

MUNI
ARTS



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Egejská oblast před a po santorinské katastrofě





Prof. Václav Marek

When
the Santorini
volcano has
erupted?



Prof. Mirek Bárta



Summary of the opinions:

Klontza – Jaklova, V. 2008: Datierung der Katastrophe von Santorini. Kurze Zusammenfassung des bisherigen Standes der Forschung und vorherrschende Tendenzen. Anodos 10. Trnava.



What's wrong?

Hard science and humanities – tackling the question of the absolute chronology of the Santorini eruption

Věra Klontza-Jaklová

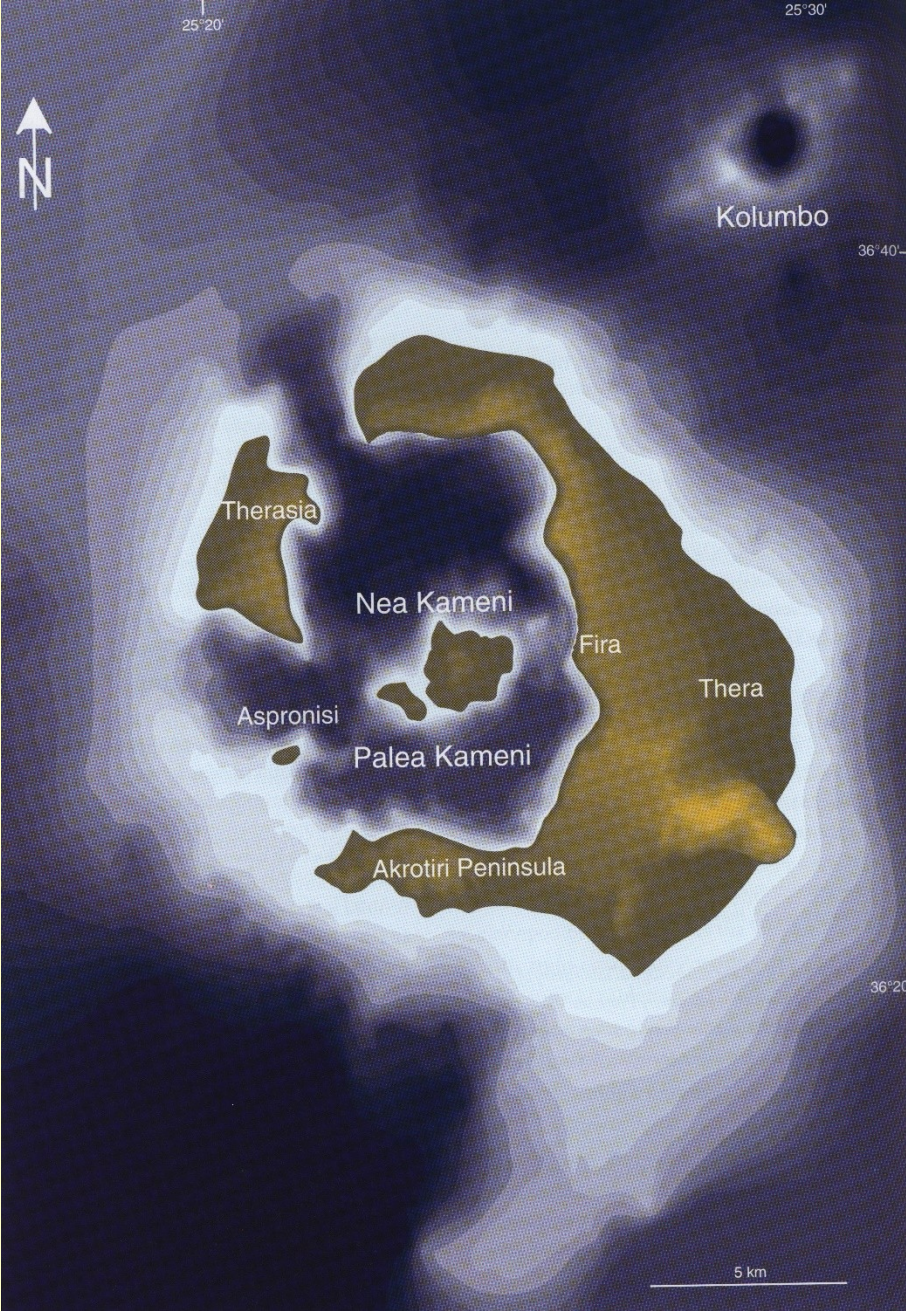


FILOZOFICKÁ FAKULTA
MASARYKOVA UNIVERZITA

459



Santorini islands today









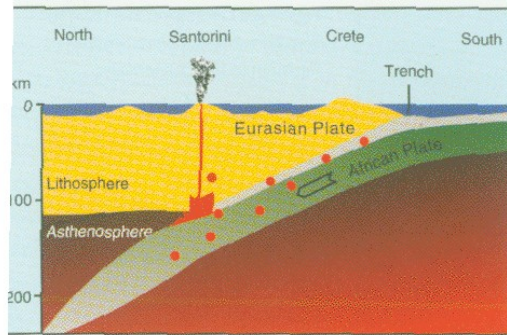
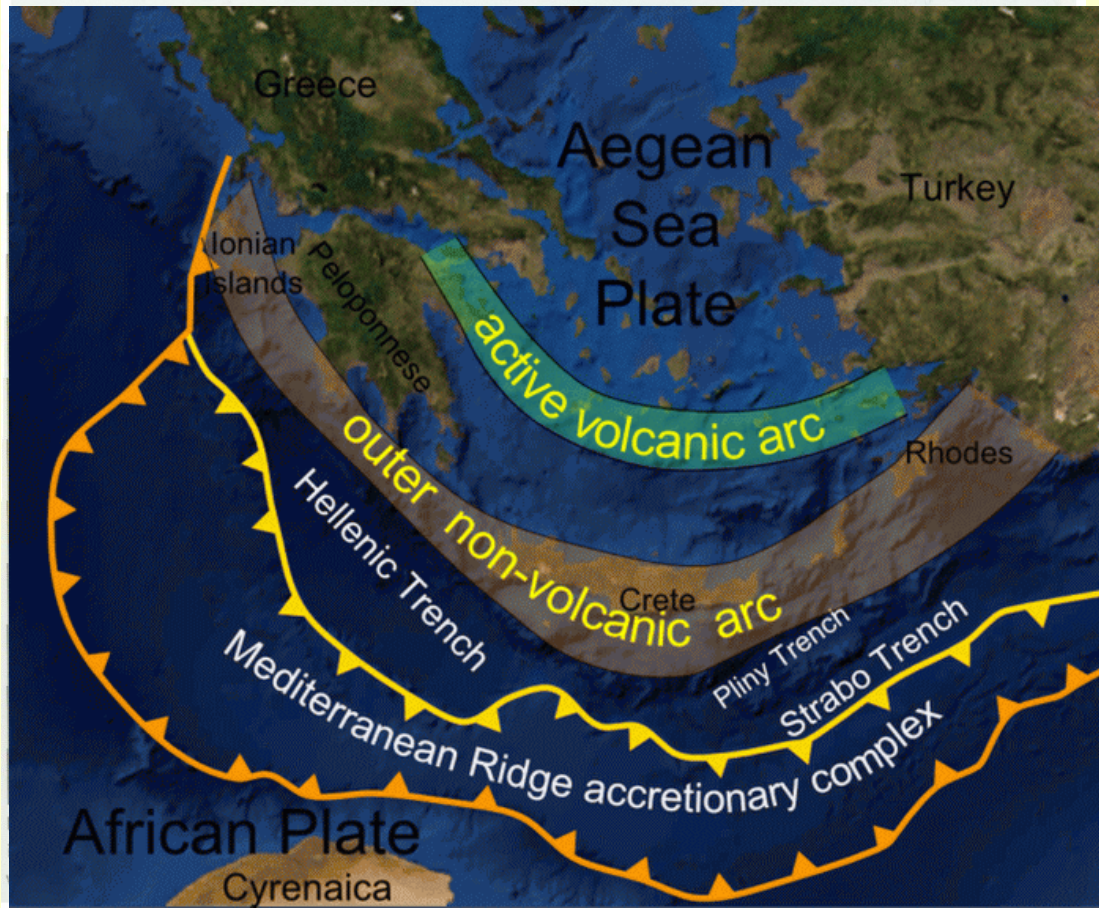


Figure 2.4 A north-south section through the subduction zone near Crete illustrates the African plate descending under the Eurasian Plate. The red dots represent the area where earthquakes are generated at a depth of about 150 to 170 kilometers below the volcanic belt. Modified after Schou Jensen and Håkansson (1990).

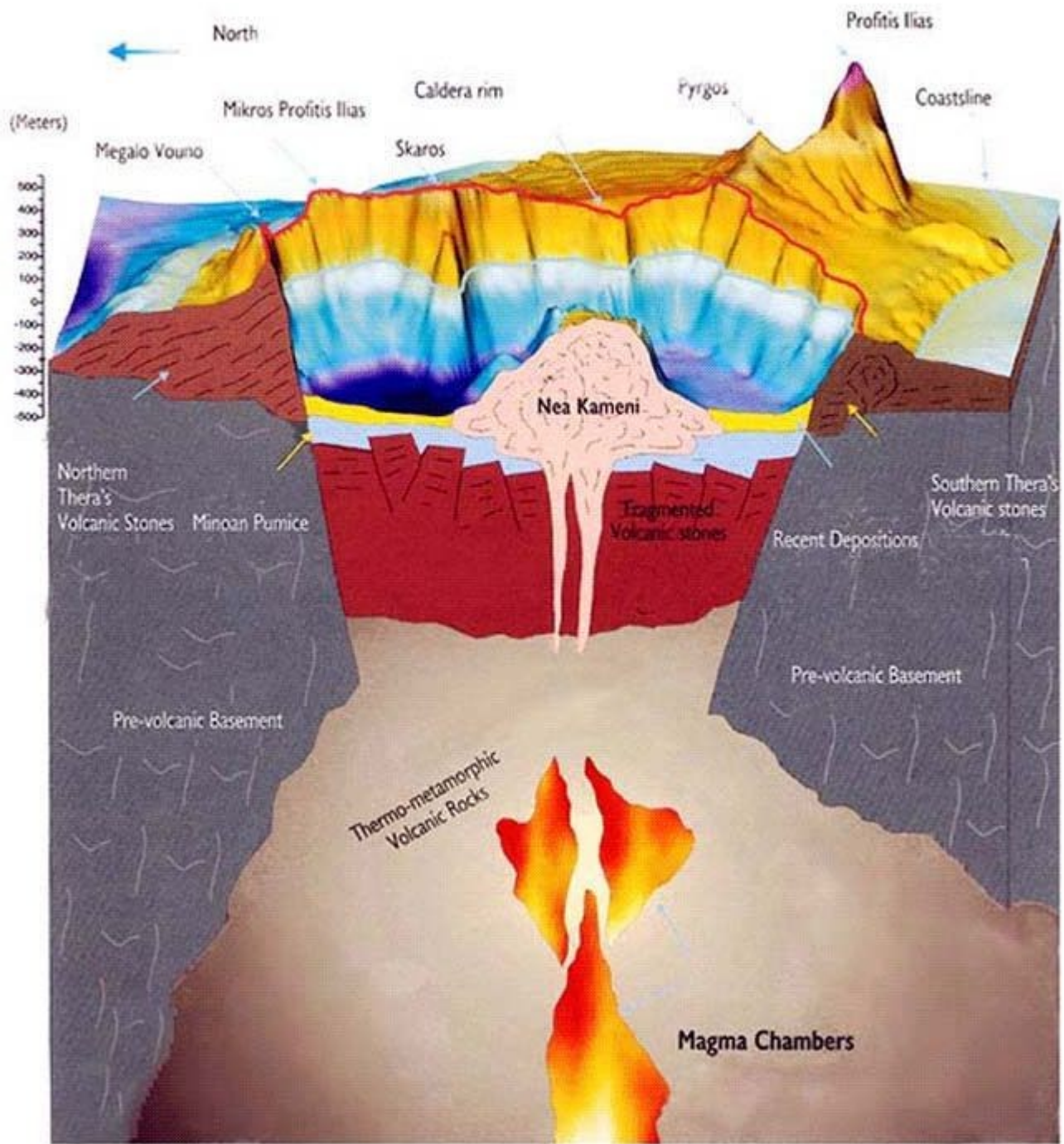
tion of earthquakes and the tsunamis they generate (Fig. 2.5) (Papazachos and Panagiotopoulos, 1993).

In the eastern part of the Aegean arc, the volcanic rocks are andesites and rhyodacites of a type that is characteristic of volcanoes on continental margins (Pichler *et al.*, 1972; Keller, 1982). These magmas will be described in greater detail in Chapter 3, but at this point it will suffice to note that they result from the interaction of mantle-derived magmas with the earth's upper crust.

Today, the Aegean region is fragmented into many segments. In a geological sense, it is relatively young (Fig. 2.6). As recently as the Miocene, this region, known as the Aegean landmass, was still structurally coherent, even though faulting beginning around the



Schematic geological section of Santorini



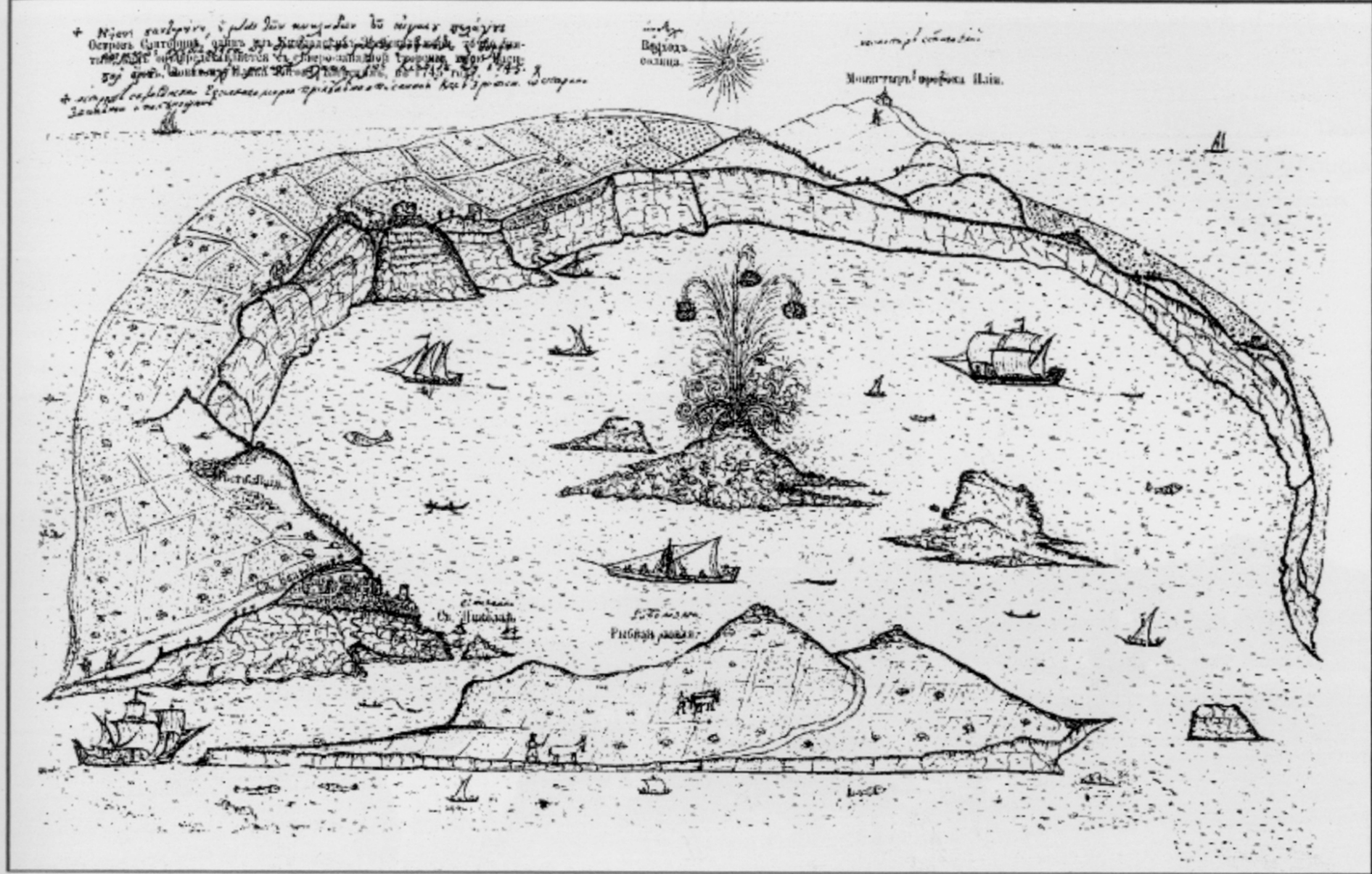


Figure 12.4 The Russian monk Barskij circumnavigated Santorini in 1745. He made astonishingly precise drawings of everything he saw, including geological structures such as the lavas of Skaros. At the time of Barskij's visit there were three

Kameni islands in the caldera: Palea, Mikra and Nea Kameni. His illustration shows an active volcano on Nea Kameni. The volcano Georgios was quiet at that time and had had no significant activity since 1711. From Monioudi-Gavala (1977).

Eruption in 1926



Figure 12.9 The four-year eruption of Nea Kameni from 1925 through 1928 produced two domes, 'Daphne' and 'Nautilus'. The latter is named for the ship of Captain Nemo who, in Jules

Verne's *20,000 Leagues under the sea* emerged in this volcanic eruption. Photo Nellys, courtesy Professor A. Kontaratos.





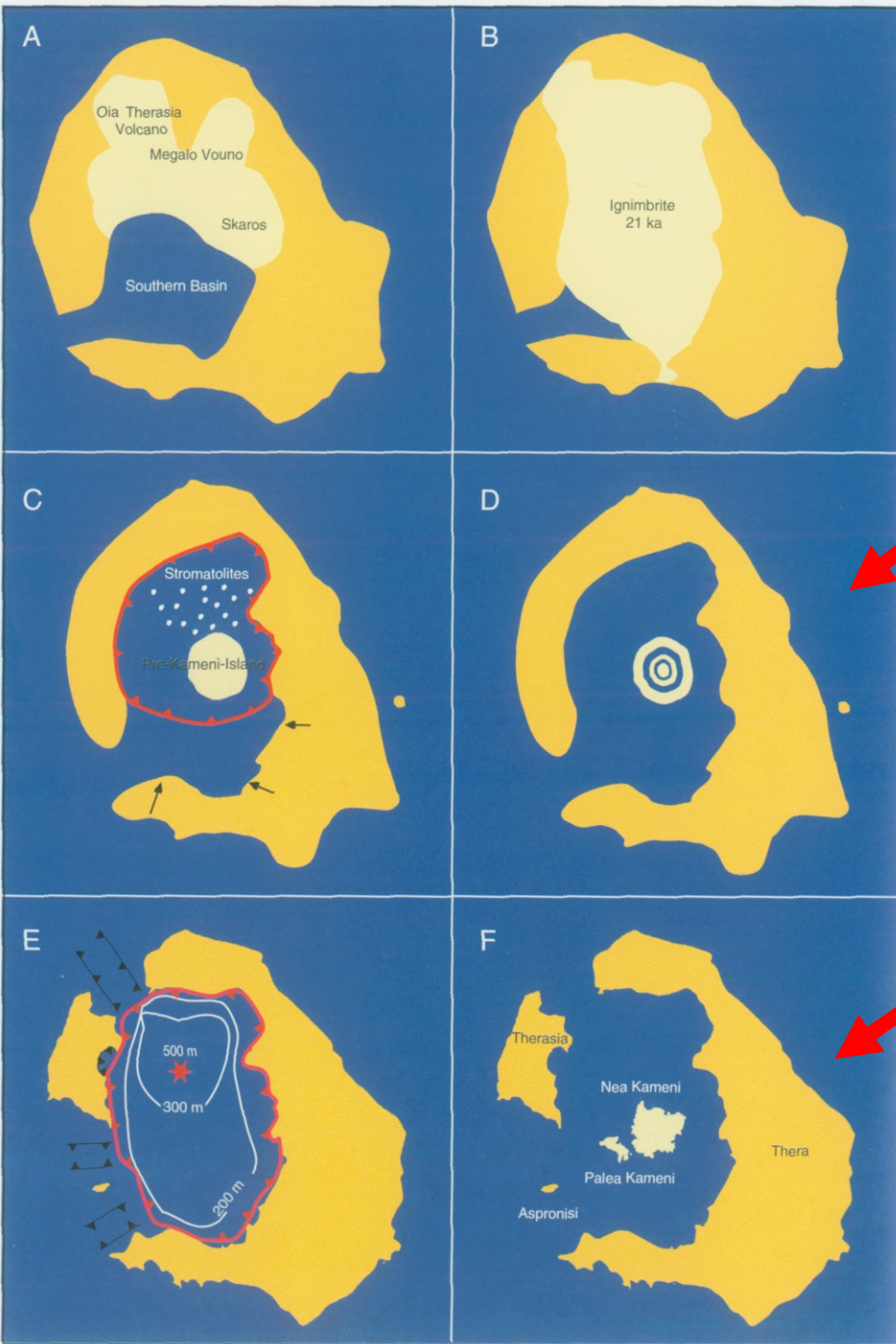
Oia

Fira

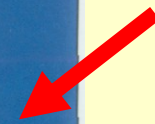
Akrotiri

Agios Profitis Elias





Before BA eruption



Contemporary state



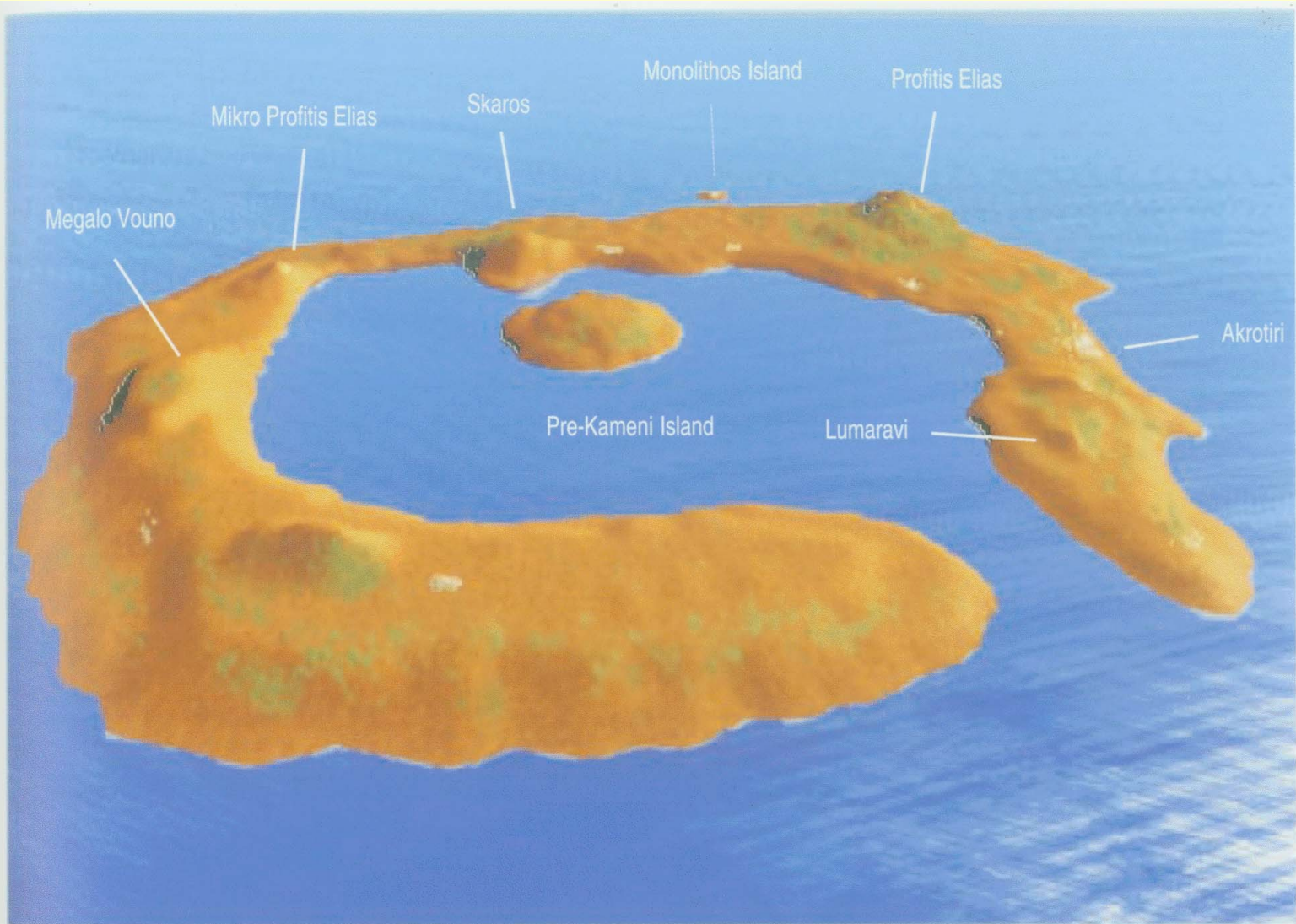


Figure 10.16 A reconstruction shows the Bronze Age ring-island in a bird's-eye view from the west. In the foreground one sees the reconstructed parts of Therasia and Aspronisi that were formerly connected to Thera. The pre-Kameni island is situated in the middle of the caldera, and Akrotiri is near the

shore on the far right. White dots mark the known Bronze Age sites. The reconstruction is based on numerous observations and measurements of the Minoan deposits as well as the topography of Thera, Therasia, and Aspronisi.



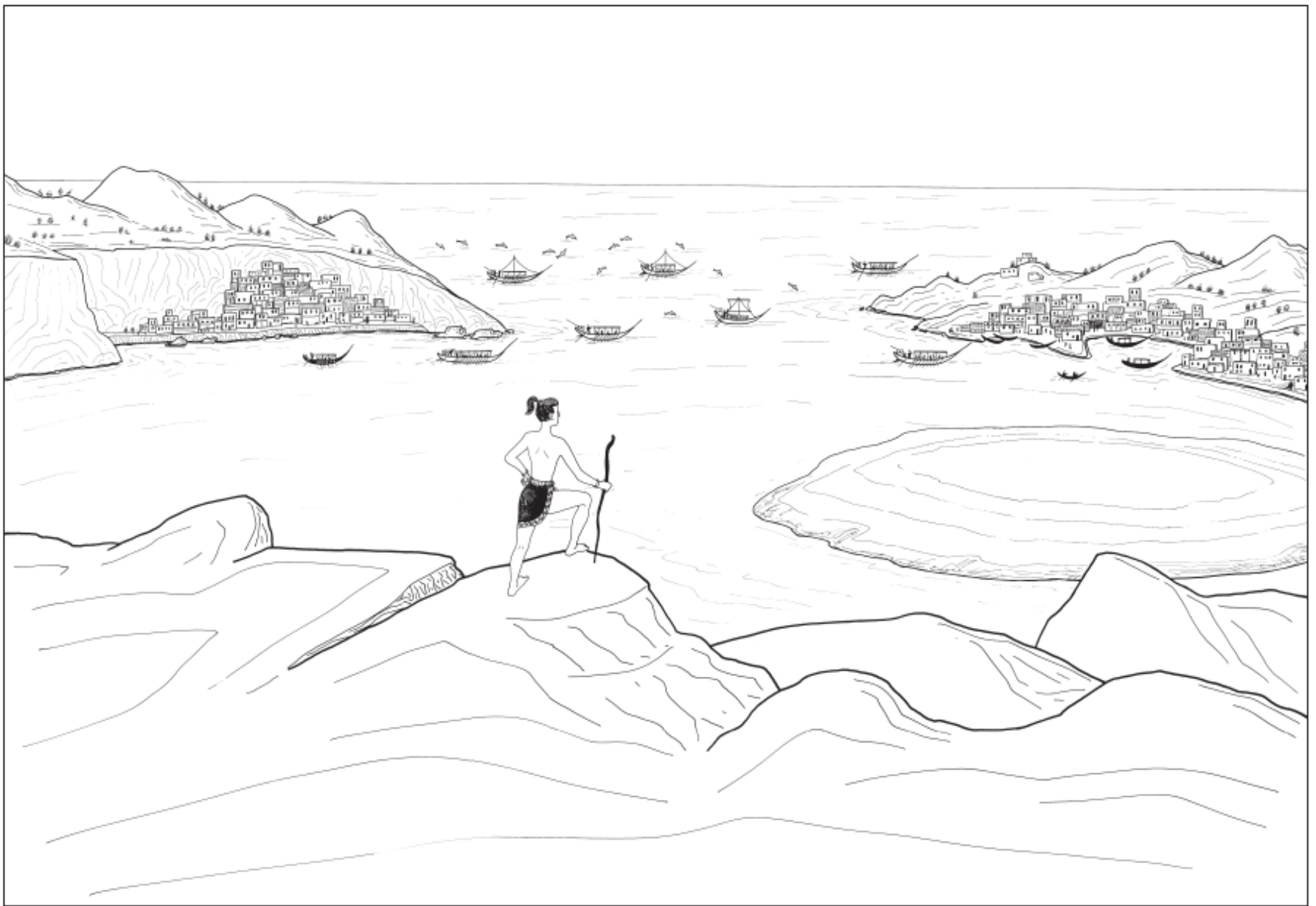
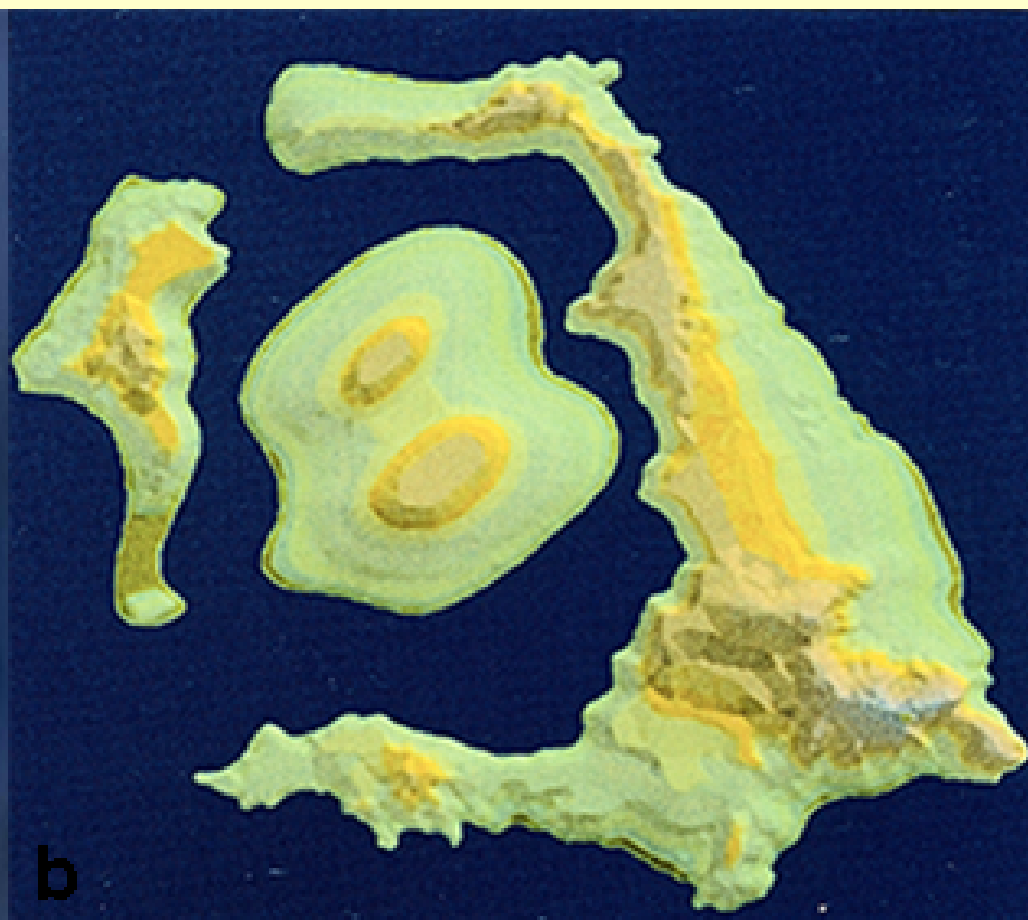
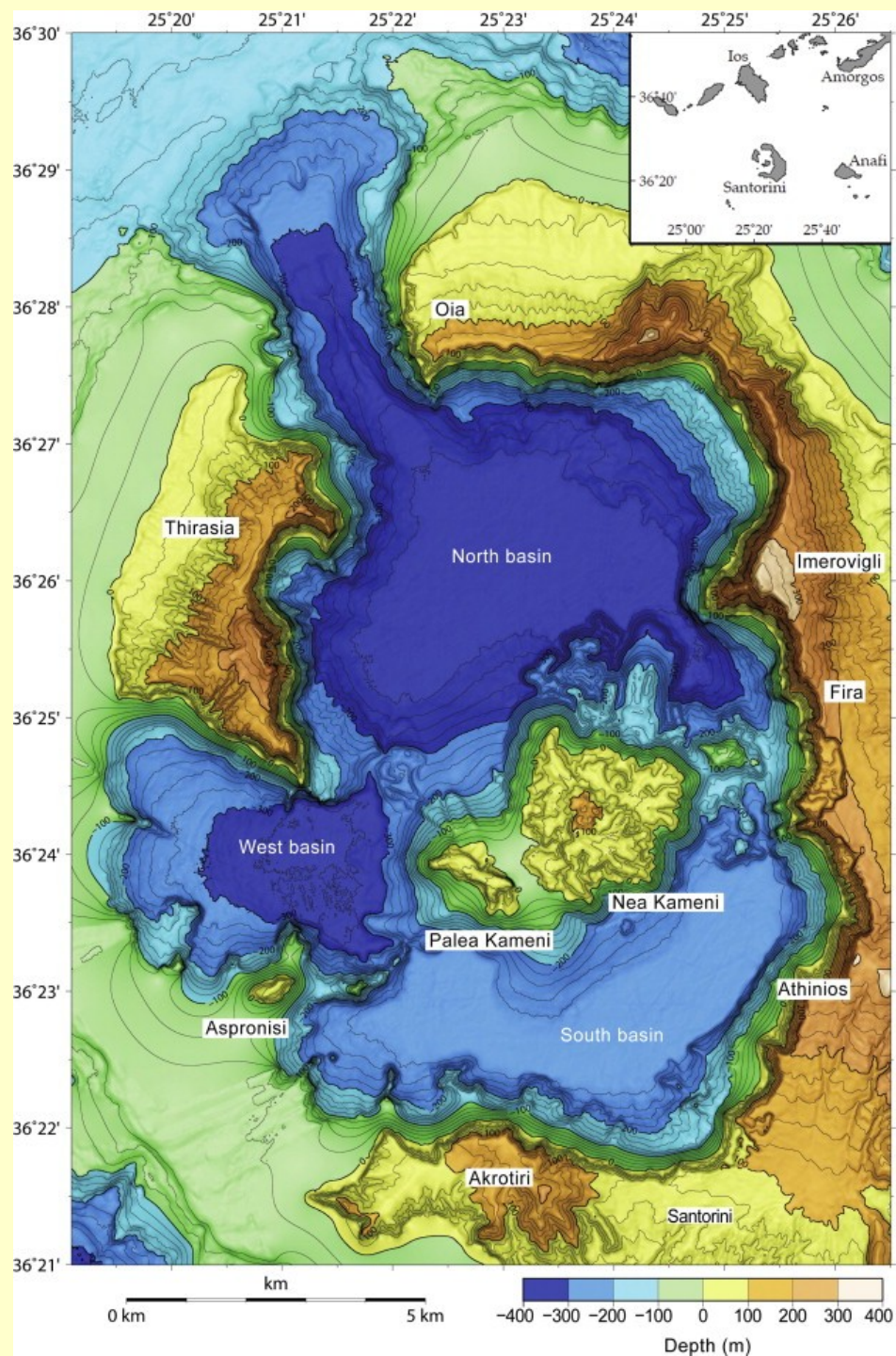


Figure 6. A reconstruction of the perspective proposed in this article. Specifically, the Flotilla Fresco is a landscape of the west side of Strongyle. (i.e. Thera prior to the Bronze Age volcanic eruption), with its inundated caldera as seen from its east lip. (Drawing by Doug Faulmann.)









Krakatoa 1883

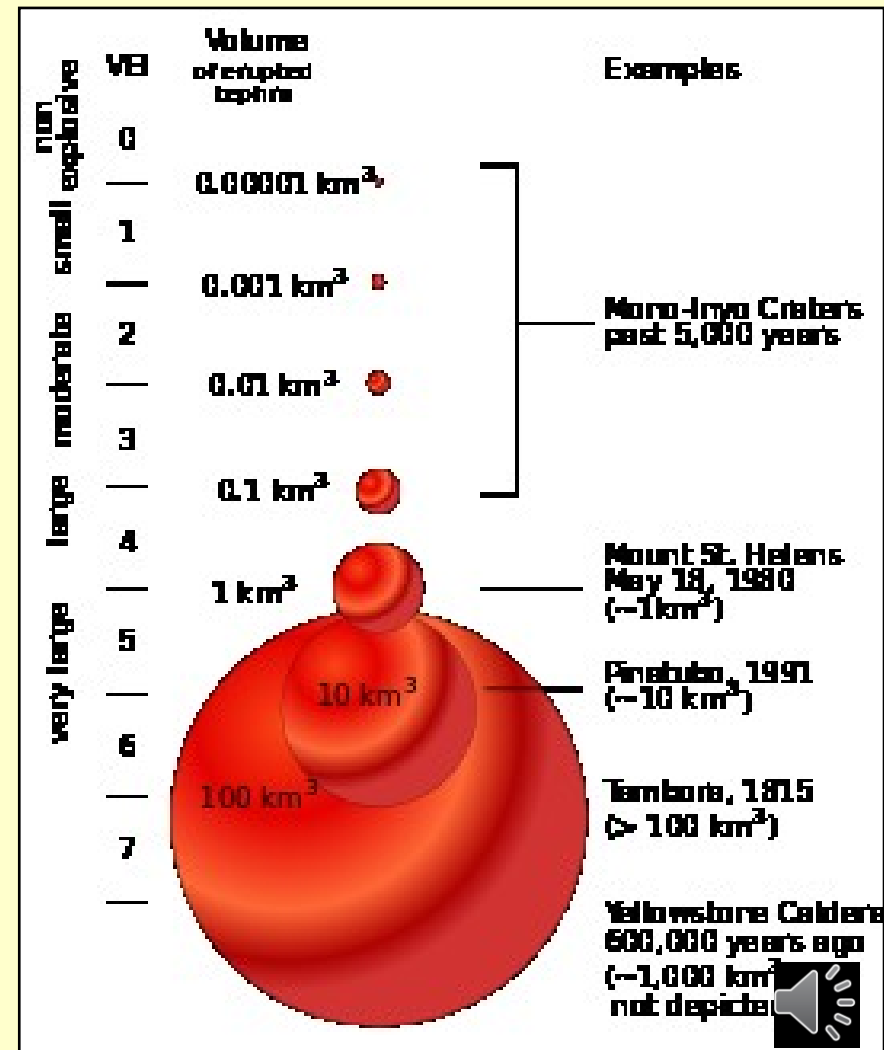


Tambora 1815



Reconstruction of the event:

- WARNING
- PHREATIC
- PLINYIAN
- TRANQUILIZING PROCESSES



Prof. Floyd McCoy





SANTORINI

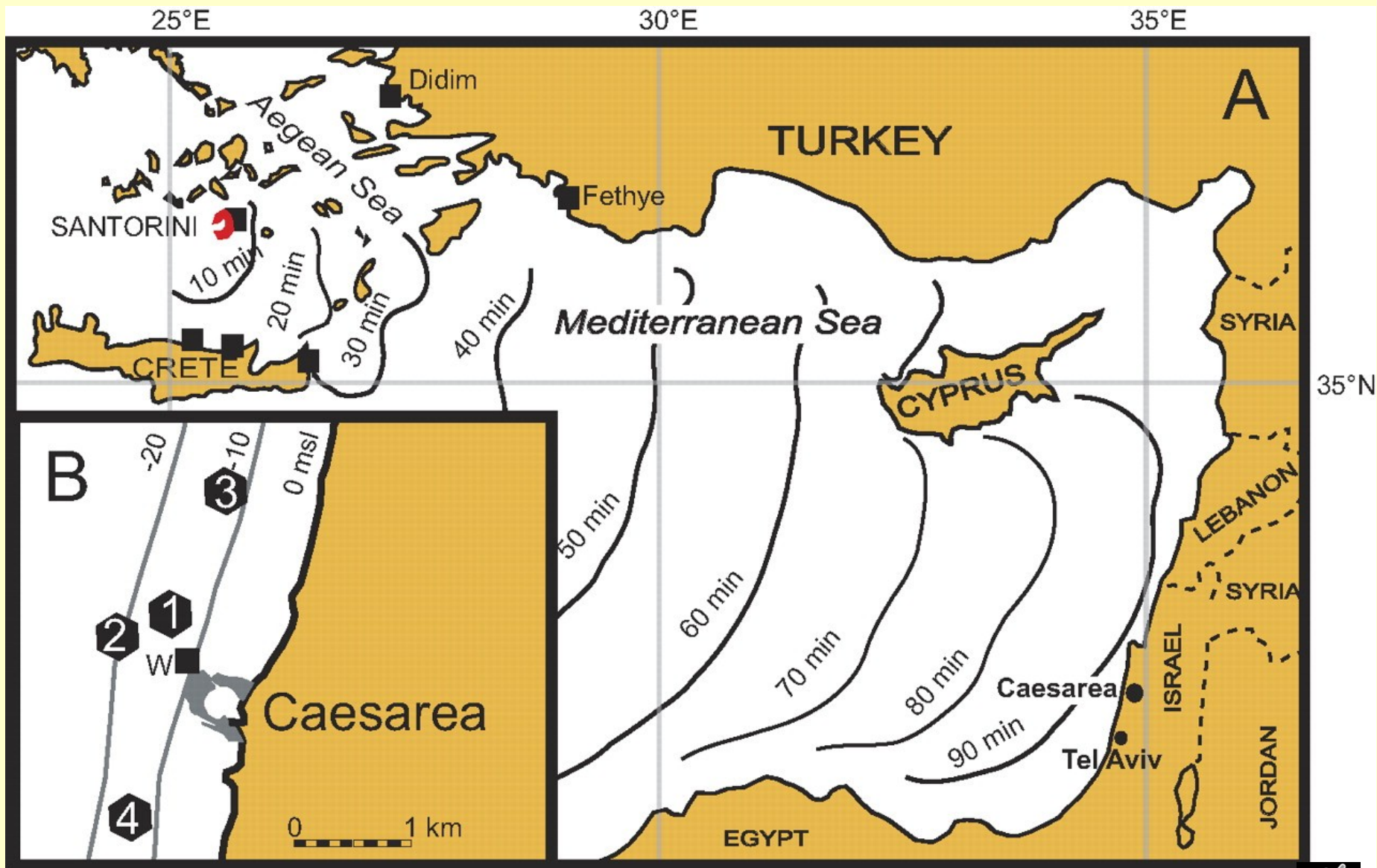

BASEMENT
OUTCROPS











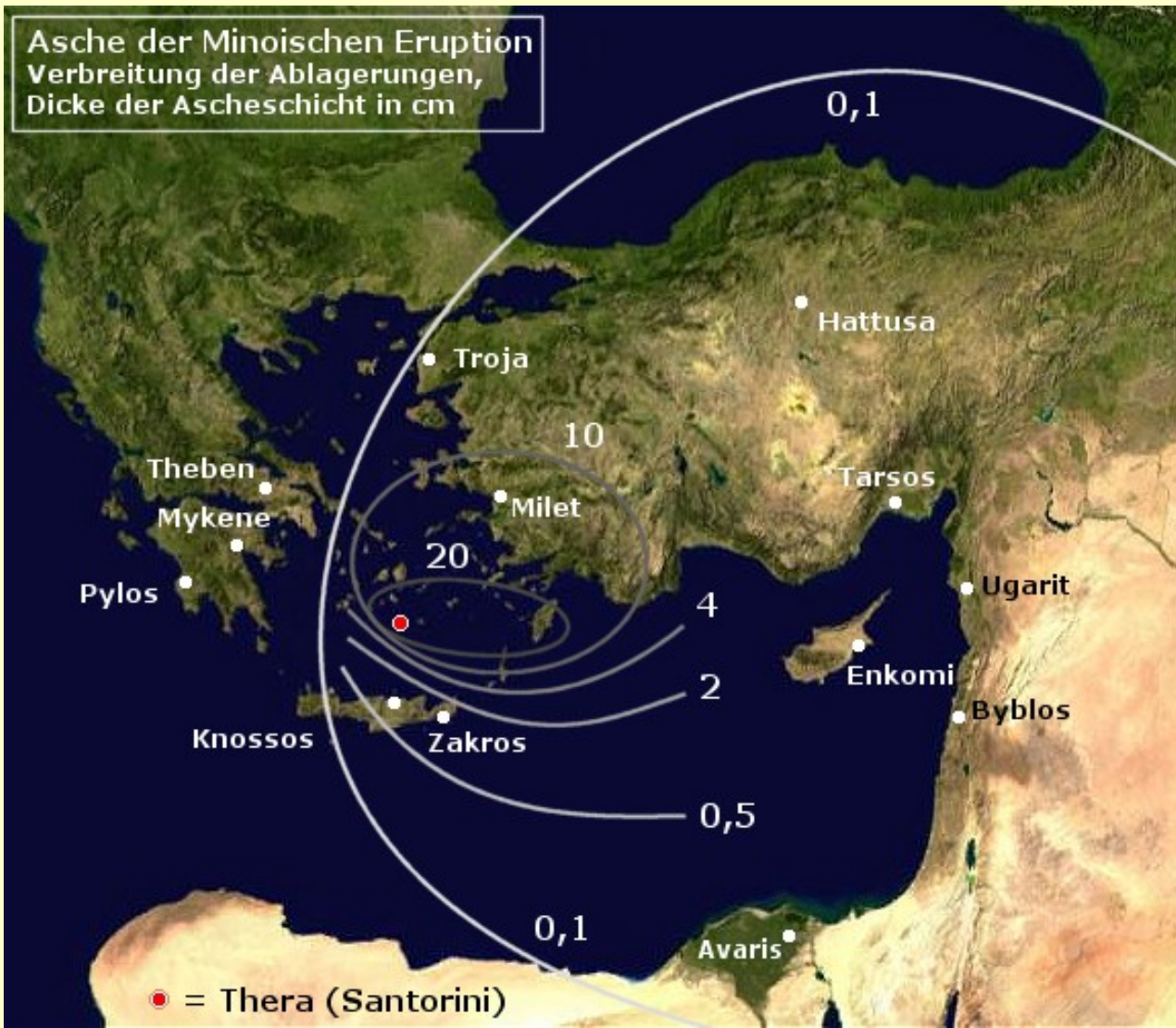
Tsunami debris
(Palaikastro, Eastern Crete)



Sandy MacGillivray
Henrik Bruins



Theran ash





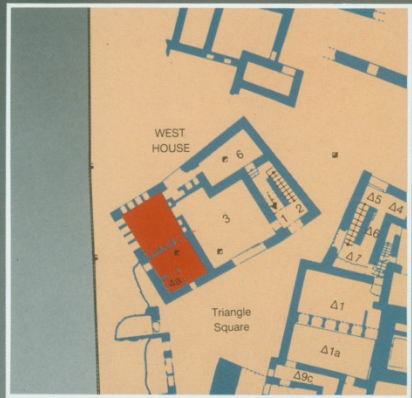
Early excavations

field work

Contemporary



Akrotiri



WEST HOUSE



EXCAVATIONS AT AKROTIRI, THERA

0 10 20 m.



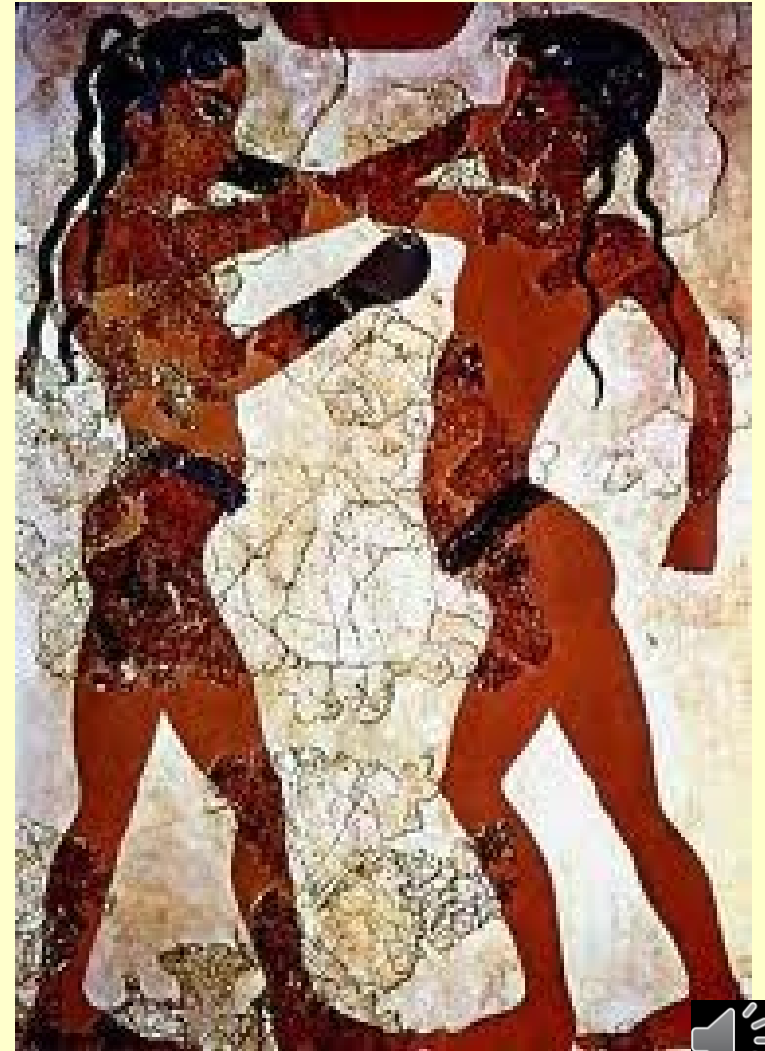


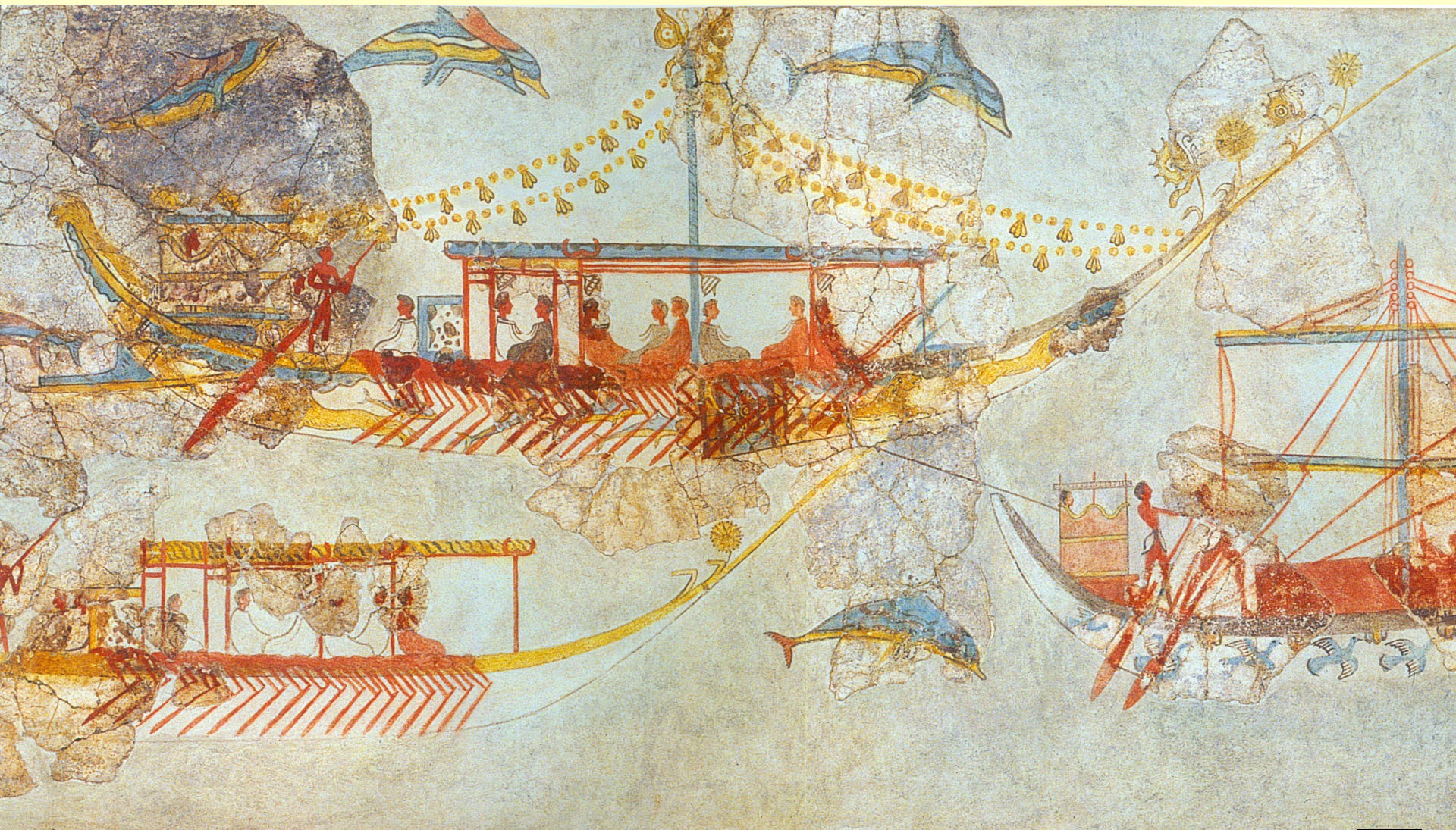


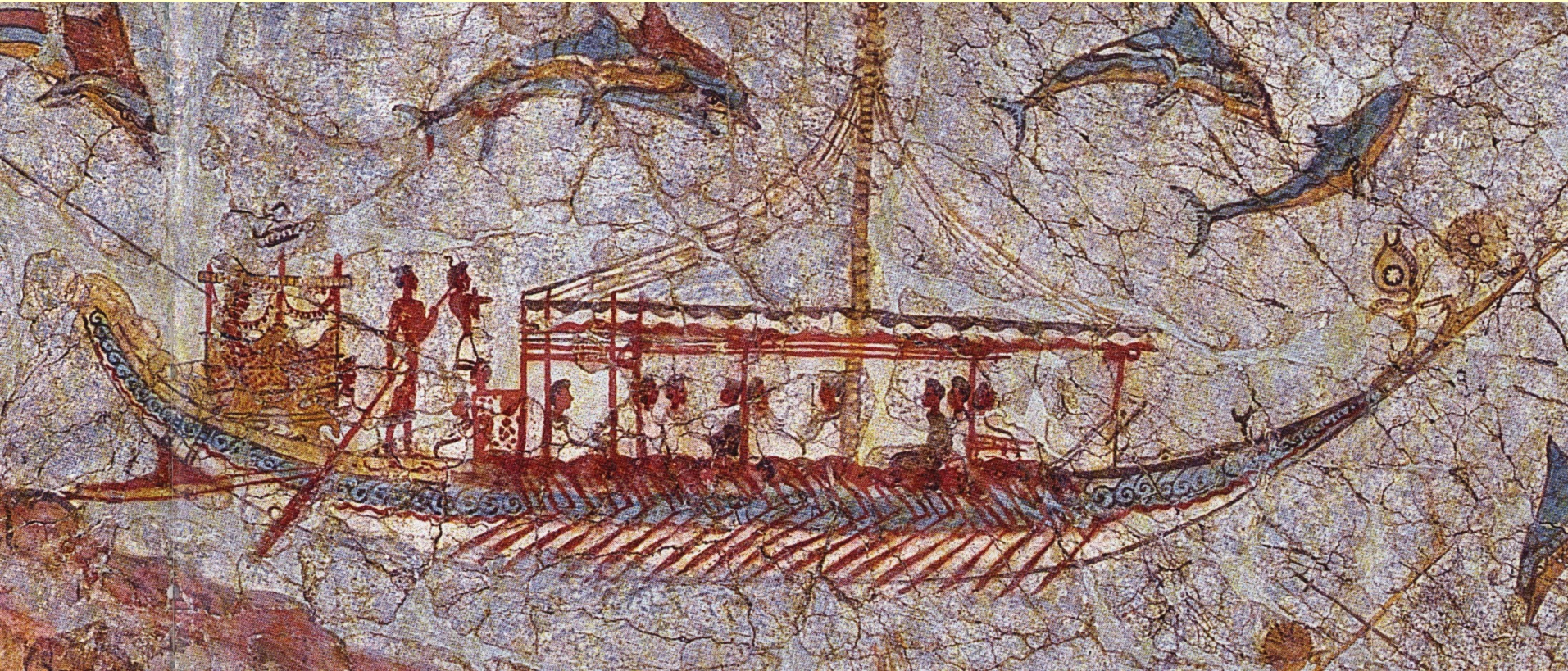




<http://www.therafoundation.org/wallpaintingexhibition>











LM IA/B pottery





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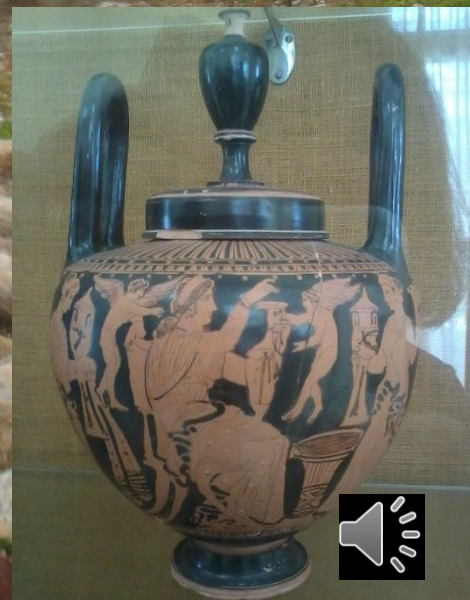
ce where the
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High Dating BCE	Crete	Greece	Low Dating BCE	Egypt
1750	MM III	MH III	1700	
1700	LM IA	LH I	1600	
	LM IB	LH IIA	1500	
1490	LM II	LH IIB	1430	Hatshepsut/Tuthmosis III (1479-1425)
1430	LM IIIA1	LH IIIA1	1390	
1390	LM IIIA2	LH IIIA2	1370/1360	Amenhotep III (1391-1353)
1300			1300	



FIGURE 1.2 THE 14TH CENTURY



Protopalatial polities → Neopalatial Knossian state



Administration and taxes



State ideology



Peak Sanctuaries

Juktas



Karfi

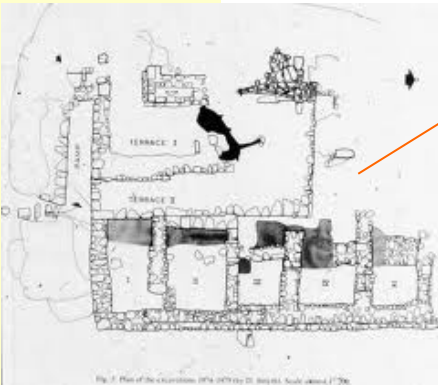


Fig. 1. Plan of the excavations (1974-1979) by D. Boukhal, scale reduced 1/200.



Oxa



Petsopas



Main center/capital:

Knossos

Regional centers

Chania

Rethymnon?

Galatas

Phaistos/
Ay. Triada

Malia

Petras

Zakros

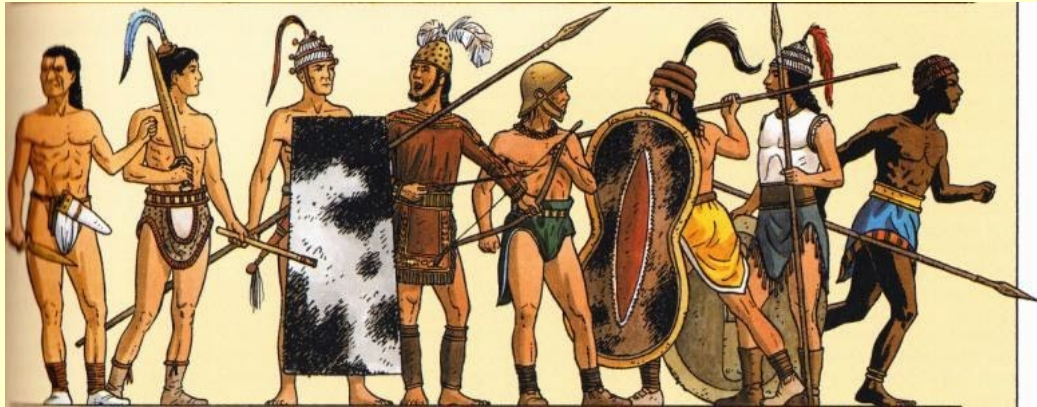
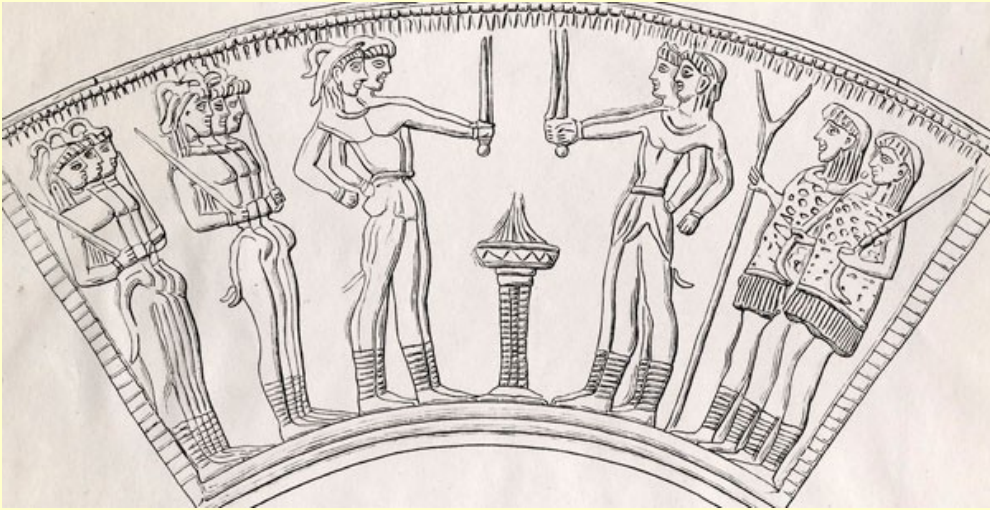
Central villages

- Kommos, Myrtos Pyrgos, Gournia, Priniatikos Pyrgos, Mochlos, Pseira, Palaikastro, Tylissos, Vathypetro, Makryialos,...

Villages, forts, farm, hamlets

- Papadiokampos, Kannia,...

Army

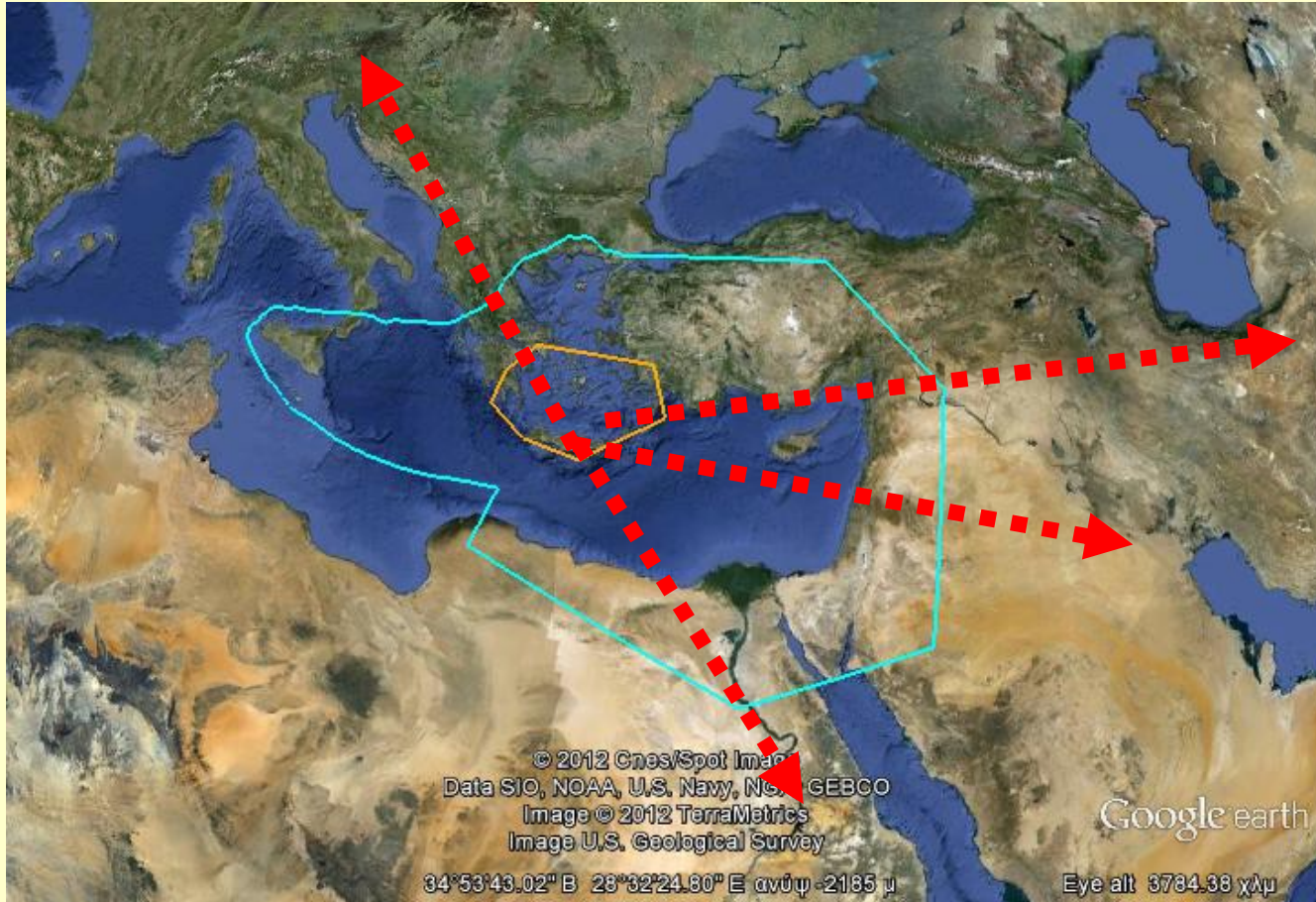


Exchange and measurements system



- Hard and Soft infrastructures





Knossian
territory

Trade zone

Long-distance
intermediated
trade

Chronological synchronization:

- Egypt x Crete
- Imports and imitations of Minoan artifacts in Egypt, in Greek mainland and on Cycladic islands, in Asia Minor and on Near East.



Egypt

SIP or Dynasty XVIII?



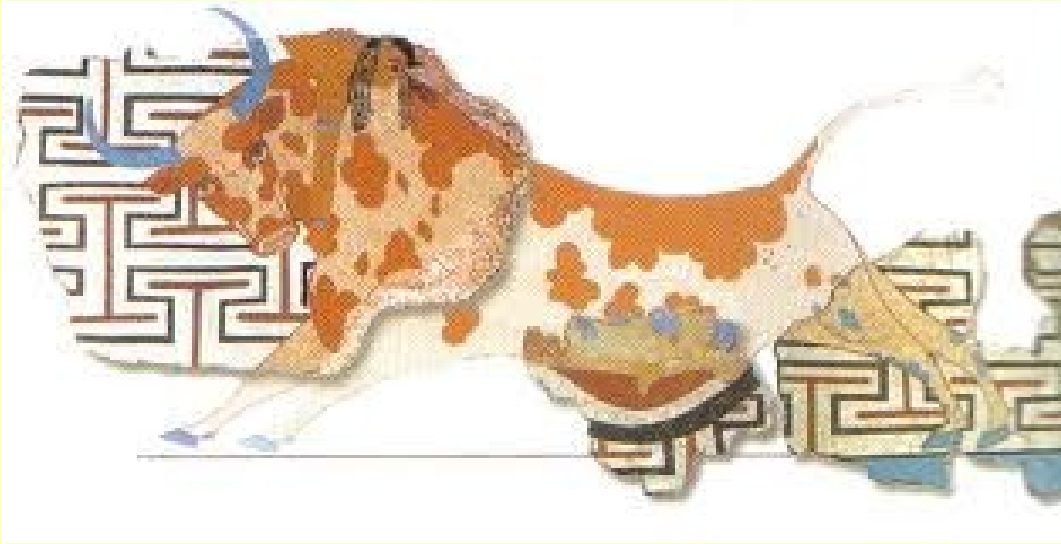
Hyksos King Apepa or Apepy I - (Greek Apopis), 16 th. Dynasty

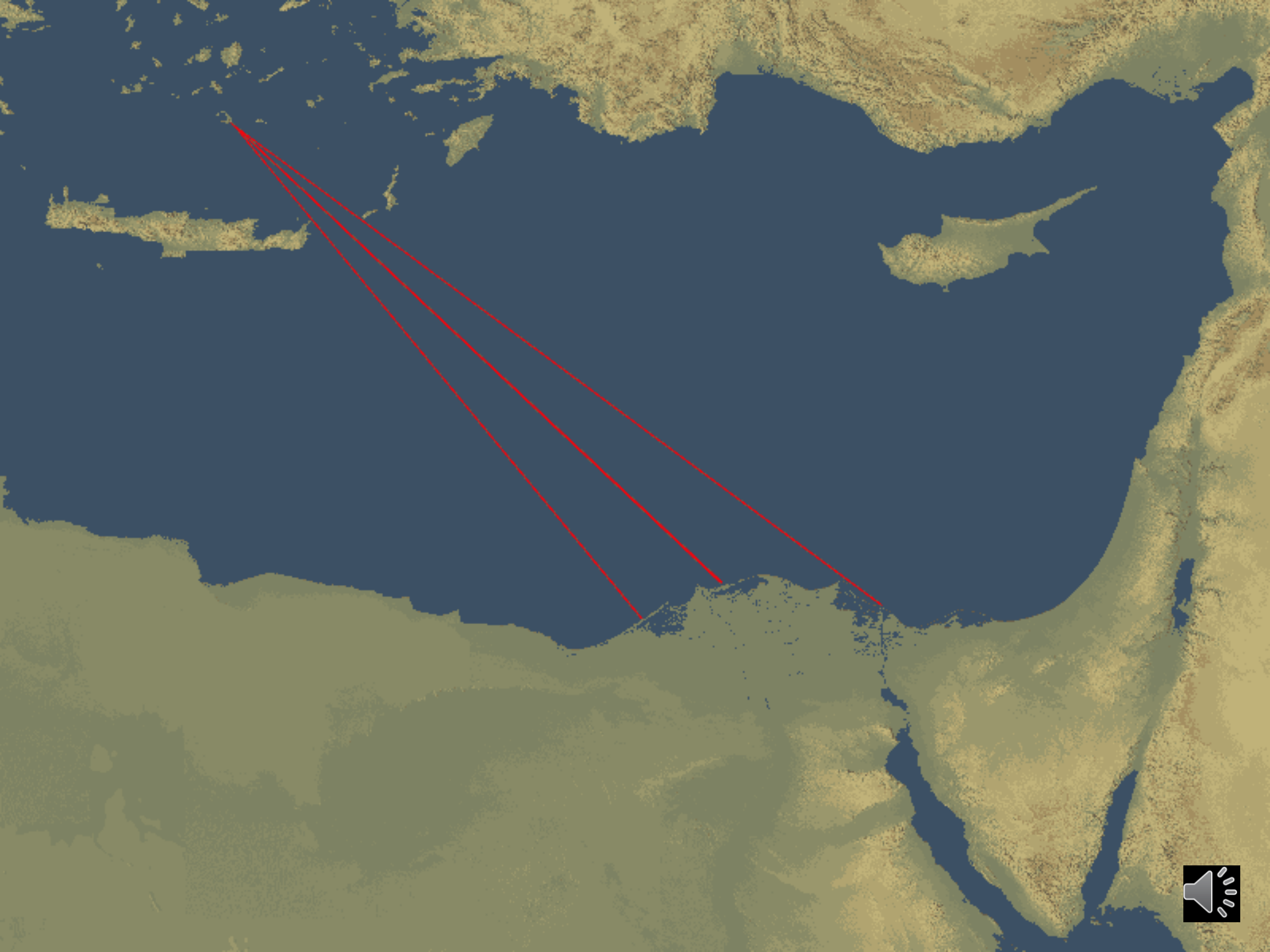


Ahmose I



Avaris (Egypt)





Alalakh

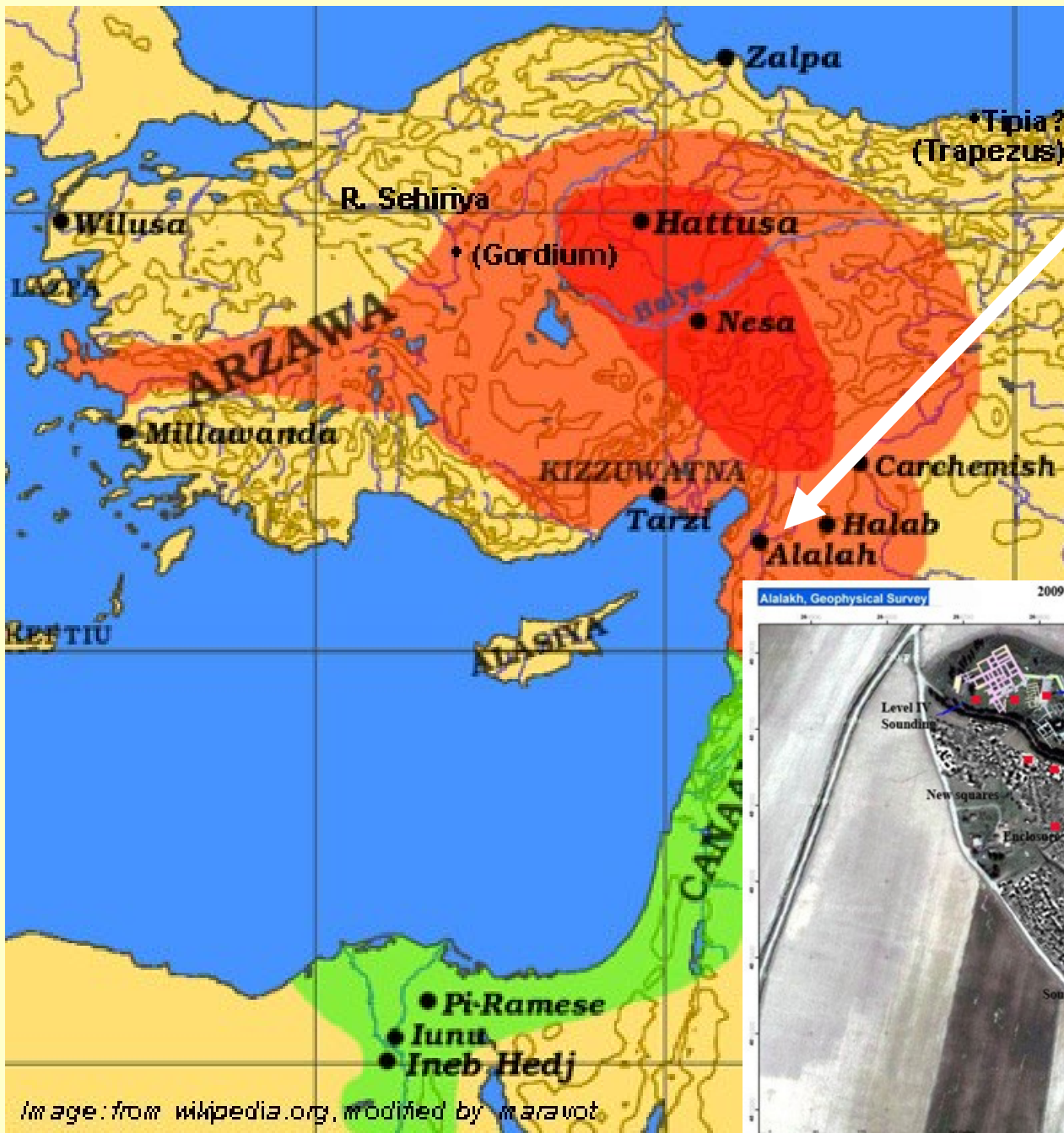
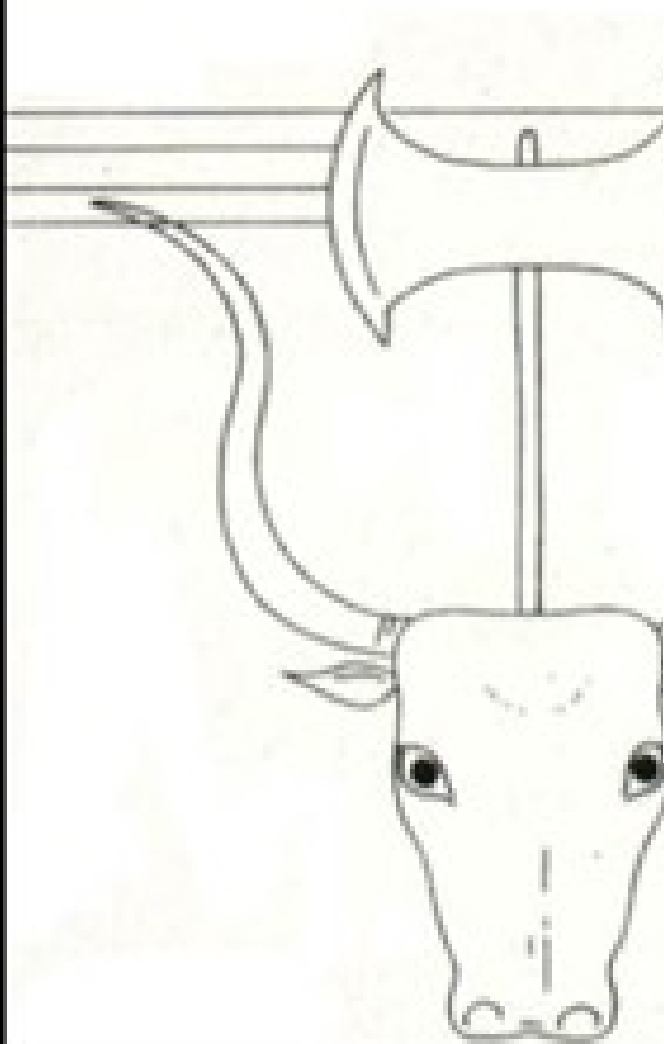
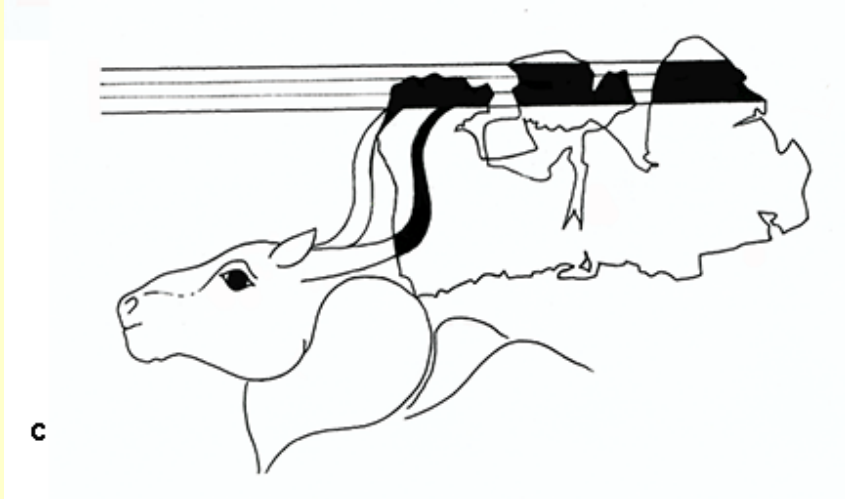
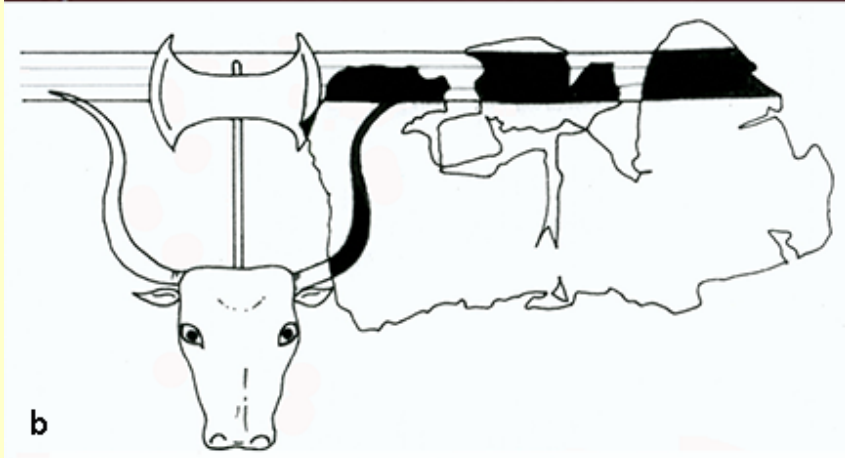


Image: from wikipedia.org, modified by maravot



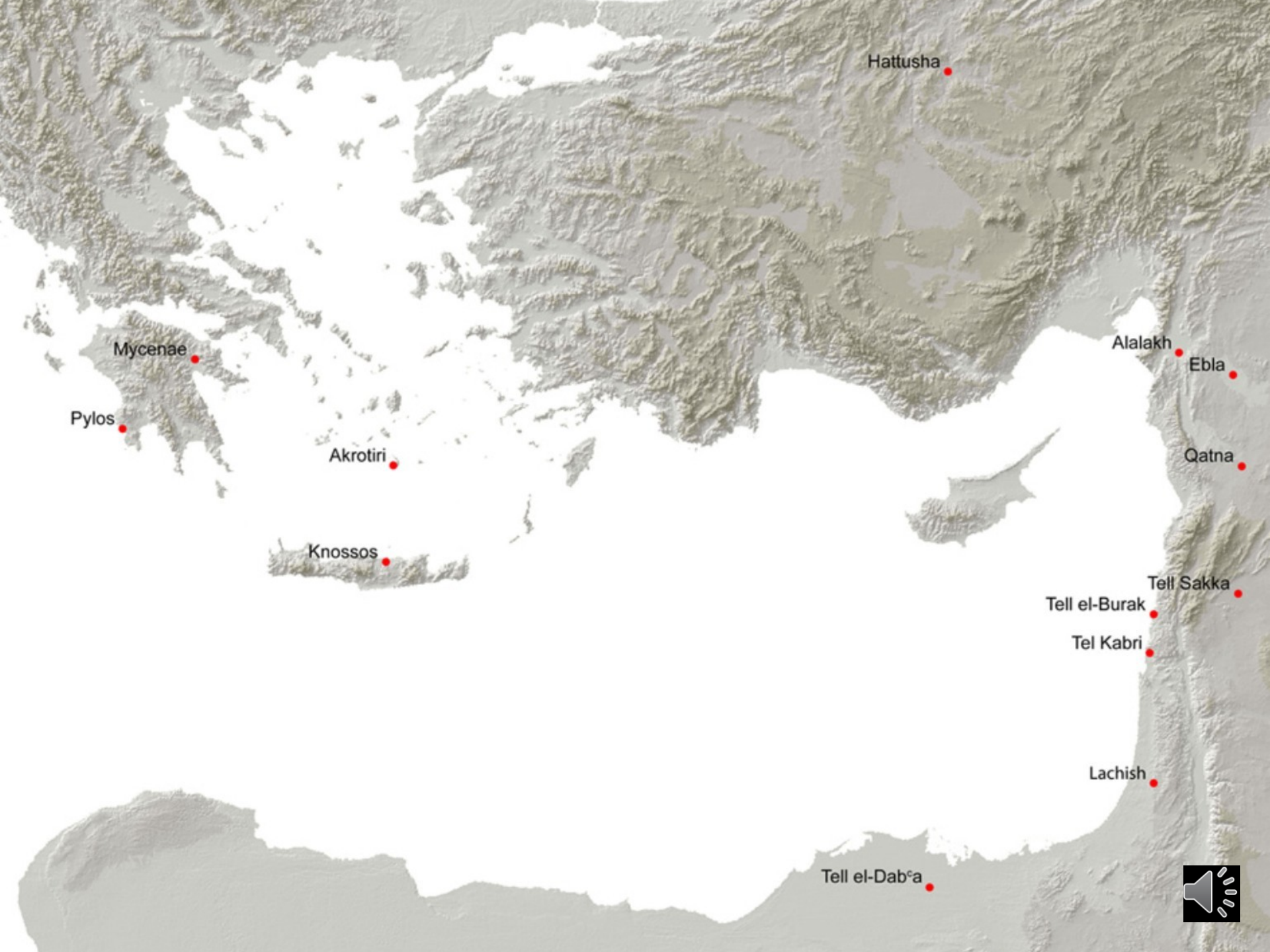
Reconstruction of the Alalakh Level VII wall paintings (after Niemeier and Niemeier 1998)





Quatna





Hattusha

Mycenae

Pylos

Akrotiri

Knossos

Alalakh

Ebla

Qatna

Tell Sakka

Tell el-Burak

Tel Kabri

Lachish

Tell el-Dab'a





Khayan cartouche



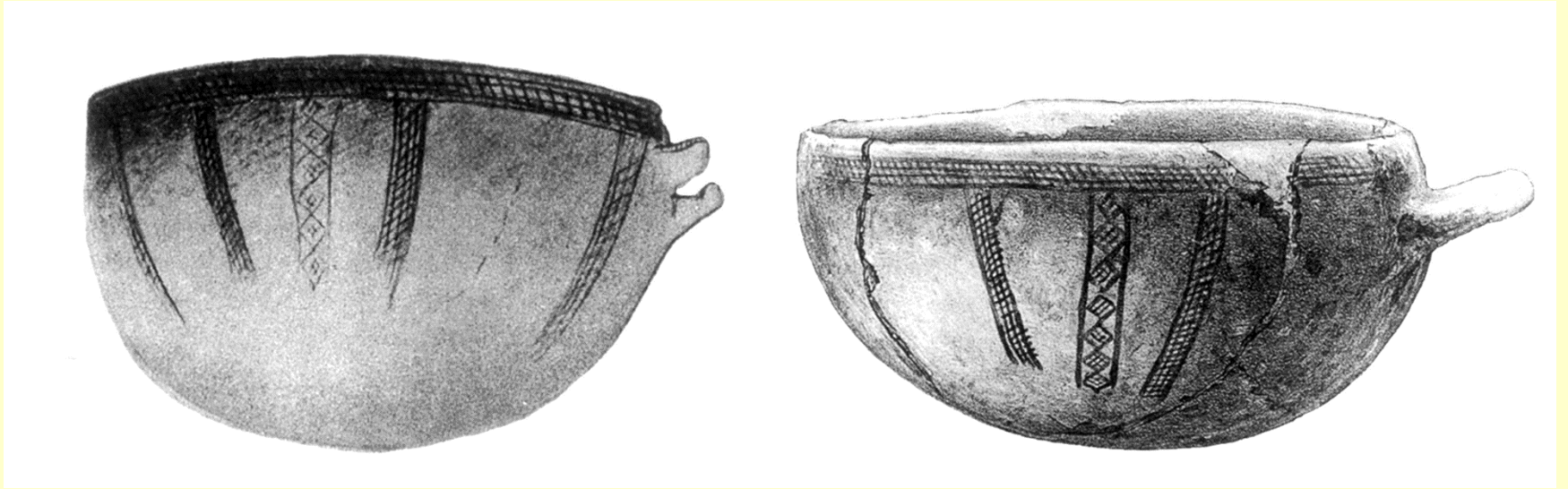
Abydos



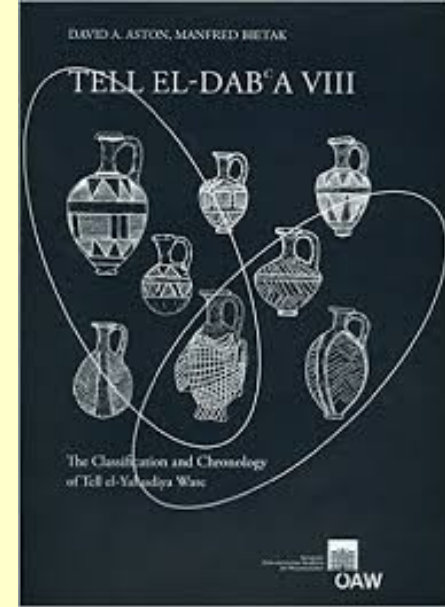
Pacheia Ammos




Cypriot White Slip Ware



Tell el-Yahudiya Ware





Ahmose's reign can be fairly accurately dated using the Heliacal rise of Sirius in his successor's reign, but because of disputes over from where the observation was made, he has been assigned a reign from **1570-1546**, **1560-1537** and **1551-1527** by various sources. Manetho gives Ahmose a reign of 25 years and 4 months; this figure is supported by a 'Year 22' inscription from his reign at the stone quarries of Tura. A medical examination of his mummy indicates that he died when he was about thirty-five, supporting a 25-year reign if he came to the throne at the age of 10. The radiocarbon date range for the start of his reign is **1570-1544 B.C.E.** 

Natural sciences

- Radiocarbon
- Dendrochronology
- Glaciology (Ice core dating)



Radiocarbon

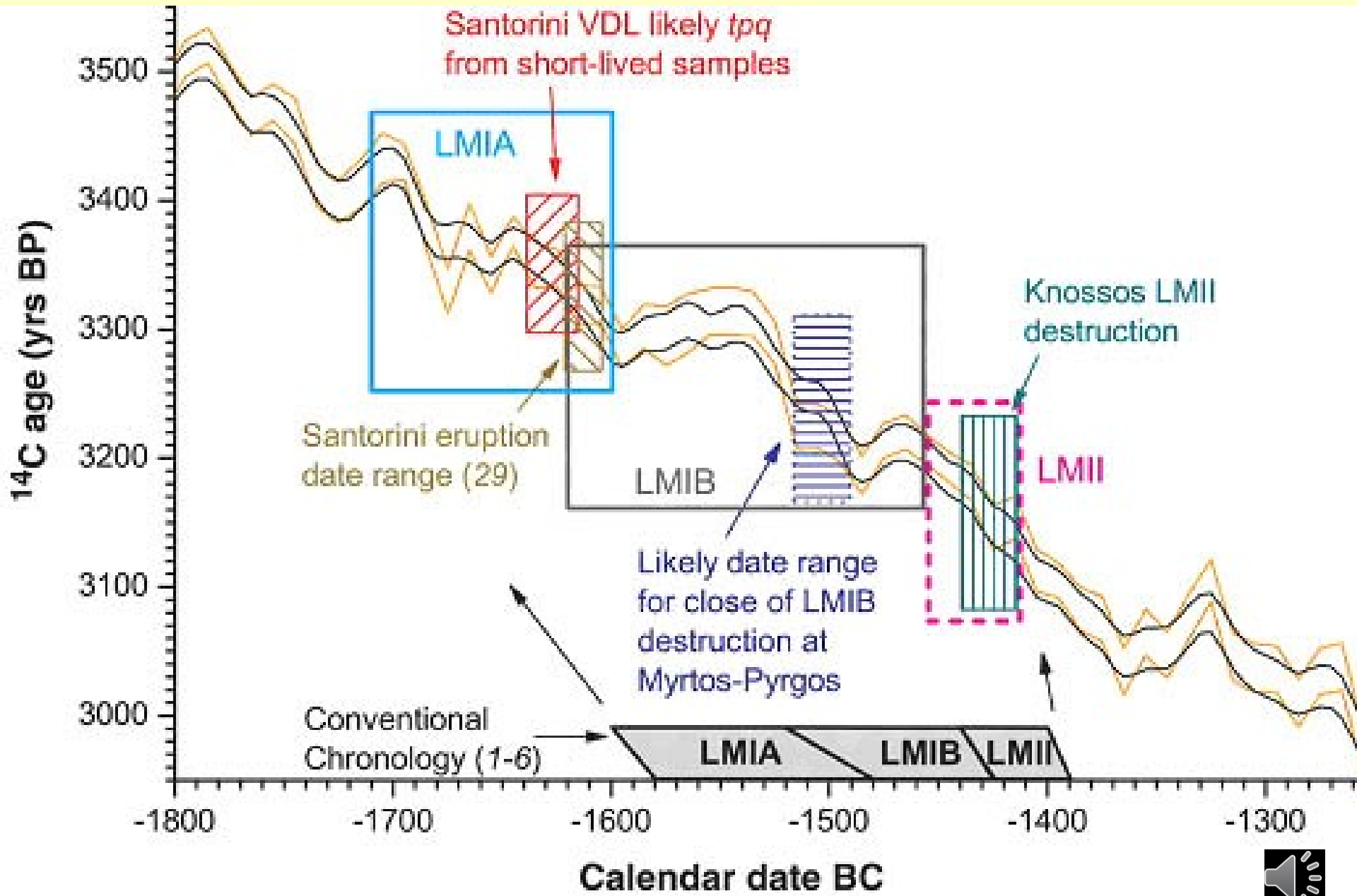
- Already the first dating placed the event into the frame of 17th C BC
- There are about 30.000 data from entire region available



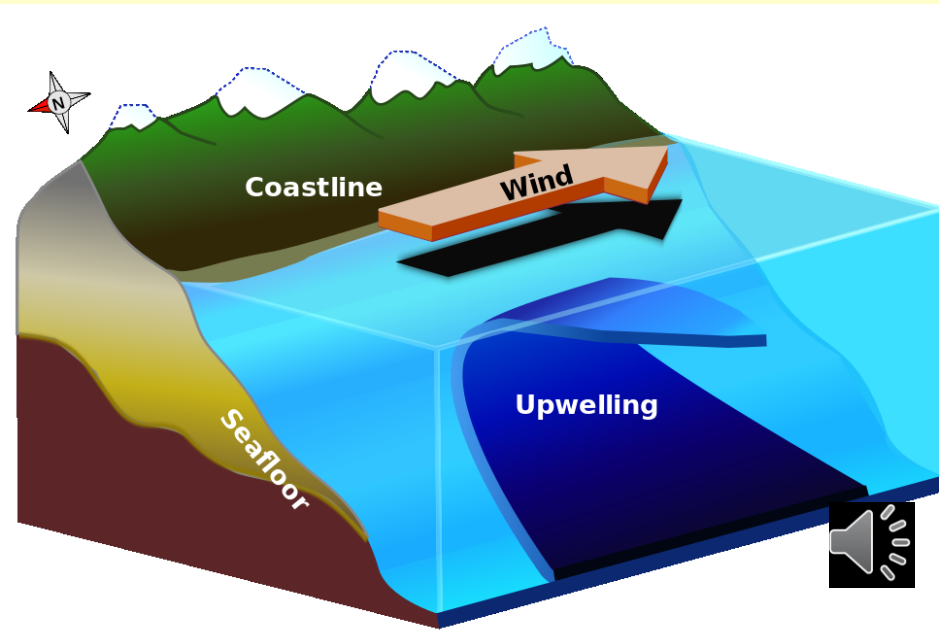
Olive branch burnt during the BA eruption

Radiocarbon and dendrochronology: 1628 B.C.





- Calibration
- Dendrochronology
- Statistics
- ^{14}C - sufficient CO_2
- Volcanic vents and upwelling effect
- Variability of cosmic radiation



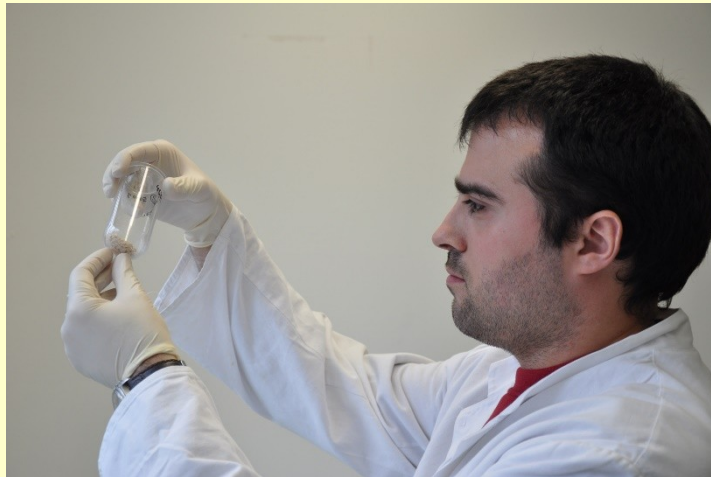
Will we ever obtain the correct answer?

Is radiocarbon method serious or not?

New project: Leibnitz Laboratory (Kiel) & MU Brno

Financial support: INSTAP

- **The goal of the project was to test the probability of systemic mistake caused by so called “old” or “volcanic” CO₂.**



Dr. Ricardo Fernandes



$\delta^{12}\text{C} - ^{13}\text{C} - ^{14}\text{C}$ in annual plants

- Santorini
- Crete
- Germany

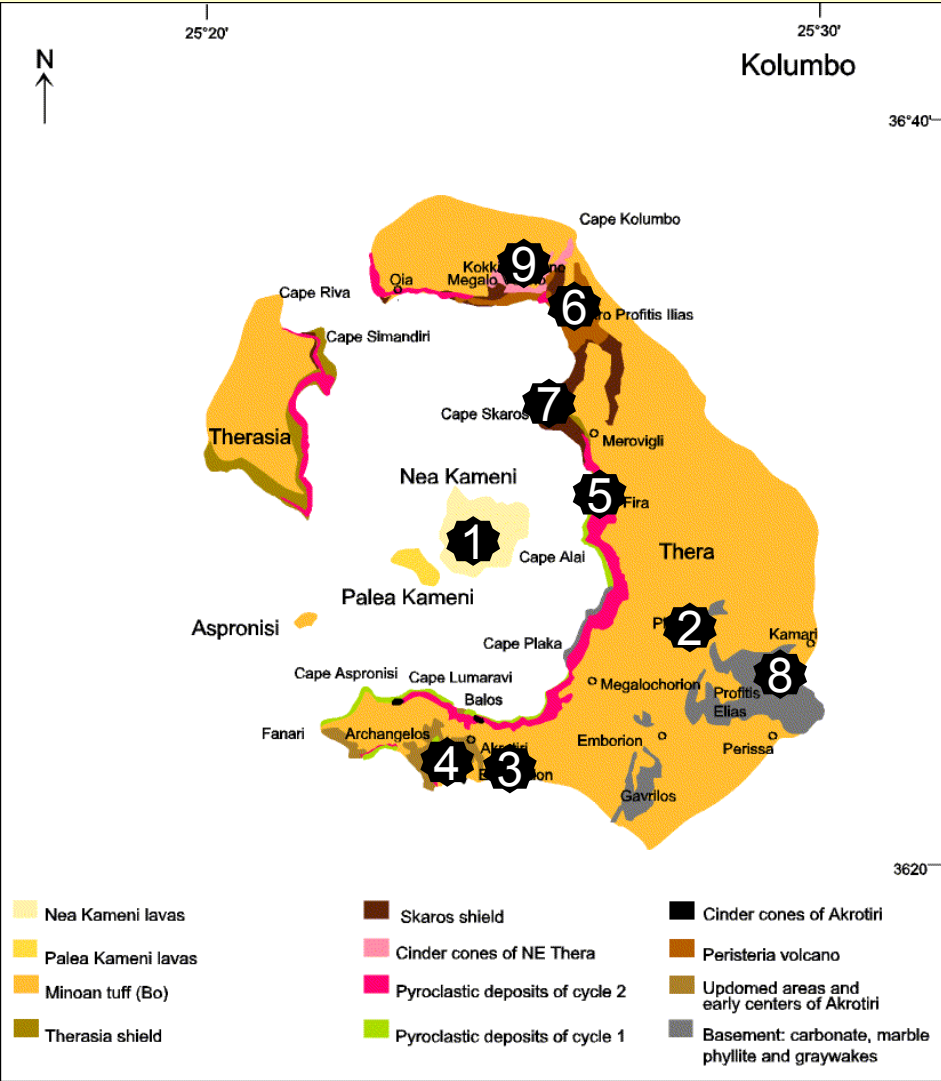


Spring and summer 2014

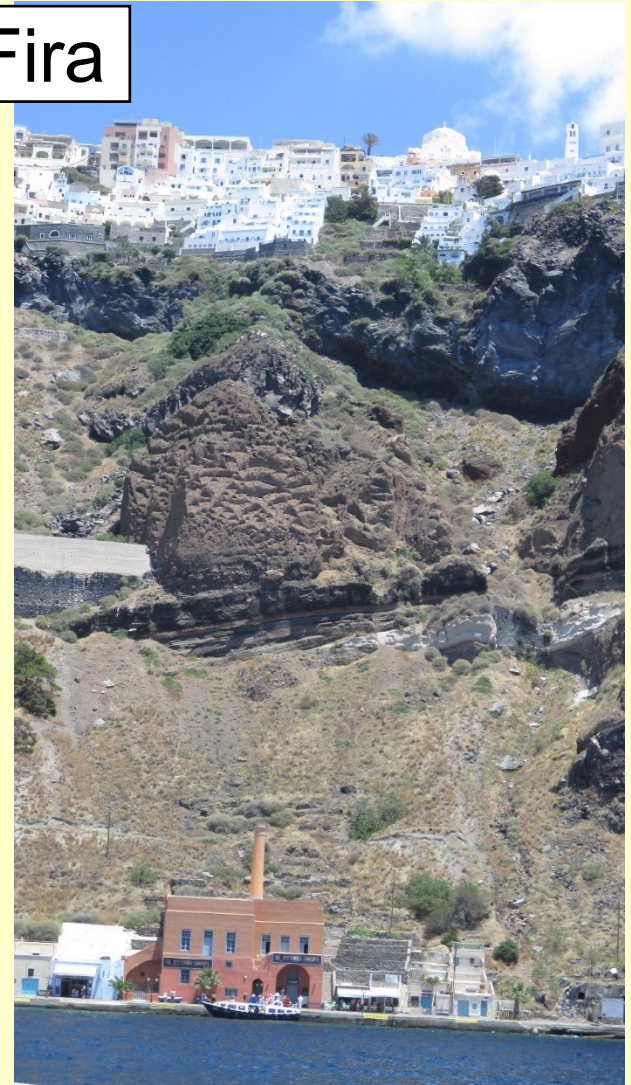
The primary goal of the mission was to collect samples of annual plants growing

1. On the islands of Santorini and Nea Kameni. On Nea Kameni, the aim was to obtain samples growing at different distances from the volcano, while on the main island it was intended to obtain samples of plants growing on different geological volcanic structures
2. On Crete in order to obtain samples from same region and similar geological circumstances
3. In Germany in order to obtain a reference





5 Fira



1 Nea Kameni



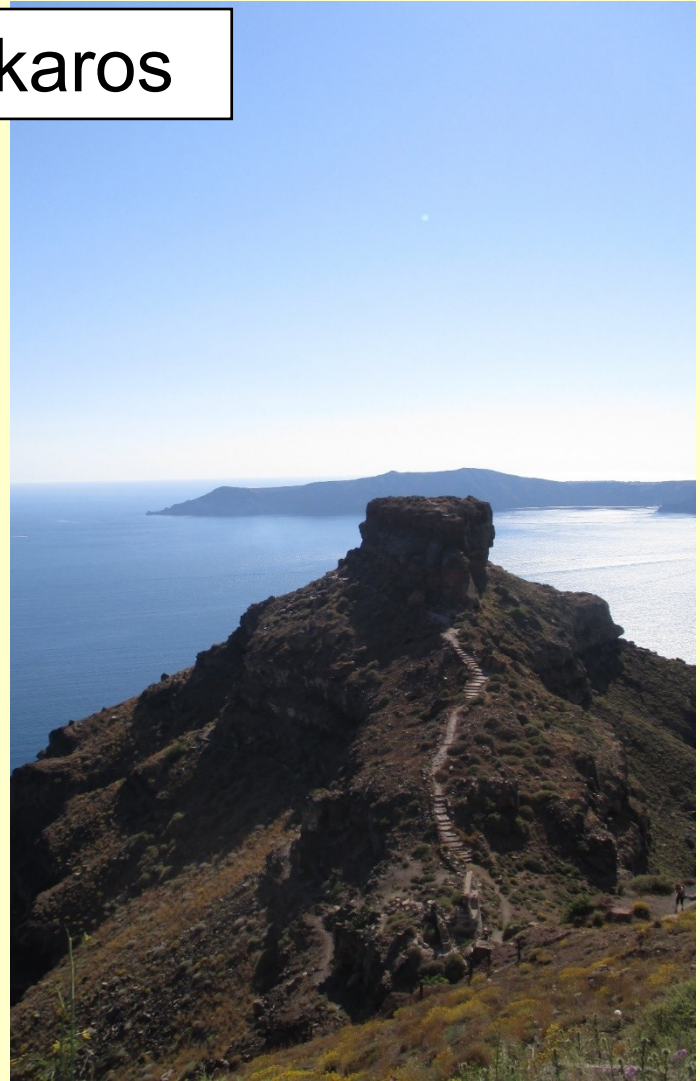
2 Pyrgos



3 Akrotiri



7 Skaros



4 Red beach



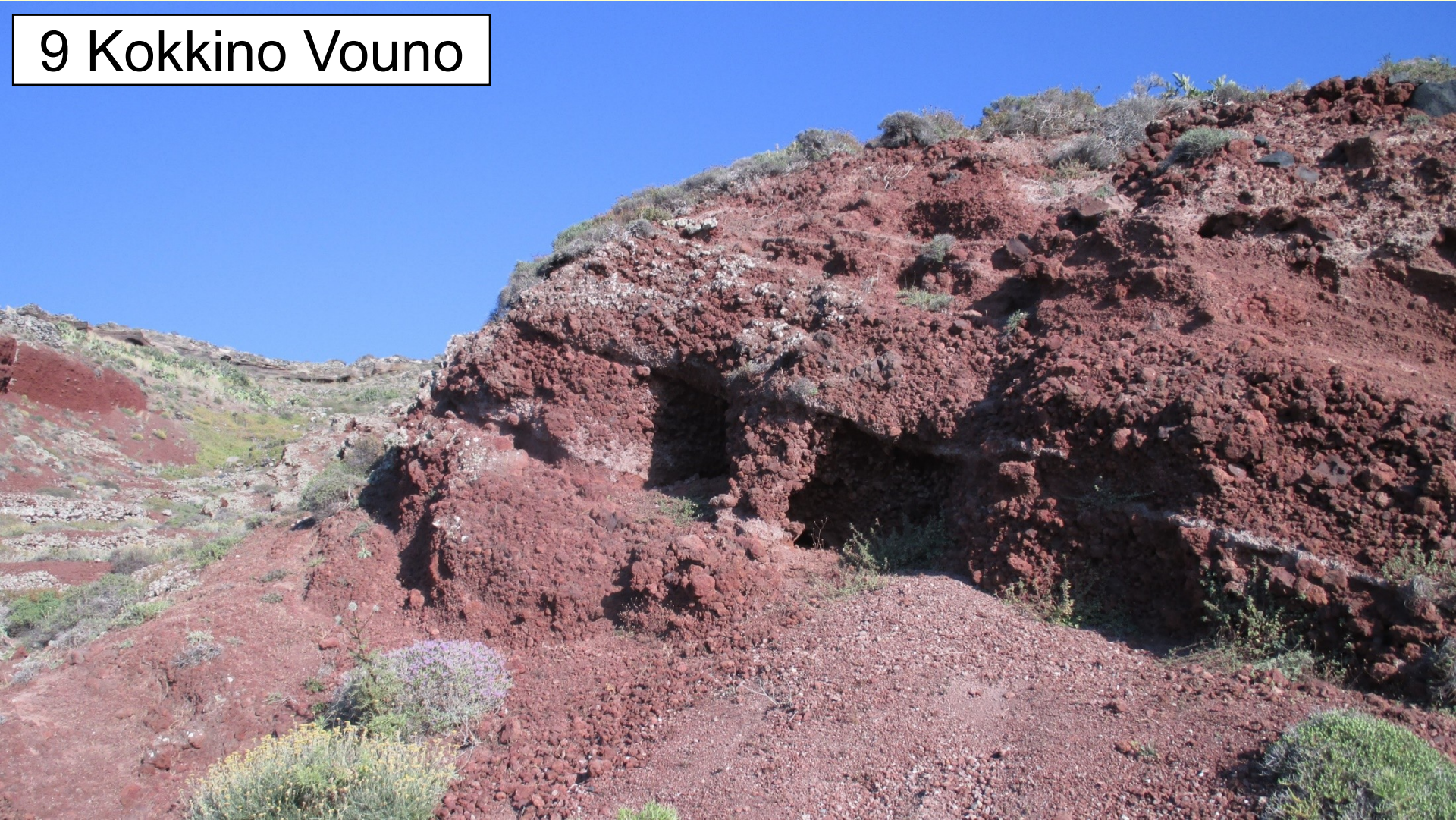
6 Mikros Profitis Ilias

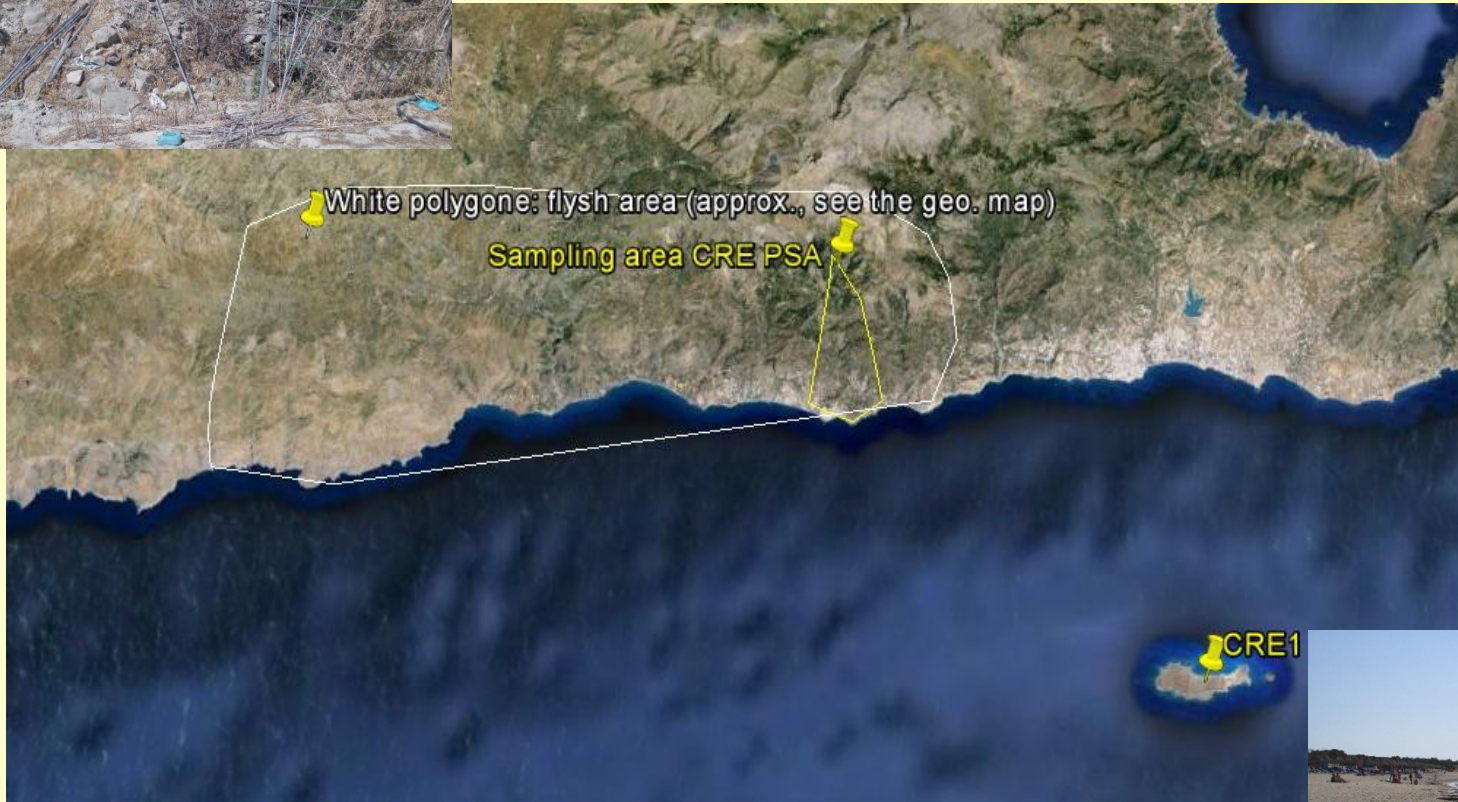


8 Kamari



9 Kokkino Vouno







Rhumspringe

Altheim Blaubeuren



Sampling methodology

- Only plants, or parts thereof, which had first grown during the spring 2014, were collected. Efforts were made to collect samples of different species from each location, but some species (like wild rosemary, grape leaves, grass, thyme) were collected across the range of locations in order to



Lab No	Site	SampleID	d13C	F	F1sRME	RoundedAge	RoundedAge1s
GU38031	Chryssi island	CRE1001	-27	1,032	0,0037	-254	29
GU38032	Chryssi island	CRE1002	-27	0,958	0,0035	346	29
GU38033	Psari Forada - Kato Symi (Crete)	CRE PSA 0002	-27	1,02	0,0034	-156	27
GU38034	Psari Forada - Kato Symi (Crete)	CRE PSA 0003	-12	1,031	0,0037	-243	29
GU38035	Nea Kameni	SAN1001	-29	1,026	0,0037	-206	29
GU38036	Nea Kameni	SAN1005	-13	1,026	0,0037	-204	29
GU38037	Nea Kameni	SAN1006	-30	1,031	0,0037	-244	29
GU38038	Nea Kameni	SAN1007	-25	0,819	0,0029	1604	29
GU38039	Nea Kameni	SAN1010	-28	1,026	0,0037	-203	29
GU38040	Pyrgos (Santorini)	SAN2002	-29	1,029	0,0037	-229	29
GU38041	Pyrgos (Santorini)	SAN2003	-15	1,025	0,0037	-197	29
GU38042	Akrotiri (Santorini)	SAN3001	-28	1,027	0,0034	-216	27
GU38043	Akrotiri (Santorini)	SAN3002	-26	1,032	0,0037	-251	29
GU38044	Red beach (Santorini)	SAN4001	-28	1,026	0,0037	-209	29
GU38045	Red beach (Santorini)	SAN4002	-29	1,024	0,0037	-192	29
GU38046	Caldera above the old port (Santorini)	SAN5002	-14	1,023	0,0037	-183	29
GU38047	Mikro (Vouno, Santorini)	SAN6001	-29	1,03	0,0037	-234	29
GU38048	Mikro (Vouno, Santorini)	SAN6003	-27	1,031	0,0037	-241	29
GU38049	Skaros (Santorini)	SAN7004	-28	1,032	0,0037	-256	29
GU38050	Skaros (Santorini)	SAN7006	-27	1,028	0,0037	-225	29
GU38051	Kamari (Santorini)	SAN8001	-27	1,037	0,0034	-293	27
GU38052	Kamari (Santorini)	SAN8002	-29	1,035	0,0037	-273	29
GU38053	Kamari (Santorini)	SAN8003	-28	1,029	0,0037	-230	29
GU38054	Oia - red slope (Santorini)	SAN9002	-30	1,027	0,0037	-214	29
GU38055	Altheim (Germany)	A1	-29	1,031	0,0034	-246	26
GU38056	Altheim (Germany)	A2	-29	1,029	0,0037	-229	29
GU38057	Altheim (Germany)	A5	-28	1,022	0,0034	-177	27
GU38058	Blaubeuren (Germany)	B5	-30	1,016	0,0034	-129	27
GU38059	Blaubeuren (Germany)	B6	-31	1,024	0,0037	-190	29
GU38060	Blaubeuren (Germany)	B8	-31	1,027	0,0037	-217	29
GU38061	Rhumspringe/Harz (Germany)	R01	-32	1,024	0,0034	-192	27
GU38062	Rhumspringe/Harz (Germany)	R03	-31	1,031	0,0037	-247	29
GU38063	Rhumspringe/Harz (Germany)	R04	-31	1,029	0,0032	-226	27





- Different values:

- SAN1007 sample collected directly in the crater, ergo right by the source of the ^{14}C -sufficient carbon
- CRE1002 Laboratory mistake?





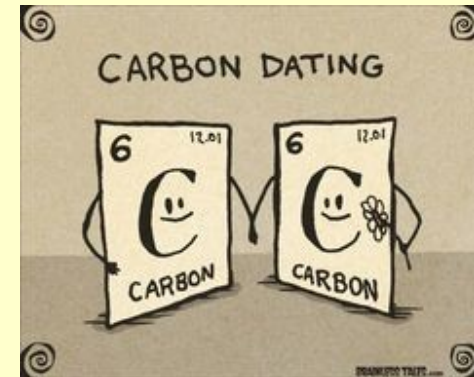
Is it valid for the past?

- Difficult to answer...
- Current study
- They could be more vents across the island
- However, we can assume that the samples collected in Akrotiri up to now were not contaminated by ^{14}C -sufficient CO_2
- “high” dates from all other tested regions



14C - Conclusions

- The method is reliable also for mid 2nd millennium BC
- Probability of high chronology increased significantly



Dendrochronologie



➤ Growth anomalies

1644 \pm 20 BC.

➤ Long-lived sequoias

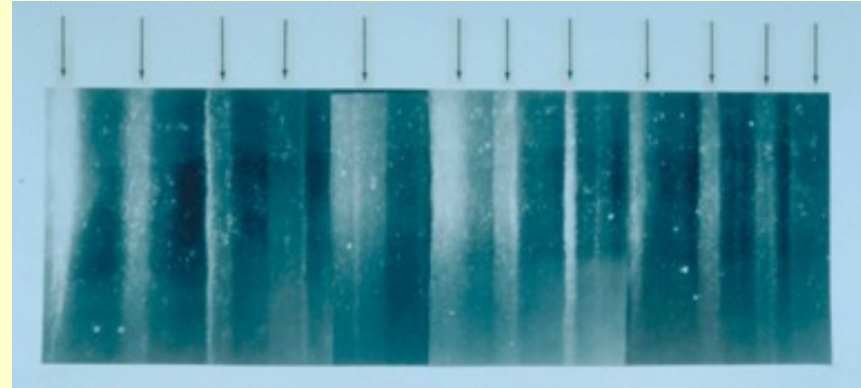


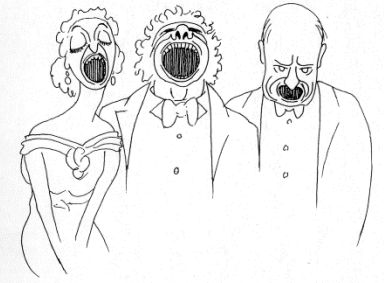
Problem with olive wood



Ice core dating

- Specifics of Ice layers in Grenland glaciers
- Layers containing sulfuric acids and other sulfuric compounds
- GIPS2, GRIP a NORTH GRIP: 1623 ± 36 BC
- Dye3: 1645 ± 7 BC.





High or Low Chronology?

LM IA (LH IA)	13 th Dynasty - SIP
LM IB (LH II)	Late of SIP and early 18 th dynasty
LM II – IIIA:1	Tuthmose III
Late LM IIIA:1	– Amenophes III

MM III	13 th Dynasty - SIP
LM IA (LH I)	Late of SIP and early 18 th dynasty
LM IB – LM II (LH IIA – B)	Tuthmose III
LM IIIA: 1	Amenophes III



- **Bietak, M. 1995:**
Connections between Egypt and the Minoan World. New results from Tell el-Dab'a/Avaris. in Davies, W. V. Schofield, L. (eds.), 19 – 28.

- **Manning, S. W. Ramsey, Ch. B. Doumas, Ch. Marketou, T. Cadogan, G. Pearson, Ch. 2002:**
New Evidence for an early date for the Aegean late Bronze Age and Thera eruption, *Antiquity* 76, 733 – 744.

LM IA	15 th and Early 18 th Dyn.
LM IB	18 th Dynasty (Thutmoside)

SIP
Early 18 th Dynasty



How to deal with differences between the results of natural sciences and archaeological methods?

- When did the event occurred?
 - SIP or 18th Dynasty
 - 1650 or 1530
 - Where is problem and who is wrong?



Why is the absolute date of the Santorini volcano eruption so important?

- Synchronism of historical development of the Mediterranean and Near Eastern regions

- Fixing of the Central European BA chronology.

- Possibility to ask the causal



We don't change our mind, you
should change yours!

- ✓ Typology
- ✓ Stratigraphy
- ✓ Inaccuracy of Egyptian
chronology
- ✓ Historical interpretation



Summary

- Differences between archaeological data and hard sciences are still actual
- High chronology shows higher probability (as mathematical, as historical)

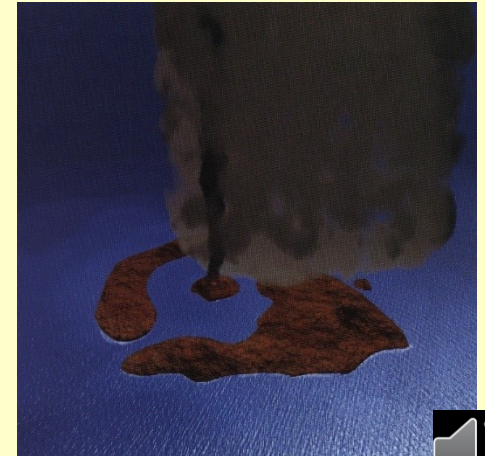


Central Europe?



Methodology

- Impact of Santorini volcano eruption in the Aegean and the entire Eastern Mediterranean
- Could that event impact Central European Regions? If yes how?
- Relevancy of such questions
- Applicable methodology
- Chronology
- Environment
- Cultural changes



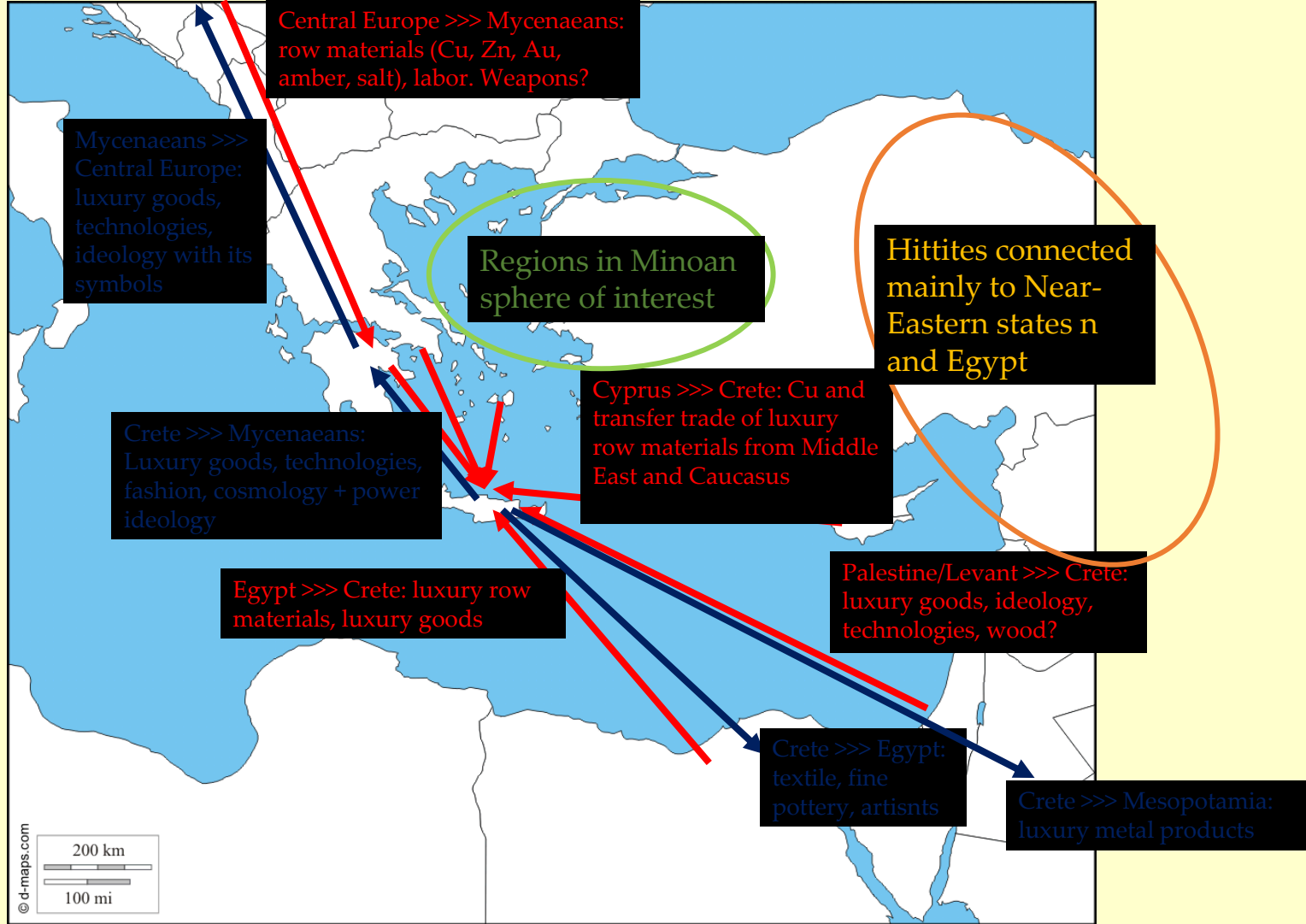
Chronoogy		CRETE	GREECE	EGYPT	CYPRUS	Near East	Europe Reinecke	Europe Conventional		
HIGH	LOW									
1700	1800	MM IB	MH II	SIP	MC II	MB I	BA3	EBA		
		MM II					MB I - II	BB1		
	1700	MM III	MH III		MC III	MB II				
		1600			LM IA			LH I	LC IA	
	1600	1500	LM IB		LH IIA	DYN XVIII	LC IB	LB I	BB2 (BC1)	
			1500		1400		LM II		LH IIB	
	1500	1400	LM IIIA1		LH IIIA		LC II	LB II	BD	LBA
			LM IIIA2		LH IIIB					
			1300		LM IIIB		LH IIIC			



Adoption/acceptance of elite's culture features

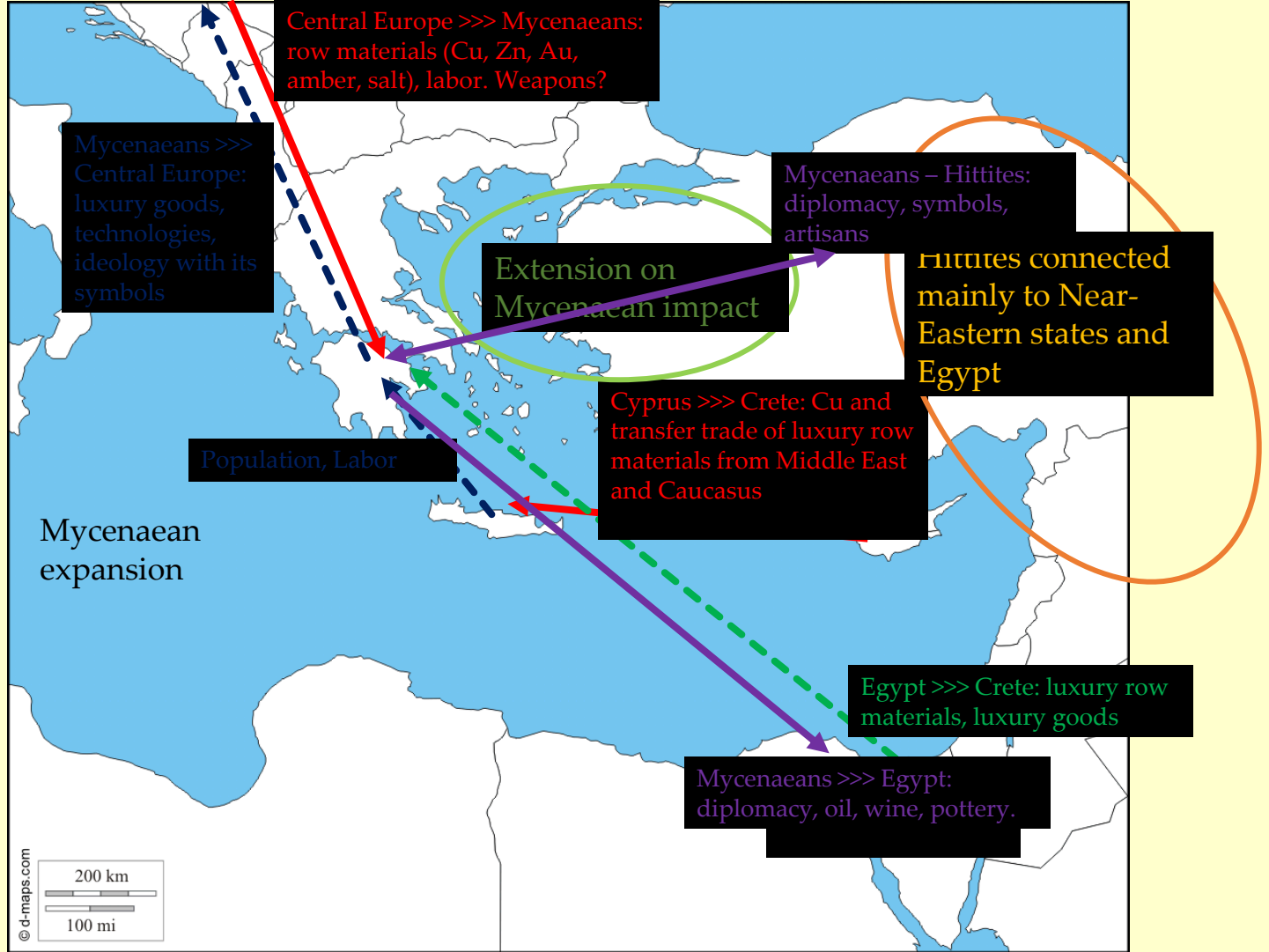
Elite culture	Crete (LM IA)	Mycenaeans (LH I)
Architecture	Palace, villa	Castle
Burial rituals	Unknown	Tholos tombs Cist tombs
Personal items produced in palaces	Seals	Copied
	Daggers	Imported from Crete
	Swords	Copied
	Jewelry	Imports, local copies
Pottery	Palatial pottery	Imports, local copies
Common pottery	Local regional	Local regional





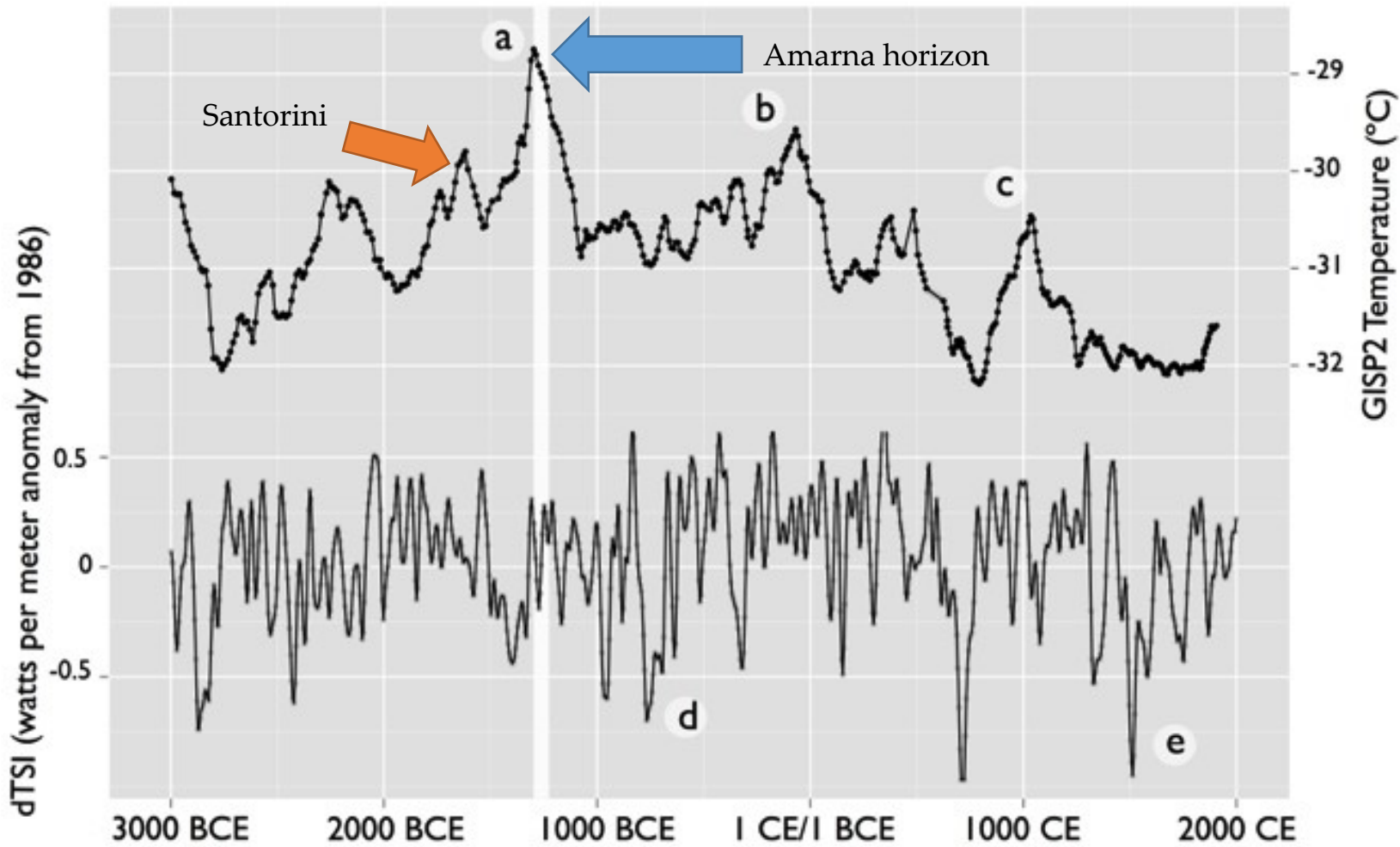
Map of contacts in the Pre-Santorini volcano eruption period.





Map of contacts in the Post-Santorini volcano eruption period.





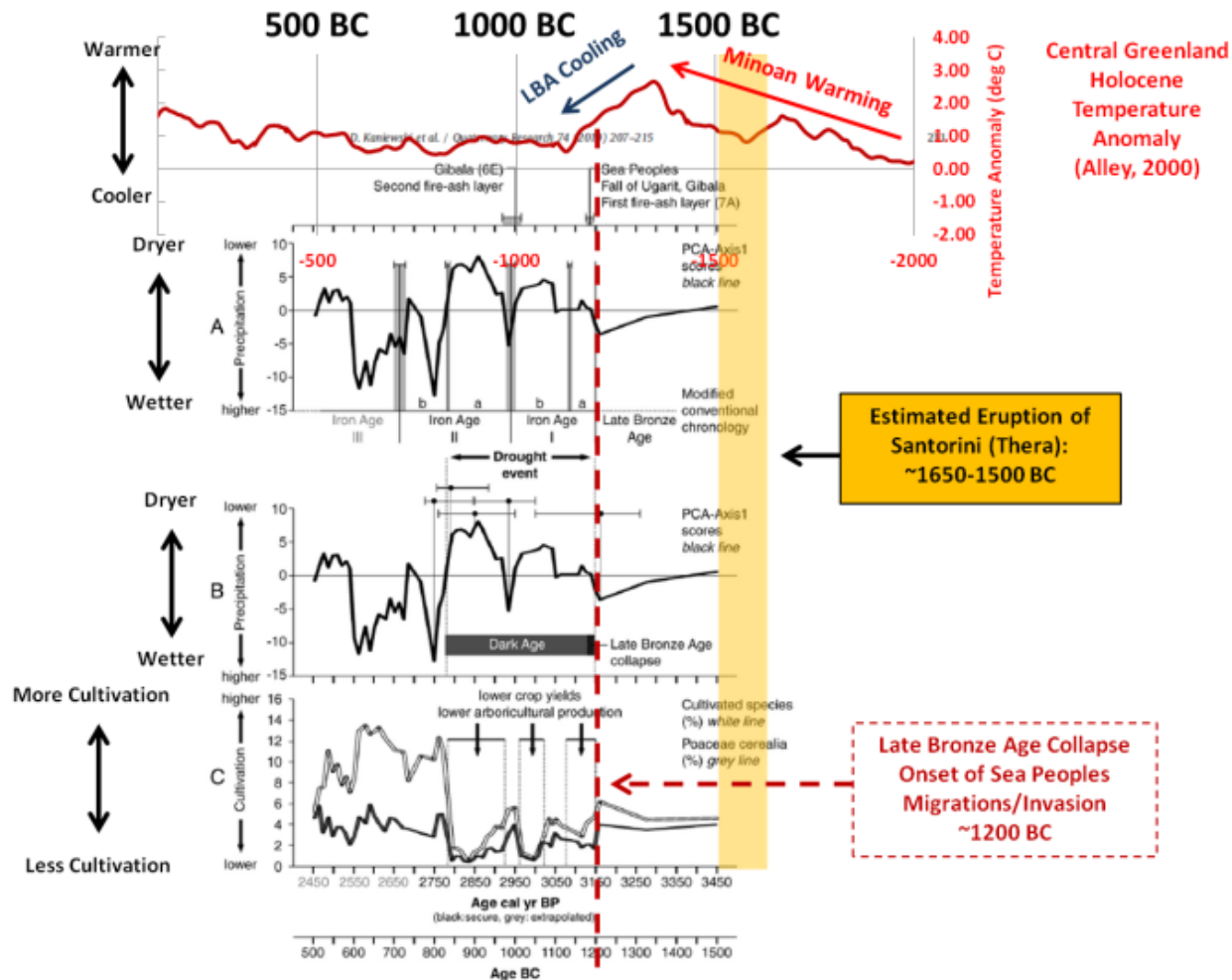
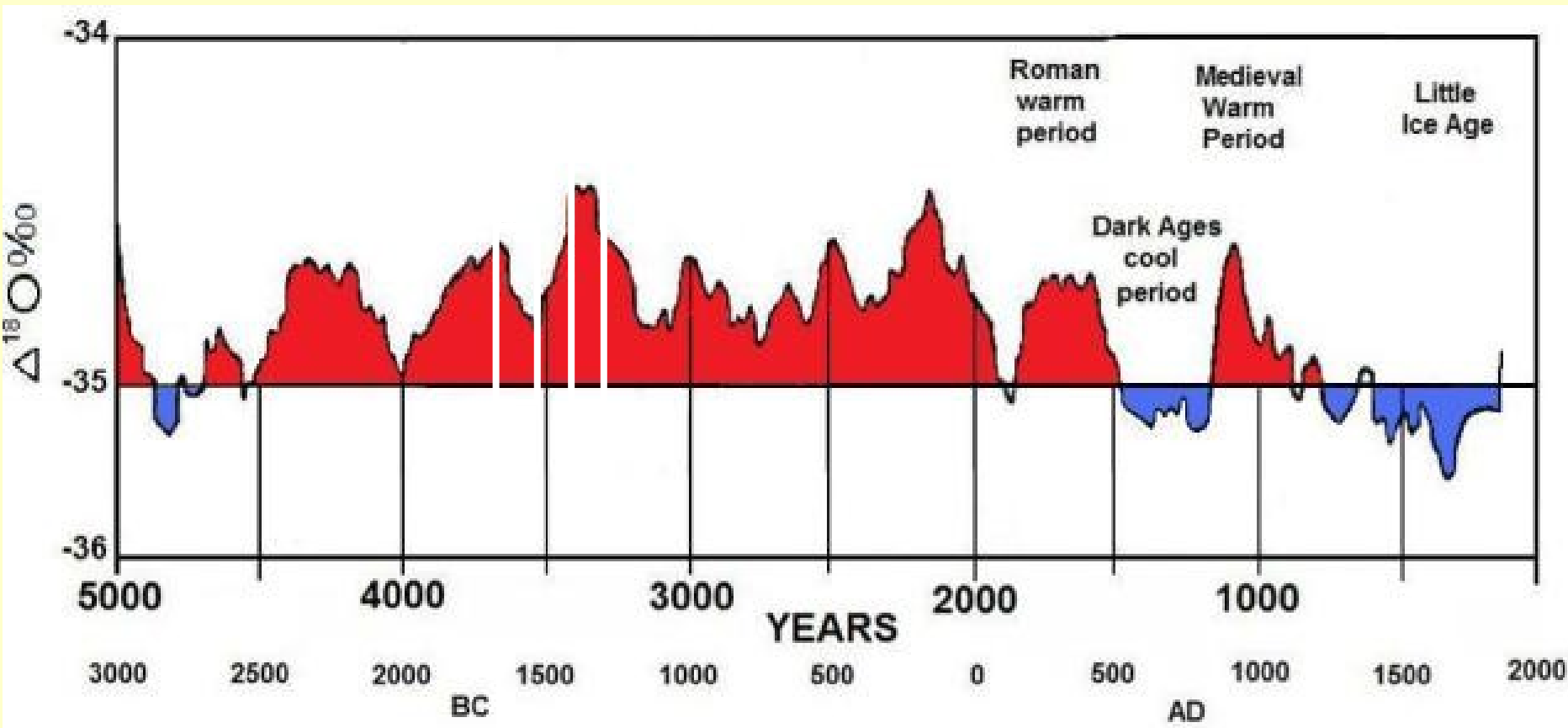


Figure 3 from D. Kaniewski et al. / Quaternary Research 74 (2010) 207–215. Late second–early first millennium BC abrupt climate changes in coastal Syria and their possible significance for the history of the Eastern Mediterranean





Chronology	Crete	Mycenaean mainland	Environment
1648 – 1613 BC (end of LM IA, LH I)	Santorini volcano eruption. Disruption of the process of state centralization. Economical short-term disaster, social. Power and environmental crisis started. Decline of the social complexity.	Nucleation of central forts/castles concluded. Trade with central European regions – raw materials, weapons, amber. From Crete: luxury goods – personal weapons, jewelry, seals, pottery, textile.	A few colder and wetter years.
1648 – 1613 – 1500 BC (LM IB, LH IIA)	Political crisis, decentralization, depopulation, destructions, local wars and battles. Impact of Mycenaean expansion.	Expansion of Mycenaean polities' external trade and political efforts. Increase of population. Turn of the main trade direction to the Hittite empire and to Egypt.	Gradual warming and raining decline.
1500 – 1420 (1400) LM II, LH II and LH IIB – LM (LH)IIIA early	Deep general crises in Crete. Depopulation, destruction of settlement structures and economy. Only one palace surviving (Knossos).	Expansion of Mycenaean power into its maximal frame. Impact to Knossos. Increase of the population continues.	Gradual warming and raining decline. In the end of the period: peak of drought and heat
1420/1400 – 1300 BC LM IIIA – B, LH IIIA - B	Knossos became one of the Mycenaean palaces. Other Cretan palatial sites were again settled but in much smaller and with restricted monumentality.	Top point of Mycenaean presentation in the Eastern Mediterranean confirmed by literary sources across entire region. Confirmed wars and conflicts with all kingdoms of the region.	Peak of drought and heat. Slow declination of the temperatures, more rains.
1300 – 1150 BC LM IIIB - C	Organized shift of Cretan settlements into the mountains. Building of refugees/ urban centers in the mountains. Destruction of Knossos.	Destruction and abandonment of almost all Mycenaean centers. Collapse of all state and social structures.	Cooling and damp.
Sea peoples			



Central Europe – a case study


Key areas:

- Chronology
- Spatio-temporal modeling
- Economy
 - Long distance trade
- Superstructure phenomena



Chronology


Reinecke's chronology	Bátora/Vladár 2015	Ožd'áni 2015	
BB1/BB2	Tumuli cultures	Klassische Hügelgräber	1200 calBC 1450 calBC
BB1	Koszider horizon Late Maďarovce	Althügelgräber	1500 calBC
BA3	Classical Maďarovce	(Vorhügelgräber)	1700 calBC
BA2	Early Maďarovce		1730 calBC

 Santorini eruption

How to define Reinecke's BB1?



Chronology

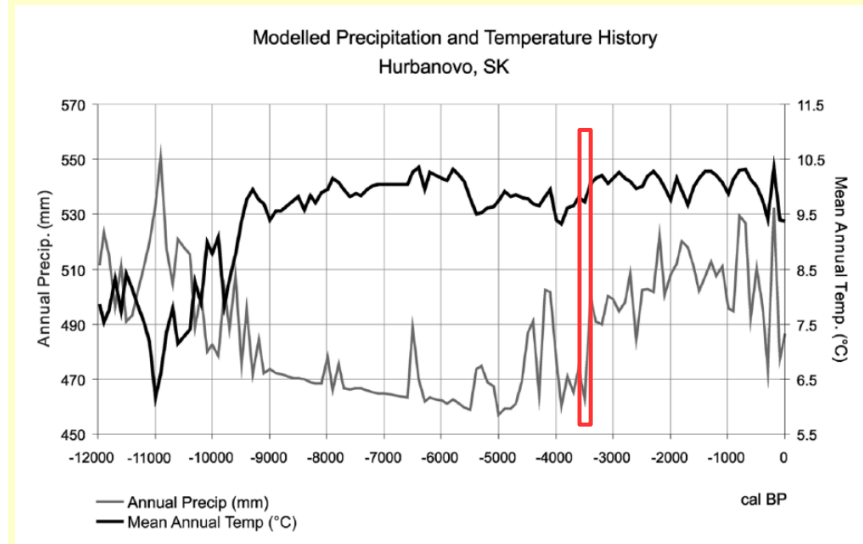
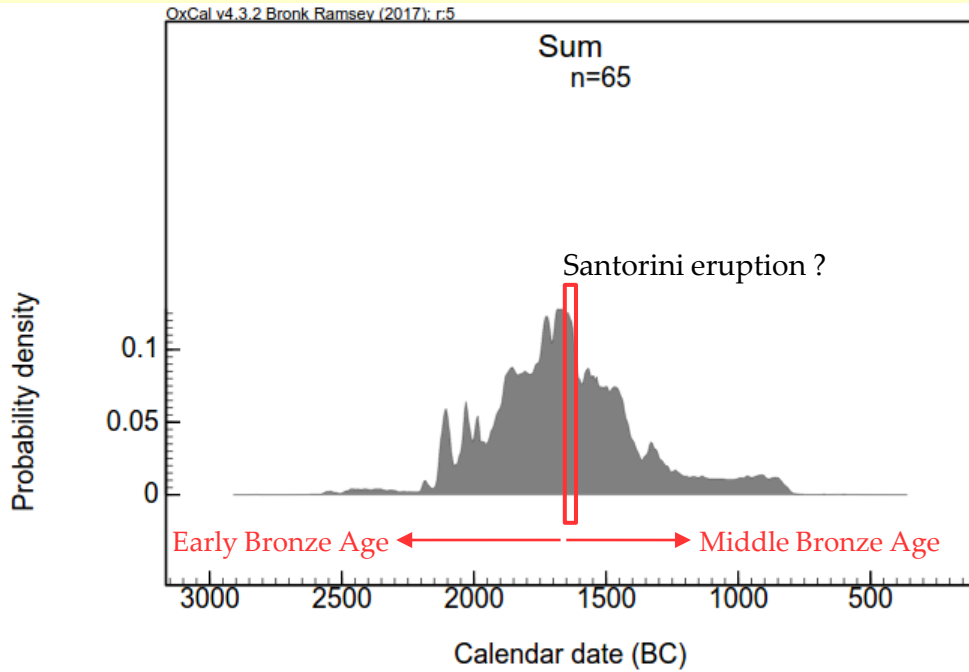
Santorini eruption 

ABS. DÁTA	REINECKE a pokračovatelia	SLOVNÉ OZNAČ.	HÄNSEL	FRANKFURTSKÁ ŠKOLA
-750/800	HB 3	NESKORÁ		MAUERN
	HB 2			KELHEIM III
	HB 1			KELHEIM II
-1000	HA 2	MLADÁ	SD II	LANGENG.
	HA 1			HART
-1200	BD			SD I
	BC(BC2) BB2(BC1)	STREDNÁ	MD III	ASENKOFEN
	BB 1			GÖGGENH.
-1800	BA 3			LOCHHAM
	BA 2	STARÁ	FD III	BÜHL
	BA 1			LANGQUAID
-2300				FD II

Furmánek 2015



Chronology

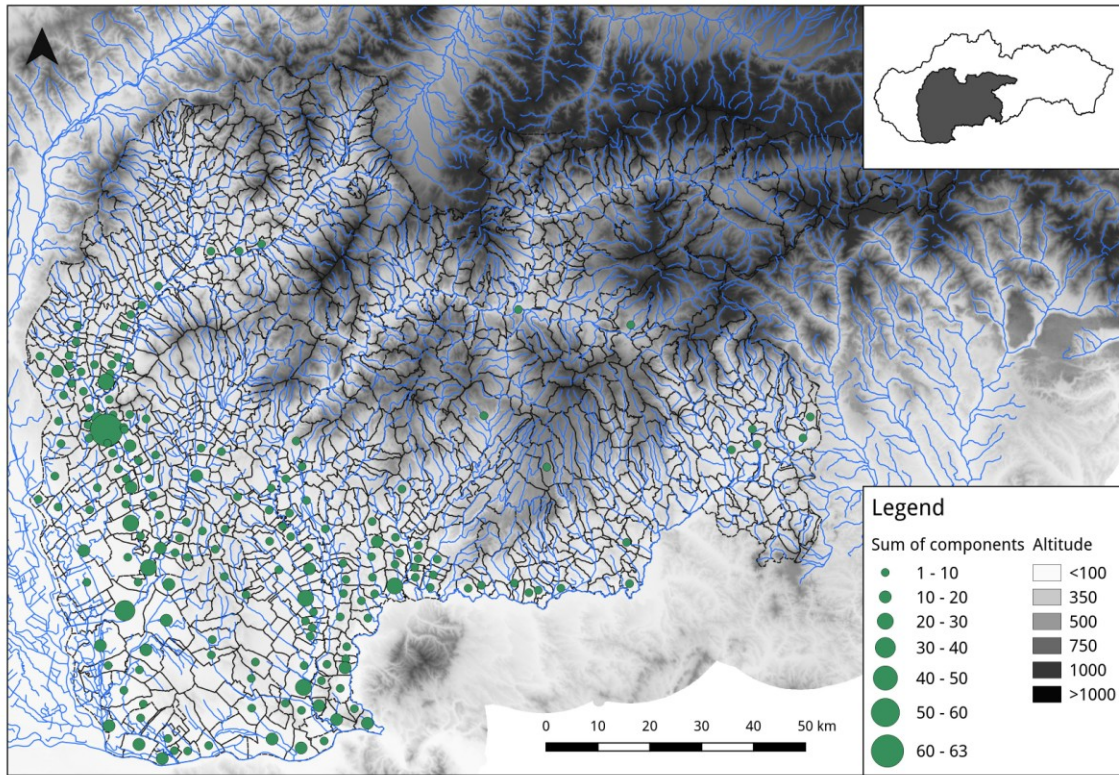


Jamrichová et al. 2014

¹⁴C data by Barta et al. 2013



Spatio-temporal modeling



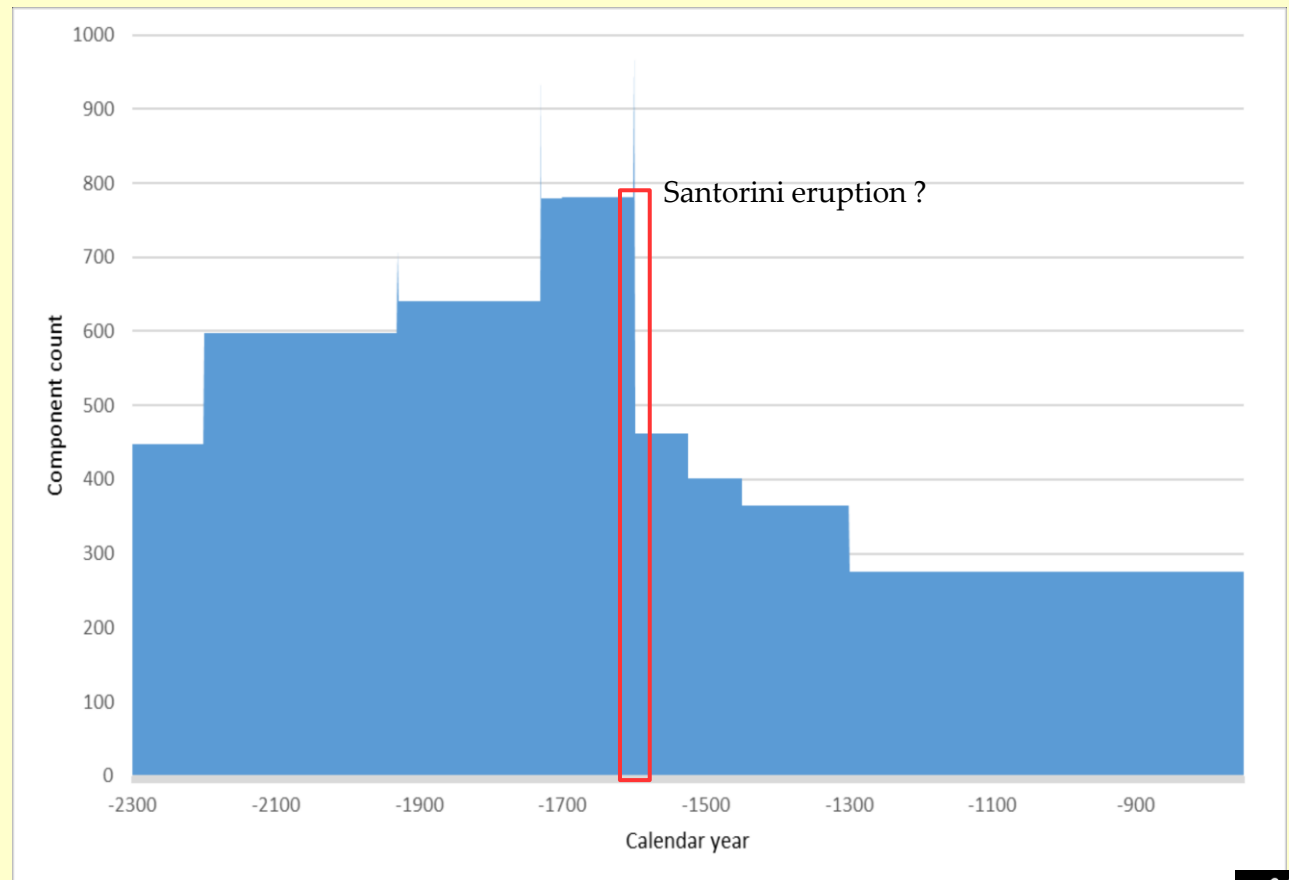
Methods

- Crema 2012
- Kolář et al. 2015

1084 parishes
1226 components



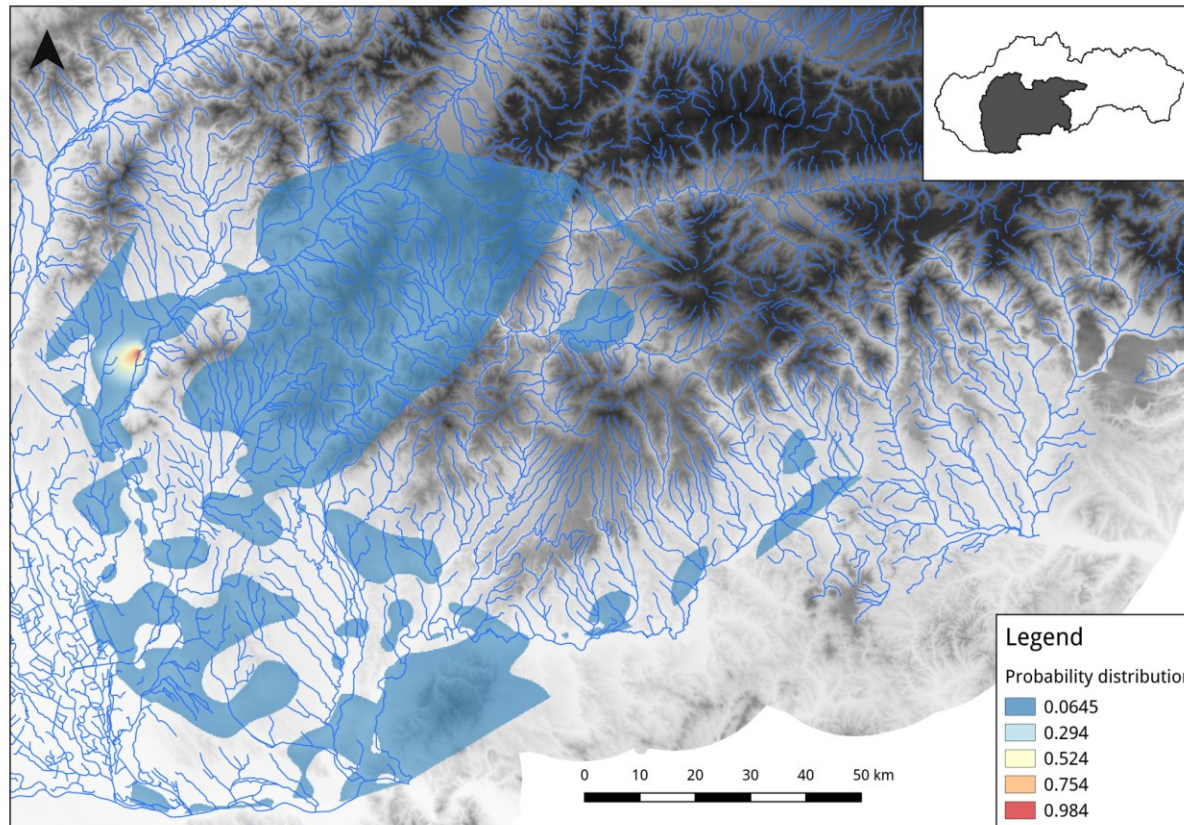
Spatio-temporal modeling



Sum of components potentially dated to each calendar year



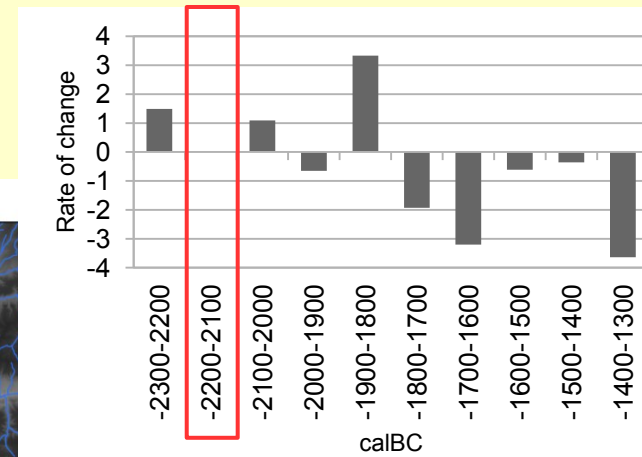
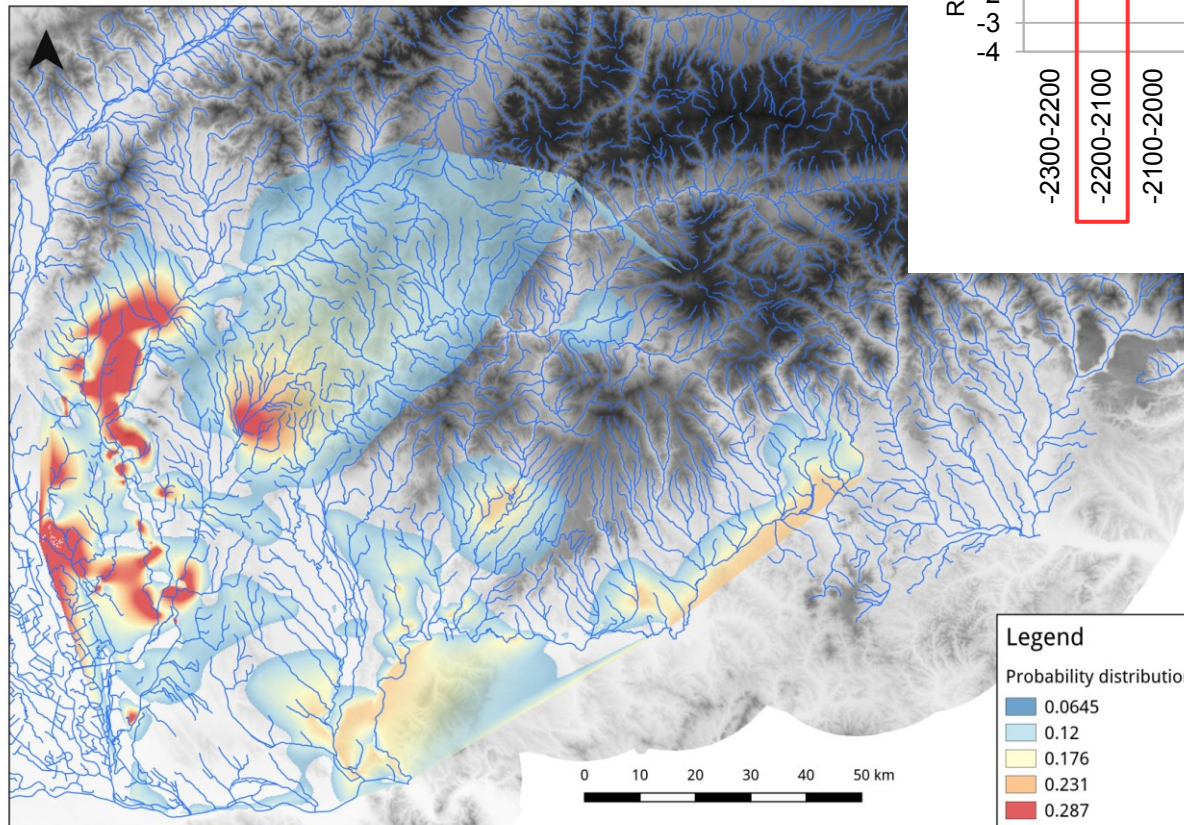
Spatio-temporal modeling



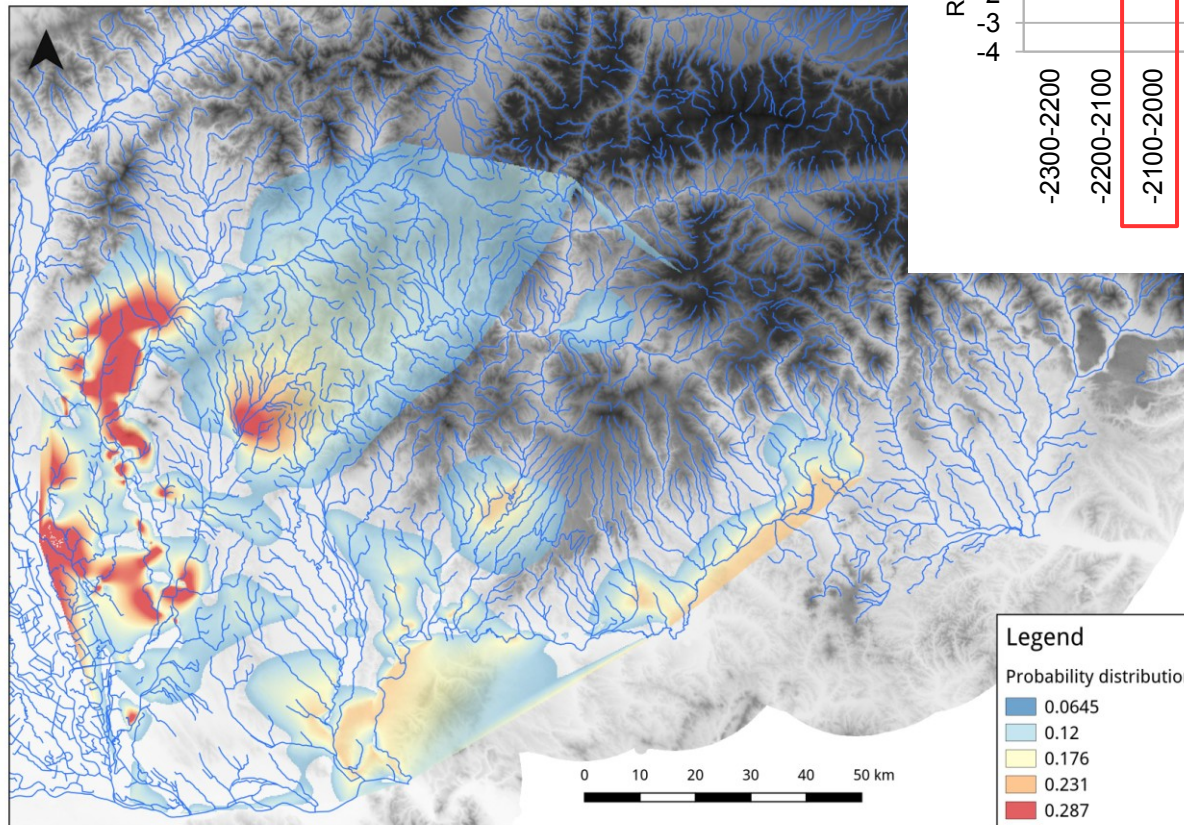
2300–2200 BC



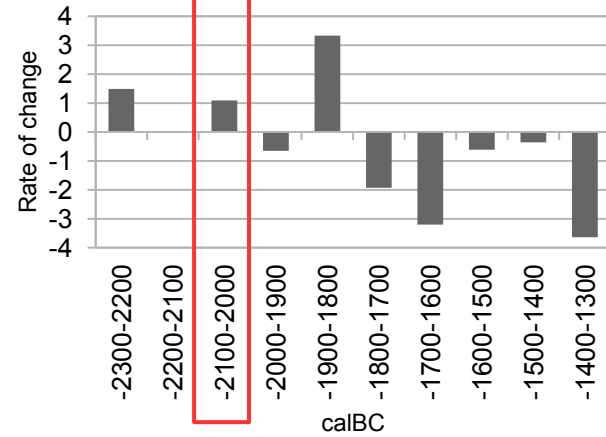
Spatio-temporal modeling



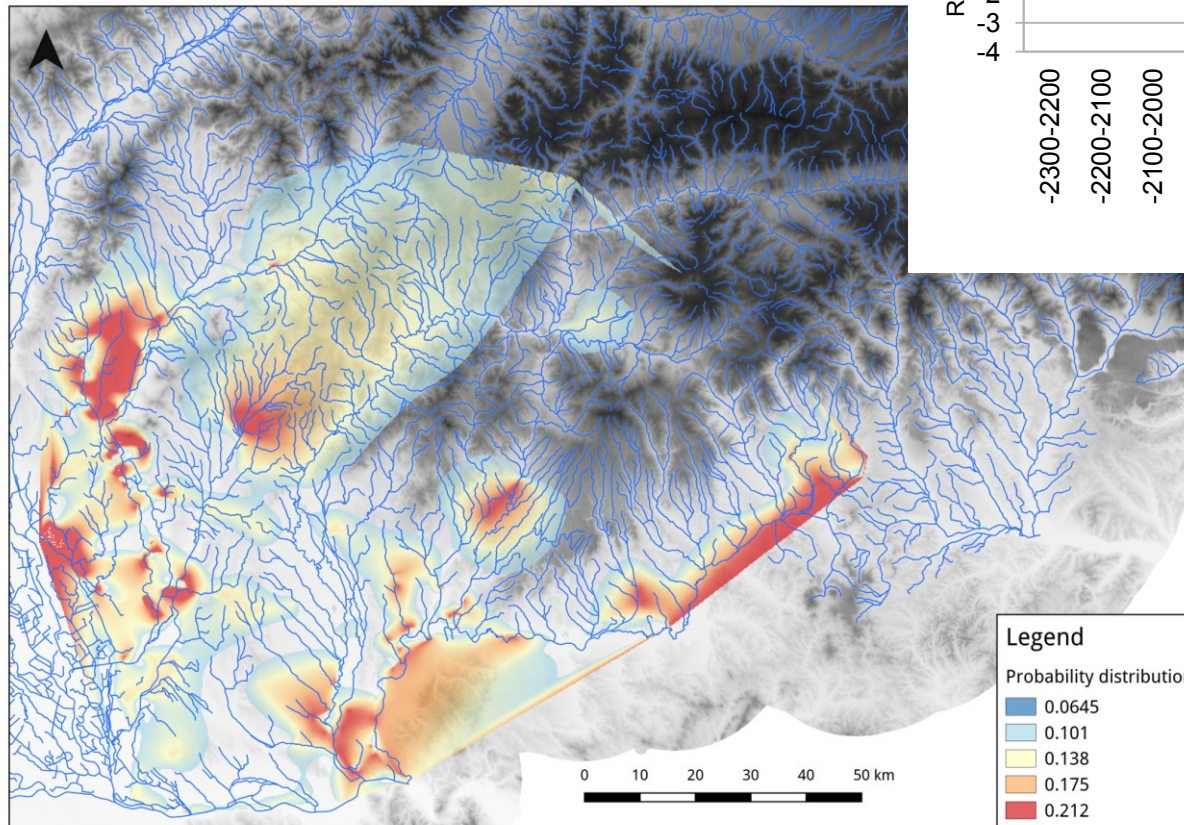
Spatio-temporal modeling



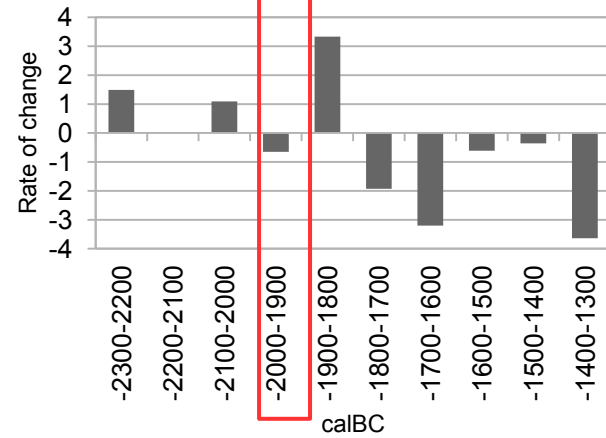
2100–2000 BC



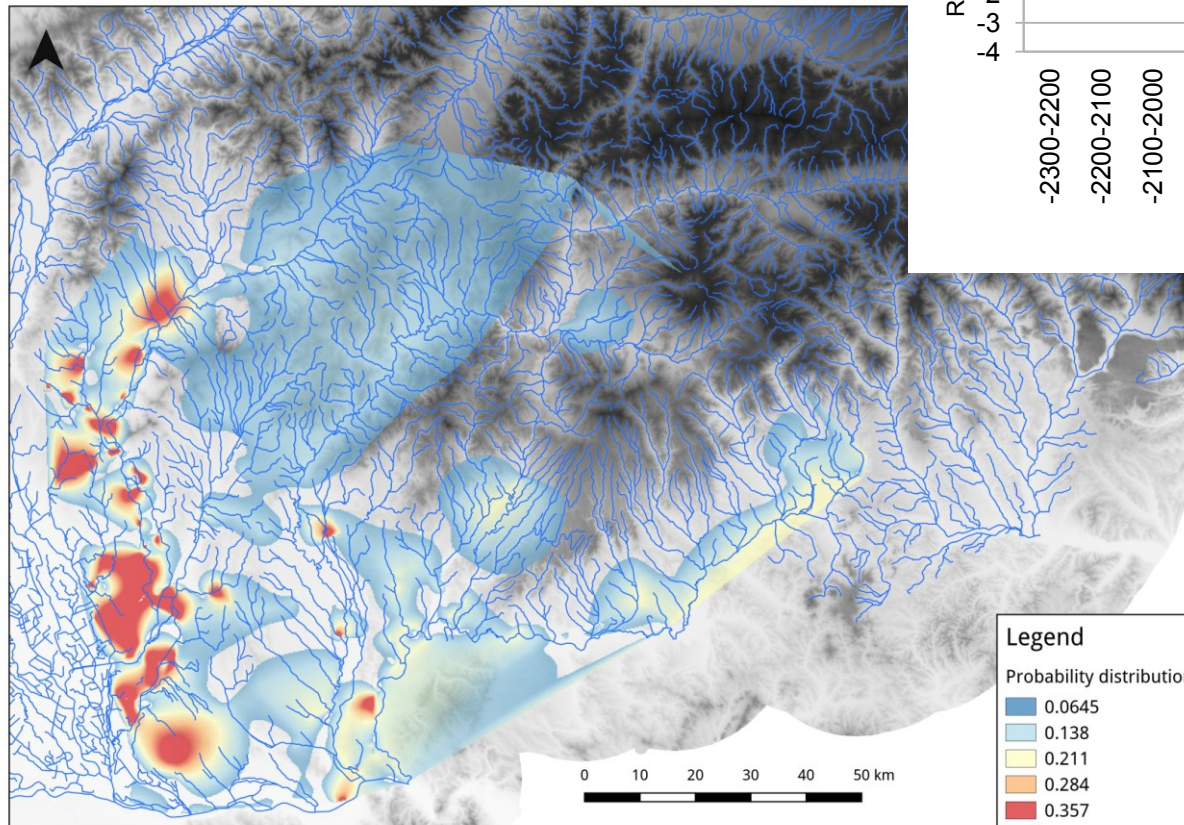
Spatio-temporal modeling



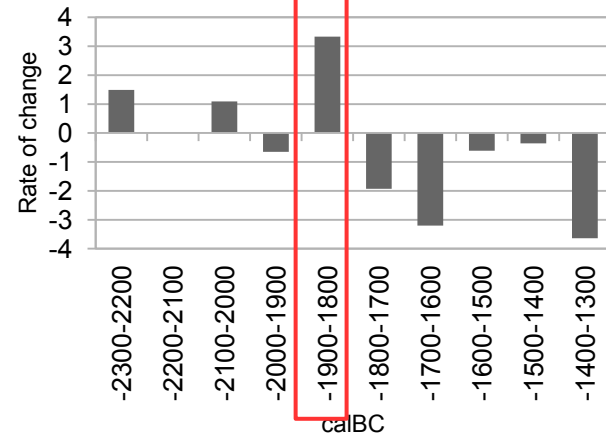
2000–1900 BC



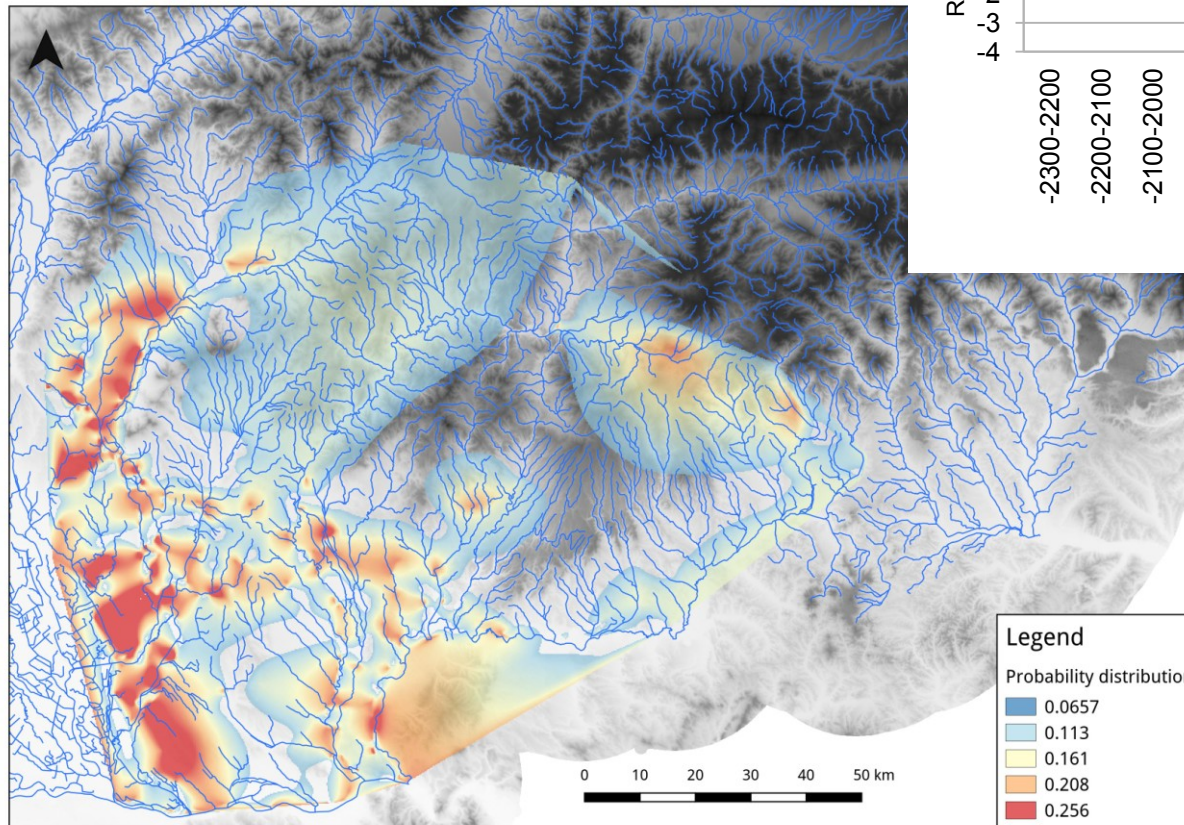
Spatio-temporal modeling



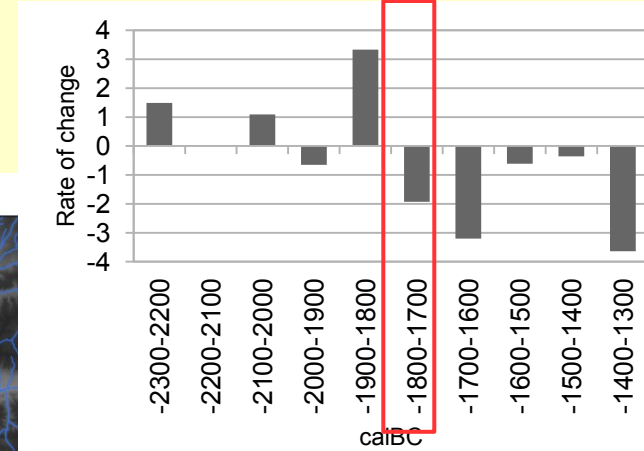
1900–1800 BC



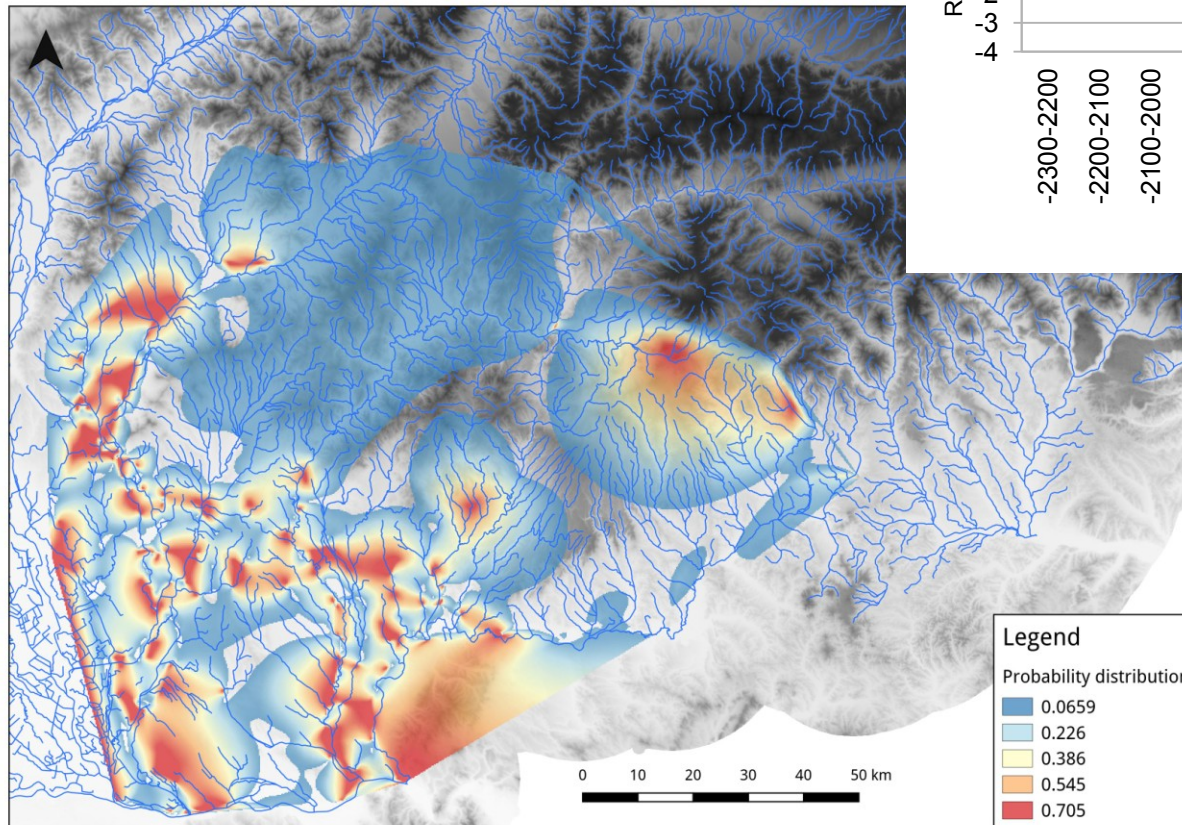
Spatio-temporal modeling



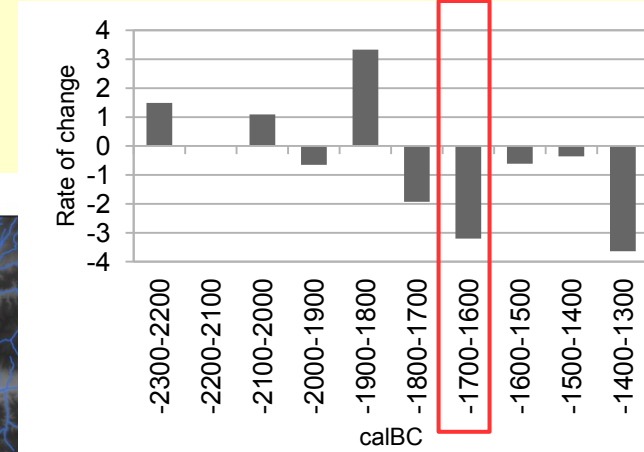
1800–1700 BC



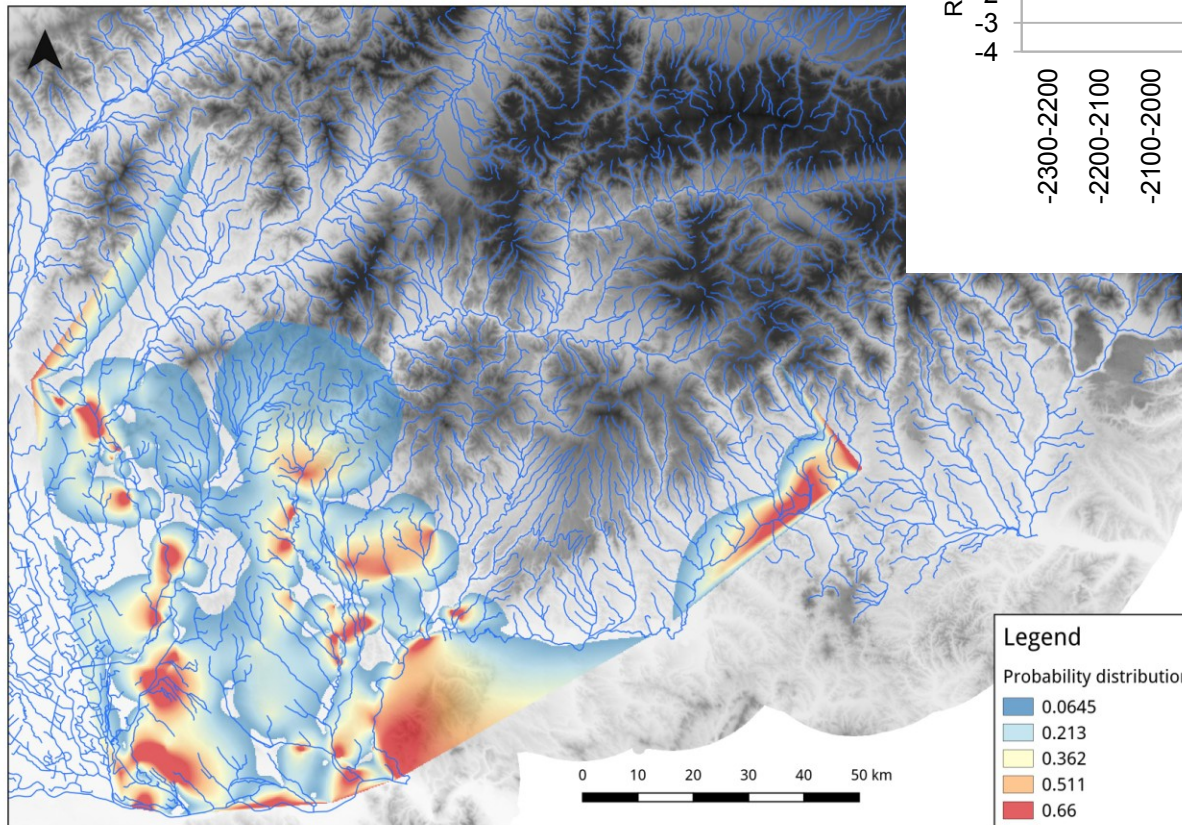
Spatio-temporal modeling



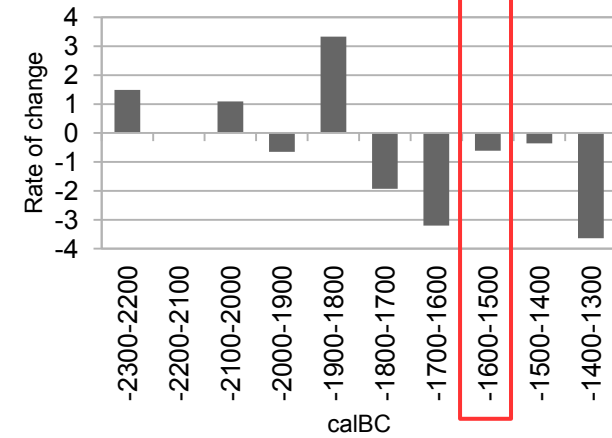
1700–1600 BC



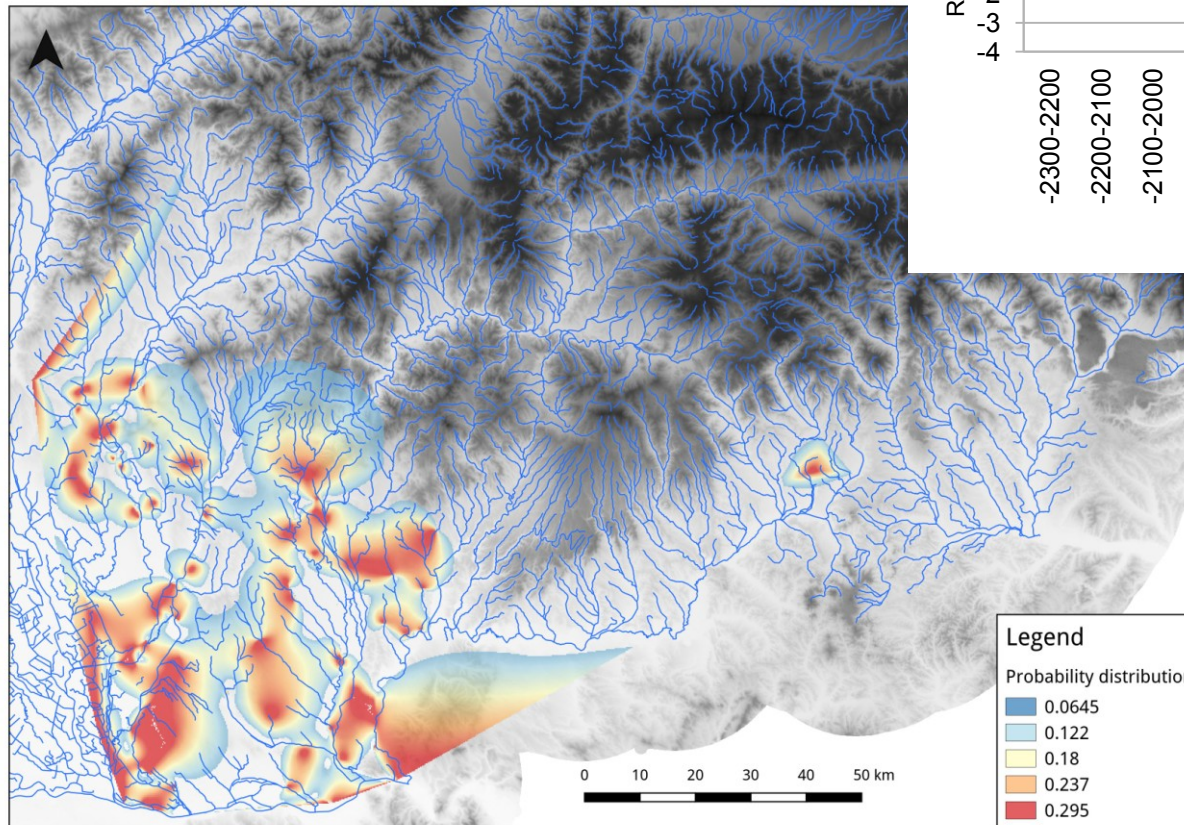
Spatio-temporal modeling



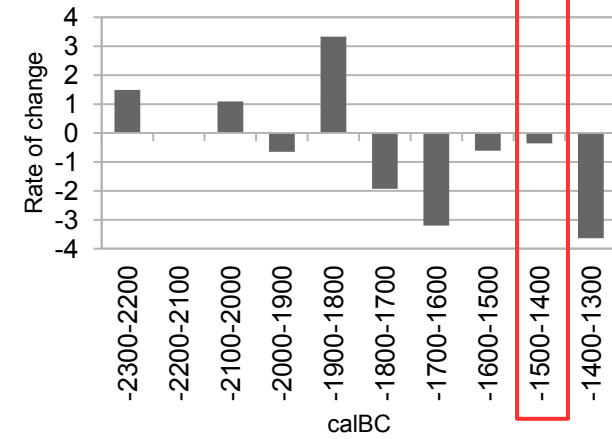
1600–1500 BC



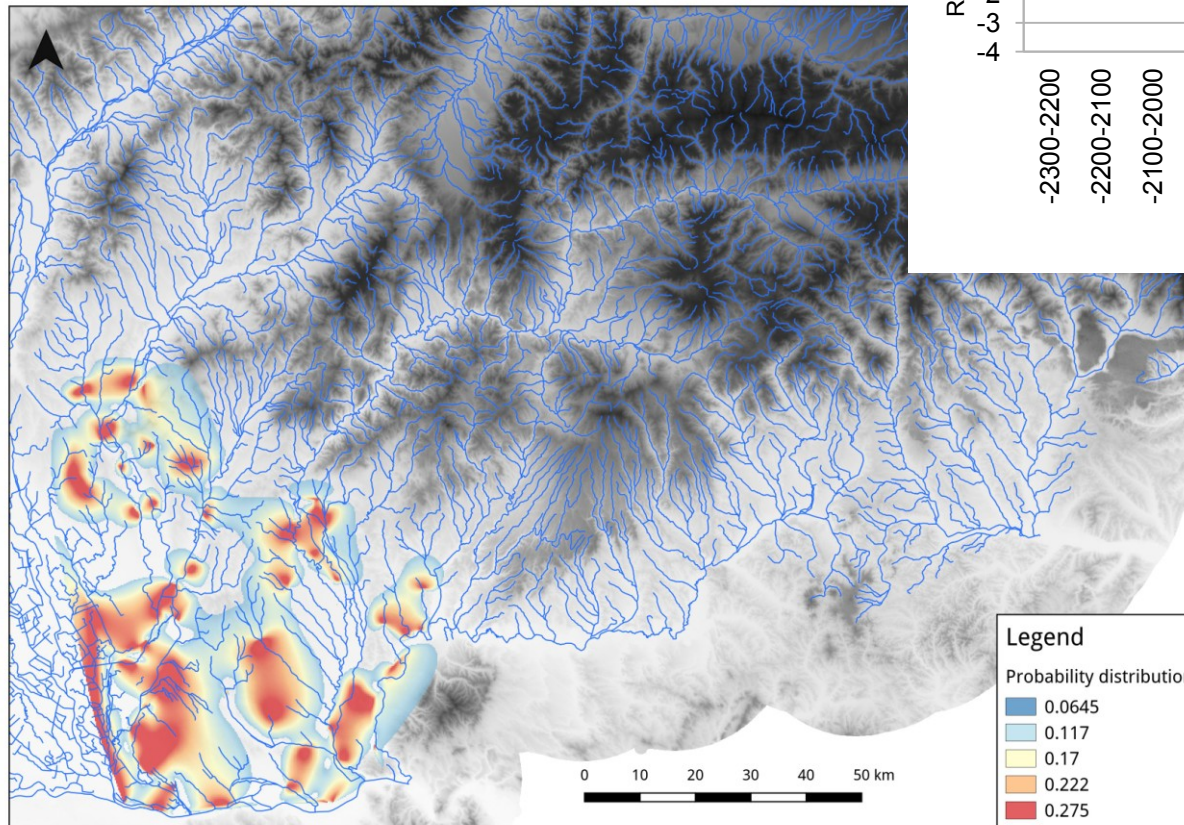
Spatio-temporal modeling



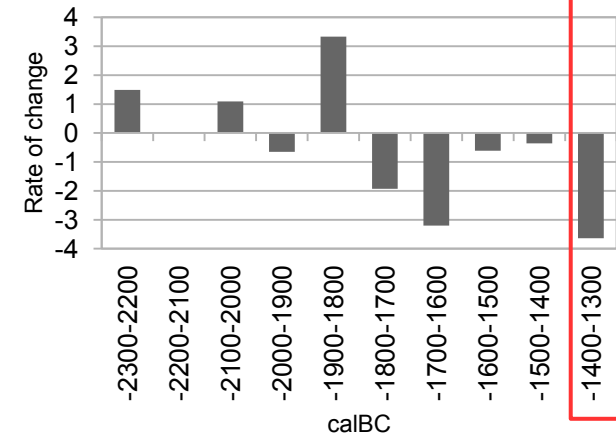
1500–1400 BC



Spatio-temporal modeling



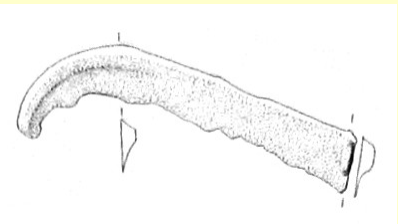
1400–1300 BC



Economy

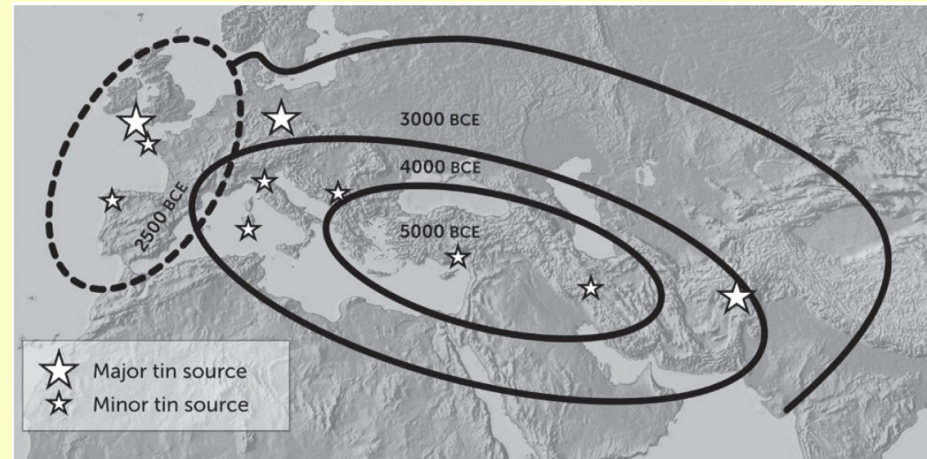
- The main food source was agriculture

Early Bronze Age	Middle Bronze Age
Emmer, eincorn + weedery	Millet
Planted in autumn	Planted in spring
Optimized for rainfall changes during the year	Unpretentious crop, high yields during dry periods
Large amount of surplus was very limited	Large surplus is supposed in Late Bronze Age



Economy

- Metallurgy
- High demand for non-ferrous metals
- Organized and intensive exploitation
- Around 1750-1650 BC established long distance trade with eastern Mediterranean

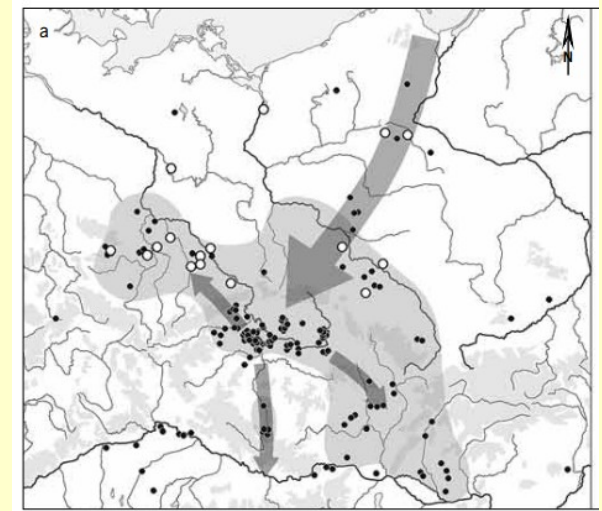


Vandkilde 2016



Economy

- Amber
- Egypt 1:2:400 (Au = amber : Ag : Cu)
- Ugarit 1:2:200 (Au = amber : Ag : Cu)
- Shift of amber distribution from Bohemia (BA2) to Slovakia (BA3-BB1) to southern Scandinavia (BB2)

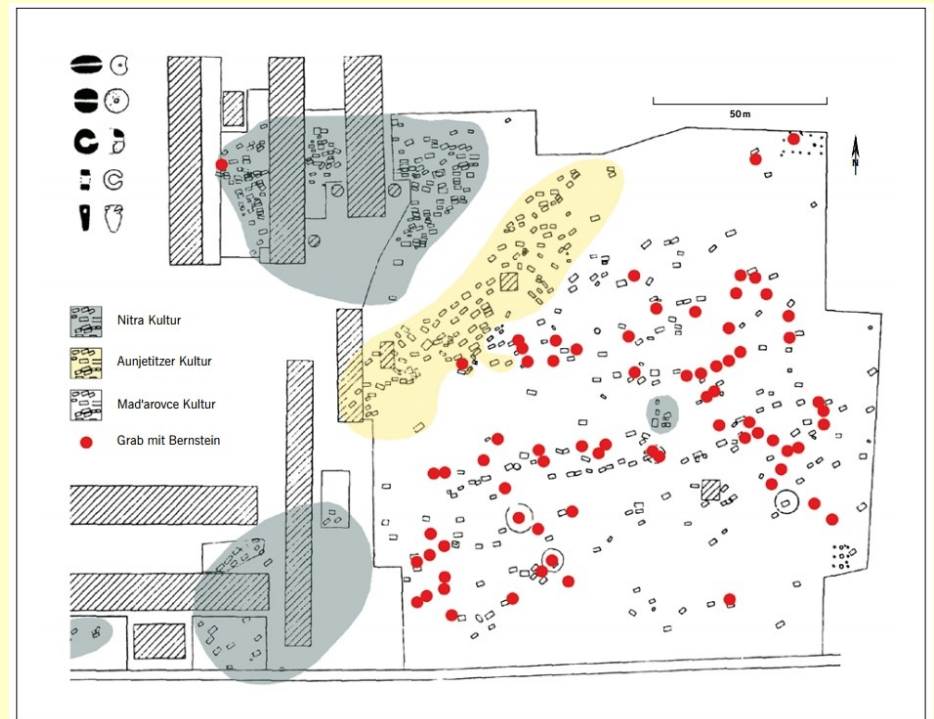


Únětice culture (Ernée 2013)



Economy

- Amber
- Incredibly rich society
- High social differences



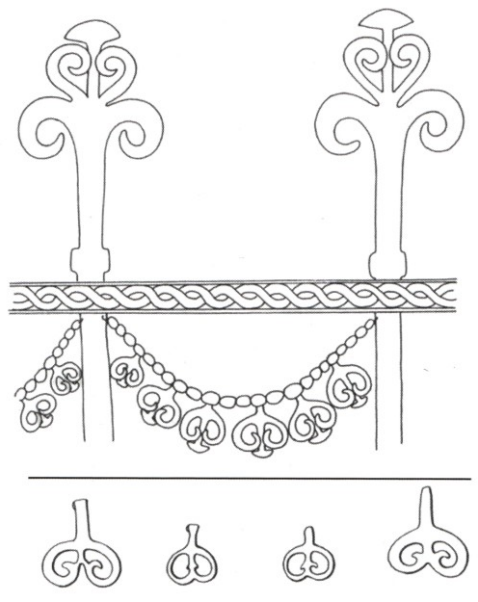
Jelšovce (Ernée 2013)



Superstructure phenomena

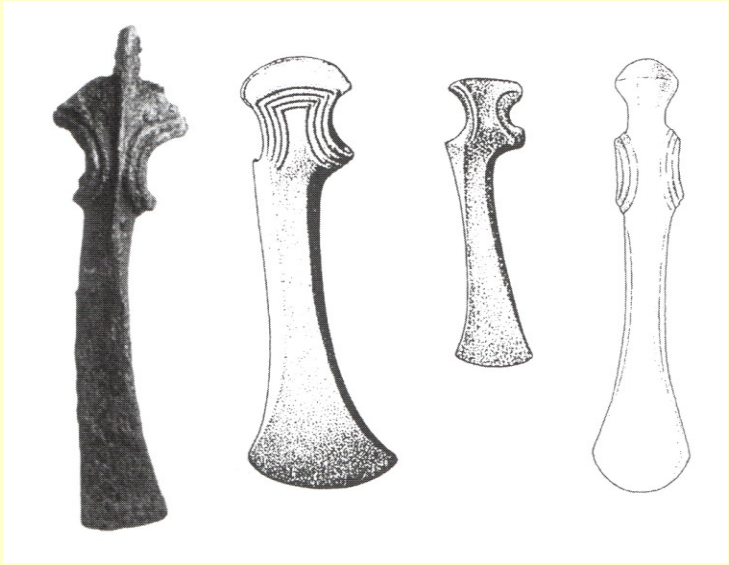
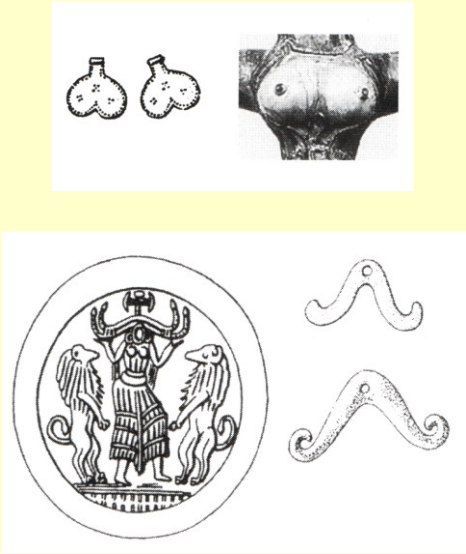
- Transfer of symbology and ideology

Kristiansen/Larsson 2005



Pannonian Basin

Thera



Syria

Anatolia

Central Europe

NW Europe



Superstructure phenomena

- Transformation of symbols connecting to **elite's legacy**: flowers symbolizing circle of the life (lilies, papyrus, ivy), women's symbolic (breast), universe symbols (stars, sun), transport and movement (wheels)
- Klontza-Jaklová 2011



Superstructure phenomena

- Burial rite

Mađarovce culture	Tumuli cultures
20-30% of graves with bronze items	45-60% of graves with bronze items
Inhumation burials	Biritual burials
No barrows	Barrows

Salka, Grave 181



Central Europe: conclusions

- Bronzization (Vandkilde 2016) – Old world globalized through long distance trade
- Three levels of impact: direct/long distance/general koine
- Intense contacts between Central Europe and Eastern Mediterranean gradually discontinued in 17th/16th century BC
- This could coincide with the effect caused by Santorini eruption
- Beginning of MBA should be moved deeper in the past (cca 1600 BC)





+ axes
+ salt
+ amber





Summary I

- EBA – contacts with the Mediterranean centers – trade and copying of their power and ideological structures – gradual increase of temperatures
- Rulers of the EBA in Central Europe slowly loose power => lower amount of luxurious imported ware
- Fortified settlements were in MBA gradually abandoned due of the changed direction of the Mycenaean lords' interest
- Transformation concerned only the upper class as there is a continuity in material culture (especially pottery)
- In MBA warriors gained special social status and were burried under barrows
- Environmental changes (cooling again)



Summary II

- Is the date of the Santorini volcanic eruption sure?
- Is it important?
- Should we believe in hard sciences?
- Should we rely on classical archaeology methods?
- Are historical sources the best?

HOW TO SOLVE THE PROBLEM???



Chronoogy		CRETE	GREECE	EGYPT	CYPRUS	Near East	Europe Reinecke	Europe Conventional
HIGH	LOW							
1700	1800	MM IB	MH II	SIP	MC II	MB I	BA3	EBA
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	LM IA	LH I	LC IA		MB III		BB2	MBA
	LM IB	LH IIA	DYN XVIII		LC IB	LB I		
LM II	LH IIB	A		LB II				
LM IIIA1	LH IIIA	LC II			B	BD	LBA	
LM IIIA2	LH IIIB							
LM IIIB	LH IIIC							
1500	1400	LM IB	LH IIA	DYN XVIII	LC IB	LB I	BC (BC2)	
		LM II	LH IIB		A	LB II		
	LM IIIA1	LH IIIA	LC II		B		BD	LBA
	LM IIIA2	LH IIIB						
	LM IIIB	LH IIIC						
1300								