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THE COLLAPSE OF THE BRONZE AGE CIVILIZATION IN THE MEDITERRANEAN AREA 3,200 YEARS AGO: CLIMATE CHANGE, NATURAL DISASTERS, WATER SCARCITY, FOOD PRODUCTION CRISIS AND WEAKENING SOCIAL GOVERNANCE

Christensen C.S.

The Bronze Age (c. 3300 – c. 1200 BC) in the eastern Mediterranean area was a historical period characterized principally by the use of bronze tools and the development of complex urban societies, as well as the adoption of writing in some areas. The Bronze Age is the middle principal period of the three-age system, following the Stone Age and preceding the Iron Age. The final decades of the Bronze Age in the Mediterranean basin are often characterized as a period of widespread societal collapse known as the Late Bronze Age collapse (c. 1200 – c. 1150 BC), although its severity and scope are debated among scholars. In this paper were analysed the possible causes of the collapse of civilization in the 1170s BC which, according to researchers, are multifaceted. Also the mysterious Sea Peoples will be discussed and the fact that bronze as a material was outcompeted by iron and iron making. The author has made an attempt to create a comprehensive picture of the events in the mid-1170s BC and the collapse consequences for humanity.

Keywords: Bronze Age, Cyprus, collapse of civilization, 1177 BC, Sea Peoples, Hittite Empire, natural disasters, climate change, Egypt, Mycenaean Greece, food production crisis, Tin Menes (Cornwall), societal collapse, resilience.

КРАХ ЦИВИЛИЗАЦИИ БРОНЗОВОГО ВЕКА В СРЕДИЗЕМНОМОРЬЕ 3200 ЛЕТ НАЗАД: ИЗМЕНЕНИЕ КЛИМАТА, СТИХИЙНЫЕ БЕДСТВИЯ, НЕХВАТКА ВОДЫ, ПРОДОВОЛЬСТВЕННЫЙ КРИЗИС И ОСЛАБЛЕНИЕ ОБЩЕСТВЕННОГО УПРАВЛЕНИЯ

Христенсен К.С.

Бронзовый век (ок. 3300 – ок. 1200 гг. до н.э.) в Восточном Средиземноморье был историческим периодом, характеризовавшимся главным

образом использованием бронзовых орудий труда и развитием сложных городских обществ, а также внедрением письменности в некоторых районах. Бронзовый век – это средний основной период трехвековой системы, следующий за каменным веком и предшествующий железному веку. Последние десятилетия бронзового века в Средиземноморском бассейне часто характеризуются как период широкомасштабного социального коллапса, известного как крах позднего бронзового века (около 1200 – 1150 гг. до н.э.), хотя его степень и масштабы обсуждаются учеными. В этой статье проанализированы возможные причины краха цивилизации в 1170-х гг. до н.э., которые, по мнению исследователей, многогранны. Также повествуется о загадочных «народах моря» и о том факте, что бронза как материал была вытеснена железом и железоделательным производством. Автором предпринята попытка создать целостную картину событий середины 1170-х гг. до нашей эры и последствий коллапса для человечества.

Ключевые слова: бронзовый век, Кипр, крах цивилизации, 1177 год до н.э., «народы моря», империя хеттов, стихийные бедствия, изменение климата, Египет, Микенская Греция, кризис производства продовольствия, Тин Менес (Корнуолл), социальный коллапс, устойчивость.

Prologue – the Bronze Age

The Bronze Age was a prehistoric period characterized by the widespread use of bronze, an alloy of copper and tin, for tools, weapons, and other implements. It followed the Neolithic (Stone Age) and preceded the Iron Age, generally spanning from around 3300 BCE to 1200 BCE in the eastern Mediterranean area.

Key Features of the Bronze Age:

1. Metallurgy: People developed advanced techniques for smelting and alloying metals, leading to stronger tools and weapons.

2 .Urbanization: The rise of early cities such as Mesopotamian city-states (Ur, Babylon), Egyptian cities (Thebes, Memphis), the Indus Valley Civilization (Harappa, Mohenjo-Daro) and Minoan Crete.

3. Trade Networks: Long-distance trade flourished, particularly for tin and copper, which were essential for making bronze.

4. Social Hierarchies: Societies became more stratified, with kings, warriors, and priests gaining power.

5. Writing Systems: Early forms of writing emerged, including cuneiform in Mesopotamia and hieroglyphs in Egypt.

6. Military Innovations: Chariots, swords, and other advanced weapons transformed warfare.

7. Religious and cultural development: Mythologies, temples, and monumental architecture like the pyramids of Egypt and ziggurats of Mesopotamia were built.

The production of bronze was probably carried out by specialists; the lengthy and complicated process involved mining, roasting and refining the copper ore, followed by smelting, alloying and casting the metal. Several different techniques, from casting in simple moulds to *cire perdue* casting, were used, as was shaping by hammering and driving. The result was both a renewal of old forms and the introduction of entirely new ones, including the sword [7, s. 4-5; 15, s. 85-88].

Bronze was a limited resource in most areas, and control over the production and distribution of the metal was therefore synonymous with great power. The use of bronze resulted in more efficient tools and thus probably also in a greater agricultural surplus. Bronze objects gave prestige and marked the social position in society. The many archaeological finds of valuable and spectacular bronze objects must be seen in this context, as groups and individuals could demonstrate and increase their power and position in society through ritual gift-giving to the gods at sacred sites and by providing rich grave goods. Bronze Age society is characterized by growing social differences, which were often based on unequal access to bronze. The first palace-organized states such as Knossos and Mycenae were formed in the Eastern Mediterranean with administration, accounting, writing and urban development [7, s. 29-31].

However regional differences in the world existed:

– Mesopotamia & Egypt: Early empires with centralized rule and organized religions.

– Indus Valley Civilization: Advanced urban planning with sophisticated drainage systems.

– China: The Shang Dynasty (c. 1600 BCE – 1046 BCE) made significant advancements in bronze casting.

– Europe: Societies were more tribal but still engaged in trade and warfare.

The differences between Southern and Northern Europe were very large, just as the differences in Bronze Age society were very large. Those who had the rights over bronze and bronze production were in power and had great influence on the development of society. Those who did not were more or less left out in terms of influencing changes in everyday life and too large differences between rich and poor and leader and people can create tensions in a country and form the basis for a real societal collapse [8, s. 11-13].

Battle of Delta – 1175 BC

The Battle of the Nile Delta was an armed clash that probably took place around 1175 BC during the invasion of the Sea Peoples. Furthermore, an attack of that nature was an indicator that the powerful kingdoms of the eastern Mediterranean (including the Egypt of the pharaohs) were facing their doomsday. The ruler of Egypt, Ramesses III, famous for his victorious wars with the Libyans, decided to deal with the attackers on a battlefield of his choosing and appropriately prepared. This conflict was recorded on the walls of the mortuary temple of Pharaoh Ramesses III in Medinet Habu. In the early years of his reign, Ramesses III faced an invasion of Indo-European peoples known collectively as the "Sea Peoples", including the local Peleset, Tjeker, Székely, Danaanites (Greeks), Shardanes and Uashasha peoples [6, p. 111].

After defeating the Sea Peoples on land, Ramesses hurried to Egypt, where preparations for the invaders' attack had already been completed. Ramesses lured the Sea Peoples and their ships to the mouth of the Nile, where he prepared an ambush. The captains of the attacking ships initially encountered no resistance at the mouths

of the Delta. They came to the conclusion that the Egyptian fleet expected there had fled and that Egypt was wide open to them. They boldly sailed into the tangle of narrow channels, thus falling into a trap with no way out – the flat-bottomed Egyptian ships, perfectly adapted to sailing in these waters, began to push the seagoing units of the Sea Peoples towards the shores densely manned by archers. The attackers, armed mostly with swords and spears, had to succumb to massed fire from close range. The decimated crews were unable to resist the boarding and surrendered one by one. The clash ended in an Egyptian victory. Their leaders were captured and beheaded, and the crew members were taken prisoner [14, p. 85-86].

The Sea Peoples movement had reached the plains of Amurru, north of the Phoenician region. Traveling by boat or land the men, women and children of the tribes moved with all their belongings, transported in heavy wagons. After a long journey from the north, they were coming dangerously close to the defence line organized by the pharaoh, near the Phoenician cities. For Ramesses III the time was critical, especially since it was necessary to halt the movement of foreigners both on land and at sea. Monitoring the situation closely, he mobilized all available forces, without neglecting as many boats as possible that could be used to transport soldiers. It seems that the Sea Peoples' land movement crossed the defence line in Palestine, and it was further south that the Pharaonic troops stopped the foreigners [6, p. 2].

While we know virtually nothing about Ramesses III's land victory, we do know more about the tactics used for his famous naval battle. In fact the Pharaoh could rely on a specific technical factor: the Sea Peoples' ships used only sails for navigation. Their invasion through the delta, using one of the branches of the Nile, was therefore a high-risk operation since their ships were difficult to maneuver, especially since the Egyptians' ships were able to move at will thanks to their crew of oarsmen [15, s. 116-118].

Inscription on the walls of the mortuary temple of Pharaoh Ramesses III at Medinet Habu: "Those who have reached my border, their seed are not; their hearts and their souls are finished forever and ever. As for those who gathered before them on the sea, a full flame was their front before the mouths of the ports, and a wall of

metal on the shore surrounded them. They were dragged, overturned and laid low on the beach; killed and piled from the stern to the bow of their galleys, while all their belongings were thrown into the water" [1, p. 23].

The battle took place somewhere north of the capital Pi-Ramesses on the Pelusiac branch of the Nile. Judging by the details carved on the walls of the temple at Medinet Habu, it is clear that the fighting was fierce. Until the discovery of the relief, there was no tangible evidence that a major battle had taken place in the 1170s. Just as the accuracy in the depiction of the battle shows the shifts in the use of military equipment [1, p.24].

On the water in Roman fashion Egyptian infantrymen attacked the enemy from the decks of their ships. Using swords, javelins, and bows, they decimated the enemy. Gradually, the Peleset and other ships were pushed back to the banks, where archers awaited and rained down deadly arrows. The Egyptian victory was impressive and illustrated the military genius of Ramesses III, at least on the defensive side. However, the Battle of Delta was one of the main reasons to the late Bronze Age collapse because of the weakening of Egypt and other great powers in the region [9, p. 165].

The year 1177 BC

In 2014 (revised in 2024) the American Archeologist Eric H. Cline published his book "1177 BC – The year Civilization collapsed". The book is an important newer key to understanding the possible Late Bronze Age collapse. This research focuses on the author's hypothesis for the Late Bronze Age collapse of civilization, a transition period that affected the Egyptians, Hittites, Canaanites, Cypriots, Minoans, Mycenaean's, Assyrians and Babylonians; varied heterogeneous cultures populating eight powerful and flourishing states intermingling via trade, commerce, exchange and cultural piggybacking, despite all the difficulties of travel and time. Eric H. Cline presents evidence to support a perfect storm of multiple interconnected failures, meaning that more than one natural and man-made cataclysm caused the disintegration and demise of an ancient civilization that incorporated empires and globalized peoples. This ended the Bronze Age and ended the Mycenaean, Minoan,

Trojan, Hittite and Babylonian cultures. Before this book the leading hypothesis during previous decades attributed the civilizations' collapse mostly to Sea Peoples of unknown origin [2, p. 366].

The prologue opens with a discussion of the Sea People, who they were, where they came from and so on. No texts from the ancient world refer to Sea Peoples. This term is used to cover a number of groups that invaded many areas of the Eastern Mediterranean in the early twelfth century BC. There was no single invasion, but a series of waves of incursions. Some of the Sea Peoples themselves arrived by land. They left no texts or monuments to commemorate their invasion(s), hence the number of conjectures about who they were and where they were. Various scholars place their origins in many different parts of the Mediterranean. Cline notes that only the origins of the Peleset (also known as the Philistines) are clearly identified. He cites evidence of their violence, but also notes that we do not even know whether they were an organized group or simply poorly organized raiders. While they undoubtedly played some role in the Late Bronze Age collapse, they were only one of many factors that created a perfect storm [3, p. 1-6].

Cline summarizes in some detail the widespread destruction around this time. The destruction of Lachish during the reign of Ramesses III is clear, although who or what caused it is not. It is also clear that Mesopotamia was not destroyed by the Sea Peoples. Similarly, there was extensive destruction in Anatolia. Some Hittite sites were destroyed, but others were simply abandoned. However, there was extensive destruction on the Greek mainland. It looks that Cyprus was probably destroyed by the Hittites and not by the Sea Peoples. This seems to have been accompanied by famine, although the abundance of bronze arrowheads also supports warfare. Cyprus survived until 1075 BC, but with serious restructuring of economic and political organization. Meanwhile, there was extensive fighting in Egypt, and new evidence shows that Ramesses III had his throat cut, suggesting the possibility of an internal coup, although massive destruction in the eastern Mediterranean is well documented, who or what because it is not [3, p. 378].

However, what about invaders and/or rapid decline in international trade? Again, these may have, according to Cline, been possible contributors, but insufficient to be the entire cause. A sharp decline in trade may have made some cities more vulnerable to attack as resources became scarcer. The question remains why the destroyed cities were not rebuilt by survivors. A rise in private merchants, as opposed to state-sponsored merchants, may have been part of increasing decentralization. Maybe we can argue that the Sea Peoples may have been a final phase in the replacement of old, centralized systems, but why did decentralization occur at all? Ugarit was destroyed by external invaders; possibly minor declines and partial collapses may have created chaos, which, in turn, may have opened up new opportunities for private traders [10, p. 88].

What about the famous seafarers? Where did they go? Some came by land as well as by sea, but coastal resettles may not have caused widespread destruction. Others suggest that the interventions were much more gradual over fifty or more years. Yet questions remain. Why did the Sea Peoples move? Were they opportunists or perhaps refugees? Finally, Cline raises the question of systemic collapse, that is failures that carried both domino and multiplier consequences. While he finds this explanation intriguing, it still leaves the question of "why"? There are many possibilities, dependence on bronze and other prestige goods among them. At best, central rulers could delay collapse but not ultimately prevent it. Cline reviews these possibilities and turns of complexity theory, which may predict collapse, but not precisely. One state is "hyper coherence" under which the interconnections in feedback loops are so tight that if anyone is broken, it can cause the collapse of the entire system. Collapse is almost inevitable because the cost of stability is very high. In short, complicated systems can break in a variety of ways. He concludes that monocausal explanations and linear explanations will not suffice [3, p. 177].

The Sea Peoples: Raiders of the Late Bronze Age

The Sea Peoples were a mysterious confederation of maritime raiders and warriors who played a major role in the Late Bronze Age collapse (c. 1200 – 1150 BCE). They attacked and destroyed several powerful civilizations in the Eastern

Mediterranean, contributing to the downfall of the Mycenaean Greece, Hittites, Canaanites and the weakening of the Egyptian New Kingdom [3, p. 187]

Origins and identity: Who were the Sea Peoples?

The exact origins of the Sea Peoples remain uncertain, but theories suggest they may have come from multiple regions:

– Aegean and Anatolia: Some scholars link them to displaced peoples from the Greek world (Mycenaeans), western Anatolia (Trojans, Luwians), or the Balkans.

– Sicily and Sardinia: Some groups may have come from Italy or the western Mediterranean, seeking new lands.

– Eastern Mediterranean Coastal Groups: Some may have been rebellious Canaanites or displaced coastal peoples from Levantine regions.

They were likely not a single ethnic group but a coalition of displaced peoples, mercenaries, and warriors seeking new settlements due to famine, climate change, or political instability.

Invasions and destruction

The Sea Peoples attacked numerous cities and kingdoms across the Mediterranean. Some of their major impacts include:

– Destruction of the Hittite Empire (c. 1190 BCE). Their capital Hattusa was burned and abandoned.

– Collapse of Mycenaean Greece. Mycenaean palaces were destroyed, leading to the Greek Dark Age.

Raids on the Levant. Many Canaanite cities fell, allowing new groups (like the Philistines) to emerge.

– Invasions of Egypt. Pharaoh Ramses III (c. 1180 BCE) fought and repelled them in a massive naval battle, as recorded in the Medinet Habu inscriptions.

Importance of the Sea Peoples in the Late Bronze Age collapse

1. Major Catalyst for the Collapse: their invasions contributed to the destruction of trade networks and destabilization of key civilizations.

2. Spread of iron technology: the fall of bronze-dependent kingdoms accelerated the use of iron weapons and tools.

3. Cultural and population shifts: the decline of older civilizations made way for new groups like the Phoenicians, Philistines and early Israelites

4. Change in warfare: their tactics, including naval raids and large-scale migrations, influenced future warfare strategies [13].

Legacy of the Sea Peoples

Though the Sea Peoples eventually disappeared as a distinct group, their invasions reshaped the ancient world. Many historians believe the Philistines, one of the peoples who settled in Canaan were descendants of the Sea Peoples. Their attacks marked the end of the Bronze Age and the beginning of the Iron Age, transforming Mediterranean history [3, p. 190].

Late Bronze Age collapse

The German historian Arnold Hermann Ludwig Heeren first dated the collapse of the Late Bronze Age to 1200 BC. In a history of Ancient Greece from 1817 Heeren stated that the first period of Greek prehistory ended around this time, based on a dating of Troy fall to 1190 BC. In 1826 he dated the end of the Nineteenth Dynasty in Egypt to around the same time. Additional events that have been dated to the first half of the 12th century BC include the invasions of the Sea Peoples, the fall of Mycenaean Greece and the fall of the Kassites in Babylonia and the carving of the Merneptah Stele, whose inscription includes the earliest attested mention of Israel in the southern Levant, as well as the destruction of the Levantine state and of the Amorite state, the fragmentation of the Luwian states in western Anatolia and a period of chaos in Canaan. The decline of these governments cut off trade routes and led to greatly reduced literacy rates in much of this area [11, p. 65].

Causes of the collapse (theories)

While the exact reasons remain debated, scholars suggest a combination of factors rather than a single cause:

1. Invasions by the “Sea Peoples”

– Mysterious groups known as the Sea Peoples attacked and destroyed cities across the region.

– Egyptian records (like those from Ramses III in the Medinet Habu inscriptions) describe major battles against these invaders.

– The origins of the Sea Peoples are uncertain, but they may have been displaced peoples from the Aegean, Anatolia, or even Europe.

2. Internal Rebellions and Civil Wars

– Evidence suggests internal uprisings and palace destructions in Mycenaean Greece and the Hittite Empire.

– Peasant revolts or power struggles may have weakened the ruling elites.

3. Climate change & drought

– Studies of ancient pollen and climate data indicate a prolonged drought and cooling period around this time.

Reduced agricultural output could have led to famine, migration, and social unrest.

4. Earthquakes (“Earthquake storms”)

– The Eastern Mediterranean sits on seismically active zones and evidence suggests a series of powerful earthquakes struck major cities.

This would have caused destruction, food shortages, and political instability.

5. Disruption of trade networks

– The Eastern Mediterranean civilizations depended on long-distance trade, particularly for tin and copper (used to make bronze).

– The collapse of trade routes led to a shortage of essential resources, crippling economies.

Cause 1: Natural disasters and their impact

1. Prolonged drought and climate change

– Studies of pollen data and ancient climate records show evidence of a major drought around 1200 BCE in the Eastern Mediterranean.

– Droughts led to famine, forcing populations to migrate and attack wealthier regions for food and resources.

– Egyptian records mention grain shortages and famines, especially during the reign of Ramses III.

– The Hittite Empire, dependent on agriculture, struggled to sustain its cities, leading to internal collapse.

Example: Clay tablet records from Ugarit (modern Syria) describe urgent grain shipments due to famine before the city was destroyed.

2. Earthquake storms (series of major earthquakes)

– The Eastern Mediterranean sits on a tectonic fault zone, and evidence suggests a period of multiple earthquakes ("earthquake storm") during the Late Bronze Age.

– These quakes destroyed cities, including Mycenaean palaces, Hittite settlements and Canaanite ports.

– Earthquakes caused fires, structural damage, and societal instability, making cities vulnerable to invasions (e.g., the Sea Peoples).

Example: The destruction layers in cities like Troy, Mycenae and Hattusa show signs of earthquake damage, rather than just warfare.

3. Volcanic eruptions and environmental impact

– Large volcanic eruptions could have worsened climate instability by releasing ash clouds, reducing sunlight, and affecting rainfall patterns.

– While the Santorini (Thera) eruption (c. 1600 BCE) happened earlier, its long-term effects may have disrupted Minoan trade and power, influencing later instability.

Potential effects:

– Ash clouds could have lowered temperatures, causing crop failures.

– Tsunamis triggered by eruptions might have damaged coastal cities and ports.

How these disasters contributed to collapse

1. Weakened agriculture → famine → mass migrations & raids

– As food supplies declined, desperate populations moved in search of resources, leading to wars and invasions.

– The Sea Peoples may have been climate refugees, forced to raid wealthier regions.

2. City destruction → economic decline & political instability

– Natural disasters ruined palace economies, which relied on centralized control of food and trade.

– Rulers lost power, and civil wars, uprisings, and local conflicts increased.

3. Trade Disruptions → Loss of Bronze Production

– Bronze requires tin and copper, which were imported through long-distance trade.

– With trade routes disrupted by disasters, civilizations couldn't produce enough weapons and tools, weakening their armies and economies.

Conclusion: the perfect storm of collapse

Natural disasters alone may not have caused the Bronze Age collapse, but they exacerbated existing issues like political instability, invasions and economic decline. The combination of climate change, drought, earthquakes, and volcanic activity created a domino effect, making societies vulnerable to collapse [3, p. 137; 4, p. 159; 3, p. 171].

Cause 2: Societal Collapse

1. Invasions and warfare (Sea Peoples & internal conflicts)

One of the most immediate causes was widespread warfare, particularly the invasions by the Sea Peoples.

Sea Peoples' raids. These mysterious warriors attacked major civilizations, destroying cities, disrupting trade, and weakening economies.

– They toppled the Hittite Empire and ravaged Canaanite cities.

– Egypt barely survived, as Ramses III repelled them but at great cost.

– Internal Conflicts. Some kingdoms experienced civil wars, uprisings, and rebellions, further destabilizing the region.

– Mycenaean collapse. Many Greek palaces were burned down, possibly due to local revolts or outside invasions.

Why it mattered? Warfare weakened centralized rule, destroyed key cities and disrupted trade networks.

2. Climate change & drought (famine and resource scarcity)

– Scientific studies (pollen analysis, lake sediment data) suggest a long-term drought hit the Eastern Mediterranean around 1200 BCE.

– Lack of rainfall led to crop failures, causing famine and forcing mass migrations.

– Egyptian records mention grain shortages and starvation, indicating widespread food crises.

Why it mattered? Societies dependent on agriculture faced economic decline, forcing people to migrate or revolt.

3. Earthquakes (“Earthquake storms”)

– The Eastern Mediterranean is a seismically active zone, and archaeological evidence suggests a series of major earthquakes around this time.

– Earthquakes caused city destruction, fires, and economic decline in regions like Mycenae, Troy, Hattusa, and Ugarit.

Why it mattered: Earthquakes weakened already struggling civilizations, making them more vulnerable to invasion [4, p. 45-47].

4. Collapse of trade networks (loss of bronze & economic breakdown)

– The Bronze Age economy relied on long-distance trade, especially for tin and copper, the essential ingredients of bronze.

– With cities destroyed and trade routes disrupted, bronze became scarce, affecting both the economy and military power.

– Some regions turned to iron for tools and weapons, but this transition was slow and chaotic.

Why it mattered: Without bronze weapons, civilizations struggled to defend themselves against invaders.

5. Political and Social Instability (Palace System Collapse)

– Most Late Bronze Age civilizations were centralized and palace-based, meaning kings controlled the economy, military, and food distribution.

– When cities were burned, invaded, or abandoned, their governments collapsed, leading to widespread decentralization.

– Without strong leadership, societies fell into disorder and depopulation.

Why it mattered? Political instability made it harder for civilizations to recover from other crises.

Which factor was the most important?

No single factor caused the Bronze Age collapse – it was a "perfect storm" of multiple crises happening at the same time.

– If only one of these factors had occurred, civilizations might have survived.

– But when invasions, famine, earthquakes, and economic breakdown happened together, societies collapsed.

Most historians believe the biggest triggers were:

1. Sea Peoples & warfare → direct destruction of cities and disruption of trade.

2. Climate change & drought → famine led to migrations and social unrest.

3. Economic breakdown → without trade, key resources (like bronze) became unavailable.

Key factors in societal collapse

Societies collapse when multiple stressors overwhelm their ability to adapt and recover. While no single factor causes collapse alone, a combination of these five key factors often leads to the downfall of civilizations:

1. Environmental and Climate Change

– Droughts, floods, deforestation, soil depletion, and temperature shifts can devastate agriculture.

– Example. The Maya civilization suffered from prolonged droughts that led to food shortages and societal breakdown.

– Example. The Ancestral Puebloans (Anasazi) abandoned their cities partly due to desertification and drought.

Why it matters? Societies depend on stable food production when the environment changes, they may not be able to adapt.

2. Economic decline and resource depletion

– Overexploitation of natural resources (timber, water, minerals) can weaken economies.

– Heavy reliance on complex trade networks means that disruptions (e.g., war or disaster) can cause shortages.

– Example. The Roman Empire suffered from inflation, over-reliance on slave labour, and resource depletion, contributing to its decline.

Why it matters? Without economic stability, states lose the ability to pay armies, maintain infrastructure and feed people.

3. Political instability and corruption

– Governments that fail to address crises lose public trust, leading to rebellions, civil wars, and fragmentation.

– Power struggles, weak leadership, and corrupt elites can drain state resources and leave civilizations vulnerable.

– Example. The fall of the Ming Dynasty was accelerated by internal corruption and peasant uprisings.

– Example. The French Revolution resulted from economic inequality, poor governance and social unrest.

4. External invasions and military defeats

– Societies that over-expand (e.g., empires) often struggle to defend their borders.

– Weak armies, poor strategy, and external threats can accelerate collapse.

– Example. The Western Roman Empire collapsed under constant attacks from Germanic tribes.

– Example. The Aztec Empire fell to Spanish conquest, partly due to internal divisions and disease.

Why it matters? Military strength helps preserve order when defences fail, collapse happens quickly.

5. Disease and pandemics

– Large, interconnected populations spread plagues and pandemics that kill millions.

– Major outbreaks weaken economies, reduce labour forces, and cause social unrest.

Example. The Black Death (1347-1351) killed up to 50% of Europe's population, leading to economic collapse and the decline of feudalism.

– Example: Smallpox and other diseases wiped out up to 90% of indigenous American populations after European contact.

Why it matters? High death tolls lead to labour shortages, economic crashes, and mass migrations [q.v.: 12].

Cause 3: Iron

Why did iron making replace bronze?

Iron replaced bronze as the dominant metal during the transition from the Bronze Age to the Iron Age (c. 1200-600 BCE) due to several key factors, including resource availability, economic efficiency, and technological advancements. Here's why iron ultimately outcompeted bronze [4, p. 73-75]:

1. Availability of raw materials

– Bronze = copper + tin → these metals were scarce and required long-distance trade (even from mines in Wales).

– Tin shortages were a major issue, especially after the Bronze Age Collapse, when trade networks broke down.

– Iron = found almost everywhere → unlike tin, iron ore is widely available across Europe, the Middle East and Asia.

– This meant societies could produce their own iron without depending on far-off trade networks.

Why it mattered? Iron was more accessible, allowing more civilizations to manufacture weapons and tools locally.

2. Cost and production efficiency

– Bronze production required casting in specialized moulds, making it labour-intensive and expensive.

– Iron, once the smelting process was refined, was cheaper to produce in large quantities.

– Empires and kingdoms could equip larger armies with iron weapons at a lower cost.

Why it mattered? Iron weapons and tools were more affordable, helping both military and agricultural expansion.

3. Technological advancements in ironworking

– Early iron weapons were initially weaker than bronze because early iron was brittle.

– However, advancements in forging and carbon infusion (creating steel) made iron stronger than bronze.

– Heat treatment techniques (e.g., quenching and tempering) improved iron's durability over time.

Why it mattered? Once smiths mastered steel-making, iron weapons became superior to bronze in strength and cutting ability.

4. Military superiority & warfare

– Iron weapons eventually became harder, sharper and more durable than bronze weapons.

– Civilizations that adopted iron weapons (e.g., Hittites, Assyrians and later Greeks and Romans) had a military advantage.

– The ability to equip larger armies with iron swords, spears and armour shifted the balance of power in warfare.

Why it mattered? Societies that used iron weapons dominated those still relying on bronze.

5. Agricultural and economic benefits

– Iron tools (plows, sickles, axes) were stronger and lasted longer than bronze tools.

– Farming efficiency increased, leading to larger food supplies and population growth.

– More people could move away from metalworking and focus on other trades, cities and state-building.

Why it mattered? Stronger iron tools boosted agriculture and economic expansion, making societies richer [4, p. 76].

Cause 4: Military explanation

An important point to consider is why long-lasting, wealthy and militarily powerful kingdoms in Egypt, Hattusa, Ugarit and Mycenae failed to defeat barbarian invaders. Military factors, particularly the end of chariot warfare and changes in armour and weaponry, provide at least a partial solution. Prior to the collapse, chariots appear to have dominated the warfare of the great kingdoms. During the Middle Bronze Age (1800-1600 BC), chariots evolved from heavy war-carts pulled by donkeys to light carts with spoked wheels. A charioteer and an archer on this lighter form of chariot pulled by faster equids provided the kings of the Near East with a powerful military force. The so-called "chariot tablets", found at Mycenaean-controlled Knossos on Crete, record a stockpile of hundreds of chariots and chariot parts, along with nearly 8,000 arrows for chariot archers [4, p. 104-106].

Reliefs depicting the Battle of Kadesh in Ramses II's mortuary temple indicate that the type of combat his army used against the Hittites was mainly based on chariots, and both sides of the conflict had thousands of them. Charioteers assembled in long lines at the front of the army and charged at their opponent's chariot line.

Meanwhile, the archers aimed to take down enemy horses and charioteers as the lines closed in on each other. After the clash, the chariots completed their pass and the archers shot at the backs of enemy charioteers. Survivors in both chariot lines wheeled around to make another pass at each other. From the complexity of these battles, it is clear that they required a great deal of setup and positioning. In fact, they may have been pre-announced or heralded, as Thutmose III's temple inscriptions at Karnak indicate [4, p. 208-210].

Unfortunately for the great kingdoms the invaders did not play by the rules of chariot warfare. After all, they did not have chariots. They were people of the sea, who poured off their boats to plunder and destroy the great cities. A force of several thousand skirmishers, possibly crammed into no more than thirty or forty boats, would have been sufficient to defeat whatever chariot force sallied out against them.

Rather than riding a chariot, these foot soldiers ran onto the battlefield in massive numbers and launched javelins at the charioteers [4, p. 136-139].

In contrast, the armies of the great kingdoms shot arrows from their chariots and used lances to knock opposing charioteers to the ground. In addition, they wore plate armour and used greaves to protect their arms, they had large shields meant to deflect a volley of arrows and they used short swords. The chariot armies of the great kingdoms were not prepared for hordes of foot soldiers who did not ride in chariots and did not rely on the bow. Their versatility and huge numbers caused enormous problems for armies of chariots. The great kingdoms had to rethink their battle tactics quickly. The Egyptians and Assyrians survived this dramatic shift in warfare, albeit in an altered state. To counter this new type of foe, they and the other great kingdoms abandoned the use of chariots in battle in favour of the heavy infantryman [5, S. 289-290].

Effects of the collapse

– End of the Mycenaean Civilization (Greece fell into a “Dark Age” with population decline and loss of writing).

– Destruction of the Hittite Empire (their capital Hattusa was burned and abandoned).

– Weakened Egyptian New Kingdom (survived but entered decline after fending off the Sea Peoples).

– Disappearance of Canaanite City-States (later replaced by new groups like the Israelites and Philistines).

– Mass migrations & cultural shifts, leading to new power centres in the Iron Age.

This period reshaped the Mediterranean world, paving the way for the rise of new civilizations like the Phoenicians, Israelites and later the Greek city-states. The Bronze Age collapse of the great kingdoms of the Eastern Mediterranean remains a topic of scholarly debate. It is clear, however, that no one factor is to blame. Several factors conspired to produce the calamity and to create conditions favourable for transition into the great Classical Age that emerged after the Dark Ages.

Environmental factors may have initially caused the mass migrations that led to violent contact between the great kingdoms and hordes of marauders. Cultural factors may have allowed or exacerbated the problems caused by the invasions. Military factors allowed the "barbarian" invaders to take down some of antiquity's greatest civilizations. It was indeed a catastrophe for most civilizations in the region, especially the great kingdoms. However, the Philistines, Israelites, Arameans, Assyrians and others actually benefitted from the decline of the traditional powers. As with the European medieval period and the Great Depression in the United States, great civilizations sometimes rise out of the ashes of a dark age [3, p. 164-167].

Conclusion

Most civilizations collapse when multiple factors hit at once. For example: The Bronze Age Collapse (c. 1200 BCE) → climate change + invasions + economic decline + earthquakes. The fall of the Roman Empire (476 CE) → economic crisis + corruption + invasions + disease. The Mayan collapse (c. 900 CE) → drought + deforestation + warfare + political instability.

At some point, a social system will also outlive itself and a reorganization of society is needed. Such a collapse can form the basis for a new and much stronger society, creating opportunities for further societal developments in a given area. This has been the case in the Eastern Mediterranean region.

However, one crucial reason to the collapse was the shift from Bronze to Iron: 1) Iron ore was abundant and did not rely on fragile trade routes; 2) Iron tools were cheaper to make and stronger with the right forging techniques; 3) Iron weapons helped armies dominate, leading to military and political shifts and 4) Iron farming tools increased food production, supporting larger populations.

Thus, iron making several hundred years later became the foundation of powerful Iron Age civilizations like the Assyrians, Greeks, Romans and Persians. Iron laid the first foundation for the civilization we have today. Therefore, one must conclude that the Late Bronze Collapse has had a greater or lesser impact on the

technical development in the last 3,000 years and the Late Bronze Age Collapse was necessary for such a development.

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Data about the author:

Christensen Carsten Sander – Doctor of History (PhD), Independent Researcher (Billund, Denmark).

Сведения об авторе:

Христенсен Карстен Сандер – доктор истории (PhD), независимый исследователь (Биллунд, Дания).

E-mail: arroyoinfancia74@gmail.com.