

## **WEATHER EVENTS DURING THE FIRST TARTAR INVASION IN HUNGARY (1241-42)**

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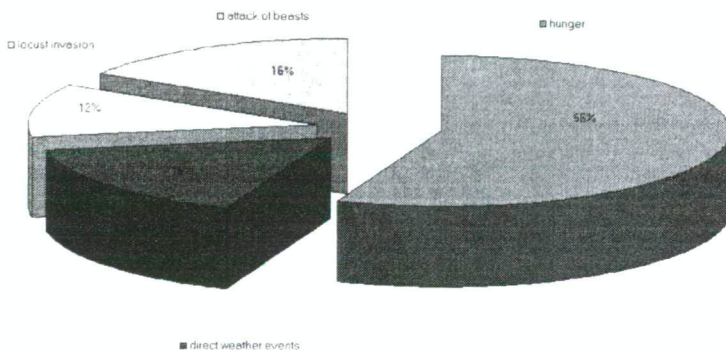
### **Summary**

On the basis of 29 sources, including 41 direct and indirect data, an attempt is made to collect and analyse the available, contemporary sources, related to events during the first Tartar invasion of Hungary in 1241-42. Most of the collected, direct information is strongly connected to the severe, long-lasting frost of January 1241 when the Danube froze over in the section flowing within the territory of Hungary.

### **Sources and conditions**

In the 13<sup>th</sup> century, the first Tartar invasion (1241-42) gained great "publicity" not only in Hungary, but also in many parts of Europe. According to the medieval narrative sources that remain to us, for Europe, the first Tartar invasion became the best known event of the 13<sup>th</sup> century concerning Hungary. Moreover, not only many foreign sources, but also an unusually large number of preserved contemporary Hungarian sources report on events during the Tartar invasion. Some weather events at this time - directly or indirectly - were also included in these narratives. These sources are especially important as they provide quite precise information on the unusually cold weather conditions during some parts of the winter of 1241-1242. Some recent research on general winter conditions in Western Europe (mainly including sources from Switzerland, Germany, and partly the Czech Lands, present Slovakia, Poland and Hungary) partly overlapping with this same period suggests that the winters of the 1240s were generally not below the average (*Pfister et al.*, 1998, 548.). On the other hand, according to Glaser and his colleagues, the winter temperature index of the 1240s was below (-2) the average (*Glaser et al.*, 1999, 26.).

In this short study, the data from 33, mainly contemporary sources, were considered: while 10 of them are Hungarian or Dalmatian, containing most of the direct weather information, 23 are foreign, Western- and Central-European sources, mainly containing indirect information. Of the 41 data, 24 speak of hunger in Hungary during and after the Tartar invasion. Seven are connected to the attacks themselves and invasion of animals such as wolf, fox, eagle and locust at about the same time. Although only 7 (together with 3 other connected data) of the sources refer to direct weather events such as winter frost, frozen rivers (mainly the Danube), melting swamps and early spring frosts, many of these indirect sources also reflect not only on the effects of the disastrous invasion but to some extent on the previous unfavourable weather conditions (*Fig. 1*).



**Figure 1** Distribution of the available sources referring to the first Tartar invasion of Hungary (1241-42)

### Information content and its interpretation

This collection of sources contains at least five types of information which can be analysed from a climate historical point of view:

1) Only one source, Rogerius (archdeacon of Várad at that time - today it is Oradea in Romania) mentions in the *Carmen miserabile* (written around 1243) the heat in the Hungarian camp during the battle of Muhi, on the 11<sup>th</sup> of April by the Sajó river (Rogerius. *Szentpétery* Vol. 2., 1937, 570.). As there are no details in the source giving a reason for this heat - whether it resulted from the great number of warriors within a small area or because of weather conditions – firm conclusion on the prevailing weather conditions cannot be drawn. However, the swamps by the Sajó river were impassable in those days. (The only possible ford for crossing the river was to find the bridge north of the scene of the battle.)

2) An unusual event is noted in five contemporary, reliable sources: the Danube was deeply frozen, in Hungary during a certain period in the winter of 1241-42 (Rogerius. *Szentpétery* Vol. 2., 1937, 583-584.; Thomas Spalatensis. MGH SS. 29/590.; Györffy, 1987a, 179.; etc.). According to Rogerius, such an event has not happened here for long time (“*Ecce, in hyeme nivis et glaciei habundantia supervenit ita, quod Danubius, quod non acciderat a multis retroactis temporibus, gelabatur*”). This opinion - concerning e.g. the 1230s - can be

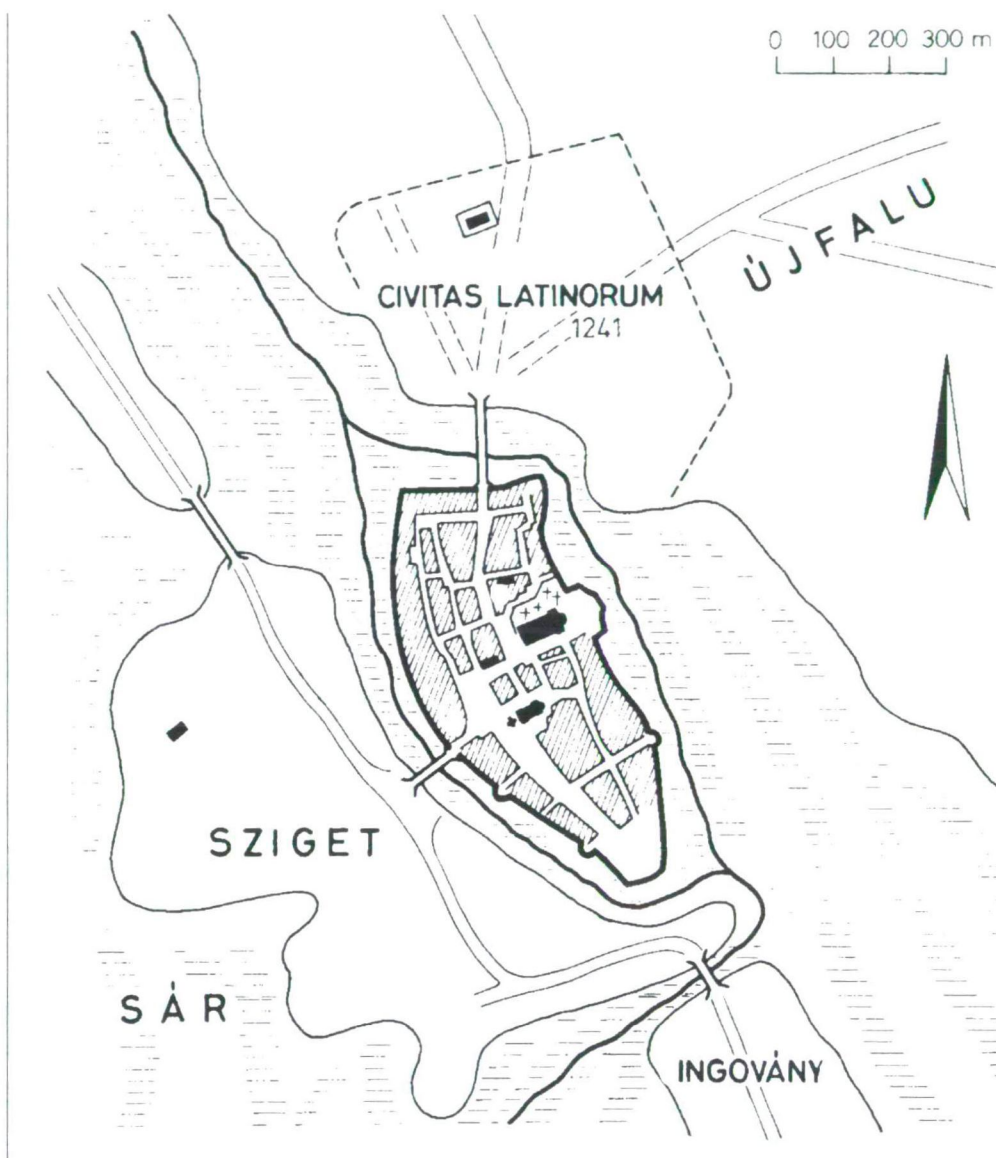
supported with the above-mentioned winter reconstruction referring to Central Europe (Pfister *et al.*, 1998, 548.; Glaser *et al.*, 1999, 26.). Rogerius also mentions the abundance of snow and ice in the same winter. (Rogerius. *Szentpétery* Vol. 2., 1937, 583.) The ice-cover of the Danube was so thick that it could hold herds of animals, and what is more, the Tartar army as well (Rogerius. *Szentpétery* Vol. 2., 1937, 584.). This could happen only if it was preceded by long-lasting, permanent frost in large sections along the Danube. Additionally, Thomas of Spalato (archdeacon) mentioned that river waters froze everywhere, which may also support the idea that strong frosts prevailed in the Carpathian Basin during this period (Thomas Spalatiensis. MGH SS. 29/592.).

In connection with the freezing-over of the Danube, it is known that some days before the Tartars crossed the river, Hungarians were skirmishing with the Tartar warriors every day. The Hungarians broke up the ice on the Danube every day: the ice-cover of the river was already quite strong in some places many days before the Tartar crossing, and the river would have been frozen much earlier if Hungarians had not frequently broken up the ice (Rogerius. *Szentpétery* Vol. 2., 1937, 583.). However, according an Austrian letter – written by Felix, the abbot of Schottenstift in Vienna (4th January, 1242) – the river would have been frozen already from Christmas (*Györffy*, 1987a, 394.). Although his information was most probably wrong as – according to other, reliable sources - Tartars did not cross the river until late January, the idea of the frozen river is perhaps based on his own experience in Vienna.

Even more exact information appears in two letters asking for help, written by Hungarians to the pope. In the first letter, written by Béla IV on the 19<sup>th</sup> of January, it is noted that the Tartars have not yet crossed the river (*Marsina*, 1987, 72.; *Szentpétery*, 1923, 214.). The second letter, written on the 2<sup>nd</sup> of February, reports that Tartars had already crossed the frozen Danube and begun the invasion of the northwestern parts of the Transdanubian region (*Györffy*, 1991, 87., *Marsina*, 1987, 74.). Presumably, the crossing took place near Buda („*portus Danubii*”) (*Györffy*, 1991, 87.). However, Tartars probably also crossed the Danube around Esztergom as well.

After crossing the Danube, Tartars attacked Óbuda and Esztergom (without success) and then, probably soon after the 2<sup>nd</sup> of February, (Székes)Fehérvár. However, by the time of the Tartar attack, the swamps around the island of Fehérvár began to melting suddenly (Rogerius. *Szentpétery* Vol. 2., 1937, 585.).

This rapid melt may have been one reason, among a number of other circumstances that while the *civitas Latinorum* at the edge of the swamp, on the mainland, could be occupied and destroyed easily, Tartars were not able to capture the fortified island surrounded by swamps (*Fig. 2*) (Thomas Spalatiensis. MGH SS. 29/593.). Although the thawing of the swamp is mentioned only by Rogerius, the other source for these events, Thomas of Spalato, does not write about this explicitly but he does accept that the swamp around the island played a significant role in the defense. As the swamp could only have protected the island if it was impassable (so not deeply frozen), this description indirectly supports Rogerius' report.



**Figure 2** Reconstructed location of the mid-thirteenth-century Fehérvár: the fortified Island and the Civitas Latinorum (*Györffy, 1987b, 378.*) (Local geographic names: Újfalú, Sziget, Sár, Ingovány)

In conformity with the above description of the events, it can be presumed that though the beginning of the severe, long-lasting frost is uncertain, it must have begun at least in the first half of January and lasted until the end of January - beginning of February. These data are also significant since - concerning the winter in Europe - there are only very limited number of direct sources available for the winter of 1241-1242 (see *Alexandre, 1987, 389-390.*).

3) According to Thomas of Spalato, Caydan (the Tartar prince) could chase the king – who had escaped from Hungary to the Dalmatian island of Trau (today Trogir in Croatia) – in the direction of Spalato (today Split in Croatia) with only part of his army because the severe frosts of early March meant there was not enough grass for the horses (Thomas Spalatiensis. MGH SS. 29/594.).

In spite of the fact that the last part of their journey led through Slavonia and Croatia (to Dalmatia), this observation may reflect to some extent the contemporary weather conditions in certain parts of the Transdanubian region as well. The length of the period of frost in March cannot be measured. It is only known that the Tartars returned to Inner Asia in spring of 1242 (which also means that they had to cross the Danube again) (*Kristó*, 1988, 131.).

4) The most numerous group, among the sources referring to the first Tartar invasion of Hungary, includes 24 mentions of the great hunger during and after the long year of war. This famine was known and reported on in Europe as much as the Tartar invasion itself. In fact, in most sources it was mentioned together with the invasion, sometimes with the comment that this famine, in the unstable period of 1242 and 1243, resulted even greater decline of population than the Tartars (*Continuatio Sancrucensis II*. MGH SS. 9/641.; *Anonymi Chronicon Austriacarum*. *Rauch*, 1793, 245.; etc.). This was also mentioned by most of the Hungarian chronicles (*Szentpétery* Vol. 1., 1937.). Some connecting details of the possible effects were discussed by Györffy (*Györffy*, 1987a, 29.).

The Tartar invasion was very much responsible for the hunger since at least two sowings and one harvest were missed in the areas east of the Danube while Tartars took or destroyed all of the reserved seeds as well as the harvest. On the other hand, these difficulties may also have been related to more than one unusually cold month of the previous winter, and perhaps the frosty weather of October in 1242, which was described for Austria, could also affect Hungary (*Continuatio Sancrucensis*. MGH SS. 9/640., see also *Brázdil and Kotyza*, 1995, 102.). There is a probability that these long-lasting frosts did not spare the yields either. Even if Rogerius mentions in his work that there was extremely cold weather with a lot of ice and much snow, snow presumably could not entirely protect the soil and the vegetation against the negative effects of severe frost over such a long period. Moreover, although significant parts of the livestock might have been driven away by the Tartars or simply left to wander about on their own, if we accept that there was deep snow and frost, the remaining domestic animals would have also suffered from the consequence of the vicissitudinous winter.

5) Other unusual circumstances are also mentioned in connection to the afore-mentioned famine. There were frequent attacks by wolf-packs (in some sources foxes and eagles are also mentioned) against humans. In some cases beasts ran into houses, attacking and eating people (Thomas Spalatiensis. MGH SS. 29/595.; *Continuatio Sancrucensis*. MGH SS. 9/641.; *Annales Polonorum*. MGH SS. 19/634., 635.; *Rocznik Traski*. MPH 2/838.; *Rocznik Małopolski*. MPH 3/167.; etc.). These descriptions may also provide indirect evidence of severe winter conditions, since such animals attack people only if their ordinary food, namely herbivores, decreased sharply in numbers, in most cases because of a very snowy (or/and frosty) winter or very dry period effecting the vegetation. In addition, according to partly the same, partly other, primarily Austrian sources (two of which were copies), locusts also appeared in great quantities, at the time (or immediately after) the famine (*Anonymi*

Chronicon Austriacarum. *Rauch*, 1793, 245.; *Continuatio Sancrucensis*. MGH SS. 9/641.; etc.).

### **Possible later parallels: was it an extreme winter?**

In the 20<sup>th</sup> century (1901/1956), ice floe appears at an average heat sum of  $-13.7\text{ }^{\circ}\text{C}$ , and massive ice cover develops at an average heat sum of  $-98.9\text{ }^{\circ}\text{C}$  on the Danube at Budapest (*Horváth*, 1979, 46.). Ice can appear at Budapest (in an optimal case) at an average winter temperature of  $3\text{ }^{\circ}\text{C}$  or less, and standing ice-cover can develop at  $1.4\text{ }^{\circ}\text{C}$  or lower average winter temperature (*Horváth*, 1979, 50.). However, the appearance and extension of ice-cover also very much depend on the temperature conditions in the upper catchment area of the river. Before the regulation works, the river had a much wider bed at Buda as well as at Pest, therefore, ice floe could start earlier than today. As an effect of the regulation works, the average duration of massive (standing) ice-cover fell dramatically, from 20 days to 8.2 days (in case of approximately the same winter temperature conditions). While the annual frequency of the appearance of standing ice-cover in winter was 68% in the 19<sup>th</sup> century (1819/20-1889/90), it descended to 43% by the first half of the 20<sup>th</sup> century (1900/01-1955/56) (*Horváth*, 1979, 60.). These differences, most probably, can be connected both to regulation works with the growing pollution of the river as well as to the changes in climatic conditions.

Applying the available historical sources of the Réthly collection, referring to the weltering and freezing over of the Danube, the best documented area in the Carpathian Basin is the present Bratislava (H-Pozsony, G-Pressburg) in Slovakia, but a considerable number of sources is available for Buda (with Pest) as well. On the basis of the data found mainly in the early newspapers of the second half of the 18<sup>th</sup> century, we can say that – similarly to the first half of the 20<sup>th</sup> century (1900/01-1955/56) – there was almost no year without at least the weltering of the Danube. In case of several winters in the second half of the 18<sup>th</sup> century, not only weltering, but also massive ice cover developed on the Danube at Buda (e.g. in 1747, 1781, 1784-1789, 1792, 1793, 1795) on which heaved wagons could cross. (Réthly, 1962.) However, in the late 19<sup>th</sup> century and at the beginning of the 20<sup>th</sup> century, significant changes occurred in the water-course of the Danube and its tributaries, which – together with growing pollution – could significantly influence the freezing conditions of the river.

As it has been already mentioned, in the second half of the 18<sup>th</sup> century the appearance of massive ice cover on the river was not especially unusual. On the basis of the available contemporary sources neither the duration of the massive ice cover on the river, nor the severity of the winter of 1241/42 can be estimated. Nevertheless, the existence of massive ice cover can be connected to colder than average temperature conditions, compared to later sources and the present situation.

### **Conclusions**

In accordance with the relatively large amount of contemporary and almost contemporary sources, some conclusions can be drawn related to the weather conditions at the time of the first Tartar invasion in Hungary. On the basis of the sources (describing the

freezing over of the Danube and attacks by wild beasts among other events) used in this study we can presume that the winter – or at least a certain part of the winter of 1241-42 was unusually cold over great parts of Hungary. Moreover, there is also a probability – based on only one reliable source - that the first part of March may have been colder than usual, not only by the Dalmatian coast (Spalato/Split), but perhaps in Slavonia and in the southwestern part of Hungary as well.

These proposed conclusions concerning weather conditions during the winter of this year in other parts of Europe differ from results of other studies from outside Hungary. The unfavorable weather conditions together with the Tartar invasion had disastrous direct and indirect consequences on the country. However, this was also followed by other, partly or entirely independent effects (e.g. a locust invasion) discussed in the article. Additionally, these data show that the widely extended view that all problems in following years were the result of the Tartar invasion is a bit over-simplified. On the other hand, it seems clear that no complete reconstruction of the winter conditions of 1241-42 can be carried out using the available contemporary sources alone. Therefore, in order to have more precise information, the application of the future results of other fields e.g. archeological, natural scientific research will be of crucial importance in testing the hypotheses developed in this study.

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