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History

Climatic Changes and the Cycle of Famines in 14th-Century Georgia

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Abstract. The study is devoted to researching the history of climatic changes that took place in Georgia during the last millennium. The Middle Ages were globally characterized by several centuries of warming, the Medieval warm period (MWP), and from the second half of the 13th century the climatic changes began, followed by the Little Ice Age (LIA) that lasted until the 50s of the 19th century. The article presents a periodization of the cycle of hunger strikes caused by 5-year droughts. In addition, the Black Death pandemic in parallel with the invasions of foreigners played a major role in the mass death of population.

Keywords: climate change, Medieval warm period (MWP), Little Ice Age (LIA), cycle of famines

Introduction

The 14th century is one of the most difficult periods in human history. After the defeat of the Crusades, Europe was plunged into an internal political and religious conflict. The political difficulties were compounded by climatic changes, crop failures, temperature drops and so on. The continuation of these disasters proved to be even more terrible, 2nd Black Plague pandemic. Worldwide pandemics began and caused the destruction of people on an unprecedented scale for several centuries. It all started with climatic changes and as it will be seen below, Georgia was also affected.

This article takes the climatic changes as a basis to better illustrate a hitherto unknown part of Georgia's history. Therefore, a brief overview of climate history from the Middle Ages to the present day will be given in order to build the analysis onto it. Information about the "Little Ice" in Georgia is contained in the works of researchers from various disciplines (Aladashvili, 2001; Bitadze et al., 2011; Khornauli, 1983; Kvavadze and Licheli, 2009; Maruashvili 1970; Shatilova et al., 2011; Tielidze et al., 2020). In addition, the work also draws on research by foreign scholars and scientists (Alexandrin et al., 2023; Bauch et al., 2020; Le Roy Ladurie, 1971; Utterström, 1955; White et al., 2018). It also draws on old Georgian historical written sources and ethnographic material.

A Brief Overview of Climate Change

From around 800 AD to 1250 there was the Medieval warm period (MWP) (White et al 2018: 254). One of the main reasons for the warming was the high solar activity. The high temperatures led to the development of agriculture, which in turn led to an increase in the population. New settlements emerged in the north, e.g. "The climatic amelioration may have facilitated the colonization of Iceland in the ninth century, and certainly facilitated that of Greenland in the tenth" (Le Roy Ladurie, 1971). Then the so-called Little Ice Age (LIA) begins. Around 1250/1270, the temperature drops and the glaciers in the mountains advance. It is also referred to as the transitional phase, around 1270-1420 (White et al., 2018); and the Little Ice Age (LIA) is placed in the period between around 1300-1850 (White et al., 2018), but some scientists count the Little Ice Age (LIA) from 1600 onwards. The fact is that the weather has become harsher since the 17th century. The Little Ice Age (LIA) probably begins from the second half of the 13th century, because at this time the temperature drops and nature begins to change. From the 13th century onwards, the advance of glaciers was recorded throughout Europe (and not only there) (Le Roy Ladurie, 1971). The transition from the warm period to the ice age, i.e. the 13th to 14th centuries, began with long periods of drought, followed by cold periods and abundant rainfall. From the 10s of the 14th century onwards, a series of rainstorms set in, causing major problems for mediaeval agriculture. Winters became longer and summers shorter. The heavy rain and lack of sunshine made it impossible to grow crops. The greatest challenge was hunger with mass famines in Europe. A particularly difficult period being 1315-1322, when it rained almost continuously and the cultivation of crops became impossible (White et al., 2018; Kelly, 2006). To make matters worse, the cessation of agriculture forced people to subsist on meat, which led to the massive destruction of domestic cattle. Hunger and epidemics caused people to die and led to cannibalism (Le Roy Ladurie, 1971). However, the majority of society suffered from persistent hunger and malnutrition and a weakened immune system, which further increased the number of victims during the second Black Death pandemic. Prior to the pandemic, there were localized mass famines in Europe after the 20s, which continued during the pandemic.

After the advance of the glaciers, the inhabitants of the north were put to the test. Where once crops could be grown or there were fertile pastures for livestock farming, everything was covered with snow. With the decline of agriculture, the European economy also declined, as many previously existing traditional farmlands were completely destroyed. Iceland is a good example of this. In Iceland, the export of homespun (vadmål) declined in the 14th century and fish products became more important for export. As a result, the coast became a more important part of the economy than the inland. Corn cultivation declined and imports increased. In England, viticulture was very high in the second half of the 13th century, but disappeared towards the end of the 14th century. The climatic changes thus had a major impact on life in Iceland and England (Utterström, 1955).

The Little Ice Age (LIA) was exacerbated during solar minima, when solar activity was lower. There were several solar minima: the so-called Wolf Minimum (1280-1350), the Spörer Minimum (1450-1540), the Maunder Minimum (1654-1715) and the Dalton Minimum (1790-1820). Even after the 14th century, major famines occurred at regular intervals. In addition to climate change, the famines were also caused by protracted wars and epidemics. Climate change caused the migration of rodents, which moved closer to people's homes. Frost was periodically severe, especially during solar minima. Glaciation reached its maximum in the new historical period, and from the second half of the 19th century, warming resumed and the glaciers began to retreat.

Climatic changes in the Caucasus. Georgia as well as the Caucasus show a strong similarity with the climatic events in Central and Southern Europe. The Medieval warm period (MWP) was also in the Caucasus:

During the so-called "Arkhyz break", the first millennium of AD, the snow receded and people began to colonise the high mountain valleys of the Alps and the Caucasus as well as Iceland and Greenland. There are remains of Alanian farming cultures in Teberda, in the Dombai valley, at an altitude of 1900 metres. Today, only the village of Teberda at an altitude of 1323 metres in the valley of the Zelenchuk River (Arkhyz district) is still inhabited (Tushinsky, 1988). In the Caucasus, the climatic anomaly of the Middle Ages lasted until the second half of the 13th century (Alexandrin et al., 2023).

The climatic changes in the Caucasus also began in the 13th century. "The increase in humidity began in the 13th and 14th centuries, which led to an increase in snowfall in winter. The humidity caused the glaciation of the Alps and the Caucasus, the glaciers began to grow forward in the valleys. Such an increase of glaciers in the Alps is called the Little Ice Age (LIA), i.e. the Fernau stage, and the middle ice age of the 19th century in the Caucasus" (Tushinsky, 1988). "Within it we distinguish three stages of Little Ice Age in the Western Caucasus: a two-fold LIA 1st stage (ca. 1270-1310 and 1370-1410), at this time glacier advance in the region could have reached its maximum in the past 1500 years; LIA 2nd stage (ca. 1500-1630) – and a well-documented LIA 3rd stage (ca. 1750-1840)" (Alexandrin et al., 2023).

Climatic changes in Georgia. In the 14th century, most of Georgia experienced the new century under Mongol rule. In the description of the unrest related to the Mongols and internal factors, in the country and the punitive expeditions of the Mongols in one of the accounts of life in Kartli preserved in the Hundred Years' Chronicle, one can perhaps recognize some parallels with the cycles of famine in Europe. The chronicler describing the events in Kartli compares them to biblical passages. He talks about the hunger, the places filled with corpses, and says that bread could only be obtained in Meskheti (Kartlis Tskhovreba, 2014).

It was already shown that in the Caucasus, as in the whole world, the "warming phase of the Middle Ages" has come, and in Georgia this is confirmed by the palynological analysis of things found in the Bethlehem Monastery. According to the researcher, the existence of a monastery at an altitude of almost 4100 metres and the possible living conditions of the monks there can be explained by a warm climate from the time of the "thaw of the Middle Ages". The warming in the 10th and 11th centuries is also confirmed in other regions of Georgia (GSE, 1977). The legendary Bethlehem Monastery, which existed only in historical documents and folklore, was rediscovered in 1948 by a mountain expedition led by mountaineer Aleksandra Japaridze (Japaridze, 1948). The undeciphered inscriptions were discovered, and dated to the 11th and 12th centuries according to the palaeogrpahic signs (Margvelashvili 1979: 19). Radiocarbon analyses of several objects found in the Bethlehem Monastery also yielded the following dates: 920±50 and 1060±125 (Mchedlishvili et al., 1986). Everything is generally dated between the 9th and 14th centuries (Mchedlishvili, 1981).

The climatic changes in Georgia also date back to the 13th century. The Chalaati glacier in Svaneti also began to advance from the 13th century (Tielidze et al., 2020). Toponymic material also confirms the existence of the Little Ice Age (LIA) in Georgia: Toponyms derived from the names of trees and plants occur at altitudes where forests no longer exist. the upper limit of the forest was 300-400 metres higher until the 14th century, it went down after cooling until the 1850s (Khornauli, 1983).

The chronicler says that at that time there was neither sowing nor building, and he cites a biblical

example: “when Elijah abstained from all activity for three years and six months; but here, the devastation continued for five years.” And in this biblical passage, the Lord punished the people and Israel’s King Ahab with a drought of three years and six months (Kartlis Tskhovreba, 2014; The Bible, Third Kings, chapters 17-18). It seems that the chronicler’s allusion to the drought as the cause of the famine rather than the abundant rains and cooling leads to a misunderstanding, but if looking closely, the history of climate change beginning with the “climatic anomaly of the Middle Ages” through the transitional period of the Little Ice Age (LIA) in the 10s of the 14th century is evident. This is before the abundant rains, the so-called Dantean Anomaly, occurred around the world, global droughts were recorded in 1302-1307, which repeated in the 60s of the 14th century (Bauch et al., 2020). The 5-year famine-strike cycle can be roughly dated. It can be discussed in connection with the confirmation of the rule of Vakhtang by the Mongols (Kartlis Tskhovreba, 2014: 387). As is known, Vakhtang was recognized as king in 1302 and died in 1308 (Lominadze, 1979). After becoming king (probably, in 1298), Vakhtang marched with Georgian troops to various battles with Mongols in the Middle East (Javakhishvili, 1982). The year of 1298 can be considered the lower limit of the famine-strike cycle. Beka I, the ruler of Samtskhe, who took in the people from Kartli, died in 1306 (GSE 1977), and the famine raged for 5 years. The chronicler thus reports the recognition of Vakhtang as king in 1302, because the 5 years of famine fall in the years 1302-1306; this dating also coincides exactly with the global drought period already mentioned.

The chronicler also describes the terrible hunger. “And such hunger raged that people ate carrion without shame. Districts and squares, roads and fields, towns and villages were filled with corpses, infants sucked with their lips the petrified breasts of their dead mothers.” It is mentioned that the cases of cannibalism during the later cycles of famine in Europe are also confirmed. In the 10s of the 14th century, after the end of the famines caused by the rains, 10 to 15 per cent of the population died of starvation (Kelly, 2006). It is hard to say how many Georgians died in the cycles of famine, but the chronicler’s words clearly show the hardship that existed. The Hundred Years’ Chronicle mainly describes the stories from eastern Georgia. The situation in western Georgia may have been much worse, as eastern Georgia had a stronger agricultural economy and more food than the west.

The chronicler emphasizes that the bread was in Meskheti. Perhaps his opinion is more or less subjective, since he must have been a Meskhetian (Kiknadze 1989), but other sources also support his opinion, which can be found in ethnographic and folkloristic records, in oral traditions (Makalatia, 1938). The people of Kartli had nowhere else to go but to Meskheti, where the wife of Beka Mandaturtukhutsesi fed the starving.

As it turned out, the climate had indeed changed, both in the Caucasus and in Georgia. Such a major event must have been reflected in some form in mythology and oral traditions. For Georgian mythology, Zurab Kiknadze offers the theme of “Eternal Spring”, taking into account the legends about Queen Tamar (Kiknadze, 2016). Some myths, Georgian as well as Ossetian, and Khevsurian Andrezi, contain information about Queen Tamar, the morning star, the creator of summer and winter and the pursuer of snow and ice, who dwelt on Mount Elbrus. Various myths describe how certain places where people used to live turned to ice (Bochorishvili 1946; Makalatia, 1938; Mamisimedishvili, 2015).

If comparing Medieval warm period (MWP) with the ethnographic material, according to which the weather at the time of Queen Tamar was good, people lived in the high mountain regions and agriculture was developed; and then, at the boundary of the 13th and 14th centuries, the climate really changed and it became cold. In the Middle

Ages, popular stories, legends and myths were used to explain the cold weather, as there was not enough knowledge for a "small climatic optimum".

In the first half of the 14th century, there was considerable rainfall throughout Europe and the water level of the Caspian Sea was high (Utterström, 1955). In view of this information, there must also have been wet years in Georgia during the same period.

Apart from hunger, it is interesting to see whether climate change has brought other problems. According to the chronicler, the Ossetians invaded from the North Caucasus and took the city of Gori. The Georgians were forced to conclude a truce because of the Mongols and Gori was left to the Ossetians. Their occupation continued until George the Brilliant drove them out (Kartlis Tskhovreba, 2014). In Georgian historiography, it is believed that due to the fact that the country was disturbed and suffered from the constant punitive expeditions of the Mongols, the Northern Caucasians became active and the invasion of the Ossetians and the capture of Gori took place in 1292-1293 (Lominadze 1979: 612-613). The activation of the Ossetians can be explained by the deterioration of climatic conditions (Togoshvili, 1958). On the threshold of the 13th and 14th centuries, the Alani villages in Arkhyz were destroyed by the intensification of the avalanche effect (Tushinsky, 1988). The Ossetians were probably massively oppressed by the drop in temperature and then moved southwards with their families and weapons in hand. The Christian kingdom of Ossetia had been an ally of Georgia for centuries and had fought against enemies. For this reason, the Ossetians kept migrating to Georgia in small groups, but this time they came with a fight and helped the enemies of the Georgians – the Ilkhans. As wars, famines, the black plague, foreign invaders, etc. killed most of the Georgian population and the Georgian feudal lords had to increase the number of serfs, the Ossetians began to colonise that part of Georgia.

Discussion

After the 14th centuries, the Little Ice Age (LIA) turned severe all over the earth. This is confirmed by the palinological material. In Atsquri, olives and vines disappear from the 17th century onwards. The different vegetation cover also indicates that the climatic conditions in south-east Georgia were different from today until the mentioned century, but the researchers' conclusion that this was during the 13th and 16th centuries rewarming is not supported. The research does not show that there was a cooling after the Medieval warm period (MWP) and that the vegetation changed before the 13th century (Kvavadze et al., 2009; Shatilova et al., 2011; 4). As mentioned above, it was in the late mediaeval period when the frost became more severe during the solar minima of Spörer and Maunder. Therefore, the destruction of olive plants and vines from the 17th century onwards can be explained by the fact that the advance of the glaciers and the cooling from the 13th century onwards were felt more in the northern high mountain regions of Georgia, which are part of the main mountain system of the Caucasus, and that the climate, which later hardened during the solar minima, was already severely affecting southern Georgia. The toponymy confirms that the vineyards are to be expected not only in the mountainous regions of southern Georgia, but also in the northern mountains: "the toponym navenakhari "the place where the vine once stood" can be found in several places, which once indicated the existence of a vineyard in this place" (Khornauli, 1983). Other data also prove that glaciation continued during the New History period. Tbilisi after the reconstruction of climatic conditions: Small glacial periods – the minima of Spörer and Maunder in the 15-16th and 17-18th centuries, – were global in scale (Aladashvili, 2001). The situation in the highland regions of Georgia was similarly serious, e.g. in Svaneti and Kehvsureti some habitable places were destroyed by the advance of the glaciers (Maruashvili, 1970). The

persistence of the Ice Age is also confirmed by a small number of preserved historical documents. Handwritten inscriptions of the annual cycle only describe important news, e.g. the invasion of the enemy, the enthronement of the king or his death, etc., and all too often in a few words. One of the great snowfalls of 1640 was considered worth recording in one of the Handwritten inscriptions (Odisheli, 1968), which means that it was indeed a story of great value, as the icing in February apparently became very severe.

During the Little Ice Age, the pressure of the North Caucasians on Georgia and resettlement continued, partly due to the deterioration of climatic conditions. This completely changed the ethnicity of Dvaleti, for example, and this region were lost to Georgia forever. The climatic changes in the late Middle Ages may also have affected the Apsuas, the people of Circassian-Adygian descent, who came from the mountains to settle in historical Abkhazia. The climatic changes were the trigger of the North Caucasian Lekianism – raiding and marauding by Daghestanian people. The land-poor mountain dwellers, whose climate became harsher, were forced to support themselves through piracy and the purchase of captives.

Conclusion

The article examines climatic changes in Georgia during the 14th century. As far as possible, their occurrence was confirmed through historical sources relating to the period of the Little Ice Age (LIA). Climate change, together with the Black Death and subsequent foreign invasions, played a major role in the destruction of Georgia. To better understand the causes of foreign emigration and the decline of agriculture, the question arises as to whether it is necessary to study climatic changes. However, given the scarcity of information, historians alone can do little without the assistance of other disciplines (archaeology, glaciology, palaeoecology, palaeoclimatology, astrophysics, etc.). Only by reconciling and analyzing the most reliable results of these sciences can be presented the history of the Little Ice Age in Georgia as fully as possible.

ისტორია

კლიმატური ცვლილებები და შიმშილობათა ციკლი XIV საუკუნის საქართველოში

ნ. გოგოლაური

ილიას სახელმწიფო უნივერსიტეტი, მეცნიერებათა და ხელოვნების ფაკულტეტი, თბილისი, საქართველო

(წარმოდგენილია აკადემიის წევრის ჯ. სამუშიას მიერ)

კვლევა ეხება საქართველოში უკანასკნელ ათასწლეულში მომხდარ კლიმატური ცვლილებების საკითხს. მთელ დედამიწაზე შუა საუკუნეები ე.წ. „შუა საუკუნეების თბილი პერიოდით“, ხასიათდებოდა, ხოლო მე-13 საუკუნის მეორე ნახევრიდან კი დაიწყო კლიმატური ცვლილებები, რასაც შედეგად მოჰყვა ე.წ. „მცირე გამყინვარება“, რომელიც გაგრძელდა მე-19 საუკუნის 50-იან წლებამდე. სტატიაში წარმოჩენილია 5-წლიანი გვალვებით გამოწვეული შიმშილობათა ციკლის პერიოდიზაცია. ამასთან, უცხოტომელთა შემოსევების პარალელურად გავრცელებული „შავი ჭირის“ ეპიდემია, რამაც გამოიწვია მოსახლეობის მასობრივი კვდომა.

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