

BRONZ DÖNEMİNDE DÜNYADAKİ GELİŞMELER

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Bronze Age

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One of the [Alaca Höyük bronze standards](#) from a pre-Hittite tomb dating to the 3rd millennium BC, from the [Museum of Anatolian Civilizations](#) in [Ankara](#)

Bronze Age

↑ [Chalcolithic](#)

Africa, [Near East](#) (c. 3300–1200 BC)

East Asia (c. 3100–300 BC)

Eurasia and Siberia (c. 2700–700 BC)

[Europe](#) (c. 3200–900 BC)

[Indian subcontinent](#) (c. 3300–1200 BC)

Topics

↓ [Iron Age](#)

[History of technology](#)

By technological eras

By historical regions

By type of technology

Technology timelines

Bronze Age (c. 3300 – c. 1200 BC) was a historical period characterised 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](#).^[1] Conceived as a global era, the Bronze Age follows the [Neolithic](#), with a transition period between the two known as the [Chalcolithic](#). The final decades of the Bronze Age in the [Mediterranean basin](#) are often characterised 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.

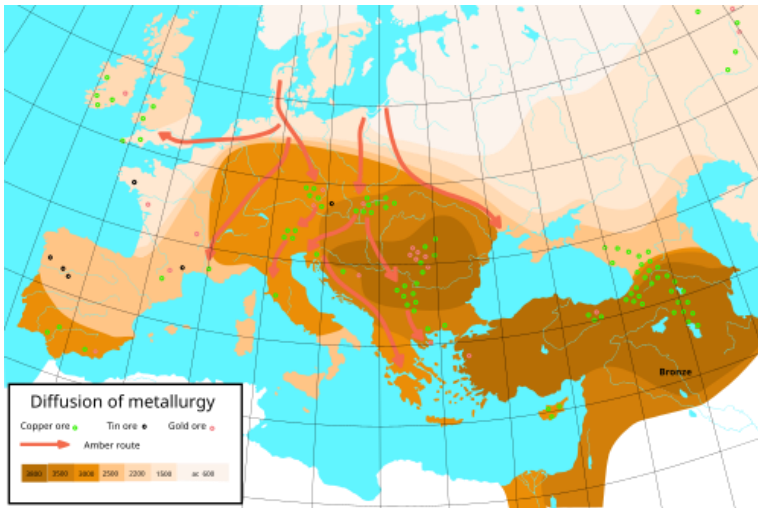
An [ancient civilisation](#) is deemed to be part of the Bronze Age if it either produced bronze by [smelting](#) its own copper and [alloying](#) it with [tin](#), [arsenic](#), or other metals, or traded other items for bronze from producing areas elsewhere. Bronze Age cultures were the first to [develop writing](#). According to archaeological evidence, cultures in [Mesopotamia](#), which used [cuneiform](#) script, and [Egypt](#), which used [hieroglyphs](#), developed the earliest practical writing systems. In the [Archaeology of the Americas](#), a five-period system is conventionally used instead, which does not include a Bronze Age, though some cultures there did smelt copper and bronze. There was no metalworking on the Australian continent prior to the establishment of European settlements in 1788.

In many areas bronze continued to be rare and expensive, mainly because of difficulties in obtaining enough tin, which occurs in relatively few places, unlike the very common copper. Some societies appear to have gone through much of the Bronze Age using bronze only for weapons or elite art, such as [Chinese ritual bronzes](#), with ordinary farmers largely still using stone tools. However, this is hard to assess as the rarity of bronze meant it was keenly recycled.

Metal use

Further information: [Tin sources and trade during antiquity](#)

Bronze Age civilisations gained a technological advantage due to [bronze](#)'s harder and more durable properties than other [metals](#) available at the time. While terrestrial iron is naturally abundant, the higher temperature required for smelting, 1,250 °C (2,280 °F), in addition to the greater difficulty of working with it, placed it out of reach of common use until the end of the 2nd millennium BC.^{[[citation needed](#)]} Tin's lower melting point of 232 °C (450 °F) and copper's moderate melting point of 1,085 °C (1,985 °F) placed both these metals within the capabilities of Neolithic pottery [kilns](#),^{[[citation needed](#)]} which date to 6000 BC and were able to produce temperatures of at least 900 °C (1,650 °F).^[2]



Diffusion of [metallurgy](#) in Europe and [Asia Minor](#)—the darkest areas are the oldest.

The Bronze Age is characterised by the widespread use of bronze, though the introduction and development of bronze technology were not universally synchronous. Bronze was independently discovered in the [Maykop culture](#) of the [North Caucasus](#) as early as the mid-4th millennium BC, which makes them the producers of the oldest-known bronze. However, the Maykop culture only had [arsenical bronze](#). Other regions developed bronze and its associated technology at different periods. Tin bronze technology requires systematic techniques: tin must be mined (mainly as the tin ore [cassiterite](#)) and smelted separately, then added to hot copper to make bronze alloy. The Bronze Age was a time of extensive use of metals and the development of trade networks.

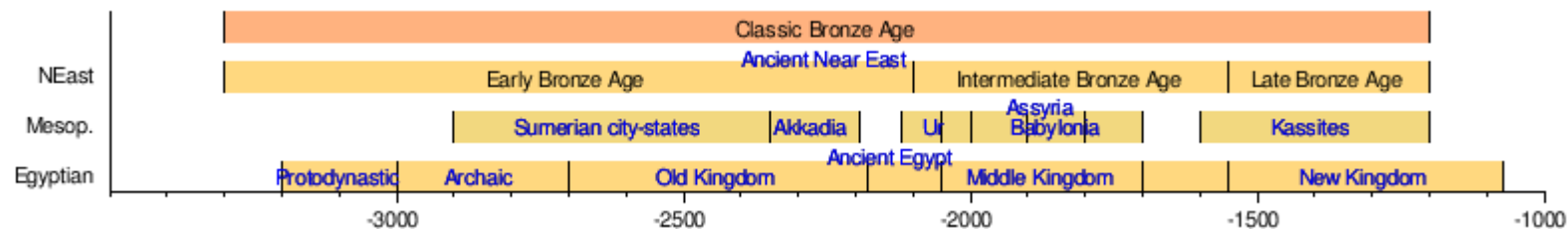
A 2013 report suggests that the earliest tin-alloy bronze was a [foil](#) dated to the mid-5th millennium BC from a [Vinča culture](#) site in [Pločnik, Serbia](#), although this culture is not conventionally considered part of the Bronze Age;^[3] however, the dating of the foil has been disputed.^{[4][5]}

Near East

Main article: [Ancient Near East](#)

West Asia and the [Near East](#) were the first regions to enter the Bronze Age, beginning with the rise of the [Mesopotamian](#) civilisation of [Sumer](#) in the mid-4th millennium BC. Cultures in the ancient Near East practised intensive year-round agriculture; developed [writing systems](#); invented the [potter's wheel](#), created [centralised governments](#) (usually in the form of [hereditary monarchies](#)), formulated written law codes, developed [city-states](#), nation-states and empires; embarked on advanced architectural projects; and introduced [social stratification](#), economic and civil administration, [slavery](#), and practised organised warfare, medicine, and religion. Societies in the region laid the foundations for [astronomy](#), mathematics, and [astrology](#).

The following dates are approximate.

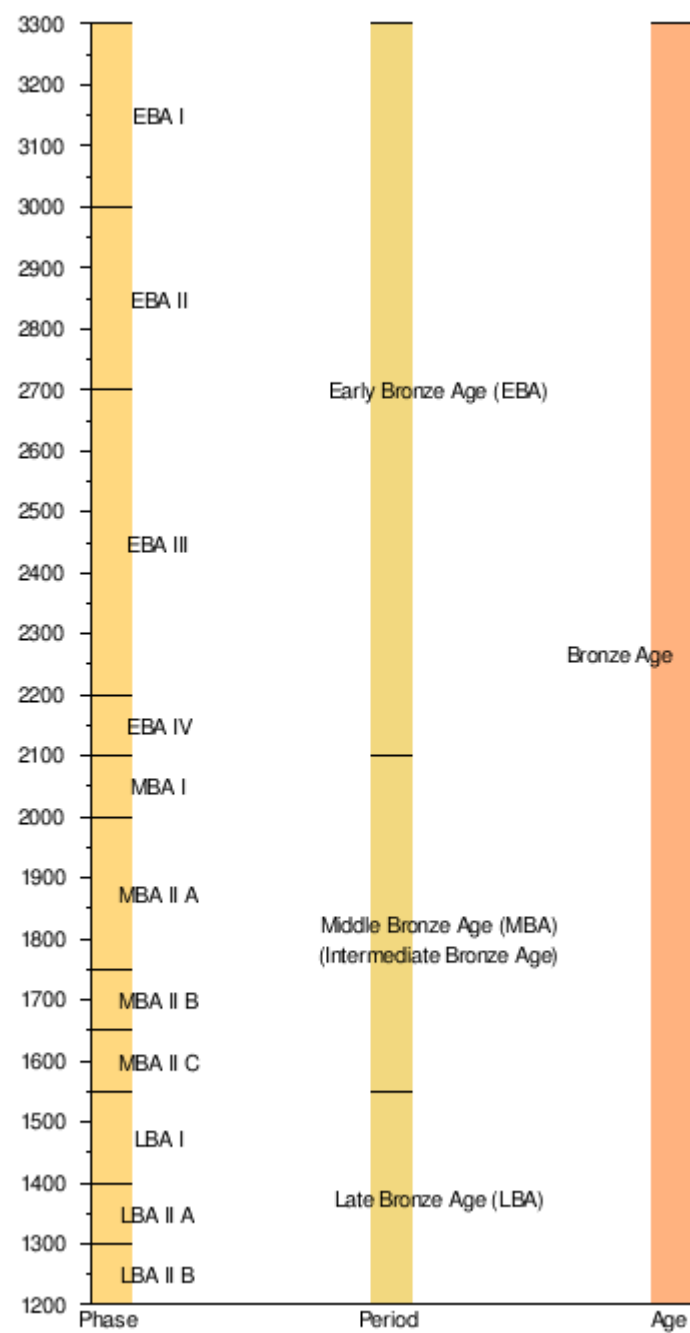


Near East Bronze Age divisions

The Bronze Age in the Near East can be divided into Early, Middle and Late periods. The dates and phases below apply solely to the Near East, not universally.^{[6][7][8]} However, some archaeologists propose a "high chronology", which extends periods such as the Intermediate Bronze Age by 300 to 500–600 years, based on material analysis of the [southern Levant](#) in cities such as [Hazor](#), [Jericho](#), and [Beit She'an](#).^[9]

- Early Bronze Age (EBA): 3300–2100 BC
 - 3300–3000: EBA I
 - 3000–2700: EBA II
 - 2700–2200: EBA III

- 2200–2100: EBA IV
- Middle Bronze Age (MBA) or Intermediate Bronze Age (IBA): 2100–1550 BC
 - 2100–2000: MBA I
 - 2000–1750: MBA II A
 - 1750–1650: MBA II B
 - 1650–1550: MBA II C
- Late Bronze Age (LBA): 1550–1200 BC
 - 1550–1400: LBA I
 - 1400–1300: LBA II A
 - 1300–1200: LBA II B ([Late Bronze Age collapse](#))



Anatolia

Further information: [Prehistory of Anatolia § Bronze Age](#)



Hittite bronze tablet from Çorum-Boğazköy dating from 1235 BC, [Museum of Anatolian Civilizations](#), [Ankara](#)

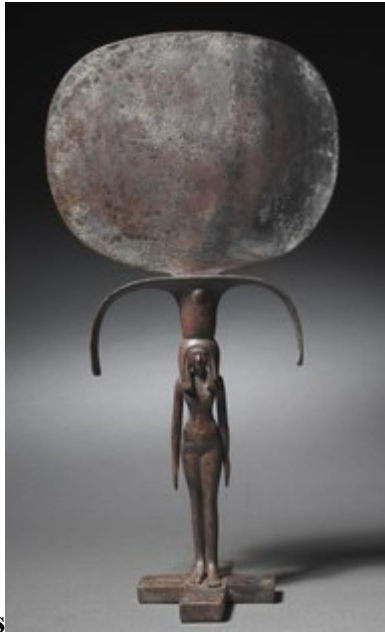
The [Hittite Empire](#) was established during the 18th century BC in [Hattusa](#), northern [Anatolia](#). At its height in the 14th century BC, the Hittite Kingdom encompassed central Anatolia, southwestern Syria as far as [Ugarit](#), and upper [Mesopotamia](#). After 1180 BC, amid general turmoil in the [Levant](#), which is conjectured to have been associated with the sudden arrival of the [Sea Peoples](#),^{[10][11]} the kingdom disintegrated into several independent "Neo-Hittite" city-states, some of which survived into the 8th century BC.

[Arzawa](#), in Western Anatolia, during the second half of the 2nd millennium BC, likely extended along southern Anatolia in a belt from near the [Turkish Lakes region](#) to the [Aegean](#) coast. [Arzawa](#) was the western neighbour of the Middle and New [Hittite Kingdoms](#), at times a rival and, at other times, a vassal.

The [Assuwa league](#) was a confederation of states in western Anatolia defeated by the Hittites under the earlier [Tudhaliya I](#) c. 1400 BC. Arzawa has been associated with the more obscure [Assuwa](#) generally located to its north. It probably bordered it, and may have been an alternative term for it during some periods.

Egypt

Main article: [Ancient Egypt](#)



Early Bronze dynas ties



Bronze mirror with a female human figure at the base, [Eighteenth Dynasty of Egypt](#) (1540–1296 BC)
Sphinx-lion of [Thutmose III](#) (1479–1425 BC)

In [Ancient Egypt](#), the Bronze Age began in the [Protodynastic Period](#) c. 3150 BC. The archaic *Early Bronze Age of Egypt*, known as the [Early Dynastic Period of Egypt](#),^{[12][13]} immediately followed the unification of Lower and Upper Egypt, c. 3100 BC. It is generally taken to include the [First](#) and [Second](#) dynasties, lasting from the Protodynastic Period until c. 2686 BC, or the beginning of the [Old Kingdom](#). With the First Dynasty, the capital moved from [Abydos](#) to Memphis with a unified Egypt ruled by an Egyptian god-king. Abydos remained the major holy land in the south. The hallmarks of ancient Egyptian civilisation, such as art, architecture and religion, took shape in the Early Dynastic Period. [Memphis](#), in the Early Bronze Age, was the largest city of the time. The Old Kingdom of the regional Bronze Age^[12] is the name given to the period in the 3rd millennium BC when Egyptian civilisation attained its first continuous peak of complexity and achievement—the first of three "Kingdom" periods which marked the high points of civilisation in the [lower Nile Valley](#) (the others being the [Middle Kingdom](#) and [New Kingdom](#)).

The [First Intermediate Period of Egypt](#),^[14] often described as a "dark period" in ancient Egyptian history, spanned about 100 years after the end of the Old Kingdom from about 2181 to 2055 BC. Very little monumental evidence survives from this period, especially from the early part of it. The First Intermediate Period was a dynamic time when the rule of Egypt was roughly divided between two areas: [Heracleopolis](#) in Lower Egypt and [Thebes](#) in Upper Egypt. These two kingdoms eventually came into conflict, and the Theban kings conquered the north, reunifying Egypt under a single ruler during the second part of the [Eleventh Dynasty](#).

Nubia

The Bronze Age in [Nubia](#) started as early as 2300 BC.^[15] Egyptians introduced copper smelting to the Nubian city of [Meroë](#) in present-day [Sudan](#) c. 2600 BC.^[16] A furnace for bronze casting found in [Kerma](#) has been dated to 2300–1900 BC.^[15]

Middle Bronze dynasties

The [Middle Kingdom of Egypt](#) spanned between 2055 and 1650 BC. During this period, the Osiris funerary cult rose to dominate popular [Ancient Egyptian religion](#). The period comprises two phases: the Eleventh Dynasty, which ruled from Thebes, and the [Twelfth](#)^[17] and [Thirteenth](#) dynasties, centred on [el-Lisht](#). The unified kingdom was previously considered to comprise the Eleventh and Twelfth Dynasties, but historians now consider part of the Thirteenth Dynasty to have belonged to the Middle Kingdom.

During the [Second Intermediate Period](#),^[18] Ancient Egypt fell into disarray a second time between the end of the Middle Kingdom and the start of the New Kingdom, best known for the [Hyksos](#), whose reign comprised the [Fifteenth](#) and [Sixteenth](#) dynasties. The Hyksos first appeared in Egypt during the Eleventh Dynasty, began their climb to power in the Thirteenth Dynasty, and emerged from the Second Intermediate Period in control of [Avaris](#) and the [Nile Delta](#). By the Fifteenth Dynasty, they ruled lower Egypt. They were expelled at the end of the [Seventeenth Dynasty](#).

Late Bronze dynasties

The [New Kingdom of Egypt](#), also referred to as the Egyptian Empire, existed during the 16th–11th centuries BC. The New Kingdom followed the Second Intermediate Period and was succeeded by the [Third Intermediate Period](#). It was Egypt's most prosperous time and marked the peak of Egypt's power. The later New Kingdom, comprising the [Nineteenth](#) and [Twentieth](#) dynasties (1292–1069 BC), is also known as the [Ramesside period](#), after the eleven pharaohs who took the name of Ramesses.

Iranian plateau



Late 3rd-millennium BC silver cup from Marvdasht, [Fars](#), with linear-Elamite inscription

Further information: [Iranian plateau](#)

[Elam](#) was a pre-Iranian ancient civilisation located east of Mesopotamia. In the Middle Bronze Age, Elam consisted of kingdoms on the [Iranian plateau](#), centred in [Anshan](#). From the mid-2nd millennium BC, Elam was centred in [Susa](#) in the [Khuzestan](#) lowlands. Its culture played a crucial role in both the [Gutian Empire](#) and the Iranian [Achaemenid dynasty](#) that succeeded it.

The [Oxus civilisation](#)^[19] was a Bronze Age Central Asian culture dated c. 2300–1700 BC and centred on the upper [Amu Darya](#) (a.k.a.). In the Early Bronze Age, the culture of the [Kopet Dag](#) oases and [Altyndepe](#) developed a proto-urban society. This corresponds to level IV at [Namazga-Tepe](#). Altyndepe was a major centre even then. Pottery was wheel-turned. Grapes were grown. The height of this urban development was reached in the Middle Bronze Age c. 2300 BC, corresponding to level V at Namazga-Depe.^[20] This Bronze Age culture is called the [Bactria–Margiana Archaeological Complex](#).

The [Kulli culture](#),^{[21][22]} similar to that of the [Indus Valley Civilisation](#), was located in southern [Balochistan](#) (Gedrosia) c. 2500–2000 BC. The economy was agricultural. Dams were found in several places, providing evidence for a highly developed water management system.



[Master of Animals](#) in [chlorite](#), [Jiroft culture](#), c. 2500 BC, Bronze Age I, [National Museum of Iran](#)

[Konar Sandal](#) is associated with the hypothesized [Jiroft culture](#), a 3rd-millennium BC culture postulated based on a collection of artefacts confiscated in 2001.

Levant



Chalcolithic copper mine in the [Timna Valley](#), Negev Desert, Israel

Further information: [History of the ancient Levant § Bronze Age](#), [Canaan](#), [Prehistory of the Levant](#), and [List of archaeological periods \(Levant\)](#)

In modern scholarship, the chronology of the Bronze Age Levant is divided into:

- Early Syrian, or Proto Syrian – corresponding to the Early Bronze Age
- Old Syrian – corresponding to the Middle Bronze Age
- Middle Syrian – corresponding to the Late Bronze Age

The term *Neo-Syria* is used to designate the early [Iron Age](#).^[23]

The old Syrian period was dominated by the [Eblaite first kingdom](#), [Nagar](#) and the [Mariote second kingdom](#). The [Akkadians](#) conquered large areas of the Levant and were followed by the [Amorite kingdoms](#), c. 2000–1600 BC, which arose in [Mari](#), [Yamhad](#), [Qatna](#), and [Assyria](#).^[24] From the 15th century BC onward, the term [Amurru](#) is usually applied to the region extending north of [Canaan](#) as far as [Kadesh](#) on the [Orontes River](#).

The earliest-known contact of [Ugarit](#) with Egypt (and the first exact dating of Ugaritic civilisation) comes from a [carnelian](#) bead identified with the Middle Kingdom pharaoh [Senusret I](#), whose reign is dated to 1971–1926 BC. A [stela](#) and a statuette of the Egyptian pharaohs [Senusret III](#) and [Amenemhet III](#) have also been found. However, it is unclear when they first arrived at Ugarit. In the [Amarna letters](#), messages from Ugarit c. 1350 BC written by [Ammittamru I](#), [Niqmaddu II](#), and his queen have been discovered. From the 16th to the 13th century BC, Ugarit remained in constant contact with Egypt and Cyprus ([Alashiya](#)).

[Mitanni](#) was a loosely organised state in northern Syria and south-east Anatolia, emerging c. 1500–1300 BC. Founded by an [Indo-Aryan](#) ruling class that governed a predominantly [Hurrian](#) population, Mitanni came to be a regional power after the Hittite destruction of [Kassite](#) Babylon created a power vacuum in Mesopotamia. At its beginning, Mitanni's major rival was Egypt under the [Thutmosids](#). However, with the ascent of the Hittite empire, Mitanni and Egypt allied to protect their mutual interests from the threat of Hittite domination. At the height of its power during the 14th century BC, Mitanni had outposts centred on its capital, [Washukanni](#), which archaeologists have located on the headwaters of the [Khabur River](#). Eventually, Mitanni succumbed to the Hittites and later [Assyrian](#) attacks, eventually being reduced to a province of the [Middle Assyrian Empire](#).

The [Israelites](#) were an [ancient Semitic-speaking people](#) of the [Ancient Near East](#) who inhabited part of Canaan during the [tribal and monarchic periods](#) (15th–6th centuries BC),^{[25][26][27][28][29]} and lived in the region in smaller numbers after the fall of the monarchy. The name "Israel" first appears c. 1209 BC, at the end of the Late Bronze Age and the very beginning of the Iron Age, on the [Merneptah Stele](#) raised by the Egyptian pharaoh [Merneptah](#).

The [Arameans](#) were a Northwest Semitic semi-nomadic [pastoral](#) people who originated in what is now modern Syria (Biblical [Aram](#)) during the Late Bronze and early Iron Age. Large groups migrated to Mesopotamia, where they intermingled with the native Akkadian (Assyrian and Babylonian) population. The Aramaeans never had a unified empire; they were divided into independent kingdoms all across the Near East. After the [Bronze Age](#) collapse, their political influence was confined to Syro-Hittite states, which were entirely absorbed into the [Neo-Assyrian Empire](#) by the 8th century BC.

Mesopotamia

Main article: [History of Mesopotamia](#)



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The [Mesopotamian Bronze Age](#) began c. 3500 BC and ended with the [Kassite](#) period c. 1500 – c. 1155 BC). The usual tripartite division into an Early, Middle and Late Bronze Age is not used in the context of Mesopotamia. Instead, a division primarily based on art and historical characteristics is more common.

The [cities of the Ancient Near East](#) housed several tens of thousands of people. [Ur](#), [Kish](#), [Isin](#), [Larsa](#), and [Nippur](#) in the Middle Bronze Age and [Babylon](#), [Calah](#), and [Assur](#) in the Late Bronze Age similarly had large populations. The [Akkadian Empire](#) (2335–2154 BC) became the dominant power in the region. After its fall, the [Sumerians](#) enjoyed a renaissance with the [Neo-Sumerian Empire](#). [Assyria](#), along with the [Old Assyrian Empire](#) (c. 1800–1600 BC), became a regional power under the [Amorite](#) king [Shamshi-Adad I](#). The earliest mention of Babylon (then a small administrative town) appears on a tablet from the reign of [Sargon of Akkad](#) in the 23rd century BC. The Amorite dynasty established the city-state of Babylon in the 19th century BC. Over a century later, it briefly took over the other city-states and formed the short-lived First Babylonian Empire during what is also called the [Old Babylonian Period](#).

Akkad, Assyria, and Babylonia used the written East Semitic [Akkadian language](#) for official use and as a spoken language. By that time, the Sumerian language was no longer spoken, but was still in religious use in Assyria and Babylonia, and would remain so until the 1st century AD. The [Akkadian](#) and Sumerian traditions played a major role in later Assyrian and Babylonian culture. Despite this, Babylonia, unlike the more militarily powerful Assyria, was founded by non-native Amorites and often ruled by other non-indigenous peoples such as the [Kassites](#), [Arameans](#) and [Chaldeans](#), as well as by its Assyrian neighbours.

Asia



Political boundaries in 2000 BC

Central Asia

Agropastoralism

For many decades, scholars made superficial reference to Central Asia as the "pastoral realm" or alternatively, the "nomadic world", in what researchers call the "Central Asian void": a 5,000-year span that was neglected in studies of the origins of agriculture. Foothill regions and glacial melt streams supported Bronze Age agro-pastoralists who developed complex east–west trade routes between Central Asia and China that introduced wheat and [barley](#) to China and [millet](#) to Central Asia.^[30]

Bactria–Margiana Archaeological Complex

Main article: [Bactria–Margiana Archaeological Complex](#)

The [Bactria–Margiana Archaeological Complex](#) (BMAC), also known as the Oxus civilisation, was a Bronze Age civilisation in Central Asia, dated c. 2400 – c. 1600 BC,^[31] located in present-day northern [Afghanistan](#), eastern [Turkmenistan](#), southern [Uzbekistan](#) and western [Tajikistan](#), centred on the upper [Amu Darya](#) (Oxus River). Its sites were discovered and named by the Soviet archaeologist [Viktor Sarianidi](#) (1976). [Bactria](#)

was the Greek name for the area of [Bactra](#) (modern [Balkh](#)), in what is now northern Afghanistan, and [Margiana](#) was the Greek name for the Persian [satrapy](#) of [Marguš](#), the capital of which was [Merv](#) in present-day Turkmenistan.

A wealth of information indicates that the BMAC had close international relations with the [Indus Valley](#), the [Iranian plateau](#), and possibly even indirectly with Mesopotamia. All civilisations were familiar with [lost wax casting](#).^[32]

According to a 2019 study,^[33] the BMAC was not a primary contributor to later South-Asian genetics.

Seima-Turbino phenomenon

Main article: [Seima-Turbino phenomenon](#)

The [Altai Mountains](#), in what is now southern Russia and central [Mongolia](#), have been identified as the point of origin of a cultural enigma termed the [Seima-Turbino Phenomenon](#).^[34] It is conjectured that changes in climate in this region c. 2000 BC, and the ensuing ecological, economic, and political changes, triggered a rapid and massive migration westward into northeast Europe, eastward into China, and southward into Vietnam and Thailand^[35] across a frontier of some 4,000 mi (6,000 km).^[34] This migration took place in just five to six generations and led to peoples from Finland in the west to Thailand in the east employing the same metalworking technology and, in some areas, horse breeding and riding.^[34] However, recent genetic testings of sites in south Siberia and [Kazakhstan](#) ([Andronovo](#) horizon) would rather support spreading of the bronze technology via [Indo-European migrations](#) eastwards, as this technology had been well known for quite a while in western regions.^{[36][37]}

It is further conjectured that the same migrations spread the [Uralic](#) group of languages across Europe and Asia, with extant members of the family including [Hungarian](#), [Finnish](#) and [Estonian](#).^[34]

East Asia

China

Main articles: [Erlitou culture](#), [Shang dynasty](#), [Sanxingdui](#), and [Lower Xiajiadian culture](#)



A [Shang dynasty](#) two-handled bronze *gefuding gui* (1600–1046 BC)



[Spring and Autumn period](#) *pu* bronze vessel with interlaced [dragon](#) design (c. 770 – c. 481 BC)

In China, the earliest bronze artefacts have been found in the [Majiyao culture](#) site (3100–2700 BC).^{[38][39]}

The term "Bronze Age" has been transferred to the archaeology of China from that of Western Eurasia, and there is no consensus or universally used convention delimiting the "Bronze Age" in the context of [Chinese prehistory](#).^[40] The "Early Bronze Age" in China is sometimes taken to be coterminous with the reign of the [Shang dynasty](#) (16th–11th centuries BC),^[41] and the Later Bronze Age with the subsequent [Zhou dynasty](#) (11th–3rd centuries BC), from the 5th century, called [Iron Age China](#) although there is an argument to be made that the Bronze Age never properly ended in China, as there is no recognisable transition to an Iron Age.^[42] Together with the jade art that precedes it, bronze was seen as a fine material for ritual art when compared with iron or stone.^[43]

Bronze metallurgy in China originated in what is referred to as the [Erlitou](#) period, which some historians argue places it within the Shang.^[44] Others believe the Erlitou sites belong to the preceding [Xia dynasty](#).^[45] The United States [National Gallery of Art](#) defines the Chinese Bronze Age as c. 2000 – c. 771 BC, a period that begins with the Erlitou culture and ends abruptly with the disintegration of [Western Zhou](#) rule.^[46]

There is reason to believe that bronze work developed inside of China apart from outside influence.^[47] However, the discovery of the Europoid [Tarim mummies](#) in Xinjiang has caused some archaeologists such as [Johan Gunnar Andersson](#), Jan Romgard, and An Zhimin to suggest a possible route of transmission from the West eastwards. According to An Zhimin, "It can be imagined that initially, bronze and iron technology took its rise in West Asia, first influenced the Xinjiang region, and then reached the Yellow River valley, providing external impetus for the rise of the Shang and Zhou civilizations." According to Jan Romgard, "bronze and iron tools seem to have traveled from west to east as well as the use of wheeled wagons and the domestication of the horse." There are also possible links to [Seima-Turbino culture](#), "a transcultural complex across northern Eurasia", the Eurasian steppe, and the Urals.^[48] However, the oldest bronze objects found in China so far were discovered at the [Majiayao](#) site in [Gansu](#) rather than at [Xinjiang](#).^[49]

The production of Erlitou represents the earliest large-scale metallurgy industry in the Central Plains of China. The influence of the Seima-Turbino metalworking tradition from the north is supported by a series of recent discoveries in China of many unique perforated spearheads with downward hooks and small loops on the same or opposite side of the socket, which could be associated with the Seima-Turbino visual vocabulary of southern Siberia. The metallurgical centres of northwestern China, especially the [Qijia culture](#) in Gansu and [Longshan culture](#) in [Shaanxi](#), played an intermediary role in this process.^[50]

Iron use in China dates as early as the [Zhou dynasty](#) (c. 1046 – 256 BC), but remained minimal. Chinese literature authored during the 6th century BC attests to knowledge of iron smelting, yet bronze continues to occupy the seat of significance in the archaeological and historical record for some time after this.^[51] W. C. White argues that iron did not supplant bronze "at any period before the end of the Zhou dynasty (256 BC)" and that bronze vessels make up the majority of metal vessels through the [Eastern Han period](#), or to 221 BC.^[52]

The Chinese bronze artefacts generally are either utilitarian, like spear points or [adze](#) heads, or "[ritual bronzes](#)", which are more elaborate versions in precious materials of everyday vessels, as well as tools and weapons. Examples are the numerous large sacrificial tripods known as [dings](#); there are many other distinct shapes. Surviving identified Chinese ritual bronzes tend to be highly decorated, often with the [taotie](#) motif, which involves stylised animal faces. These appear in three main motif types: those of demons, symbolic animals, and abstract symbols.^[53] Many large bronzes also bear [cast inscriptions](#) that are the bulk of the surviving body of early [Chinese writing](#) and have helped historians and archaeologists piece together the history of China, especially during the Zhou dynasty.

The bronzes of the Western Zhou document large portions of history not found in the extant texts that were often composed by persons of varying rank and possibly even social class. Further, the medium of cast bronze lends the record they preserve a permanence not enjoyed by manuscripts.^[54] These inscriptions can commonly be subdivided into four parts: a reference to the date and place, the naming of the event commemorated, the list of gifts given to the artisan in exchange for the bronze, and a dedication.^[55] The relative points of reference these vessels provide have enabled historians to place most of the vessels within a certain time frame of the Western Zhou period, allowing them to trace the evolution of the vessels and the events they record.^[56]

Japan

Main article: [Yayoi period](#)



2nd-century BC Yayoi [dōtaku](#) bronze bell



2nd-century BC Yayoi bronze

spearheads

The Japanese archipelago saw the introduction of bronze during the early [Yayoi period](#) (c. 300 BC), which saw the introduction of metalworking and agricultural practices brought by settlers arriving from the continent. Bronze and iron smelting spread to the Japanese archipelago through contact with other ancient East Asian civilisations, particularly immigration and trade from the ancient Korean peninsula, and ancient mainland China. Iron was mainly used for agricultural and other tools, whereas ritual and ceremonial artefacts were mainly made of bronze. ^[clarification needed]^[57]

Korea

Main articles: [Gojoseon](#) and [Mumun pottery period](#)



Bronze artefacts from Daegok-ri, [Hwasun](#), Korea

On the Korean Peninsula, the Bronze Age began c. 1000–800 BC. ^[58]^[59] Initially centred around [Liaoning](#) and southern Manchuria, Korean Bronze Age culture exhibits unique typology and styles, especially in ritual objects. ^[citation needed]

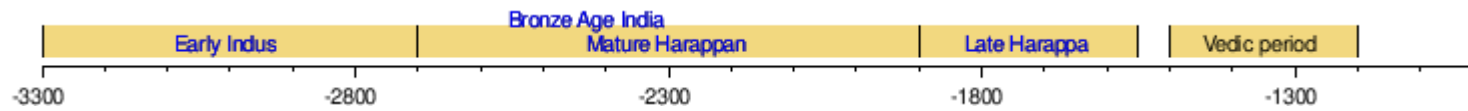
The [Mumun pottery period](#) is named after the Korean name for undecorated or plain cooking and storage vessels that form a large part of the pottery assemblage over the entire length of the period, but especially between 850 and 550 BC. The Mumun period is known for the origins of intensive agriculture and complex societies in both the Korean Peninsula and the Japanese Archipelago.

The Middle Mumun pottery period culture of the southern [Korean Peninsula](#) gradually adopted bronze production (c. 700–600 BC) after a period when [Liaoning-style bronze daggers](#) and other bronze artefacts were exchanged as far as the interior part of the Southern Peninsula (c. 900–700 BC). The bronze daggers lent prestige and authority to the personages who wielded and were buried with them in high-status megalithic

burials at south-coastal centres such as the [Igeum-dong site](#). Bronze was an important element in ceremonies and for mortuary offerings until 100 BC.

South Asia

(Dates are approximate, consult linked articles for details)



Indus Valley

Main article: [Indus Valley Civilisation](#)



[Dancing girl](#) of [Mohenjo-daro](#), c. 2500 BC

The Bronze Age on the [Indian subcontinent](#) began c. 3300 BC with the beginning of the [Indus Valley Civilization](#). Inhabitants of the Indus Valley, the [Harappans](#), developed new techniques in metallurgy and produced copper, bronze, lead, and tin. The Late Harappan culture (1900–1400 BC), overlapped the transition from the Bronze Age to the Iron Age; thus it is difficult to date this transition accurately. It has been claimed that a 6,000-year-old copper amulet manufactured in [Mehrgarh](#) in the shape of a wheel spoke is the earliest example of [lost-wax casting](#) in the world.^{[60][61]}

The civilisation's cities were noted for their urban planning, baked brick houses, elaborate drainage systems, water supply systems, clusters of large non-residential buildings, and new techniques in handicraft (carnelian products, seal carving) and metallurgy (copper, bronze, lead, and tin).^[62] The large cities of [Mohenjo-daro](#) and [Harappa](#) likely grew to contain between 30,000 and 60,000 people,^[63] and the civilisation during its florescence may have contained between one and five million people.^[64]

Southeast Asia

The [Vilabouly Complex](#) in Laos is a significant archaeological site for dating the origin of bronze metallurgy in Southeast Asia.

Thailand

In [Ban Chiang](#), Thailand, bronze [artefacts](#) have been discovered that date to 2100 BC.^[65] However, according to the radiocarbon dating on the human and pig bones in Ban Chiang, some scholars propose that the initial Bronze Age in Ban Chiang was in the late 2nd millennium.^[66] In [Nyaung-gan](#), Myanmar, bronze tools have been excavated along with ceramics and stone artefacts. Dating is still currently broad (2300–500 BC).^[67] [Ban Non Wat](#), excavated by [Charles Higham](#), was a rich site with over 640 graves excavated that gleaned many complex bronze items that may have had social value connected to them.^[68]

Ban Chiang, however, is the most thoroughly documented site and has the clearest evidence of metallurgy when in Southeast Asia. With a rough date range from the late 3rd millennium BC to the 1st millennium AD, this site has artefacts such as burial pottery (dated 2100–1700 BC) and fragments of bronze and copper-base bangles. This technology suggested on-site casting from the beginning. The on-site casting supports the theory that bronze was first introduced in Southeast Asia from a different country.^[69] Some scholars believe that copper-based metallurgy was disseminated from northwest and central China south and southwest via areas such as [Guangdong](#) and [Yunnan](#) and finally into southeast Asia c. 1000 BC.^[66] Archaeology also suggests that Bronze Age metallurgy may not have been as significant a catalyst in social stratification and warfare in Southeast Asia as in other regions, and that social distribution shifted away from chiefdoms to a [heterarchical](#) network.^[69] Data

analyses of sites such as Ban Lum Khao, Ban Na Di, Non-Nok Tha, Khok Phanom Di, and Nong Nor have consistently led researchers to conclude that there was no entrenched hierarchy.^[70]

Vietnam

Further information: [Dong Son culture](#)

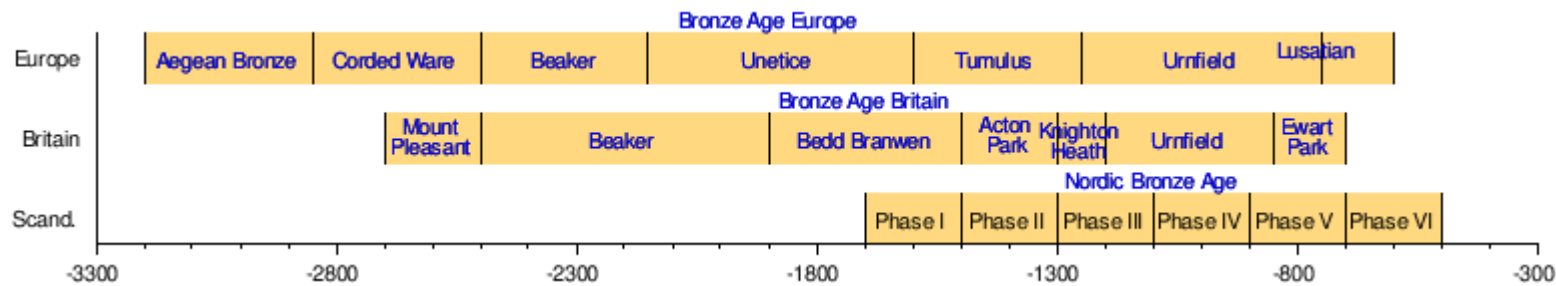
Dating to the Neolithic, the first bronze drums, called the [Dong Son drums](#), were uncovered in and around the [Red River Delta](#) regions of northern Vietnam and Southern China. These relate to the [Dong Son culture](#) of Vietnam.^[71]

Archaeological research in Northern Vietnam indicates an increase in rates of infectious disease following the advent of metallurgy; skeletal fragments in sites dating to the early and mid-Bronze Age evidence a greater proportion of lesions than in sites of earlier periods.^[72] There are a few possible implications of this. One is the increased contact with bacterial and/or fungal pathogens due to increased population density and land clearing/cultivation. Another implication is decreased levels of immunocompetence in the Metal Age due to changes in diet caused by agriculture. The last implication is that there may have been an emergence of infectious diseases that evolved into a more virulent form in the metal period.^[72]

Europe

Main article: [Bronze Age Europe](#)

A few examples of named Bronze Age cultures in Europe roughly in relative order—dates are approximate.



The chosen cultures overlapped in time and the indicated periods do not fully correspond to their estimated extents.

Southeast Europe

Main articles: [Old Europe \(archaeology\)](#) and [Varna culture](#)

Further information: [Prehistory of Southeastern Europe § Bronze Age](#), and [Bronze Age in Romania](#)



[Valchitran Treasure](#) dated 1600–1100 BC

[Urnfield culture](#), c. 13th–12th century BC^[73]



Bronze chariot wheel,

Radivojevic et al. (2013) reported the discovery of a tin bronze foil from the [Pločnik archaeological site](#) dated to c. 4650 BC as well as 14 other artefacts from Serbia and Bulgaria dated before 4000 BC, showing that early tin bronze was more common than previously thought and developed independently in Europe 1500 years before the first tin bronze alloys in the Near East. The production of complex tin bronzes lasted for about 500 years in the Balkans. The authors reported that evidence for the production of such complex bronzes disappears at the end of the 5th millennium BC, coinciding with the "collapse of large cultural complexes in north-eastern Bulgaria and Thrace". Tin bronzes using [cassiterite](#) tin were reintroduced to the area some 1500 years later.^[3]

The oldest golden artefacts in the world are dated between 4600 and 4200 BC, and were found in the Necropolis of Varna. These artefacts are on display in the [Varna Archaeological Museum](#).^{[74][75][76]}

The [Dabene Treasure](#) was unearthed from 2004 to 2007 near [Karlovo](#) in central Bulgaria. The treasure consists of 20,000 gold jewellery items from 18 to 23 carats. The most important of them was a dagger made of gold and [platinum](#) with an unusual edge. The treasure was dated to the end of the 3rd millennium BC. Scientists suggest that the Karlovo valley used to be a major crafts centre that exported golden jewellery across Europe. It is considered one of the largest prehistoric golden treasures in the world.^[citation needed]

Aegean

Main article: [Aegean civilization](#)



The gold [Mask of Agamemnon](#) produced during the [Mycenaean civilisation](#), from [Mycenae](#), Greece, 1550 BC

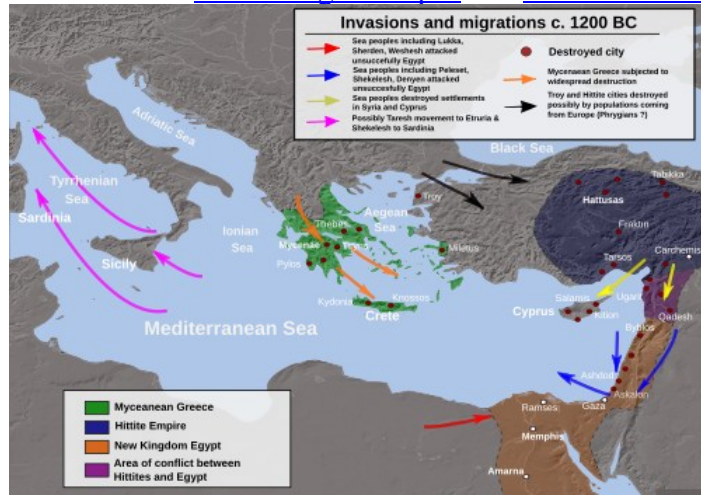
The Aegean Bronze Age began c. 3200 BC, when civilisations first established a far-ranging trade network. This network imported tin and charcoal to [Cyprus](#), where copper was mined and alloyed with tin to produce bronze. Bronze objects were then exported far and wide. [Isotopic](#) analysis of tin in some Mediterranean bronze artefacts suggests that they may have originated from [Bronze Age Britain](#).^[77]

Knowledge of navigation was well-developed by this time and reached a peak of skill not exceeded (except perhaps by [Polynesian](#) sailors) until 1730 when the invention of the [chronometer](#) enabled the precise determination of longitude.

The [Minoan civilisation](#) based in [Knossos](#) on the island of [Crete](#) appears to have coordinated and defended its Bronze Age trade. Ancient empires valued [luxury goods](#) in contrast to [staple foods](#), leading to famine.^[78]

Aegean collapse

Main articles: [Bronze Age collapse](#) and [Greek Dark Ages](#)



Invasions, destruction and possible population movements during the collapse of the

Bronze Age, c. 1200 BC

Bronze Age collapse theories have described aspects of the end of the Bronze Age in this region. At the end of the Bronze Age in the Aegean region, the [Mycenaean](#) administration of the regional trade empire followed the decline of Minoan primacy.^[79] Several Minoan [client states](#) lost much of their population to famine and pestilence. This would indicate that the trade network may have failed, preventing the trade that would previously have relieved such famines and prevented illness caused by malnutrition. It is also known that in this era, the [breadbasket](#) of the Minoan empire—the area north of the [Black Sea](#)—also suddenly lost much of its population and thus probably some capacity to cultivate crops. Drought and famine in Anatolia may have also led to the Aegean collapse by disrupting trade networks, therefore preventing the Aegean from accessing bronze and luxury goods.^[80]

The Aegean collapse has been attributed to the exhaustion of the [Cypriot](#) forests causing the end of the bronze trade.^{[81][82][83]} These forests are known to have existed in later times, and experiments have shown that charcoal production on the scale necessary for the bronze production of the late Bronze Age would have exhausted them in less than 50 years.

The Aegean collapse has also been attributed to the fact that as iron tools became more common, the main justification for the tin trade ended, and that trade network ceased to function as it did formerly.^[84] The colonies of the Minoan empire then suffered drought, famine, war, or some combination of the three, and had no access to the distant resources of an empire by which they could easily recover.

The [Thera eruption](#) occurred c. 1600 BC, 110 km (68 mi) north of Crete. Speculation includes that a [tsunami](#) from Thera (more commonly known today as [Santorini](#)) destroyed Cretan cities. A tsunami may have destroyed the Cretan navy in its home harbour, which then lost crucial naval battles; so that in the [LMIB/LMII](#) event (c. 1450 BC) the cities of Crete burned and the [Mycenaean civilisation](#) conquered [Knossos](#). If the eruption occurred in the late 17th century BC as most chronologists believe, then its immediate effects belong to the Middle to Late Bronze Age transition, and not to the end of the Late Bronze Age, but it could have triggered the instability that led to the collapse first of Knossos and then of Bronze Age society overall. [\[citation needed\]](#) One such theory highlights the role of Cretan expertise in administering the empire, post-Thera. If this expertise was concentrated in Crete, then the Mycenaeans may have made political and commercial mistakes in administering the Cretan empire. [\[citation needed\]](#)

Archaeological findings, including some on the island of Thera, suggest that the centre of the Minoan civilisation at the time of the eruption was actually on Thera rather than on Crete. [\[85\]](#) According to this theory, the catastrophic loss of the political, administrative and economic centre due to the eruption, as well as the damage wrought by the tsunami to the coastal towns and villages of Crete, precipitated the decline of the Minoans. A weakened political entity with a reduced economic and military capability and fabled riches would have then been more vulnerable to conquest. Indeed, the Santorini eruption is usually dated to c. 1630 BC, [\[86\]](#) while the Mycenaean Greeks first enter the historical record a few decades later, c. 1600 BC. [\[citation needed\]](#) The later Mycenaean assaults on Crete (c. 1450 BC) and Troy (c. 1250 BC) would have been a continuation of the steady encroachment of the Greeks upon the weakened Minoan world. [\[citation needed\]](#)

Central Europe



[Nebra sky disc](#) from the [Aunjetitz culture](#), present-day Germany (1800–1600 BC)

In Central Europe, the Early Bronze Age [Unetice culture](#) (2300–1600 BC) includes numerous smaller groups like the [Straubing](#), [Adlerberg](#) and [Hatvan](#) cultures. Some very rich burials, such as the one located at [Leubingen](#) with grave gifts crafted from gold, point to an increase of social stratification already present in the [Unetice culture](#). Cemeteries of this period are small and rare. The Unetice culture was followed by the Middle Bronze Age (1600–1200 BC) [tumulus culture](#), characterised by inhumation burials in [tumuli](#) barrows. In the eastern Hungarian [Körös](#) tributaries, the early Bronze Age first saw the introduction of the [Mako culture](#), followed by the [Otomani](#) and Gyulavarsand cultures.

The late Bronze Age [Urnfield](#) culture (1300–700 BC) was characterised by cremation burials. It included the [Lusatian culture](#) in eastern Germany and Poland (1300–500 BC) that continues into the Iron Age. The Central European Bronze Age was followed by the Iron Age [Hallstatt culture](#) (700–450 BC). Important sites include [Biskupin](#) in Poland, [Nebra](#) in Germany, [Vráble](#) in Slovakia, and Zug-Sumpf in Switzerland.

German prehistorian [Paul Reinecke](#) described Bronze A1 (Bz A1) period (2300–2000 BC: triangular daggers, flat axes, stone wrist-guards, flint arrowheads) and Bronze A2 (Bz A2) period (1950–1700 BC: daggers with metal hilt, flanged axes, halberds, pins with perforated spherical heads, solid bracelets) and phases Hallstatt A and B (Ha A and B).

Southern Europe



[Nuraghe Santu Antine](#) in [Torralba](#), [Sardinia](#), [Italy](#)

The [Apennine culture](#) was a technology complex in central and southern Italy spanning both the Chalcolithic and Bronze Age proper. The [Camuni](#) were an ancient people of uncertain origin who lived in [Val Camonica](#), in present-day [Lombardy](#), during the Iron Age, although groups of hunters, shepherds, and farmers are known to have lived in the area since the Neolithic.

Located in [Sardinia](#) and [Corsica](#), the [Nuragic civilisation](#) lasted from the early Bronze Age (18th century BC) to the 2nd century AD, when the islands were already [Romanised](#). They take their name from the characteristic Nuragic towers, which evolved from the pre-existing megalithic culture, which built [dolmens](#) and [menhirs](#).

The towers are unanimously considered the best-preserved and largest megalithic remains in Europe. Their purpose is still debated: some scholars consider them monumental tombs, others as [Houses of the Giants](#), other as fortresses, ovens for metal fusion, prisons, or finally temples for a solar cult. Near the end of the 3rd millennium BC, Sardinia exported to Sicily a culture that built small dolmens, trilithic or polygonal shaped, that served as tombs, as in the Sicilian dolmen of "Cava dei Servi". From this region, they reached [Malta](#) and other countries of Mediterranean basin.^[87]



Reconstructed [Terramare culture](#) houses

The [Terramare](#) was an early [Indo-European](#) civilisation in the area of what is now [Pianura Padana](#) in northern Italy, before the arrival of the [Celts](#), and in other parts of Europe. They lived in square villages of wooden [stilt houses](#). These villages were built on land, but generally near a stream, with roads forming a [grid plan](#). The whole complex was of the nature of a fortified settlement. The Terramare culture was widespread in the [Pianura Padana](#), especially along the [Panaro](#) river, between [Modena](#) and [Bologna](#), and in the rest of Europe. The civilisation developed in the Middle and Late Bronze Age during the 17th–13th centuries BC.

The [Castellieri culture](#) developed in [Istria](#) during the Middle Bronze Age. It lasted for more than a millennium, from the 15th century BC until the Roman conquest in the 3rd century BC. It takes its name from the fortified boroughs (*Castellieri*, [Friulian](#): *cjastelir*) that characterised the culture.

The [Canegrate culture](#) developed from the mid-Bronze Age (13th century BC) until the Iron Age in the Pianura Padana, in what are now western [Lombardy](#), eastern [Piedmont](#), and [Ticino](#). It takes its name from the township of [Canegrate](#), where, in the 20th century, some fifty tombs with ceramics and metal objects were found. The Canegrate culture migrated from the northwest part of the Alps and descended to Pianura Padana from the [Swiss Alps](#) passes and the Ticino.

The [Golasecca culture](#) developed starting from the late Bronze Age in the [Po plain](#). It takes its name from Golasecca, a locality next to the Ticino, where in the early 19th century abbot [Giovanni Battista Giani](#) [\[it\]](#) excavated its first findings comprising some 50 tombs with ceramics and metal objects. Remains of the Golasecca culture span an area of about 20,000 km² (4,900,000 acres) south to the Alps, between the Po, [Sesia](#), and [Serio](#) rivers, dating to the 9th–4th centuries BC.

Western Europe

Great Britain

Main article: [Bronze Age Britain](#)



Bronze shield, [Bronze Age Britain](#), 1300–1000 BC

In Great Britain, the Bronze Age is considered to have been the period from c. 2100 to 750 BC. Migration brought new people to the islands from the continent.^[88] Tooth enamel isotope research on bodies found in early Bronze Age graves around [Stonehenge](#) indicates that at least some of the migrants came from the area of present-day Switzerland. Another example site is [Must Farm](#) near [Whittlesey](#), host to the most complete Bronze Age wheel ever to be found. The [Beaker culture](#) displayed different behaviours from earlier Neolithic people, and cultural change was significant. Integration is thought to have been peaceful, as many of the early [henge](#) sites were seemingly adopted by the newcomers. The rich [Wessex culture](#) developed in southern Britain at this time. Additionally, the climate was deteriorating; where once the weather was warm and dry it became much wetter as the Bronze Age continued, forcing the population away from easily defended sites in the hills and into the fertile valleys. Large livestock farms developed in the lowlands and appear to have contributed to economic growth and inspired increasing forest clearances. The [Deverel-Rimbury culture](#) began to emerge in the second half of the Middle Bronze Age (c. 1400–1100 BC) to exploit these conditions. [Devon](#) and [Cornwall](#) were major sources of tin for much of western Europe and copper was extracted from sites such as the [Great Orme](#) mine in northern [Wales](#). Social groups appear to have been tribal but with growing complexity and hierarchies becoming apparent.

The burials, which until this period had usually been communal, became more individual. For example, whereas in the Neolithic a large [chambered cairn](#) or [long barrow](#) housed the dead, Early Bronze Age people buried their dead in individual barrows (commonly known and marked on modern British [Ordnance Survey](#) maps as tumuli), or sometimes in [cists](#) covered with [cairns](#).

The greatest quantities of bronze objects in England were discovered in [East Cambridgeshire](#), with the most important finds being the 6500-piece [Isleham Hoard](#).^[89] Alloying of copper with tin to make bronze was practiced soon after the discovery of copper. The techniques needed to deliberately alloy copper with zinc to form brass first arrived in Great Britain late in the first millennium BC.^[90] One copper mine at Great Orme in North Wales, reached a depth of 70 metres.^[91] At [Alderley Edge](#) in Cheshire, carbon dating has established mining at around 2280 to 1890 BC with a 95% probability.^[92] The earliest identified metalworking site (Sigwells, Somerset) came much later, dated by globular urn-style pottery to c. the 12th century BC. The identifiable [sherds](#) from over 500 mould fragments included a perfect fit of the hilt of a sword in the Wilburton style held in [Somerset County Museum](#).^[93]

Atlantic Bronze Age

Main article: [Atlantic Bronze Age](#)



The Sword of Jutphaas, [Hilversum culture](#), c. 1500 BC

The Atlantic Bronze Age as cultural geographic region is a cultural complex (c. 2100 – c. / 800 / 700 cal. BC) that includes different cultures in the context of the Atlantic Iberian Peninsula (Portugal, Andalucía, Galicia, Asturias, Cantabria, País Vasco, Navarra and Castilla and León), the Atlantic France, Britain and Ireland, while the [Atlantic Bronze Age](#) as cultural complex of the final phase of the Bronze Age period is dated between c. 1350 and 700 BC. It is marked by economic and cultural exchange. Commercial contacts extend to Denmark and the Mediterranean. The Atlantic Bronze Age was defined by many distinct regional centres of metal production, unified by a regular maritime exchange of products.

Ireland

Main articles: [Prehistoric Ireland § Bronze Age](#), and [Atlantic Bronze Age](#)

The Bronze Age in Ireland began c. 2000 BC when copper was alloyed with tin and used to manufacture Ballybeg type flat axes and associated metalwork. The preceding period is known as the [Copper Age](#) and is characterised by the production of flat axes, daggers, [halberds](#) and [awls](#) in copper. The period is divided into three phases: Early Bronze Age (2000–1500 BC), Middle Bronze Age (1500–1200 BC), and Late Bronze Age (1200 – c. 500 BC). Ireland is known for a relatively large number of Early Bronze Age burials. The country's [stone circles](#) and [stone rows](#) were built during this period.^[94]

One of the characteristic types of artefacts of the Early Bronze Age in Ireland is the flat axe. There are five main types of flat axes: Lough Ravel crannog (c. 2200 BC), Ballybeg (c. 2000 BC), Killaha (c. 2000 BC), Ballyvalley (c. 2000–1600 BC), Derryniggin (c. 1600 BC), and a number of metal ingots in the shape of axes.^[95]

Northern Europe

Main article: [Nordic Bronze Age](#)

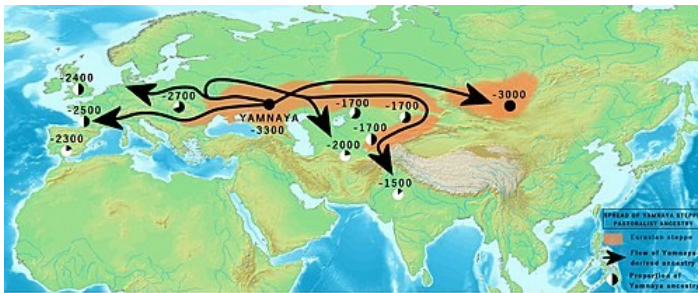


[Trundholm sun chariot](#), Denmark, c. 1500 BC

The Bronze Age in Northern Europe spans the 2nd millennium BC, ([Unetice culture](#), [Urnfield culture](#), [Tumulus culture](#), [Terramare culture](#) and [Lusatian culture](#)) lasting until c. 600 BC. The [Northern Bronze Age](#) was both a period and a Bronze Age culture in Scandinavian pre-history, c. 1700–500 BC, with sites as far east as Estonia. Succeeding the Late Neolithic culture, its ethnic and linguistic affinities are unknown in the absence of written sources. It was followed by the [Pre-Roman Iron Age](#).

Even though Northern European Bronze Age cultures came relatively late, and came into existence via trade, sites present rich and well-preserved objects made of wool, wood and imported Central European bronze and gold. Many rock carvings depict ships, and the large stone burial monuments known as stone ships suggest that shipping played an important role. Thousands of rock carvings depict ships, most probably representing sewn plank-built canoes for warfare, fishing, and trade. These may have a history as far back as the neolithic period and continue into the Pre-Roman Iron Age, as shown by the [Hjortspring boat](#). There are many mounds and rock carving sites from the period. Numerous artefacts of bronze and gold are found. No written language existed in the Nordic countries during the Bronze Age. The rock carvings have been dated through comparison with depicted artefacts.

Eastern Europe



Bronze Age spread of [Yamnaya](#) steppe pastoralist ancestry into two subcontinents—Europe and South Asia, and location of the [Afanasievo culture](#), which has the same genetic characteristics as the Yamnayas.^[88]

The [Yamnaya culture](#) (c. 3300–2600 BC) was a Late Copper Age/Early Bronze Age culture of the [Pontic-Caspian steppe](#)^{[96][97]} associated with early [Indo-Europeans](#). It was followed on the steppe by the [Catacomb culture](#) (c. 2800–2200 BC) and the [Poltavka culture](#) (c. 2800–2200 BC). The closely-related [Corded Ware culture](#) in the [forest-steppe](#) region to the north (c. 3000–2350 BC) spread eastwards with the [Fatyanovo culture](#) (c. 2900–2050 BC), which subsequently developed into the [Abashevo culture](#) (c. 2200–1850 BC) and the [Sintashta culture](#) (c. 2200–1750 BC). The earliest known [chariots](#) have been found in Sintashta burials and there is earlier evidence for chariot use in the Abashevo culture. The Sintashta culture expanded further eastwards into central Asia becoming the [Andronovo culture](#), while the [Srubnaya culture](#) (c. 1900–1200 BC) continued the use of chariots in eastern Europe.

Caucasus

[Arsenical bronze](#) artefacts of the [Maykop culture](#) in the [North Caucasus](#) have been dated to around the 4th millennium BC.^[98] This innovation resulted in the circulation of arsenical bronze technology through southern and eastern Europe.^[99]

Part of [a series](#) on

[Human history](#)
and [prehistory](#)

↑ [before *Homo*](#) ([Pliocene epoch](#))

[Prehistory](#)

[Recorded history](#)

↓ [Future](#) ([Holocene epoch](#))

Africa

Sub-Saharan Africa

See also: [Copper metallurgy in Africa](#)

Iron and copper smelting appeared around the same time in most parts of Africa.^{[16][100]} As such, most [Classical African civilisations](#) outside Egypt did not experience a distinct Bronze Age. Evidence for iron smelting appears earlier or at the same time as copper smelting in [Nigeria](#) c. 900–800 BC, [Rwanda](#) and [Burundi](#) c. 700–500 BC and [Tanzania](#) c. 300 BC.^{[100][101][102]}

There is a longstanding debate about whether copper and iron metallurgy were independently developed in sub-Saharan Africa or introduced from the outside across the Sahara from North Africa or the Indian Ocean.^[100] Evidence for theories of independent development and outside introduction are scarce and the subject of active scholarly debate.^[100] Scholars have suggested that both the relative dearth of archaeological research in sub-Saharan Africa as well as long-standing prejudices have limited or biased our understanding of pre-historic metallurgy on the continent.^{[101][103][104]} One scholar characterised the state of historical knowledge: "To say that the history of metallurgy in sub-Saharan Africa is complicated is perhaps an understatement."^[104]

West Africa

Copper smelting took place in West Africa prior to the appearance of iron smelting in the region. Evidence for copper smelting furnaces was found near [Agadez](#), Niger that has been dated as early as 2200 BC.^[101] However, evidence for copper production in this region before 1000 BC is debated.^{[105][16][101]} Evidence of copper mining and smelting has been found at [Akjoujt](#), [Mauretania](#) that suggests small scale production c. 800—400 BC.^[101]

Americas

See also: [Metallurgy in pre-Columbian America](#) and [Metallurgy in pre-Columbian Mesoamerica](#)

The [Moche culture](#) of South America independently discovered and developed bronze smelting.^[106] Bronze technology was developed further by the [Inca](#) and widely used for utilitarian objects and for sculpture.^{[107][unreliable source?]} A later appearance of limited bronze smelting in western Mexico suggests either contact of that region with [Andean civilisations](#) or separate discovery of the technology. The [Calchaquí](#) people of northwestern Argentina had bronze technology.^[108]

Trade

Trade and industry played a major role in the development of Bronze Age civilisations. With artefacts of the [Indus Valley Civilisation](#) found in ancient Mesopotamia and Egypt, it is clear that these civilisations were not only in touch with one another, but also trading. Early long-distance trade was limited almost exclusively to luxury goods like spices, textiles, and precious metals. Not only did this make cities with ample amounts of these products rich, but it also led to an intermingling of cultures for the first time in history.^[109]

Trade routes were not just on land. The first and most extensive trade routes were along rivers such as the [Nile](#), the [Tigris](#), and the [Euphrates](#), which led to the growth of cities on the banks of these rivers. The later domestication of camels also helped encourage [trade routes](#) overland, linking the Indus Valley with the [Mediterranean](#). This further led to towns appearing where there was a pit-stop or caravan-to-ship port.

See also

- [Dover Bronze Age Boat](#)

- [Ferriby Boats](#)
- [Hillfort](#)
- [Langdon Bay \(Kent\) hoard](#)
- [Middle Bronze Age migrations \(ancient Near East\)](#)
- [Oxhide ingot](#)
- [Shropshire bulla](#)
- [Timeline of human evolution](#)
- [Tollense valley battlefield](#)

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GENİŞLETİLMİŞ İSLAM BİLİMCİLERİ AĞIRLIKLİ İCAT VE BULUŞLAR LİSTESİ (Taslak)

Hazırlayan: Yüksel Atakan 22 Nisan 2025

#	Tarih	Bilim İnsanı	Ülke / Bölge	Alan	Katkı / İcat Açıklaması	Kaynaklar
1	~820	İbn Türk	Türkistan (Abbasi)	Matematik	İlk cebirsel sistematik eserlerden biri	Aydın Sayılı, F. Sezgin
2	~830	El-Hârizmî	Horasan (Abbasi)	Matematik	Cebir kitabı, sıfırın tanımı	Britannica, F. Sezgin
3	~850	Sâbit bin Kurra	Harran (Abbasi)	Matematik	Sayı teorisi, oranlar	F. Sezgin, Sayılı
4	~950	El-Kerhî	Bağdat (Abbasi)	Matematik	Lineer denklemler	Fuat Sezgin
5	~1020	İbn Sina	İran	Matematik	Geometrik ve mantıksal çözümlemeler	Britannica
6	~1048	Ömer Hayyam	İran (Selçuklu)	Matematik	Kübik denklemlerin çözümü	Sezgin
7	~1200	Nasîrüddin Tûsi	İran (İlhanlılar)	Matematik	Trigonometrinin sistematikleşmesi	Britannica, Sezgin

8	~1400	Kâşî (el-Kaşı)	Semerikand (Timur)	Matematik	Ondalık sayı sistemi	A. Sayılı, F. Sezgin	
9	~1450	Ali Kuşçu	İstanbul (Osmanlı)	Matematik	Eğitim amaçlı sistematik matematik eserleri	Aydın Sayılı	
10	~965	İbn el-Heysem	Mısır (Fatımî)	Fizik	Kamera obskura, ışık teorisi	Britannica, Sezgin	
11	~1000	İbn Sina	İran	Tıp	“El-Kanun fi’t-Tıbb” – 600 yıl referans kitap	Britannica, Sezgin	
12	~800	Zerkali (El-Zarqali)	Endülüs	Astronomi	Güneş yılı uzunluğunu doğru hesapladı	Fuat Sezgin	
13	~850	Abbas bin Firnas	Kurtuba (Endülüs)	Mühendislik	Planör benzeri uçuş giriřimi	Sezgin	
14	~1200	El-Cezerî	Diyarbakır (Artuklu)	Mekanik	Otomatlar, saat, pompa sistemleri	Sezgin, Sayılı	
15	~1300	İbn Şatır	Şam (Memlükler)	Astronomi	Kopernik'e benzeyen Güneş sistemi modeli	Britannica	
16	~1600	Galileo Galilei	İtalya	Fizik	Teleskop geliştirme, serbest düşme yasaları	Britannica	
17	~1700	Isaac Newton	İngiltere	Fizik	Kütleçekim, hareket yasaları	Britannica	
18	~1800	Carl F. Gauss	Almanya	Matematik	Gaussian dağılım, sayı teorisi katkıları	Britannica	
19	1905	Albert Einstein	Almanya	Fizik	Görelilik kuramı	Britannica	
20	1977	Rivest-Shamir-Adleman	ABD	Bilgisayar	RSA algoritması (asimetrik kriptografi)	MIT, Britannica	
21	~750	Câbir bin Hayyan	Kufe (Abbasi)	Kimya	Modern kimyanın öncüsü, damıtma, süblimasyon teknikleri	F. Sezgin, Britannica	
22	~870	Er-Râzî (Rhazes)	Rey (İran)	Tıp	Çiçek ve kızamık ayrımı, hastane yönetimi	Britannica, Fuat Sezgin	
23	~1100	İbn Rüşd (Averroes)	Kurtuba (Endülüs)	Felsefe/Tıp	Aristo'nun eserlerine şerhler, tıpta psikolojik hastalıklar	Britannica	
24	~1000	El-Birûnî	Harezm	Astronomi	Yerçekimi önsezisi, Dünya'nın yarıçapı ölçümü	A. Sayılı, Britannica	
25	~850	Ahmed bin Musa	Bağdat	Mekanik	Üç kardeşlerle otomatlar üzerine ilk kitap	Fuat Sezgin	

26	~800	Yuhanna bin Mâsûye	Bağdat	Tıp	Psikiyatri öncüsü, göz hastalıkları tedavisi	Sezgin
27	~850	Huneyn bin İshak	Bağdat	Tıp	Tıbbi tercümelelerin öncüsü	Britannica
28	~1280	Kutbettin Şirazi	İran	Astronomi	Gökkuşağı oluşum teorisi	A. Sayılı
29	~1000	Ebu Nasr Farabi	Türkistan	Felsefe	Aristo'nun mantığını İslam felsefesine aktardı	Fuat Sezgin
30	~1300	İbn Nafis	Şam	Tıp	Küçük kan dolaşımını keşfetti	Britannica
31	~1600	Takiyüddin	İstanbul (Osmanlı)	Astronomi	Mekanik saatler, rasathane	A. Sayılı, Sezgin
32	~1250	Cemşid el-Kaşi	Semerikand	Matematik	Pi sayısını ondalık sistemle hassas hesapladı	Britannica, Sayılı
33	~850	Yahya bin Halid el-Bermekî	Bağdat	Eczacılık	İlk sistematik eczacılık çalışmaları	Sezgin
34	~950	Ebu'l Vefâ el-Bûzcânî	İran	Astronomi	Sferik trigonometriyi geliştirdi	Sezgin, Britannica
35	~1230	Ebu'l Feth el-Muzaffar	Anadolu (Selçuklu)	Mekanik	Su gücüyle çalışan makineler	A. Sayılı
36	~1400	Kadıızâde Rûmî	Bursa – Semerikand	Astronomi	Uluğ Bey'in rasathanesinde önemli çalışmalar	Sezgin
37	~1200	Şemseddin Semerikandî	Semerikand	Mantık/Fizik	İlim tasnifleri, mantık sistematikleştirmesi	A. Sayılı
38	~1100	Nizamülmülk	İran (Selçuklu)	Eğitim	Nizamiye Medreseleri – bilim eğitiminin kurumsallaşması	Britannica
39	~1300	İbn Battûta	Fas	Coğrafya	Seyahatnâmeleriyle dünya bilgisi	Sezgin
40	~850	İbn Kuteybe	Irak	Bilim tarihi	Bilgi dallarının sınıflandırılması	Sezgin
41	~850	İbn Haldun	Tunus	Felsefe	Sosyal bilimlerin temelleri, tarih felsefesi	Britannica
42	~1000	El-Birûnî	Harezm	Astronomi	Dünya'nın çapını hesapladı, yerçekimi teorisi	Aydın Sayılı, Britannica
43	~1300	İbn Battûta	Fas	Coğrafya	Seyahatnâme ile coğrafya üzerine önemli çalışmalar	Sezgin
44	~800	El-Râzî	Rey (İran)	Tıp	Çocuk hastalıkları, kimyasal maddeler üzerine çalışmalar	Britannica, F. Sezgin

45	~950	İbn Sîrîn Britannica	Mısır (Fatımî)	Tıp	Rüyaların tıbbi analizleri ve psikolojik hastalıklar üzerine ilk eserler	
46	~1150	Al-Ghazali	Endülüs (İspanya)	Felsefe/Mantık ve epistemoloji üzerine önemli katkılar	Britannica	
47	~1300	İbn Haldun	Tunus	Felsefe/Tarih felsefesi, sosyal teoriler, devletin yapısı üzerine incelemeler	Aydın Sayılı	
48	~850	El-Mu'izz	Kûfe (Abbasi)	Astronomi	Astrolojik haritalar ve astronomik gözlemler	Fuat Sezgin
49	~1250	Uluğ Bey	Semerikand (Timur)	Astronomi	Uluğ Bey Rasathanesi ve yıldız katalogları	Sezgin, A. Sayılı
50	~1200	El-Cezerî	Diyarbakır (Artuklu)	Mekanik	Su mühendislik sistemleri, otomatlar, ilk robotlar	Sezgin, Sayılı
51	~950	El-Bâtânî	Endülüs	Astronomi	Güneşin hareketleri üzerine sistematik gözlemler	Fuat Sezgin
52	~1100	İbn Rüşd Britannica	Endülüs	Felsefe/Tıp	Aristoteles'in eserlerinin yorumlanması, tıp ve felsefe üzerine katkılar	
53	~1000	El-Ma'mûn	Bağdat	Astronomi	Matematiksel gözlemler, yıldız haritaları	Fuat Sezgin
54	~1100	İbn Rüşd	Endülüs	Felsefe/Tıp	Aristo'nun yorumları ve İslam felsefesine önemli katkılar	Britannica
55	~1200	Nasîrüddin Tûsi	İran (İlhanlılar)	Astronomi	Güneş'in hareketleri üzerine çalışmalar	Britannica, Sezgin
56	~950	El-Fergânî	Endülüs	Astronomi	Ekinoksların hesaplanması ve astronomik haritalar	Aydın Sayılı
57	~1400	Kadıızâde Rûmî	Osmanlı İmparatorluğu	Astronomi	Kadıızâde Rûmî'nin astronomi üzerine önemli eserleri	Sezgin
58	~1300	El-Bazârî	Endülüs	Matematik	Cebirsel denklemler üzerine teorik çalışmalar	Britannica
59	~1100	El-Bîrûnî	Harezmi	Astronomi	Yerçekimi teorisi, Dünya'nın çapını hesapladı	Britannica
60	~950	İbn el-Şâtir	Şam	Astronomi	Güneş sistemini heliosentrik bir modelle açıklama	Fuat Sezgin

61	~1000	İbn Sinâ	İran	Felsefe/Tıp	Tıbbi tedavi üzerine önemli yazılar, özellikle göz hastalıkları üzerine	Britannica
62	~850	İbn al-Ahmedî	Endülüs	Bilim Tarihi	İslam dünyasında ilk bilimsel tarih çalışması	Sezgin
63	~900	El-Tûsî	İran	Astronomi	Optik üzerine önemli çalışmalarda bulundu	Sezgin
64	~1100	El-Kindi	Kûfe	Felsefe/Tıp	Matematiksel ve mantıksal metotların felsefede kullanımı	Britannica, Sezgin
65	~1100	El-Tûsî	İran	Astronomi	Aristo'nun astronomik teorilerine karşı yazdığı eserler	Sezgin
66	~1300	İbn Rüşd	Endülüs	Felsefe	Aristo'nun felsefesini İslam felsefesine entegre etti	Britannica
67	~1000	El-Süleymânî	İstanbul (Osmanlı)	Mühendislik	İlk otomatik makineler üzerine çalışmalar ve icatlar	Fuat Sezgin, Aydın Sayılı
68	~850	El-Kâşî	Semerikand	Matematik	4. dereceden denklemlerin çözümü üzerine eserler	Fuat Sezgin, Britannica
69	~1250	El-İdrîsî	Fas	Coğrafya	Dünya haritası ve coğrafi bilgilerle önemli katkılar	Britannica, A. Sayılı
70	~900	El-Kindî	Kûfe (Abbasi)	Felsefe	Filozofik düşüncenin matematikle ilişkilendirilmesi	Britannica
71	~1000	El-Cezerî	Diyarbakır (Artuklu)	Mekanik	İlk mekanik araçlar ve sistemler üzerine çalışmalar	Sezgin
72	~1250	El-Kâzîmî	Bağdat	Astronomi	Trigonometri ve astronomide önemli katkılar	Fuat Sezgin
73	~1100	İbn Tufeyl	Endülüs	Felsefe	Felsefi çalışmalar ve insanın doğasını ele alan önemli eserler	Britannica
74	~850	El-Hârizmî	Horasan (Abbasi)	Matematik	Matematiksel denklemler ve sıfırın kullanımı üzerine önemli katkılar	Fuat Sezgin
75	~950	El-Fergânî	Endülüs	Astronomi	Yıldız haritaları ve astronomik gözlemler	Aydın Sayılı
76	~1250	Takiyüddin	İstanbul (Osmanlı)	Astronomi	Takiyüddin Rasathanesi ve önemli astronomik gözlemler	Fuat Sezgin
77	~1100	İbn Rüşd	Endülüs	Felsefe/Tıp	Aristoteles'in yorumları, tıpta psikolojik hastalıklar	Britannica

78	~850	İbn Haldun	Tunus	Felsefe	Sosyal bilimlerin temellerini attı, tarih üzerine önemli eserler yazdı	Fuat Sezgin
79	~1200	El-Cezerî	Diyarbakır (Artuklu)	Mekanik	Su gücüyle çalışan makineler, otomatlar	Fuat Sezgin, Aydın Sayılı
80	~950	El-Kâzîmî	Bağdat	Astronomi	Dünya çapını ve göksel hareketleri hesapladı	Fuat Sezgin
81	~1300	İbn Battûta	Fas	Coğrafya	Seyahatnâmeleriyle dünya bilgisi	Sezgin
82	~1000	El-Bîrûnî	Harezm	Astronomi	Yerçekimi teorisi, Dünya'nın çapını hesapladı	Aydın Sayılı, Britannica
83	~1250	Uluğ Bey	Semerikand (Timur)	Astronomi	Uluğ Bey Rasathanesi ve yıldız katalogları	Sezgin, A. Sayılı
84	~1400	Kadızzâde Rûmî	Bursa – Semerikand	Astronomi	Kadızzâde Rûmî'nin astronomi üzerine önemli eserleri	Sezgin
85	~1150	El-Ghazali	Endülüs (İspanya)	Felsefe	Mantık ve epistemoloji üzerine önemli katkılar	Britannica
86	~900	El-Tûsî	İran	Astronomi	Optik üzerine önemli çalışmalarda bulundu	Sezgin
87	~1250	El-Kâşî	Semerikand	Matematik	Pi sayısını ondalık sistemle hassas hesapladı	Britannica, Sayılı
88	~850	İbn el-Heysem	Mısır (Fatımî)	Fizik	Kamera obskura, ışık teorisi üzerine çalışmalar	Sezgin
89	~800	El-Râzî	Rey (İran)	Kimya	Kimya alanında ilk deneysel çalışmalar, alkollü içeceklerin arıtılması	Fuat Sezgin, Britannica
90	~1000	Câbir bin Hayyan	Kûfe (Abbasi)	Kimya	Kimyanın temelleri, damıtma ve süblimasyon teknikleri	Aydın Sayılı, Fuat Sezgin
91	~1200	İbn Şatır	Şam (Memlükler)	Astronomi	Kopernik'e benzer güneş sistemi modeli	Britannica
92	~1300	Kutbettin Şirazi	İran	Astronomi	Gökkuşağı oluşum teorisi, atmosfer hakkında önemli çalışmalar	Aydın Sayılı
93	~1300	El-Bâhith	Endülüs	Matematik	Cebirsel denklemlerin analitik çözümleri üzerine çalışmalar	Britannica

94	~800	Huneyn bin İshak	Bağdat	Tıp	Tıbbi eserlerin Arapçaya çevirisi ve çevirmenlikte öncülük	Britannica
95	~850	El-Kindî	Kûfe	Felsefe	Aristo'nun mantık eserlerini İslam felsefesine entegre etti	Britannica
96	~1250	El-İdrîsî	Fas	Coğrafya	Dünya haritası, coğrafi keşiflerin temellerini atma	Aydın Sayılı
97	~1300	İbn Nafis	Şam	Tıp	Küçük kan dolaşımını keşfetti, kalp üzerine önemli araştırmalar	Britannica
98	~1400	Kâşî (el-Kaşi)	Semerikand (Timur)	Matematik	Ondalık sayı sistemi ve matematiksel tablolar	Sezgin, A. Sayılı
99	~1000	El-Kâzîmî	Bağdat	Astronomi	Astronomik tablolar ve güneş sistemi üzerine gözlemler	Britannica, Fuat Sezgin
100	~1600	Galileo Galilei	İtalya	Fizik	Teleskop geliştirme, serbest düşme yasaları	Britannica
101	~1100	El-Bîrûnî	Harezm	Astronomi	Dünya çapını ve göksel hareketleri hesapladı	Aydın Sayılı, Britannica
102	~1200	Şemseddin Semerikandî	Semerikand	Fizik	İlim tasnifleri, mantık sistematikleştirmesi	A. Sayılı
103	~800	Yuhanna bin Mâsûye	Bağdat	Tıp	Göz hastalıkları tedavisi, gözlüklerin ilk tasarımı	Sezgin
104	~950	Ebu'l Vefâ el-Bûzcânî	İran	Astronomi	Sferik trigonometriyi geliştirdi	Sezgin, Britannica
105	~1100	Nizamülmülk	İran (Selçuklu)	Eğitim	Nizamiye Medreseleri – bilim eğitiminin kurumsallaşması	Britannica
106	~1300	Takiyüddin	İstanbul (Osmanlı)	Astronomi	Mekanik saatler, rasathane	A. Sayılı, Sezgin
107	~800	İbn Kuteybe	Irak	Bilim tarihi	Bilgi dallarının sınıflandırılması	Sezgin
108	~1300	Kadızcâde Rûmî	Bursa – Semerikand	Astronomi	Uluğ Bey'in rasathanesinde önemli çalışmalar	Sezgin
109	~1150	El-Ghazali	Endülüs (İspanya)	Felsefe	Mantık ve epistemoloji üzerine önemli katkılar	Britannica
110	~1250	Uluğ Bey	Semerikand (Timur)	Astronomi	Uluğ Bey Rasathanesi ve yıldız katalogları	Sezgin, A. Sayılı
111	~1200	El-Cezerî	Diyarbakır (Artuklu)	Mekanik	Su gücüyle çalışan makineler, otomatlar	Fuat Sezgin, Aydın Sayılı

112	~1300	Kutbettin Şirazi	İran	Astronomi	Gökkuşağı oluşum teorisi, atmosfer hakkında önemli çalışmalar	Aydın Sayılı
113	~950	El-Kâzîmî	Bağdat	Astronomi	Astronomik tablolar ve güneş sistemi üzerine gözlemler	Fuat Sezgin
114	~1300	İbn Battûta	Fas	Coğrafya	Seyahatnâmeleriyle dünya bilgisi	Sezgin
115	~850	El-Kindî	Kûfe	Felsefe	Aristo'nun mantık eserlerini İslam felsefesine entegre etti	Britannica
116	~850	El-Tûsî	İran	Astronomi	Optik üzerine önemli çalışmalarda bulundu	Sezgin
117	~850	El-Bâhith	Endülüs	Matematik	Cebirsel denklemlerin analitik çözümleri üzerine çalışmalar	Britannica
118	~1200	El-İdrîsî	Fas	Coğrafya	Dünya haritası, coğrafi keşiflerin temellerini atma	Aydın Sayılı
119	~1300	İbn Nafis	Şam	Tıp	Küçük kan dolaşımını keşfetti, kalp üzerine önemli araştırmalar	Britannica
120	~1400	Kâşî (el-Kaşi)	Semerikand (Timur)	Matematik	Ondalık sayı sistemi ve matematiksel tablolar	Sezgin, A. Sayılı
121	~1000	Câbir bin Hayyan	Kûfe (Abbasi)	Kimya	Kimyanın temelleri, damıtma ve süblimasyon teknikleri	Aydın Sayılı, Fuat Sezgin
122	~1100	El-Bîrûnî	Harezmi	Astronomi	Dünya çapını ve göksel hareketleri hesapladı	Aydın Sayılı, Britannica
123	~1150	El-Ghazali	Endülüs (İspanya)	Felsefe	Mantık ve epistemoloji üzerine önemli katkılar	Britannica
124	~1200	Şemseddin Semerkandî	Semerikand	Fizik	İlim tasnifleri, mantık sistematikleştirmesi	A. Sayılı
125	~850	Yuhanna bin Mâsûye	Bağdat			

NOT: Bu liste tam olmayıp düzeltmeler de gerekebilir. YZ listeyi 300'e kadar ücret karşılığı (20-200 USD) daha üst programla uzatabiliyor.

⚡ Arap ve Osmanlı Bilimsel Katkıların Özeti:

İslam Dünyası, özellikle Arap Bilim Adamları ve Osmanlı İmparatorluğu, ortaçağ boyunca büyük bilimsel atılımlar yapmış ve bilimin pek çok farklı dalında katkılar sağlamıştır. İbn Sina (Avicenna), İbn al-Haytham, El-Razi, İbn Khaldun, El-Battani, Mimar Sinan, Kâtip Çelebi gibi ünlü isimler, sadece Arap Dünyası'nda değil, dünya çapında bilime katkıda bulunmuş önemli şahsiyetlerdir.

Optik, astronomi, tıp, matematik, kimya, felsefe, mimarlık, harita yapımı ve toplum bilimleri gibi alanlarda yapılan bu keşifler, Batı'daki bilimsel gelişmeleri de büyük ölçüde etkilemiştir.

Ayrıca, Osmanlı İmparatorluğu'nda, medrese eğitimi ve bilimsel ilerlemeler, toplumun kültürel ve bilimsel gelişimine büyük katkı sağlamıştır. Özellikle Mimar Sinan, Evliya Çelebi ve Kâtip Çelebi gibi isimler, Osmanlı'nın zirve dönemindeki bilimsel ve kültürel birikimi yansıtmaktadır.