

Demetra of the Steppes: The Climatic History of the Turks

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Abstract

Several historical episodes of Turks during periods of climatic extremes have been examined. In particular, several key dates (536–537, 627, 1259, 1783, and 1884) mark significant periods of anomalous climatic and meteorological upheavals of pan-Eurasian and global importance.

The role of epidemiological factors in political, social, and economic events in the lives of nomadic civilizations has also been highlighted.

The conclusion drawn is that climatic and ecological conditions had a significant influence on the history of the nomadic peoples of the Great Steppe and Kazakhstan.

Keywords: *climatic extremes, meteorological upheavals, epidemic diseases, Turks, Great Steppe*

Demetra of the Steppes

Unlike most sedentary mega-empires and imperial agglomerations, nomadic mega-empires are less stable and longer lasting. Many factors contribute to this, including climate.

There are currently hundreds, if not thousands, of studies on the impact of climate on historical events. For example, the "Great Hunnic Invasion" or the "Great Mongol Campaign" are directly associated with abnormal climatic and meteorological conditions in the Great Steppe and Eurasia at the time. There is currently no need to delve deeply into this scientific debate. However, by analyzing scientific literature and

opinions, one can reach the following conclusion: most often, climate does not determine historical events but rather complements (enhances or stimulates) them. This excludes cases where the climate plays a direct role (e.g., the Great Flood and the eruption of Vesuvius).

The first half of the first millennium AD and the early Middle Ages were a time of two major upheavals in much of European Eurasia: the decline of the Great Roman Empire and abnormal climatic changes. The brilliant, centuries-long era of Praetorian Rome — Octavian Augustus, Gnaeus Pompeius, Cornelius Sulla, Julius Caesar, Trajan, and Marcus Aurelius — had long passed and became almost legendary. The Roman Empire ceased to be in a monolithic state, such as the "tortoise" formation of Roman cohorts, and was split into two parts.

Some researchers suggest that Roman legionnaires may have even participated in the Battle of Talas, near the city of Talas (Taraz), a caravan hub on the Great Silk Road, on the side of the Xiongnu against the Chinese army. However, this is merely a hypothesis. However, during the decline of the Roman Empire, the Vandals of Geiseric, the Huns of Attila, and the Goths of Alaric advanced victoriously across the lands of the Eternal City.

The process of the gradual movement of "barbarian" tribes into the territory of the Roman Empire began. There were many reasons for this: the "barbarization" of the Roman army, the counteroffensive nature of peoples and tribes who had suffered under Rome, extensive farming practices that forced the search for new, more favorable lands, the crisis of tribal authority, and many other factors.

Another process, the so-called "Early Medieval Climate Anomaly", a sharp cooling in Europe and the continental part of Eurasia, coincided with and accelerated the decline of the Roman Empire. This cooling affected the period from approximately 500 to 750 AD.

The year 536 was particularly tragic for the Eurasian continent, which is considered by many scientists to be the worst year in human history. As a result of the powerful eruption of three Icelandic volcanoes, hundreds of millions of tons of ash and dust were ejected into the atmosphere from 536--537. An ashen fog descended over much of Eurasia and the Mediterranean, blocking the sun for nearly a year and a half. The lack of warmth led to a sharp temperature drop of nearly 1.5–2.5 degrees Celsius during the summer months. The consequences of this anomaly spread across the following decades and even centuries. Famine, crop failure, bubonic plague, cold, and high child mortality all became tragic consequences of this environmental catastrophe.

Just as the eruption of Mount Etna once led to the destruction of Pompeii, the eruptions of volcanoes in Iceland, possibly in North America, completed and contributed to the fall of the Roman Empire. The climatic anomaly caused by volcanic activity and the sharp drop in temperature on the Eurasian continent became the main cause of the first Great Migration of Peoples, which included the advance of

"vandals" and "barbarians" from the east, south, and north onto the Roman-European subcontinent.

As a result of the ecological crisis, the population of southern Europe decreased three to four times, to approximately 10 million people. People from the east and north – the Huns, Scythians, Goths, and Sarmatians – came to these lands. The rapid population growth of these people and the food shortages caused by the "climate anomaly" forced them to move toward more favorable and warmer lands in southern Europe.

The migration of people began earlier than the "pessimum"—approximately the mid-300s AD—during the first invasions of Huns into the Roman Empire. Under pressure from Huns and other Eastern tribes, Ostrogoths, Visigoths, Franks, Saxons, and other tribes were also forced to move west and south into Europe, settling in Spain, Italy, Gaul, and England. Following them were Slavic and some Turkic tribes, who settled in Eastern Europe.

In 2019, Valentin Viktorovich Barinov, Anna Vladimirovna Tainik, Orlan Chukkaevich Oidupaa, and Vladimir Stanislavovich Myglan published a study titled *"Extreme Climatic Events in the Altai-Sayan Region Over the Last 1500 Years Based on Dendrochronological Data."* Through the analysis of tree ring anomalies in the Altai-Sayan mountain system, they studied climate dynamics over the past 1,500 years. For this analysis, the researchers also used two extensive chronologies of extreme events: a 4,100-year chronology of extreme events for the Yamal Peninsula and a 5,000-year chronology for the western part of North America. When the data were compared, extreme events in different regions were considered to coincide when the dates matched exactly or differed by only one year¹.

On the basis of their research, the scientists concluded, *"In nearly half of the cases, the extreme events identified in the Altai-Sayan region are traceable beyond the region. A comparison with data from the Yamal Peninsula revealed eight common dates (536, 537, 627, 1259, 1372, 1481, 1783, and 1884), whereas the chronology for the western part of North America revealed seven common events (536, 537, 627, 934, 1259, 1546, and 1884). The events of 536--537, 1259, and 1884 are common to all three chronologies."*

In his 2018 dissertation, V. V. Barinov also provided the following data:

"A comparison with data on stratospheric volcanic eruptions (VEIs ranging from 4--7) revealed that 58% of the major extreme climatic events in the Altai-Sayan region coincided with volcanic eruptions. Examples of the consequences of volcanic eruptions, which have led to catastrophic outcomes for populations throughout the

¹ Barinov, V.V., Tainik, A.V., Oidupaa, O.Ch., Myglan, V.S. (2019). Extreme Climatic Events in the Altai-Sayan Region Over the Last 1500 Years Based on Dendrochronological Data. Journal "Biodiversity and Conservation of the Gene Pool of Flora, Fauna, and Population of the Central Asian Region," No. 3. д

*Northern Hemisphere, include the extreme events of 536–537, 627, 1258–1259, 1783–1785, and 1884. Verification of major extreme climatic events with historical sources confirmed that these dates correspond to reports of frost, crop failure, famine, and other issues in agricultural regions. In this case, the 19 extreme climatic events traceable at the upper tree line in the Altai-Sayan region had a significant impact not only on mountain ecosystems but also on the economic activities of the population in the plains of the Altai-Sayan region and neighboring territories. "*²

Thus, several key dates (536–537, 627, 1259, 1783, and 1884) mark periods of significant (pan-Eurasian and global) climatic and meteorological upheavals, which may have influenced the course of historical events in Eurasia. For the analysis of climate change impacts, we specifically selected the Altai region, which is regarded as the ancestral homeland of Turks and a region central to many historical events in the Great Steppe (Altai, southern Siberia, Turkestan, Mongolia, northern China, and other steppe or adjacent regions).

Let us take, for instance, the years 1258 and 1259. The weather and climatic changes during these years in the world and Eurasia were likely caused by one of the largest volcanic eruptions recorded in human history—the eruption of the Samalas volcano in the Rinjani volcanic complex on the island of Lombok in Indonesia. As a group of international researchers wrote in the journal *Nature Geoscience* in 2017:

*"During the Samalas eruption, more than 40 cubic kilometers of dense magma were ejected, and according to estimates, the eruption column reached a height of 43 kilometers. "*³

In other words, the gas-ash column reached the height of five Mount Everests! Scientists believe that the Lombok eruption was the largest volcanic eruption in the last several thousand years. It was so powerful that, according to many researchers, it triggered the onset of the "Little Ice Age" in Eurasia, which was accompanied by sharp cooling across much of the continent. Additionally, during this time in 1258, another significant eruption occurred—El Chichón in Mexico, whose ash also spread to various parts of the world.

What was the most significant historical event in the Great Steppe and Central Eurasia during this time? The answer is well known: it was the beginning of Khan Hulagu's major westward campaign on September 12, 1259, although there were other important events as well. However, Hulagu's campaign was not sudden.

² Barinov, V.V. (2018). Extreme Climatic Events in the Altai-Sayan Region Over the Last 1500 Years Based on Dendrochronological Data: Dissertation for the degree of Candidate of Biological Sciences. Place of Defense: Siberian Federal University, Krasnoyarsk.r

³ Sébastien Guillet, Christophe Corona, Markus Stoffel et al. Climate response to the Samalas volcanic eruption in 1257 revealed by proxy records. *Nature Geoscience*, V.5, 2017

Khan Hulagu had begun his westward advance with his main army in October 1253 after first sending a nomadic force of 12,000 under Kitbuqa Noyan in 1252. This campaign was extremely slow and deliberate. Only on September 1259 did he finally make a decisive move, crossing the Euphrates River. It is quite possible that the climatic catastrophe of 1259 pushed him toward this bold action.

The consequences of the volcanic cataclysms were also experienced later. The Chinese chronicle *Yuan Shi* from 1369 reported the following:

*"At this time, there was a great drought in the state. The water in the rivers had completely dried; the grasses in the steppes were burning out. More than 4/10 of the horses and livestock perished. The people had no means of sustenance... The nation's strength was utterly depleted."*⁴

The Mongols began their conquests half a century earlier, in 1206, when Temujin was elected khan at the Great Mongol-Turkic Kurultai and took the title of Genghis Khan (Tengiz Khan), meaning "Lord of All (Waters), Ruler of Rulers." However, the subsequent cataclysms pushed the post-Mongol empires to maintain maximum control over sedentary people, autotrophs, in more favorable climatic conditions and resource-rich regions.

Let us turn to the key date of 627 AD. It is important to understand that historical events do not always manifest immediately but often have a delayed effect. Negative events influencing historical outcomes accumulate over time, eventually leading to decisive results.

Three years after this date, in 630 AD, the Eastern Turkic Khaganate fell, absorbed by the Chinese Empire during the reign of Tugbir Kagan Kat Il-Khan (Ashina Dobi) (620–630). The Turkic Khaganate temporarily fell under Chinese control until its revival and finally died in 744 AD. It is doubtful, of course, that the Eastern Turkic Khaganate collapsed solely because of a climatic anomaly. However, the climate and weather anomaly of 627 AD may have hastened its downfall, particularly due to harsh economic conditions that reduced the efficiency of livestock farming, which in turn weakened Khaganate's military power and defensive capabilities.

Now, let us turn to the period of 536–537 AD. This was the time of war between Rouran (Turgut) Khaganate and the Teleut state of Gaochang. The Teleuts (possibly the ancestors of modern Khakass people) were a Turkic tribe that was part of the Tiele-Tele-Dingling group. The Rourans were a Turkic–Mongolic tribe, considered by some researchers to be descendants of the Huns. In turn, modern Mongols are thought to be descendants of Rourans. Additionally, it is believed that western Turkic avars originated from several Rouran tribes that migrated far to the west. Part of

⁴ Iakinf (Bichurin, N.Ya.) (1829). The History of the First Four Khans of the Chingisid House. Saint Petersburg.

Eastern Kazakhstan up to Lake Balkhash was included in the Rouran Khaganate, with Amgay ruling as khagan during 526–527 AD.

The nature of the war between the Teleuts and Rourans is not fully known, and the conflict began much earlier, in 508 AD. The war had an episodic character, with victories alternating between the Rourans and Teleuts. However, from 536–537 AD, military activities intensified, and by 641 AD, the Teleut tribal alliance had fallen. It is possible that the climate crisis of 536–537 AD led to the increased military activities of the Rourans, transforming the war into one with economic motivations. The worsening climate and livestock farming conditions may have pushed the Rouran Khaganate to further political expansion, as they conducted large-scale military campaigns, reaching as far as the Aral Sea and Crimea. They also waged several wars with Iran and China. In 551 AD, Bumin defeated the main Rouran forces and took the title of Il-Khan. Following the fall of the Rouran Khaganate in 552–553 AD, the remaining Rourans, after migrating and resettling, were absorbed into the ethnic composition of their victors—the Turks.

The period of 536–537 AD also marked the rise of the powerful Turgut tribal union on the Eurasian stage, led by the legendary Ashina clan. The birth, rise, and fall of the Great Turkic Khaganate occurred against the backdrop of a prolonged cooling process from 536–660 AD, associated with volcanic activity (not only in Indonesia). This period is known in the scientific literature as the late antique little ice age (LALIA).

The authors of the 2018 article "Cooling and societal change during the Late Antique Little Ice Age from 536 to approximately 660 AD" note:

*"Although any hypothesis about the causal link between the unprecedented sixth-century thermal shock caused by volcanic events and subsequent outbreaks of plague, rising and falling empires, human migrations, and political upheavals requires caution, our recently obtained understanding of the multifaceted impact of LALIA aligns well with the major transformative events that occurred in Europe during that time."*⁵

In a certain sense, one could say that just as economic conditions gave rise to the great Mongol Empire of Genghis Khan, so did economic conditions (caused by sharp climatic changes), which earlier gave rise to the Great Turkic Khaganate of the Ashina clan.

Interestingly, the climatic extremum of 536–537 contributed to the birth of the Great Turkic Khaganate, whereas a similar climatic extremum in 627 contributed to

⁵ Büntgen Ulf, Vladimir S. Myglan, Fredrik Charpentier Ljungqvist et al. Cooling and societal change during the Late Antique Little Ice Age from 536 to approximately 660 AD. *Nature Geoscience*, V9, N°3, 2016

the fall of the Eastern Turkic Khaganate. In the first case, the extremum led to the necessity of expansionist wars due to the depletion of livestock and pasture resources, whereas the second extremum, a hundred years later, ultimately exhausted the strength of the Turks in their struggle against sedentary China.

Importantly, as already noted, nomadic life is more sensitive to climatic fluctuations and changes. Sedentary peoples and economies can compensate for negative climatic conditions with new technologies, such as improving irrigation systems and introducing new crops. Specifically, the cooling of 536 may have contributed to the shift of Sakalibo (Proto-Slavs or Proto-Chuvash, according to various versions), sedentary inhabitants of the Middle Volga region, to the plow-horse system of field cultivation (the so-called Imenkovo culture) during this economically challenging time. This technology allowed them to somewhat offset crop failures caused by cooling.

For a nomad, who practices animal husbandry on vast natural pasturelands, the only option is to migrate to more favorable environments. The more extensive and prolonged the climatic changes are across space and time, the larger and longer the migrations of nomadic peoples. The further they travel. However, since favorable lands are often already occupied by other nomadic or sedentary people, such forced migrations are usually accompanied by conquest campaigns and military conflicts. The more territory a nomad can occupy and control, the fewer risks they face in maintaining their nomadic economy. Simply put, the greater the intensity and impact of a climatic extremum, the larger and more powerful the nomadic empires and confederations become, expanding their territories to minimize economic risk through new lands, new cultural environments, and alternative economic methods.

Of course, as we have already discussed, climatic conditions and abrupt periods of climate change do not dictate but rather complement, modify, enhance, or weaken the ongoing political processes and historical events in the Great Steppe and Eurasia.

However, another crucial factor must not be overlooked—epidemics. There is no doubt that climatic factors significantly contributed to the emergence and spread of epidemic diseases across the Great Steppe, leading to mass deaths of nomads due to the "Black Death" (plague) and cholera. Naturally, such tragic events also had an impact on the political, social, and economic dynamics of nomadic civilizations. In the "Collection of Materials Relating to the History of the Golden Horde," medieval Persian authors are quoted:

*"In 833 (1430) and the preceding year, in the lands of Saray, Desht, and the Kipchak steppes, there was a severe drought and an extraordinarily large pestilence, from which a large portion of the population perished, so that only a few of the (Tatars) with their herds survived."*⁶

⁶ Collection of Materials Relating to the History of the Golden Horde. Excerpts from Persian Works, Collected by V.G. Tizenhausen. Leningrad, Academy of Sciences of the USSR Press, 1941. 1

Additionally, the Iranian historian Fasih Ahmad ibn Jalal ad-Din Muhammad al-Havafi (1375–1442) wrote about major epidemics in Eurasia in his book "Mujmal-i-Fasihi (The Fasih Chronicle)":

*"The death of Emir Ali Dervish—one of the princess Gauharshad-aga's closest attendants—may Allah have mercy on them both! Many people died from the cholera that ravaged herats such that the number exceeded all limits. I write here of the deaths of some well-known nobles, but mentioning all of them would be beyond the scope of this brief account. In total, approximately ten thousand corpses lay in the city and beyond, rotting and swelling, and no one was willing to bury them. On one day, four thousand seven hundred coffins and other items were loaded onto pack animals, and the gates of Herat, not including those who died on the outskirts, were removed. The city of Herat is one-fourth the size of its surrounding areas. Among every two hundred inhabitants of Herat, its suburbs, and its surrounding districts, only one person likely survives. No one could find coffins or burial shrouds. Those transported to the cemetery were mostly loaded onto pack animals, which were led by bearers, with each animal carrying four or five corps. They dumped pits and dumped the bodies in, covering them with earth. The stories people tell about this are beyond the truth... and after they left Herat, plague and cholera spread there three months later. The Almighty Allah saved the angelic persona of His Majesty, his sons, and the pillars of the state from this disaster. "*⁷

These events occurred as a result or consequence of the climatic extremes of 1258–1259, as noted by Barinov.

There are numerous other historical accounts of devastating epidemics that led to the near-total depopulation of the Great Steppe at various times. Thus, there is no doubt that climatic and environmental conditions played a significant role in shaping the history of the nomadic peoples of the Great Steppe and Kazakhstan.

Undoubtedly, for a complete understanding of the history of Kazakhstan and the Great Steppe, this issue requires thorough and systematic research and factual analysis within the framework of a new science—political and socioeconomic climatology.

⁷ Fasih Ahmad ibn Jalal ad-Din Muhammad al-Havafi. Fasih's Compendium. Tashkent, "Fan," 1980