatay, 1937–1949*, Oxford.
- Xenaki-Sakellariou, A. 1985  
*Les tombes a chambre de Mycènes. Fouilles de Chr. Tsountas (1887–1898)*, Paris.
- Xenaki-Sakellariou, A. & C. Chatziliou 1989  
*Peinture en Metal’ à L’Époque Mycénienne*, Athens.
- Yadin, Y. *et al.* 1960  
*Hazor II, an account of the second season of Excavations, 1956*, Jerusalem.
- Yalçın, Ü., C. Pulak & R. Slotta (eds.) 2005  
*Das Schiff von Uluburun. Welthandel vor 3000 Jahren. Katalog der Ausstellung des Deutschen Bergbau-Museums Bochum vom 15. Juli 2005 bis 16. Juli 2006*, Bochum.
- Yasur-Landau, A. & E.H. Cline 2007  
‘Poetry in motion: Canaanite rulership and Aegean narrative art at Tel Kabri’, in *Epos. Reconsidering Greek epic and Aegean Bronze Age archaeology*, S.P. Morris & R. Laffineur (eds.) (Aegaeum 28), Liège, 157–66.
- Yasur-Landau, A. & E.H. Cline 2008  
‘Preliminary report on the results of the 2008 excavation at Tel Kabri’, <http://digkabri.files.wordpress.com/2008/08/report-on-the-results-of-the-2008-excavation-season-at-tel-kabri.pdf>
- Yeh, H., P. Liu, M. Briggs & C. Synolakis 2002  
‘Propagation and amplification of tsunamis at coastal boundaries’, *Nature* 372 (24 Nov.), 353–5.
- Yon, M. (ed.) 1991  
*Arts et industries de la Pierre* (Ras Shamra–Ugarit 6), Paris.
- Yu, S.-Y., J. Shen & S. Coleman 2007  
‘Modeling the radiocarbon reservoir effect in lacustrine systems’, *Radiocarbon* 49, 1241–54.
- Yurgalevitch, C.M. & W.H. Janes 1988  
‘Carbon dioxide enrichment of the root zone of tomato seedlings’, *Journal of Horticultural Science* 63, 265–70.
- Zeidler, J.A., C.E. Buck & C.D. Litton 1998  
‘The integration of archaeological phase information and radiocarbon results from the Jama River Valley, Ecuador: a Bayesian approach’, *Latin American Antiquity* 9, 160–79.
- Zielinski, G.A. & M.S. Germani 1998  
‘New ice-core evidence challenges the 1620s BC age for the Santorini (Minoan) eruption’, *Journal of Archaeological Science* 25, 279–89.
- Zielinski, G.A. 2000  
‘The calendrical age of the Santorini (Minoan) eruption remains uncertain’, in Bietak 2000a, 34.