"Minding the Gap"

Gaps, Destructions, and Migrations in the Early Bronze Age Aegean: Causes and Consequences

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Abstract

The upheavals and transformations in Greece and the Cyclades during the late third millennium B.C.E. must be considered in the light of related events throughout the eastern Mediterranean, as well as in regions farther east and west. The prolonged desiccation event between ca. 2300 and 2000 B.C.E., for which there is extensive evidence in the Near East and Egypt (and perhaps a far wider region), is explored together with the potential impact of roughly contemporaneous developments including migrations, the displacement of trading networks, warfare, new weapons technologies, and the appearance of sailing vessels in the Mediterranean.*

PROPOSED CLIMATE EVENTS, ABANDONMENTS, DESTRUCTIONS, AND MIGRATIONS IN THE NEAR EAST AND EGYPT AT THE CLOSE OF THE EARLY BRONZE AGE

This article considers developments in the Cyclades and continental Greece in Early Bronze (EB) II and III in relation to the course of events in Anatolia, the Khabur River basin, the Levant, Canaan, Cyprus, Egypt, Crete, Malta, and Spain. I begin with the asserted evidence for prolonged severe drought (and/or soil erosion) between ca. 2300 and 2000 B.C.E. in many of these areas and its consequences. The generality, degree of impact, geographic scope, and ultimate cause or causes of the climate event are matters of continuing discussion.[1] Some climatologists, concentrating on evidence from the Near East, believe that the moisture-laden North Atlantic cyclonic westerlies, which seasonally break into the Mediterranean trough and provide the winter precipitation needed for dry farming, failed for reasons still unknown and that 250 years later precipitation, carried by westerlies, returned the area to pre-aridification levels.[2] Some recent studies suggest an even broader Northern Hemisphere–wide megadrought event at 4.2 ka b.p.[3] extending to a far wider area and possibly involving a change in solar irradiance or a succession of major volcanic eruptions. Others, however, have questioned the existence of a pervasive or continuing climate event anywhere.[4]

The pattern of change in western Asia beginning 2300–2250 B.C.E. was clearly uneven, with the impact and chronology differing between areas.[5] Weiss states the proposed Near Eastern climate event in maximum terms—"societies responded to the abrupt climate change with political collapse, regional abandonment, nomadization, and habitat-tracking to sustainable agricultural regions"—a view rejected by Koliński, who cites recent evidence from excavations to indicate that the effect in the Khabur Valley was neither so general nor so closely correlated in time.[6] Of course, critical thresholds may be breached in some regions at certain times and not in others. The amount of social storage

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[1] Weiss et al. 1993; Dalfes et al. 1997; Cullen et al. 2000; Finné and Holmgren 2010, 48–9; Finné et al. 2011; Rapp and Jing 2011, 125; Butzer 2012, 3633–34; Weiss 2012a.

[2] Weiss 2012b.

[3] E.g., Triantaphyllou et al. 2009.

[4] Koliński 2007; Middleton 2012.

[5] Riehl et al. 2008; Riehl 2009.

[6] Koliński 2007; Weiss (forthcoming). Ur (2010a, 157) and Middleton (2012) are also cautious with respect to the dramatic nature and geographic scale of a climate event. See also Wilkinson (1994) with regard to his Brittle Economy Model.

available from prior years and the area over which stocks are shared are also relevant factors. Overall, areas dependent on rainfall or variable streams appear to have been severely impacted, while the number of sites and the population along the banks of major rivers (or perhaps in some cases in areas of marsh or adequate springwater) may have increased in this period.[7] In particular, the cessation of major grain imports may have been critical with regard to the demise of the Akkadian empire. Of course, a major desiccation event, even in one critical area, that sets a population in motion and interrupts a trade network for essential imports can produce cascading effects. Network theory teaches that the more interconnected the whole, the more likely that local losses will be repaired when they occur, until the time when a critical stress level is reached, at which point the entire system will collapse.[8]

Whatever the role of climate change in the Khabur Valley, the closing centuries of the third millennium B.C.E. witnessed major dislocations in many areas. In Anatolia, the arc of destruction included Troy, where the great walls of Troy II–III fell into ruin and Troy IV suffered six destruction levels. The inhabited area shrank drastically; surrounding smaller sites disappeared along with evidence of external contacts; and signs of stress on barley crops appeared. Faunal remains indicate an altered diet containing a significant percentage of deer and other nondomesticates.[9] Sites in Cilicia and the central Taurus mountain range (such as the major metallurgical site of the Kestel mines and the adjacent 65 ha site of Göltepe located 80 km north of Tarsus)[10] and to the east across the Taurus range at Kültepe were abandoned as well. In the Khabur Valley in northeastern Syria, many major Akkadian sites such as Tell Leilan were buried in dust and abandoned ca. 2250–2220 B.C.E. (fig. 1).[11] Many other Syrian sites were abandoned early in EB IVB, with the final wave of destruction and abandonment coming at the end of EB IVB in the late third millennium.[12] Some of the people set in motion headed south toward river land, to judge from texts reporting that a 180 km long wall called the Repeller of the Amorites was built across the center of Mesopotamia to limit nomadic incursions.[13] Another long wall, known as the Très Long Mur, was built to protect "the new karstic-spring Orontes River urban refugia from 'Amorite' nomad incursions."[14] In Canaan, a decrease in rainfall beginning ca. 2300 B.C.E. and resulting in the creation of the wadis visible today has been proposed as the cause of the precipitous decline in the number of inhabited sites in EB III–IVB,[15] including the hiatus posited at Ugarit.[16] West of the Jordan and the Dead Sea, not a single site has been found that survived the collapse. A few sites survived in the stream-fed northern Levant.[17] In Cyprus, the Philia phase of the Early Bronze Age, characterized by a uniformity of material culture indicating close connections between different parts of the island and linked to a broader eastern Mediterranean interaction sphere, broke down ca. 2200 B.C.E., perhaps responding to the general collapse of overseas systems rather than, or in addition to, climatic factors.[18] In Egypt, the incidence of famine increased in the late 6th Dynasty as Nile levels fell, reaching a minimum ca. 2200 B.C.E.,[19] as the Old Kingdom began its collapse into the chaos of the First Intermediate Period. The autobiography of Ankhtifi (a southern provincial governor of the 9th Dynasty ca. 2100 B.C.E.) inscribed on a rock-cut tomb reports starvation caused by Nile failure, dislocation, and the breakdown of order.[20]

Greece in general receives more rain than the Near East or Egypt, but with local differences: in periods of dryness, the west-facing valleys of Achaea fare better than Laconia and Messenia, for example.[21] There is some evidence for dryness in the Peloponnese and other parts of Greece in the late third millennium B.C.E. Major episodes of soil erosion are reported; proposed causes range from farming practices to catastrophic summer rains to climate change involving an absence of rain.[22] The Lerna Early Helladic (EH) III deposit includes birds that can exist only in a climate significantly drier than the present climate.[23] Contem-

[7] Peltenburg 2007; Weiss (forthcoming).

[8] Scheffer et al. 2012. Perrow (1999) advances the hypothesis that the more complex and tightly coupled a system, the greater the risk of catastrophic collapse.

[9] Pavúk et al. (forthcoming).

[10] Yener 1995; see also Muhly 1993; Yener and Vandiver 1993a, 1993b.

[11] Weiss et al. 1993.

[12] Porter 2007; Schwartz 2007, 52; Ur 2010b, 388, 412.

[13] deMenocal 2001, 669 (citing Weiss et al. 1993).

[14] Weiss 2012b, 13.

[15] Mazar 1990, 151–73; Falconer 1994; de Miroschedji 2009.

[16] Astour 2002, 165–66.

[17] de Miroschedji 2009.

[18] Frankel and Webb 2012, 1380 (citing Webb and Frankel 1999).

[19] Redford 1992, 61–2.

[20] Butzer 2012, 3633.

[21] Regarding the Late Bronze Age, see, e.g., Carpenter 1966, 37, 63; O'Brien 2013, 15.

[22] Van Andel et al. 1986, esp. 113; Maran 1998, 452–53; Weiberg and Finné 2013.

[23] Gejvall 1969, 47–9, 55.

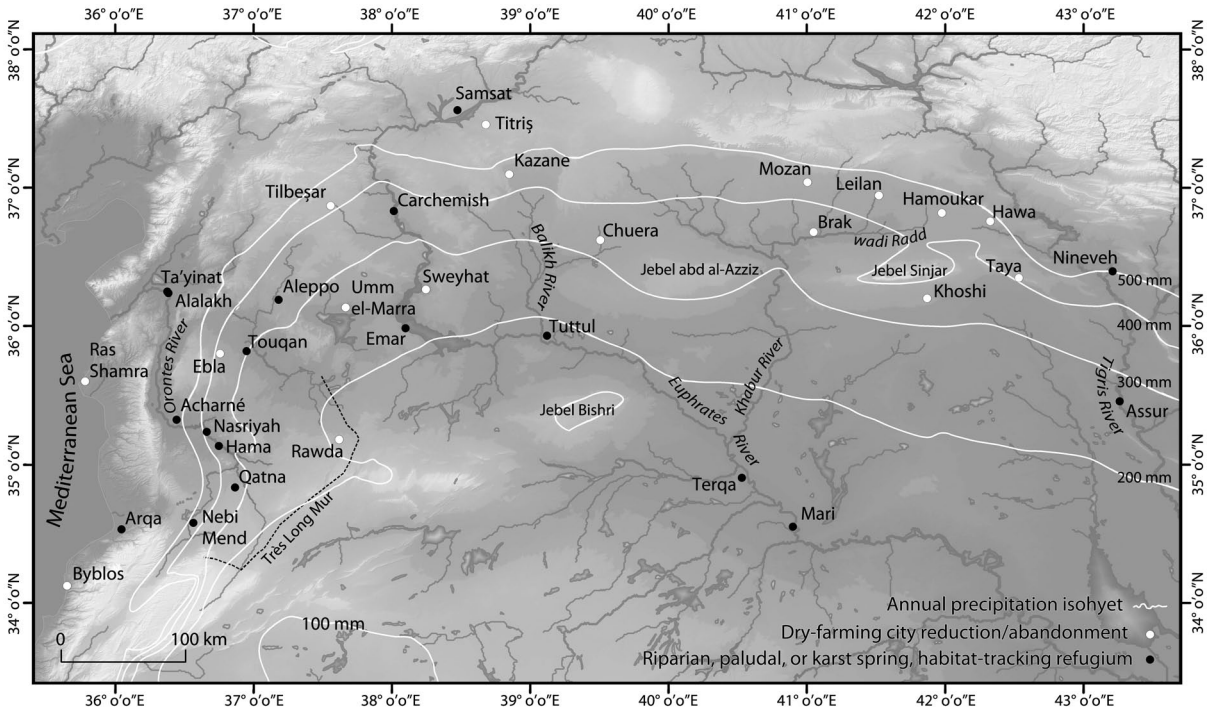

Fig. 1. Map of Syria and Mesopotamia, 4.2–3.9 ka b.p. (after Weiss 2012b, fig. 5; courtesy H. Weiss).

poraneous evidence from the Cyclades is lacking. The islands today suffer frequent water shortages with great interyear variability. Major differences exist between islands, but none is entirely water sufficient in the long run, as Broodbank and others have noted.[24] There is some evidence for water stress on Crete toward the end of the Early Minoan (EM) period,[25] particularly in the east of Crete, which witnessed many destructions in or at the end of EM II. In central Crete, the period from EM III to Middle Minoan (MM) IA appears to have been a time of considerable increase in social complexity.[26] Central Crete is better watered in general. The exception is the Mesara Plain to the east of the Phaistos palace, which may explain the rapid and intense Phaistian settlement of the abundantly watered Amari Valley to the north after the consolidation of palatial authority at the beginning of the Old Palace period ca. 1950 B.C.E. Throughout Crete today, interyear variation is high, with water availability dependent in good part both on the extent of the winter snowfall and on whether melting comes gradually or in torrents. Such variability may have intensified the need for interyear social storage and for a more complex society. Whether mainland Greece, Crete, or the Cyclades were greatly affected directly by shortage of rain in EB III or suffered the secondary effects of climate disaster in lands to the east and south remains an open question.

It is worth noting that in EB I–II, prior to the postulated climate change event, the eastern shore of the Aegean led the western shore in access to metal sources and trade networks, site size, fortification walls, and social complexity (e.g., Troy, Poliochni, Thermi, Panaztepe, Liman Tepe, Miletos, Bakla Tepe). Kouka notes that by ca. 3000 B.C.E. Liman Tepe already had long houses containing gold and silver jewelry and, when reorganized in EB II, became a site of more than 20 ha with a huge bastion.[27] Moreover, the administrative use of seals and of common systems of weights over large areas began in the Near East and traveled

[24] Van Andel et al. 1986, esp. 113; Broodbank 2000, 77–8; Wilson 2008, 98.

[25] The evidence is summarized by Moody (2009, 244), who concludes that "summer evaporation soars to an interglacial high between ca. 2200–2000 B.C."; see also Bottema and Sarpaki 2003.

[26] Watrous 2004, 266–67.

[27] Kouka 2013.

west.[28] (A recent claim that "the northeastern Peloponnese appears to have been at the forefront of development in the Aegean"[29] in EB II clearly applies only to the western shore of the Aegean and the Cyclades.) During EB I–II, Cycladic islanders in their longboats surely played a vital role in the transmission of goods, knowledge, and beliefs from east to west across the Aegean. The presence in the Cyclades in EB II of seals and sealings,[30] as well as of weights consistent with systems employed first in the Near East and along the eastern shore of the Aegean and then in Greece in EB II, was a manifestation of this role.[31] We should, however, recognize as well the early Cretan prominence in metallurgy, perhaps beginning in EB I as suggested with respect to the metallurgical installation at the site of Chrysokamino.[32]

DESTRUCTIONS, ABANDONMENTS, AND MIGRATIONS IN MAINLAND GREECE, THE CYCLADES, CRETE, MALTA, AND SPAIN: CAUSES AND CONSEQUENCES

I turn now to the destructions and abandonments in continental Greece and the Cyclades in EB III. In the Aegean, the so-called International Age of EB II was followed by a period of turmoil.[33] On the Greek mainland, the massive Rundbau granary at Tiryns and the substantial corridor houses at various sites, including the House of the Tiles at Lerna and the Weißes Haus at Kolonna on Aegina, were destroyed. The construction of the corridor houses ended, along with the pre-state sealing-administration systems of Lerna and Geraki in Laconia.[34] By the Middle Helladic/Middle Cycladic period, evidence of seals and sealings disappeared, metallurgy declined, and luxury goods practically disappeared.[35] In the Cyclades, the manufacture of marble objects ceased or sharply declined, and cist tomb burial ended.[36] Fortifications were created on hilltops, apparently for the purpose of protecting food supplies and people for limited periods in expectation of raids—for example, at Kastri on Syros and Panormos on Naxos. At Panormos, the end was surely violent, to judge from the facts that the entrance was burnt and sling stones and a spearhead were found in the debris.[37] Many Cycladic sites were abandoned, including the putative pan-Cycladic ritual center of Dhaskalio Kavos on Keros.[38] Cycladic material ceased to appear at Helladic sites. The arc of upheaval extended farther west as well, for the temple culture of Malta and the metallurgical culture of Rio Tinto in Spain ended ca. 2000 B.C.E.[39] It is worth noting that the direction of regional abandonments appears to have moved from east to west over time, beginning in the Khabur River valley early in the 23rd century B.C.E.

On Crete, Cycladic-type burials and funerary assemblages, so clearly evident at Ayia Photia, Gournes, and Poros in EM I, beginning in EM II, along with locally made Cycladic-type pottery, were replaced in part by imports from the Cyclades. Jars from the metalliferous islands of Melos, Siphnos, and Kea are prominent among the assemblages.[40] The acquisition of metals was surely of prime importance to Minoans on Crete, who may have undertaken the requisite voyages. Brogan observes that four boat models were present in the excavated material from EM II Mochlos and suggests that the evident wealth present, including imported gold objects, may reflect local maritime capabilities.[41] West Crete exhibits a different pattern. There is little evidence of direct contact with either the rest of Crete or the Cyclades. Instead, along with pottery of the local tradition, there appeared in EM IIA a locally made black-slipped ware of Helladic-Cycladic shapes, including sauceboats. The island of Kythera with its west Cretan–type settlement is a likely point of transmission. By EM IIB, such pottery no longer appeared in west Crete.[42]

Crete, and in particular the northeast coast, was not exempt from disturbance in EM IIB, as shown by the destruction at Mochlos (unexpected by the inhabitants, it would seem),[43] the massive perimeter walls erected at various sites in EM III, and the likely construction of harbor fortification walls at Malia at this time.[44] Central Crete does not appear to have been

[28] Rahmstorf 2006a, 2006b, 2011.

[29] Weiberg and Finné 2013, 22.

[30] Zachos and Dousougli 2008, esp. 93–4; Georgiadis 2012, 188.

[31] Rahmstorf (2003) suggests further that the weights were principally employed in connection with cultural exchanges of metals.

[32] Betancourt 2006.

[33] Forsén 1992, 204–20, 255–56.

[34] Tiryns: Kilian 1986. Lerna: Dickinson 1994, 189; Wiencke 2000, 652–53. Geraki: Weingarten et al. 2011. Sealing use ended as well at the 10 or more other sites on the mainland and in the Cyclades, where sealings have been found in EH/Early Cycladic II–III contexts (Rahmstorf 2003, 296).

[35] Snodgrass 1971, 383–86; 2006; Philippa-Touchais 2011.

[36] Broodbank 2000, 177–78, 322.

[37] Doumas 1992; Angelopoulou 2003, 2008.

[38] Renfrew et al. 2009, 2012.

[39] Amzallag 2009, 509; Broodbank 2013.

[40] Brogan 2013.

[41] Soles 2012; Brogan 2013.

[42] Nodarou 2011.

[43] Brogan 2013.

[44] Watrous 2004, 255; Watrous and Hadzi-Vallianou 2004, 445.

greatly affected, however, and by EM III seems to have been well on the way toward palace-centered polities in the process of state formation,[45] as indicated by the large-scale construction activity and the appearance of exotic foreign imports at Knossos, Archanes, Malia, and Phaistos. Todaro describes the "re-organization of the Phaistos hill at the beginning of the EM III period, in the course of a large building project that marked the beginning of the palatial phenomenon in south central Crete."[46]

Beginning in EB II in the northern Cyclades and central Greece and continuing into EB III as far as Aegina and the southern Cyclades, metal forms and burnished pottery of western Anatolian type, the infamous Kastri Group, appeared, often in significant quantities.[47] Crete, however, was largely exempt from these developments, with only one teapot and a few sherds reported to date.[48] On the now-deserted island of Christiana (the closest of the Cyclades to Crete), however, Kastri Group depas handles and other sherds were visible on the surface of a saddle between two hills when several colleagues and I climbed to the location in 1998.[49]

The boundary between the Cyclades and Crete marks an abrupt limit to the distribution of Kastri Group pottery and metallurgy. Pottery of the Phylakopi I type is also known from Christiana but is infrequent on Crete, again indicating a line of demarcation. Eastern Adriatic Cetina culture objects that appeared in mainland Greece at this time are also absent from Crete.[50] Indeed, the first appearance of monumentality and literacy in the Aegean was on Crete in EM III–MM I and may have resulted from the fortunate position of Crete, distant enough from the turmoil in Anatolia, the Cyclades, and mainland Greece and sufficient in population relative to size to resist destructive incursions but close enough to receive stimuli from the civilizations of Egypt and the Near East.

Fifty years ago, when I first began to study the Aegean Bronze Age, it was the general belief that the EB III period marked the arrival of a new people—indeed, the coming of the Greeks.[51] Today, the prevailing view is different, in part because excavations in the intervening years have shown that the appearance of Kastri Group pottery and Anatolian metal forms preceded the destructions and in part because of the absence of an overall pattern, geographical or chronological, in the last half of the third millennium B.C.E. in mainland Greece and the Cyclades. Destructions occurred at both the beginning and end of EH III. In some cases, destructions were followed by gaps of centuries—one thinks, for example, of Ayia Irini on Kea (Rutter's prime example), Tsoungiza in the Nemea Valley, Aegion on the north coast of Achaea, or Geraki in Laconia, which was abandoned after a fierce fire in EH IIB.[52] Almost no EH III pottery has been identified from Laconia.[53] At Lerna, the destruction of the House of the Tiles appears to have been followed by immediate reoccupation of the site, but of a different nature, while at Thebes, Orchomenos, and Eutresis in Boeotia and at Tiryns in the Argolid, there is no apparent break in occupation but rather evidence of site reorganization. Rutter has noted, however, that "the dramatic differences between the EH II and EH III repertoires of cooking pottery suggest that a shift in the manner of food preparation, possibly signaling a change in diet as well, may have been a facet of this cultural transition."[54] Kolonna on Aegina is of special interest, for it appears to have received jewelry from the eastern Mediterranean on at least one occasion during EH III[55] and is the only major fortified site known in the early stages of the succeeding Middle Helladic period. Crego has proposed that colonists from Kolonna may have been responsible for the reoccupation of Ayia Irini on Kea in Period IVa.[56] Ships with armed men aboard are depicted on Aeginetan pottery.[57] Many of the destructions in the Cyclades and on the mainland may have been the results of attacks and sometimes occupation by other Cycladic islanders or mainlanders, in which Kolonna on the island of Aegina in the Saronic Gulf may have played a prominent role, apart from possible raids from Anatolia or movements from the Balkans. There can be no doubt that Greece (with the possible exception of Kolonna) suffered a severe recession in complexity and interconnectedness by the early Middle Helladic period or that the Cyclades experienced a wave of destructions, depopulations in some cases, and major

[45] Tomkins 2012.
[46] Todaro 2013.
[47] Broodbank 2000, 309–19; Choleva 2012; Pullen 2013.
[48] Davaras and Betancourt 2004, 231–32.
[49] See also Sotirakopoulou 1993, 16–17.
[50] Maran 1986, 1998; Rambach 2001, 2002, 2004.
[51] Caskey 1960. Cf. Forsén 1992; Manning 1995; see also Rutter 2001a, 2001b; Pullen 2008.
[52] Papazoglou-Manioudaki 2010, 131; Weingarten et al. 2011.
[53] Cavanagh and Mee 2011.
[54] Rutter 2001a, 116.
[55] Reinholdt 2008. I am indebted to Joseph Maran for this reference.
[56] Crego 2010, 843.
[57] Philippa-Touchais 2007, 108 (citing Siedentopf 1991, 24–5, pls. 35–8).

cultural change. Of course, some societies will always be more resourceful and resilient than others, qualities that may be displayed by local adaptation to new circumstances, by a willingness to migrate, and/or by resorting to warfare if necessary.[58]

It is worth noting that in addition to Anatolian impulses, eastern Adriatic Cetina culture objects and influences appeared at Olympia and elsewhere in the Peloponnese with increasing frequency toward the end of EH III, suggesting the movement of people whose type-fossils appear in the central/western Mediterranean as well.[59] EH III also saw the first appearance of the horse in Greece.[60] Nomadic or seminomadic people may have arrived in Greece at this time.[61] Barber, in her seminal book on prehistoric weaving, has pointed to changes in spindlewhorls and the virtual absence of terracotta loomweights in Thessaly and Boeotia at the time, noting that nomads typically did not carry bulky loomweights but used pieces of local rock instead.[62] A Near Eastern text known as the Assyrian King List speaks of "the seventeen [Amorite] kings who lived in tents" prior to the rule of Shamshi-Adad.[63]

CLIMATE IN CONTEXT: WARFARE, PIRACY, TRADING NETWORK DISRUPTION, METALLURGY, WEAPONRY, AND SEAFARING

Warfare and piracy have occurred frequently in the eastern Mediterranean throughout history without a propelling climate event, sometimes with devastating consequences (such as the abandonment of some of the Cyclades during the deprivations of Barbarossa). Migrations may occur for reasons apart from climate-induced water shortages and, whatever the cause, may or may not result in warfare. Migration and diffusion as explanations for major change have been out of fashion for half a century, but people, technologies, and ideas do move (as, e.g., the Hyksos). Piracy can occur, of course, when there are no food shortages, but it may receive further impetus when shortages exist. Braudel once observed that there is usually a surplus of grain somewhere in the Mediterranean—the problem is to find it and ship it.[64] If, however, the severity of climate change was as great as has been suggested, grain anywhere may have been difficult to find, thus stimulating more intense and sometimes violent searches.

Complicating the picture toward the close of the third millennium B.C.E. are the impact first of the spread of furnace smelting and subsequently the appearance of tin bronze on the number and nature of weapons; the disruption and reorganization of trading networks for metals, food, and/or prestige goods and accompanying relationships; and the coming of the age of sail. By Early Cycladic (EC)/EM I–early EC/EM II, a large dagger made of arsenical copper appeared at the Cycladic-style site of Ayia Photia on Crete.[65] Metal daggers are conspicuous in Cycladic graves from EC II.[66] Indeed, such daggers may have been worn not merely as possessions but also as symbols of status by warriors throughout much of the Mediterranean, in a period that also saw the appearance, first in western Anatolia, of the firmly hafted slotted spearhead and the widespread construction of defensive circuits with bastions.[67] The diffusion of furnace smelting may have played a critical role. The fortified sites around the Rio Tinto in Spain, which appeared suddenly at the beginning of the third millennium and disappeared equally suddenly at its end, were probably centers of furnace smelting.[68] By EB II, tin bronze, capable of producing better and more easily cast weapons, was in use at Troy, and it appeared at Poliochni on Lemnos, Thermi on Lesbos, and Kastri on Syros by EC III. Weapons and other objects from Kastri are made from metal whose sources are in Anatolia.[69] Conflict resulting from the disruption of food supplies and fueled by increasing availability and/or improvement in weapons may have been more significant than food shortages in themselves in destabilizing societies.

Lastly, the impact of the transformation of seafaring in this period requires consideration. By at least the beginning of EC II, longboats capable of covering 20–50 km per day and carrying substantial loads of people, animals, and food—or of warriors—existed (fig. 2, top).[70] Nevertheless, the appearance of sailing vessels in the Aegean would surely have transformed the prospects for trade, raid, and settlement. Sails were apparently already in use by at least the fifth millennium B.C.E. in the Persian Gulf.[71] A depiction of an Egyptian Nile boat under sail appeared in the late fourth millennium B.C.E.[72] By the 26th century B.C.E., during the 4th Dynasty, substantial harbors that could

[58] Cf. Weiberg and Finné 2013.
[59] Rambach 2001, 2002, 2004.
[60] von den Driesch and Boessneck 1990; Banks 2013, 455.
[61] Rutter 1988.
[62] Barber 1991, 307–8; see also Carington Smith 1976, 218–39, 400–4; 1992, 690; Pavúk 2012, 124.
[63] Glassner 1993, 147.
[64] Braudel 1972, 570–76 (quoted in Dickinson 2010, 26).
[65] Muhly 2013.
[66] Sherratt 2007, 250.
[67] Broodbank 2000, 285; Branigan 2012, 8.
[68] Amzallag 2009, 509.
[69] Stos-Gale et al. 1984, 23, 30–6.
[70] Broodbank and Strasser 1991, 241; Broodbank 2000, 102, 260, 287; Maran 2008.
[71] Carter 2006.
[72] Broodbank 2010, 255.

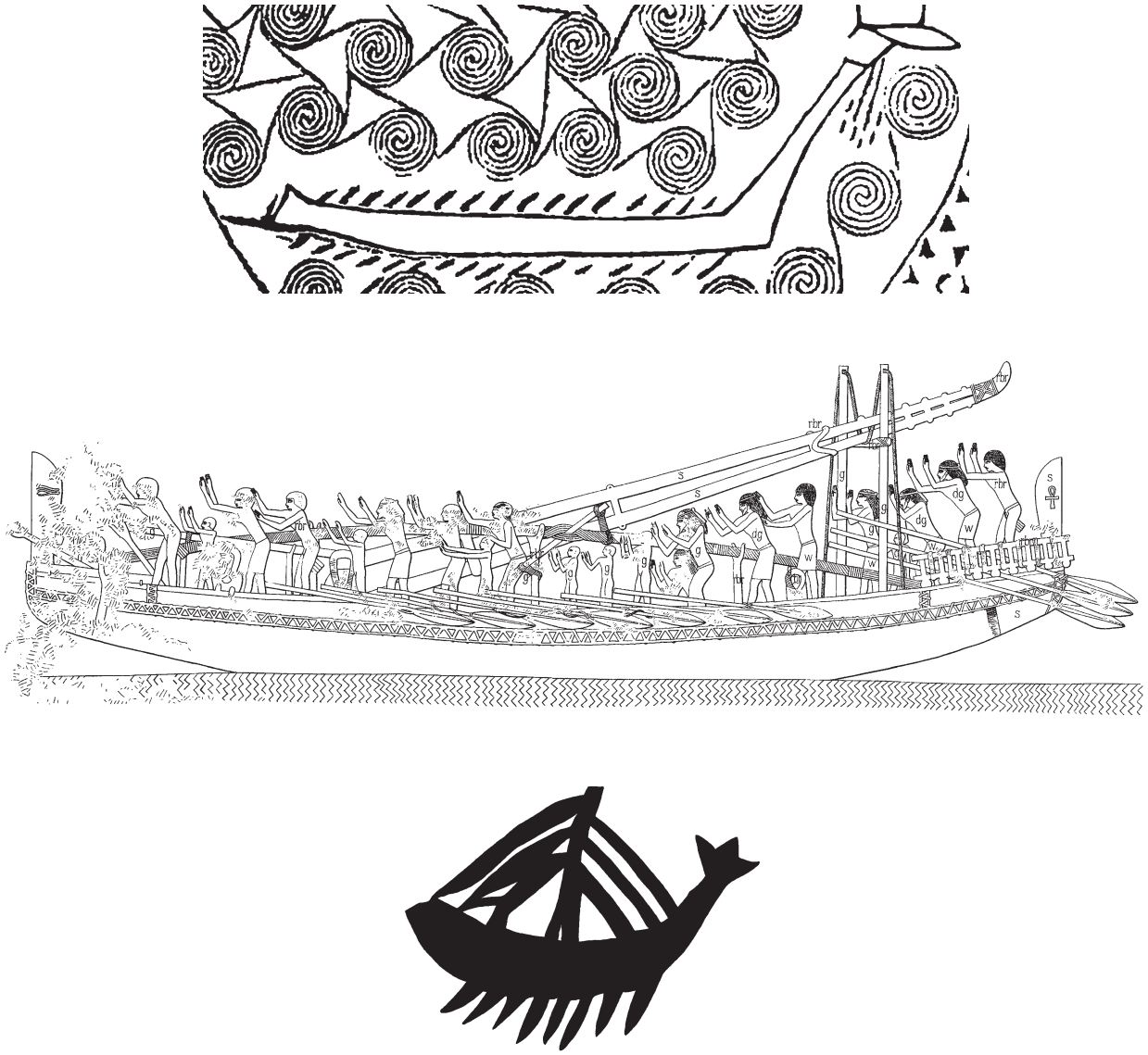

Fig. 2. Ships in the prehistoric Mediterranean: *top*, detail from an EC II "frying pan" depicting a longboat; *center*, sailing ship from the relief in the Temple of Sahure, 5th Dynasty (modified from Borchardt 1913, pl. 12); *bottom*, drawing of a MM I seal depicting a ship with sails and oars (Oxford, Ashmolean Museum, inv. no. AN1938.761).

serve sailing vessels were created on the Red Sea.[73] By the middle of the third millennium, seagoing sailing vessels were traveling from Egypt to Byblos.[74] The text known as the Annal Stone from the reign of Snofru (ca. 2575–2550 B.C.E.) describes 40 ships bringing wood from a foreign land and ships of 100 cubits (more than 50 m). The funerary boat from the pyramid of Khufu, his predecessor, was made with approximately 38 tons of imported cedar.[75] Broodbank, citing the work of Wachsmann, notes that beginning in the early 25th century B.C.E. "monuments of the pharaohs . . . show large, developed ships with a bipod or tripod mast . . . a yard above and a boom below, and long oars" (see fig. 2, center).[76] Such ships may have brought newcomers

[73] Tallet 2013.
[74] Bietak 2010, esp. 142–43.
[75] Mark 2009.
[76] Broodbank 2010, 255; see also Wachsmann 1998, 13–14, figs. 2.2–8.

from Anatolia to Cyprus at the beginning of the Philia phase, ca. 2450–2400 B.C.E., and/or at the time of the breakdown of the Philia culture, ca. 2200 B.C.E.[77] The earliest description in human history of an amphibious attack comes from the Testament of Uni, ca. 2300 B.C.E. during the reign of the 6th Dynasty pharaoh Pepi I. Uni describes an Egyptian assault by sea on fortified Canaanite sites, most likely including Tell es-Sakan near Gaza, a key stop on the Byblos route. The site was later destroyed during the First Intermediate Period when the voyages to Byblos ceased.[78]

Evidence of contact with Egypt and the Near East, beginning at Knossos (ivory tusk and stone vase fragments), Mochlos, and Tholos E at Phourni-Archanes in EM IIA and increasing greatly in the Mesara and at Archanes in EM III, surely suggests voyaging in the Aegean by sail.[79] It seems unlikely that Egyptian voyaging would have ended abruptly at Byblos. (It is also worth noting that the onset of long-distance voyaging may have brought Aegean populations into contact with pathogens to which they had no immunity. Third-millennium B.C.E. Near Eastern texts speak of the plague.)[80] Crete produces wood suitable for seagoing ships, and it seems highly likely that Minoans would have soon sought to master the technology of sailing. While the earliest context for a Minoan seal impression depicting a sailing vessel is probably MM I (see fig. 2, bottom),[81] the image already depicts an advanced sailing technology,[82] and of course the actual technology may have been more advanced than the carver knew or was able to depict.[83] Moreover, there is no way of knowing how soon after their first appearance sailing vessels became a part of the seal carvers' repertoire. Seal carvers may have continued with earlier motifs because of their putative apotropaic function or in order to indicate continuity of possession or authority. In addition, sailing vessels may have been depicted only after Cretans had acquired them and wished to convey that fact. Thus, their actual first use may have come earlier than their depiction on seals. Of course, such vessels may have engaged in both raid and trade. EM III/MM IA saw the first appearance of Minoan pottery at Lerna, Asine, Ayios Stephanos, and Aegina. The line dividing Crete from the Cyclades and the mainland with respect to the Kastri and Phylakopi I material already noted continued into the second millennium B.C.E. with respect to Aeginetan Ware, which appeared widely on the mainland in the Middle Helladic but was absent from Crete—not a single sherd has been reported from Knossos or Malia, for example, whereas Minoan pottery appears in the Cyclades and, as noted, along the eastern coast of the Peloponnese.

CONCLUSIONS

The late third-millennium B.C.E. pattern is familiar: voyagers came first to trade, then to raid, and in some cases, to settle, not always peacefully. A climate event may have provided a major impetus to the process, which also encompassed an expansion in numbers of arsenical copper daggers, the first appearance of tin bronze weapons, and the arrival of vessels under sail. There is still much to learn concerning the relative significance of these crucial factors and the nature of their interaction. One point is clear, however: disruptions and developments in Greece, the Cyclades, and the northeastern Aegean during the Early Bronze Age should not be analyzed solely in their local context, but rather should be considered in the light of events and developments of many kinds occurring in Anatolia, Cyprus, the Near East, Mesopotamia, the Levant, Canaan, Egypt, the Balkans, and the western Mediterranean. Moreover, both natural phenomena and human responses, and particularly the interaction between them, are central to our understanding of the history of humankind.

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[77] Kouka 2009, 36–40; Peltenburg 2013; Webb and Frankel 2013, 59.

[78] de Miroschedji 2012.

[79] Broodbank 2000, 341–49; Phillips 2008, 30–40 (Archanes), 78–82 (Knossos), 198–204 (Mochlos).

[80] McNeil 1976, 78–86.

[81] Broodbank 2010.

[82] Wedde 2000, 331–33.

[83] I thank Peter Kuniholm for this observation.

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