

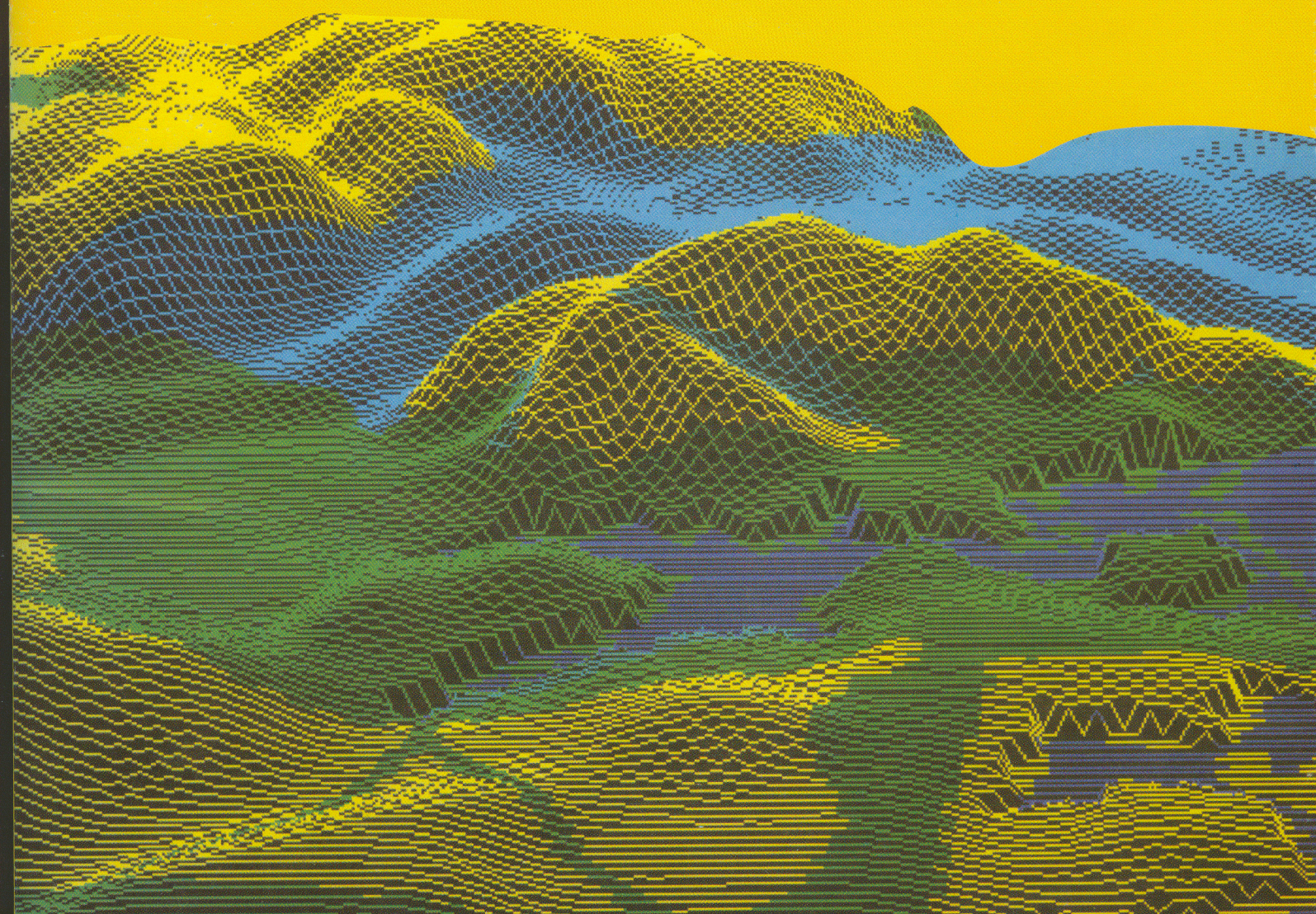
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A CONTRIBUTION TO THE RECONSTRUCTION OF WEATHER AND ENVIRONMENT IN CENTRAL EUROPE IN THE 16th CENTURY

Jan MUNZAR

Abstract

The first physico-geographical descriptions of larger towns include passages from Latin humanistic topographies from the mid-16th century. However, their praise to the location, healthy environment, climate, etc. for Olomouc, Louny or Prague is merely an unrealistic part of the standardized humanistic rhetorical model.

The hitherto oldest realistic course of weather in the territory of the Czech Republic for the concrete month or season originates from the SE Moravia for November 1533 and Autumn 1543 with the data being found for the period of 1533-1545. The course of weather and its socio-economic impacts apply for the year of 1555 and for the southern Bohemia. From 1588-1591 we then have a detailed weather characteristics of eleven months including its environmental impacts. Author of the characteristics was a Moravian noble man Karel of Žerotín. The work applies mainly to the district of Moravia (Náměšť nad Oslavou and surroundings) in July and August 1588, and/or in October and November 1591 (of Gregorian calendar) the data from Germany, where the author was travelling.

Shrnutí

Příspěvek k rekonstrukci počasí a životního prostředí ve střední Evropě v 16. století.

K prvním fyzicko-geografickým popisům větších měst patří pasáže z latinských humanistických topografií od poloviny 16. století. Jejich chvála polohy, zdravého povětří, klimatu atd. pro Olomouc, Louny nebo Prahu je však pouze nerealistickou součástí standardizovaného humanistického retorického modelu.

Zatím nejstarší realistický popis průběhu počasí na území České republiky pro konkrétní měsíc nebo sezonu je z jihovýchodní Moravy pro listopad 1533 a podzim 1543, obsažený v záznamech z let 1533-1545. Průběh počasí celého roku a jeho socio-ekonomických impaktů je pro rok 1555 a jižní Čechy. Z let 1588-1591 se pak dochovala podrobná charakteristika počasí 11 vybraných měsíců a jejich dopadů na životní prostředí. Jejím autorem je moravský šlechtic Karel ze Žerotína. Týká se převážně Moravy (Náměšti nad Oslavou a okolí), v červenci a srpnu 1588, popřípadě v říjnu a listopadu 1591 však i Německa, kde pobýval na cestách.

Key words : historical weather, historical environment, 16th century, Central Europe

1. INTRODUCTION

The Committee for Historical Geography at the Historical Institute, Czech Academy of Sciences, Prague was re-established in 1991. One of its expert groups concentrated on historical ecology and historical development of environment (Boháč 1995, Semotanová 1995, Munzar 1995b).

Three years later, in August 1994, a meeting of the Committee on Historical Monitoring of Environmental Changes (Simmons and Mannion 1995) took place in the Czech Republic, linking up with the Regional Conference of International Geographical Union in Prague.

In March 1995, Prof. dr. J. Jacobeit and dr. R. Glaser organized a workshop on historical climatology at the Geographical Institute, University of Würzburg named Climatic Variations and Anomalies in Europe of the 16th Century, aimed at establishing closer cooperation

among experts dealing with the issue as well as at coordination of both gradual compilation of data documenting climatic peculiarities of this period of time with relatively great climatic reversal changes in various parts of Europe, and the set-up of historical climatic maps and their synoptic interpretation in order to be able to look for similarities in the future development of weather and climate in Europe. This is a follow-up initiative to the long-term geographically motivated historical research of environment made by R. Glaser and his colleagues, which has up to now resulted in the first two volumes of meritorious and unique edition "Materials to the study of former environment". "The Home Chronicle of Hüsner Family of Wiesenbronn" was published as the first volume with records on economy, history, climate and geography of Mainfranken in the Main catchment area dating from 1750-1894 (Glaser-Schenk-Schröder 1991). The next volume was a monograph "Weather - Climate - Environment: Records and



Fig.1: Position of localities from the territory of Czech Republic in question.

Data from Franconia, Saxony, Saxony-Anhalt and Thuringia from 1500-1699" (Glaser-Militzer 1993).

To follow up with the above activities the paper aims at documenting the first more detailed information about weather and air in Central Europe of the 16th century as well as about their socio-economic impacts, and thus at contributing to the reconstruction of environment in this period.

2. COMMENDATION OF URBAN ENVIRONMENT IN HUMANIST DESCRIPTIONS

There is no doubt that one of the most detailed humanist descriptions of towns in the Czech Lands of the 16th century is a Latin poem "*Praise of Olomouc*" that was written by Simon Ennius Klatovsky and published in honour of the town council in 1550 (Bartocha 1946, Nešpor 1946). After describing location of this important Moravian town, the poem includes a passage about the cleanliness and usefulness of the River Morava which flows through the town and a separate section named "*Praise of the town for its mild climate*":

There is a particularly mild climate in our town, and the delicious air does good to all burghers, since the town has built all their abodes at a healthy place on the firm rock foundation. Winds soaked with poisonous vapours are forbidden here and the blow of plague will

never be let in to enter. There has always been just a fine and healthy breeze and seldom any forbidding breath of infection..."

Other verses of the section speak of longevity of the local burghers, well-known doctors who can successfully cure town inhabitants in the case of harmful diseases, and famous drug-stores.

Another example of such a description is from the versed celebration of Louny, a town in Bohemia, "*Descriptio urbis Lunae Boiemicae*" originating from 1558 whose author is a humanist Martin Rakovsky from Rakov: "...*There is probably no such a town in Bohemia with more pleasant and healthier climate. There are no harmful vapours here, neither moors, nor nasty smells. The soil is fertile, somewhat sandy, and always in the sun. The NW winds make the landscape very healthy.*" Similar praise can be heard about the towns of Prague from one of the first Czech botanists and a physician Adam Zálužanský from Zálužany in his calendar for 1596, who claims that "*they do good with their mildest and most excellent weather while being situated right in the middle of Bohemian Land near the Vltava River amidst vineyards and gardens*" (Hrudíčka 1930).

However, it is easy to assume that the commendations of towns as well as the praise of their climate, healthy air and other natural components of environment were usually not based on reality. They were simply a part of the model of poem or essay issued

usually by local town council or at the expenses of local sponsors.

3. WEATHER IN MORAVIA (1533-1545)

The so far oldest systematic daily observations of weather in the territory of the Czech Republic date back to 1533-1545, and the experts succeeded in authorization of the records and their localizing in the southeastern Moravia, ie. in the present district of Uherské Hradiště (Munzar 1994, 1995a). The author - Jan of Kunovice (1482-1545) - was known to have made his observations regularly every day, but practically it was only in the period from the Autumn to Spring, data recorded in the warm half-a-year are usually missing. In spite of the fact that the weather character studies of longer periods counting several days are still rare, they can very well contribute to the reconstruction of climate in Central Europe in the 1st half of the 16th century (with the data of Julian calendar being respected):

November 1533 (southeastern Moravia)

The whole month was mild and moist up to the day 27. This was the date when a strong and very cold wind began to blow from the North. [original in Latin]

Autumn 1543 (southeastern Moravia)

There was no frost this year until the St. Wenceslas [28 October]. After this date, there were some four harmless frosts and again a clean [with no frost] month till the St. Martin [11 November]. The severe winter began as late as on the Tuesday after the St. Martin [13 November] due to cold winds with rather big frosts. However, it did not last longer than till Saturday [17 November], and there were again warm days with heavy and abundant rains and snow. There were also big and nasty waters [floods], and the heat lasts to this date, ie. 10 December, along with great and thick fogs [original in Czech].

4. WEATHER IN BOHEMIA (1555)

The first detailed description preserved for the course of the whole year is that of 1555 from southern Bohemia. Its author is a town scrivener in České Budějovice, Jan Petřík from Benešov, who lived in 1499-1559. With regard to his extraordinary character, we would like to cite him in full translation from the Czech original with explanatory notes in brackets:

"This year [1555] began - as it corresponds to its winter nature - with cold, frosts and big snows, as it was enough snow before the New Year as well. But then after Candlemas [2 February], the snow cover was off in such a way that it did not cause any floods.

The **Spring** began in the Lent [27 February - 13 April] very slowly, and people could easily sow the spring corn.

The **Summer** changed its character, and there were frequent rains and sudden rainstorms not being remembered. This is why unusual floods and losses were seen in many streams, which cannot be believed by everybody. Because in Benešov near Konopiště, there was such an unexpected big water that came in through the Pražská street above the hospital where there is no stream that the two loaded carriages of Rychnovsky carmen by the hospital were taken back and then tipped over so that three of their horses were drawn. The barrels and strong-boxes with glass were then found some near Bedřč - a quarter mile of Benešov, some in the village pond - both intact and broken. [Annalist J.F. Beckovský (1658-1725) mentioned the date of Ascension-Day, ie. 23 May]. Although the corn was of good growth in terms of straw, the grain was insufficient. Peas were growing up to beat any expectations, but little flies appeared on them when at bloom and did much harm. There was enough hay, although some was damaged by the floods, and enough second hay-crop, but much of it was damaged by frequent rains and was left on meadows.

The **Autumn** was very wet, it was impossible to either plough early nor sow because of the moisture, and that was why the sowing was made only around the St. Gallus [16 October] with both rye and wheat emerging and growing nicely though.

The **Winter** began in an unusual manner as it was always warm and wet and the people could not prepare wood for heating because of bad roads. There was no snow except the week before the St. Catherine [25 November] when a small snow fell but lasted not even four days. On Monday and Tuesday of Christmas Eve [23 and 24 December] and even several days before, the days were warm as if in the Autumn. In the night before the Christmas Day [24 / 25 December], the Moon was on long and the people going for the matutinal [Mass] could see it. But the sky was dull and there were no stars in sight. On Wednesday, the Christmas Day [25 December], the weather was clear, but dull as early as after the noon, and with such fogs arisen in the evening that you could hardly see the other side of the square. Weather was unstable the whole week and was changing every day: both clear and cloudy, snow, rain, hail stones, three times, four times a day and at night as well, as if it were the month of April. On Tuesday before the New Year's Day [31 December], a wind and hails were on early in the morning, and snow and rain almost the whole day ..." [Köpl 1885].

The description by Petřík continued to 6 January 1556, and with regard to its details between 23 December 1555 and 6 January 1556 the observations are considered to be the oldest daily records preserved so



Fig.2: Karel of Žerotín (1564-1636) and his signature.

far in Bohemia (Brázdil-Kotýza 1995). The exceptional character of weather at the turn of 1555/1556 also at other places in Bohemia, Germany, Holland and Jutland call for further detailed regional analysis.

It is worth mentioning that a similar character of weather was confirmed in Germany, with a very warm period of several days around 2 February with following cold from 9 February that lasted 14 days (surroundings of Halle/S.). The unstable summer with rainstorms, floods and numerous damages is documented from the district of Eisenach. The warm, humid and unhealthy weather with occasional heavy fogs, winds and the ever clouded sky from the half of December 1555 was recorded in Saxony (Glaser-Militzer 1993).

5. WEATHER IN MORAVIA, BOHEMIA AND GERMANY (1588-1591)

The hitherto oldest weather records describing the weather situation in the territory of the Czech Republic in the course of the whole year by individual days were left by a Moravian nobleman Karel of Žerotín (1564-1636), one of the most educated representatives of his

times. His entries are included in preserved diaries that were however of wider conception and included also social events and personal experience of the author. The observation in question took 524 days from 1 January 1588 to 15 April 1589 and from 14 April to 18 December 1591 of Gregorian Calendar (Žerotín 1590, 1887; Munzar 1984, 1992, 1996). As the author was travelling a lot, his data apply to many localities in South Moravia, Bohemia, Germany and Austria not to include episodic studies made in France from 11 to 29 September 1590.

Observations in 1588-1589 took a course of no less than 16 months and were practically uninterrupted because there are only data of two days missing in the whole lot. Meteorological records from 1591, however, do not apply to every day. In the first period of time, the majority of records was related to Žerotín's residence at Náměšť nad Oslavou, then to Prague and to the German (88 days) and Austrian (10 days) territories. In the second period of the study, three quarters of the observations were focusing Bohemia and Moravia again with a centre of attention in Náměšť nad Oslavou. The rest was concentrated onto Germany in connection with Žerotín's sailing along the Elbe towards the sea from where he was expected to continue to France. The records are in Latin (1588 and 1591) and in Czech (1589). Žerotín's comprehensive assessment of 11 months as a whole are very notable and important in order to learn the environment of those times :

January 1588 (Moravia: Náměšť nad Oslavou)

With an only exception of a few days, the whole month was very pleasant and bright as if it were Spring or Autumn. People say that such a weather and so mild has not been in this country many years. [Žerotín could not make a good judgement himself since he studied in foreign countries for nearly ten years.]

February 1588 (Moravia: Náměšť nad Oslavou)

This month was both colder and less pleasant than the previous one. More often we had snow, more often very severe winds were blowing, yet the frost was bearable, and rather milder than in other years. It surely did good not only to green corn that nearly died of drought due to the last month's unusual warmth but also helped to clear the air [from plague infection].

March 1588 (Moravia: Náměšť nad Oslavou)

A colder beginning of this month brought harsh remainders of February and whole winter. Its kind end then seemed to smelling of Spring.

April 1588 (Moravia: Náměšť nad Oslavou)

What is expressed about the month of April in the proverb was evidenced again by changeability and diversity of this month. It was necessary to stand changing weather, there were rains after clear days and clear days after rains. It was particularly harmful with severe

winds that were blowing almost continuously, partly from the North, partly from the South, and made the weather situation unstable and doubtful. The frequent rains and morning frosts did considerable harm to fruits and especially to wheat, namely at less fertile places which were made unfertile either by the nature or by negligence of farmers. [The assessment of April weather made more than 400 years ago is interesting both by having pointed out the meridional character of circulation and the fact that the April piece of weather-lore that Žerotín had in mind has not been preserved for us. It is perhaps worth mentioning here an older entry about changeable April-like weather in December 1555 in the above description by Jan Petřík of Benešov from southern Bohemia].

July 1588 (Germany: Mansfeld-Magdeburg-Lüneburg-Lübeck-Hamburg)

This month, in other years very harmful by its oppressive heat, was of the least summer character this year. There was nearly no sultry weather at all, and only eight days were without rain with sun rays lightly dispersing finer clouds. Should this character of the month be ascribed to weather which was specific in this year, or to the location of these landscapes which are both swampy and maritime, I do not know. Nevertheless, I assume that earth moisture generates denser air which then gives rise to numerous clouds, and this could most probably be a cause to the changeability [of weather].

August 1588 (Germany: Bremen-Bamberg-Regensburg)

Also this month was very often a rainy one, no less than the preceding month. [Žerotín's data about July and August of 1588 in Germany or Austria favourably complement the German information of wet summer, low yields of grain and the consequential growth of prices in Hessen or Thuringia (Glaser-Militzer 1993).]

May 1591 (Moravia, partly Bohemia)

This month was very windy. It was not hot but bearable and mild. There was a big drought at the beginning and frequent and abundant rains at the end. Hoar frost did not harm the vineyards. Rains flooded the near meadows to make them unuseful this year. Corn appeared to be promising, with rich and well built ears but there is a fear that it might catch rot in the continual rains. There were [practically] no heats, and if so they were easily bearable.

June 1591 (Moravia: Náměšť nad Oslavou)

This month which is normally unpleasant because of excessive heat was almost chilly this year due to continuous rains and winds. At first, the weather was pleasant but did not last long. And although it was raining nearly without any stop, yet the soil suffered from such a strange drought that fields could be ploughed only with difficulties. It was most probably issuing of the fact that

the heavy rains washed the earth surface without having got properly in, and if some water penetrated into the soil in some way supplying some moisture, the soil was immediately dried out by severe gusts of wind. All fruit crop was spoilt - either rotten due to the frequent and abundant rains or unripened due to cold. Vineyards suffered great losses as well, and although we do not fear that harvest will be insufficient, we think that there will not be enough sweetness and quality because the Sun does its duties only poorly this year. Among other, we have arrived at this conclusion because the grapes were in bloom late and therefore will certainly ripen late too. On the top of it, a certain kind of vine called Rivola in our language, of reddish colour, that gives splendid sweetness to wine has become entirely extinct. Grain was greatly abundant in the whole area with God's help, and it could compensate for losses of the last year [1590]. The best harvest was in more cultivated and more fertile areas. God will endeavour that we use his gifts to his glory and do not misuse them. [A German source from the area North of Stuttgart confirms that it was raining steadily in the time of harvest, there was enough grain but it was soaked (Glaser-Militzer 1993).]

September 1591 (Moravia: Náměšť nad Oslavou)

The whole month was very pleasant and bright. Except for a couple of days when the weather was colder, the weather was remarkably mild which would have compensated for the unstable weather of preceding months if only the frosts would not have damaged the vineyards in this month thus taking from us all hopes for abundant crop and its high-grade and quality.

October 1591 (Moravia and Bohemia, Germany from 12 October: a trip on the Elbe River)

In its greater part this month was characterized by bright and pleasant days so that it really could be claimed that the Autumn has compensated for bad weather in the Summer with its kindness. However, it is uncertain whether it could have also compensated for losses caused by this summer weather namely in wine-growing districts, since we dwell in the North now where no wine is grown. [As to Žerotín's entries about the crop and quality of wine in Moravia or in winegrowing districts of Central Europe in general, records from the greater part of Germany confirm the year of 1591 not to be favourable for vintners. In spite of the fact that the yields were average or even sufficient, wine was acid due to the lack of warmth (Glaser-Militzer 1993).]

November 1591 (Germany: Hamburg and surroundings)

With great dislike I spent the whole month idling in Stade where I could not do anything else but carefully watch changes of winds as well as growing and shrinking of the Moon. [Žerotín and his companion had to wait for favourable wind to sail on the sea.]... And the entire delay would have been even more hateful should the

whole month not have relieved my moodiness to some extent by its bright and dry weather. When I made myself tired by reading or writing in the house, I could refresh myself nearly every day by a walk, horse ride, carriage trip or similar entertainments thanks to favourable weather. [Žerotín's records about unfavourable wind for sailing to Normandy in order to lend a hand to the troops of French King Henry IV at besieging Rouen are scattered in both non-systematically arranged daily entries and his preserved letters from Stade that he wrote to his friends in many places in Europe in Latin, Italian and Czech (Rejchrtová 1982).]

6. CONCLUSION

The weather records from 1555 and 1588-1591 link up with the hitherto oldest preserved observations of Jan of Kunovice from the southeastern Moravia originating from 1533-1545, and extend out so far knowledge of weather, climate and environment in Central Europe in the 16th century to a considerable extent. They complement for the given years the so far most extensive reconstruction of historical weather for the northwestern Bohemia that was published by K. Pejml

(1966) thirty years ago. The mentioned study includes only an entry on rainy and bad weather at the harvest time that lasted for many weeks in the summer of 1591, which has now been confirmed not only for the territory of Moravia but also for Germany (Glaser-Militzer 1993). It is worth mentioning the mild January of 1588 since some authors assess the 2nd half of the 16th century as a beginning of the Little Ice Age in Europe. It seems, however, that according to the so far knowledge, it is impossible to speak of any cooling trend in this period of time but rather of sudden weather reversals in the main seasons of the year.

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