

DAILY METEOROLOGICAL OBSERVATIONS OF CHARLES SENIOR OF ŽEROTÍN IN THE YEARS 1588-1591

*R. BRÁZDIL*¹⁾, *O. KOTYZA*²⁾

¹⁾ Department of Geography, Masaryk University, Kotlářská 2,
611 37 Brno, Czech Republic

²⁾ District Museum of Local History, P.O.Box 100,
412 01 Litoměřice, Czech Republic

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SUMMARY

The contribution deals with the analysis of daily weather observations carried out by Charles Senior of Žerotín (Karel starší ze Žerotína) (1564-1636) in the period of 1588-1591. The observations are related to different places in the Czech Lands (most frequently Náměšť nad Oslavou, further Prague), but also in Germany and Austria. The records are verified with respect to numerous reports of Czech narrative sources. They were used for determining the temperature and precipitation extremities of selected months in the Czech Lands. The interpretation of the observations is in good agreement with information from Switzerland, Germany and Poland.

KEY WORDS

Charles Senior of Žerotín - daily weather records

INTRODUCTION

Written historical sources about the weather and related phenomena belong among important sources of data for the reconstruction of the climate of the last millennium. In the 16th century traditional sources of narrative character are also completed by daily weather records. The very first records from the Czech Lands, prevailing for the winter half-year of the period of 1533-1545, come from Jan of Kunovice from southeast

Moravia (Munzar, 1994; Brázdil, Kotyza, 1995). In the years 1588-1591 they are joined by observations of the best-known representative of a famous Moravian aristocratic family, Charles Senior of Žerotín (Karel starší ze Žerotína). The fundamental information with an attempt at a brief verification of the above observations was published by Munzar (1984). The present contribution deals in detail with the verification and climatological interpretation of these records.

THE PERSONALITY OF CHARLES SENIOR OF ŽEROTÍN

The characteristic of the fate of life of Charles Senior of Žerotín is based on papers by Chlumecký (1862), Slavík (1908) and Odložilík (1936), and in details it is completed by some further sources (see quotations in the text).

Charles of Žerotín (since 1600 called Charles Senior of Žerotín - Fig. 1) was born on 15 September, 1564 at Brandýs nad Orlicí as the eldest son of Jan of Žerotín and his first wife Marie, née Černohorská, from Boskovice. From his young days he received education of high quality. His educator became Pavel Novodvorský of Pozdětín in 1570, an educated man in languages and literary art, who even later accompanied his disciple on his study travels abroad (Rybička, 1864). First, Charles of Žerotín was a pupil of the famous school of Moravian Brethren at Ivančice (Fig. 2). In about 1579 he went to the University of Strassbourg, where he was educated in mathematics, rhetoric and Latin, and then to the studies at Basle. From autumn 1582 he spent several months in Geneva with Theodor Béza, Calvin's successor and follower. This period participated markedly in the formation of his later views and life attitudes.

From Geneva he set out, together with further young noblemen, on a cavalier journey of France and England, from which he returned home in 1583, where he witnessed his father's death. After another period, when he devoted himself to travelling, in 1588, after coming of age, he took over the heritage after his father. On 8 May, 1589 he married Barbora Krajířová of Krajek, and in June of the following year their daughter Bohunka was born. At that time he supported heart and hand the Huguenot movement in France. First he lent the French king Henry IV 40,000 thaler and in 1589 he set out to France to help him in a war expedition. On the way he was informed about the illness of his wife and returned home. After his wife's death he joined the army of French Calvinists, but after ten months he returned home disappointed (Dvorský, ed., 1904). In 1593 he joined the emperor's army and participated in the fights against the Turks, for which emperor Rudolf II called him as a member of the Moravian Land Court in 1594. After a short expedition to Hungary in 1595 he devoted himself only to the political and statesman's career. In 1596 he married again Elizabeth Krajířová of Krajek, with whom he had the son Fridrich and the daughter Alena. His second wife, as well as his son Fridrich, died in 1600. The following two marriages were childless. With his last wife, Kateřina of Valdštejn, he lived from 1614 until his death.



Fig. 1. Portrait of Charles Senior of Žerotín according to Balzer's engraving



Fig. 2. Teaching at the famous school of Moravian Brethren at Ivančice, also attended by Charles Senior of Žerotín. The initial D in the Ivančice hymn book of 1564

From 1599 to 1602 Charles Senior of Žerotín conducted a lengthy court suit with Zikmund of Ditrichstein who accused him among others of high treason. The suit finished, however, by the death of the suitor before 14 February, 1602 (Dvorský, 1874). In 1602 (Fig. 3), when he refused to take the oath in the Catholic way, he was expelled from the Land Court and he retired and he worked at the management and melioration of his estates, and devoted himself to the education of his daughters and religious

meditation. But he soon returned to public activity, when he stood up against emperor Rudolf II and he put across the separation of Moravia from Bohemia in 1608, when he was elected land administrator. After joining the Opava principality to Silesia, he refrained from that office in 1615. During the uprising of the Estates he remained faithful to the emperor, in 1619 he was accused of treason and hardly escaped defenestration (Fukala, 1991).



Fig. 3. Coat of arms of Charles Senior of Žerotín on the wall of the Knights' Hall of the House of the Estates (nowadays new Town Hall) in Brno. The plastic coat of arms was placed about 1602

During his lifetime he managed a great possession (Náměšť nad Oslavou, Rosice, Přerov, Brandýs nad Orlicí, etc.) which he obtained either as inheritance from his father or from his uncle Fridrich senior of Žerotín (from him he obtained in 1598 the domain of Přerov together with the town of Přerov - Rybička, 1873), or as a dowry of his wives, and by purchase. After the defeat of the uprising of the Estates in the battle of White Mountain near Prague on 8 November, 1620 he offered shelter to many priests of the Moravian Brethren at his estates in Bohemia and Moravia (among others also to John Amos Comenius). After the issue of the fatal letters patent about banishing the non-

Catholic nobility in 1627 he sold a great deal of his estates, and, although he had an exception from the emperor, he moved to Wrocław in August, 1628. But his loyalty to the Hapsburg throne is witnessed by the fact that, although as a Protestant he had to be exiled, the domains of Přerov and Brandýs were left to him, which was exceptional at that time. From Wrocław he sometimes visited those two remaining domains and on 9 October, 1636 he died at the manor house at Přerov, where for the last three years of his life he had had to stay in bed.

The funeral of Charles Senior of Žerotín into the family tomb at Brandýs nad Orlicí took place as late as on 22 November, 1636, which was due to the bureaucratic procedure of the archbishop's office and archbishop Harrach himself, who had to make an exception to permit the funeral of a Protestant into "non-sacred soil". During the 18th century the tomb was opened several times and the remains of Charles Senior of Žerotín and his wives were robbed of jewels. Therefore the aboveground part of the tomb was pulled down and the tomb was filled with soil. Only in 1842 the relatives of the former Žerotíns had the remains of those buried in the tomb exhumated and deposited them into the family grave in the chapel of the manor-house at Bludov (Šembera, 1840; Dvorský, 1878).

THE ŽEROTÍN LIBRARY, THE ARCHIVES AND DIARIES OF CHARLES SENIOR OF ŽEROTÍN

Karel Bruntálský of Vrbno, the son of the elder daughter of Charles Senior of Žerotín, Bohunka, and her first husband, Hynek of Vrbno became the universal heir of Charles Senior of Žerotín. He obtained not only the remaining domains, but also the great Žerotín library (transferred in 1628 to Wrocław) and the archives. Karel Bruntálský, however, dies as early as in 1638, bequeathing in his testament the library to the town of Wrocław and the archives and domains to his uncle Václav of Vrbno, the lord at Fulnek. He passes the library to the town of Wrocław in 1641, where it is deposited until 1865 at the church of St. Mary Magdalen, when it is incorporated to the funds of the municipal library (Šembera, 1875; Dudík, 1877). There the Žerotín library has been deposited until the present.

Far more eventful was the fate of the great Žerotín archives. First they were deposited at the manor-house at Fulnek. When the son of Václav of Vrbno, Jan František, gained by marriage with Terezie Františka (daughter to Bernard Ignác Bořita of Martinice) Hořovice and Mrač, the archives were moved to the manor-house of Hořovice. There they were deposited together with the diaries of Charles Senior of Žerotín until 1852, when Eugen [junior] of Vrbno sold the domain of Hořovice and ordered to a Mr. Labor to burn 80 baskets of documents of the Žerotín archives. Labor, however, took out from the baskets some valuable documents (including the diaries) and sold most of them to the Berlin secondhand merchant Staargard, from where part of the legacy was bought in 1893 by the Archives of the Czech Crown (Haas, 1944; Urbánková-Hrubá, 1954). Another part of prevaillingly literary inheritance and diaries for the years 1588-1590 were

bought at the end of the 19th century by Count Karel Emanuel of Žerotín. The original diaries kept as "Pamietí P. Karla z Ž." were originally deposited at the Hořovice library under the number A.3.19 (Chlumecký, ed., 1853). After removing the Žerotín library from Bludov in 1949 the diaries were deposited in the Land Archives in Brno (Boháček, Čáda, 1958), then they were again moved to Bludov under the Inventory No. 127 (Čáda, 1971).

The last diary (year 1591) was not preserved in the original. It is known from a very old copy made by the Hungarian writer, poet and statesman János Rimay some time about the year 1609. Rimay belonged among the friends of Charles Senior of Žerotín and he copied the diary into his book, where among others he also wrote two letters of Charles Senior of Žerotín (Brábek, 1887). The book by Rimay was prepared for publication and published by the bishop of Varadín, A. Ipolyi (1887). The authors of the present paper used it as a source.

Besides the original diaries for the years 1588-1590 there exist two of their manuscript copies. One was made by the historian of the Enlightenment period, P. Gelasius Dobner, and it is deposited in his written inheritance in the Archives of the National Museum in Prague (original signature XLVII/j; Šimák, 1901). The second copy is the work of an unknown author and before 1850 it became part of the collection of J. P. Cerroni. Nowadays it is deposited in the Land Archives in Brno (fund Cerroni, signature XLVII, No. 114; see also Dudík, 1850). Both documents have the same name: "Diarium Caroli Liberi Baronis a Zierotin. Ex autographo, manu ipsiusmet Caroli de Zierotin autoris scripto, bibliothecae Horzovicensis excellentissimi Eugenii Würben" (Diaries of Charles, baronet of Žerotín. From the autograph written by Charles of Žerotín, preserved in the Hořovice library of baronet Eugen of Vrbno). From the name it follows that the copies must have been made before 1789, because Eugen [senior] of Vrbno lived in the years 1728-1789 (Sedláček, 1907) and Dobner died in 1790 (Šimák, 1901). But a question remains, whether the unknown copyist used Dobner's copy.

The authors had available for the years 1588-1590 the copies of the diaries from Cerroni's collection at the Land Archives in Brno. Against Dobner's copy the unknown author conformed the transcription of the text to the usage of the 18th century, i.e. he changed the Latin "ae" and "oe" to "a" and "o" (e.g. "colum" instead of the correct form "coelum" [sky], etc.).

Three out of four preserved diaries are written in Latin for the years 1588 (Ephemerides i.e. *Diarium in annu[m] mundi 5555 salutis humanae M.D.LXXXVIII*), 1590 (*Diarium, in quo continetur descriptio itineris in Galliam suscepti. Deus illud faxit, faustum et felix. Anni MDXC*) and 1591 (Ephemerides in *Annum Christi M.D.XCI a die 14 mensis Aprilis, in quem incidit solemne festum paschatis*). The diary of 1589 (Ephemerides in *annum Dei Salvatoris MDLXXXIX*) is written in Czech.

Meteorological records in Žerotín's diaries concern the period of January 1588 - April 1589, September 1590, April - December 1591. The reason of the interruptions in the records might have been family reasons (a difficult pregnancy of his wife and the birth of the daughter in 1590, abortion, a serious disease and the death of his wife in 1591), economical (a rebuilding of the manor-house at Rosice in 1589-1591) or political ones.

Political reasons may have prevailed, because at the time of the missing records Charles Senior of Žerotín conducted complicated diplomatic negotiations with the Protestant Henry IV (Odložilík, 1936) and every note that would have got into the hands of his adversaries would have meant an accusation of high treason and maybe a loss of life. He may have destroyed his records himself. This assumption is supported by the non-existence of the original diary of 1591, known only from a copy (Ipolyi, 1887). It cannot, of course, be excluded that part of the diaries may have got lost in the archives or may have been indiscreetly discarded (see above).

DIARY RECORDS AND THE VERIFICATION OF THEIR DATA

As follows from the diaries, Charles Senior of Žerotín, despite his young age, had a busy correspondence with many important persons, both from Bohemia and from abroad. As friendly can be denoted his relation to the famous astronomer, mathematician and professor of the Prague University, Tadeáš Hájek of Hájek. Maybe also affected by him he started recording in his diaries also notes on the weather. Tadeáš Hájek had kept similar records as early as in 1557-1558 (Kořán, 1961). Žerotín's study may have affected the keeping of meteorological records. But the real cause does not follow from the existing sources.

He was also on friendly terms with the pre-White-Mountain nobleman Petr Vok of Rožmberk, the owner of an extensive domain, collector and sponsor of the then scientists (about him see Pánek, 1989), who helped Charles Senior of Žerotín to the way to the royal Hapsburg court (Odložilík, 1936). As follows from the diaries, he visited several times Petr Vok at his Renaissance manor-house at Bechyně (Rybička, 1878).

It is interesting to compare what is written about the visits of Charles Senior of Žerotín as witnessed by the Rožmberk chronicler Václav Březan. As first is mentioned the visit of Petr Vok at Náměšť nad Oslavou in February, 1588. Březan writes: "... v středu před sv. Matějem [24.2.] Jeho Milost pán [Petr Vok] ráčil z Náměšti do Třebíče přijeti a tu přes noc zůstati; ve čtvrtek [25.2.] ... pán ráčil přijeti do Dačic a tu noclehem býti" (... on Wednesday before St. Mathew [24 Feb.] his Lordship [Petr Vok] came from Náměšť to Třebíč to stay there overnight; on Thursday [25 Feb.] ... the Lord came to Dačice and stay there for the night) (Březan II, p. 488). This report is verified by diary records (Diarium, pp. 9-10): "22 Febr. Aer frigidus et intempestus. Paulo ante prandium baro Rosenbergius advenit" (22 February. Frosty air and unsuitable [unwholesome]. Soon after breakfast the Lord of Rožmberk arrived); "23 Febr. Obscuram et frigidum co[e]lum. Baro Rosenbergius promissimemor cum conjuge huc venit" (23 February. Dark and frosty sky. The Lord of Rožmberk promised to stay here until return); "24 Febr. Obscurum sed mite co[e]lum ... diutius retiveri posset baro Rosenbergius omnes una Trebiciium profecti sumus" (24 February. Dark, but quiet sky ... after some delay we all travelled with the Lord of Rožmberk to Třebíč); "25 Febr. Nocte prof[e]cedenti ninxit. Interdiu co[e]lum fuit valde in amof[e]num. Baro Rosenbergius in Bohemiam revertens" (25 February. There

was snowfall during the preceding night. Throughout the day the sky was strongly without beauty. The Lord of Rožmberk was returning to Bohemia) (Diarium, pp. 9-10).

In that year, Charles Senior of Žerotín visited, according to his diary, Bechyně (Fig. 4) also on 13-15 December (Diarium, pp. 46-47), which, however, was not registered by Březan.



Fig. 4. A view of Bechyně about the year 1600, as seen during his visits by Charles Senior of Žerotín. A woodcut of Johann Willenberg printed in the book "Diadochos" by Bartoloměj Paprocký of Hloholy in 1602

The visit to Bechyně was also repeated in January, 1589. The reason of that visit can be derived from Březan's record: "18 Januarii, v středu po druhé neděli po Třech králích, pan Karel mladší ze Žerotína na Náměšti byl u Jeho Milosti pana Petra z Rožmberka na Bechyni a tu počátek učinil služby panna Barboře, šlechtičně z Krajku" (18 January, on Thursday following the second Sunday after Twelfth Night, Charles junior of Žerotín was at Náměšť' with His Grace Petr of Rožmberk at Bechyně, and there he began to serve the virgin Barbora, a noble-woman of Krajek) (Březan II, p. 491). Charles Senior of Žerotín wrote in his diary: "18. Jan[uarii]. Sníh napadal, čas nicméně [not finished - note of the authors], víter, metelice. Po obědě jeli sme všickni na Bechyni [sic] a tu přes noc zůstali"; "19. Jan[uarii]. Čas pošmurnej a zimavej. Rozžehnaje jse [s] panem [Petrem Vokem], odejel sem" (18 January. Snow fell, the time, however, [not finished - note of the authors], wind, snowstorm. After lunch we all went to Bechyně and there stayed over night; 19 January. Gloomy and cold time. Parting with the Lord [Petr Vok] I left) (Diarium, p. 50).

In February Charles Senior of Žerotín returns again to Bechyně. He writes in his diary: "13 Febr[uarii]. Den jasný a nepřilíš studenej ... půl hodiny po východu Slunce přijel [jsem] do Mlýna, když poobědvaje, s čerstvými koňmi, kteréž jsem byl napřed poslal, v málo hodinách na Bechyni jsem dojel"; "14. Febr[uarii]. Den velmi pěkněj, než velkej mráz. Před obědem, kterýž pozdní byl, byly oddavky"; "15. Febr[uarii]. Den neveselej. Po obědě zase k práci jsem se obrátil a koniama [sic] pana z Rožmberka až do Tábora byl odvežen" (13 February. A clear day, not too cold ... half an hour after sunrise I came to the Mill where I had lunch and with fresh horses I had sent ahead I arrived at Bechyně at an early hour; 14 February. Very nice day, but hard frost. Before lunch, which was quite late, there was the marriage; 15 February. Not very bright day. After lunch I started working again and with the horses of the Lord of Rožmberk I was taken to Tábor) (Diarium, pp. 52-53). Březan specifies the purpose of the visit: "13. februarii, v pondělí po neděli masopustní, ... Panu Karlovi mladšímu z Žerotína a na Náměšti sestra její, panna Barbora šlechtična z Krajku, též k manželství zasnoubena" (13 February, on Monday after Shrove Sunday ... to lord Charles junior of Žerotín and at Náměšť, her sister, virgin Barbora noble-woman of Krajek, was betrothed to marriage" (Březan II, p. 492).

For the sake of completeness let us mention that he also visited Bechyně on 14 and 16 September, 1590 (Diarium, pp. 60-61) which, however, was not registered by Březan.

The comparison of the diary records with chronicle reports shows their precision, when they intermingle with and complete Březan's data.

TERMINOLOGY OF CHARLES SENIOR OF ŽEROTÍN IN HIS WEATHER RECORDS

In the daily observations of Charles Senior of Žerotín a more complicated terminology is used than in the case of further daily observations of the 16th century (see Brázdil et al., 1995). He often wrote about the state of the sky (coelum) in his diaries, to which he also allocated equivalents both for temperature conditions (coelum frigidum - frosty sky) and for the cloudiness (coelum serenum - clear sky, serenissimum - the clearest, serenitas magna - very bright, mite serenum - mildly clear, mite, paulo - mild, mollis - agreeable, temperatum - balanced, placidum - quiet, amoenum - beautiful, sudum - cloudless, sed non inamoenum - but not without attraction, purissimum - cleanest, obscurum - dark, mite obscurum - mildly dark, subobscurum - cloudy, inconstans - changeable, nubilum - cloudy, mutatum - variable, triste - sad, fodum - ugly), for precipitation (coelum pluvium - rainy sky, humidum - humid) and meteorologically ambiguously interpreted phenomena (coelum dubium, infestum - uncertain sky, nitidium - glittering, intempestum - unhealthy). Similar attributes are used by the author also for the air (aer). The Latin expressions coelum and aer seem to correspond to the word 'čas' (time) used by Charles Senior of Žerotín (in the diary for 1589 written in Czech). He again uses attributes pointing to temperature conditions (čas zimavej, studenej, teplej - cold, cool, warm time), cloudiness (čas jasnej, vyjasnil se, mračnej - bright time, it has cleared, cloudy), for wind

conditions (čas tichej - quiet time), for visibility (čas mlhavej, pošmurnej - foggy, gloomy time) and an uncertain expression (čas pěknej, čistej, smutnej, neveselej, ničemnej - nice, clean, sad, not gleeful, miserable time).

The temperature patterns proper are characterized by the attributes for frost (frigus): acre - rough, intensius, ingens - strong, remissius - remission, pruina - hoar-frost, mráz velikej - great frost, velmi kluzko - very slippery [black ice]; for heat (aestus): ingens - strong, magnus - great. Precipitation conditions are expressed by terms for rain (pluvius) with attributes: tenuis - weak, frequens, copiosus - ample, lenis - mild, ingens - strong, densus - thick, crebris - frequent, impetuusus - rapid, obnoxius - acquiescent, obcontius - incessant, and further downpour - imber; for snow (nix, nivus): ninxit - snowfall, ninxit sopius - frequent snowfall, ninxit dentissimus - thick snowfall, defluxit - thaw, snih napadal - the snow has fallen, metelice - snowstorm); and for mixed precipitation: dýšť smíšeněj se sněhem - rain mixed with snow. The wind conditions are characterized by the terms: ventus vehemens - rapid wind, paulo - mild, siccus - dry, asper, rigidius - severe, acer - sharp, impetuusus - stormy, frigidus - frosty, viter tuhej, studenej, tichej, velkej - hard, cold, quiet, great wind.

The terms used point to a great stock of words of Charles Senior of Žerotín which, however, in a number of cases makes their exact interpretation difficult. In a similar way it is possible to speak about the author's poetic metaphors - e.g. sole vives suas altius enerente (the sun has risen with his highest power).

The observations of Charles Senior of Žerotín concern more or less to a greater extent the cloudiness, whereas the information about the temperature character of days are less frequent. Therefore also the determination of temperature and precipitation extremities of the individual months is more complex, but for some months it is possible to utilize his summary chronicle evaluation of the character of the month.

VERIFICATION AND INTERPRETATION OF THE DAILY WEATHER RECORDS OF CHARLES SENIOR OF ŽEROTÍN

Since Charles Senior of Žerotín travelled a great deal, his daily records are related not only to the Czech Lands (Náměšť nad Oslavou and further Prague prevailing - the quoted localities are represented in Fig. 7), but also to Germany and Austria. The interpretation of daily weather observations is given in Supplement 1. Daily observations are expressed graphically in Fig. 5.

In January, 1588 only a frosty period follows from the daily observations on 14-16 January, whereas a warm weather is mentioned in six days. In the summary evaluation, Charles Senior of Žerotín characterizes the month as agreeable and quiet, almost like in spring or autumn, with mild weather, as had not been for a long time. January is thus interpreted as warm, unlike the cold February, where frosty weather is mentioned in a half of all days. In the summary information the author characterizes it as frosty, with frequent snowfall (but he mentions only six days with snowfall) and frequent sharp wind. As for the winter months of 1588 there is one report from Bohemia about the movement

of ice and the destruction of two bridges at Nymburk in the month of February (in Kulhánek, 1911), daily records, however, not mentioning a conspicuous thaw in February. Also Pfister's (1988) interpretation for Switzerland is opposite, when he mentions colder and drier January and temperature and precipitation average February.

In March, 1588 Charles Senior of Žerotín records several times a heavy frost and snowfall up to 13 March, between 16 and 24 March he often mentions warm weather, which points to the interpretation of a temperature average month. For 20-25 March at Cheb Andreas Baier (p. 146) mentions rainy and warm days, which, from the point of view of precipitation, does not correspond to records from Moravia. In April, Charles Senior of Žerotín mentions frost in five days and rain in eleven days, which might witness a temperature average and wet month. May was, on the other hand, evidently warm and dry, as shown by the records about the prevailing clear weather and eleven warm or hot days. Precipitation fell in only five days. Czech narrative sources do not mention the spring of that year. Pfister (1988) interprets for Switzerland all three spring months as average and drier, whereas Glaser (1995) describes for Germany even a cold and wet spring.

Charles Senior of Žerotín spent the greater part of the summer season travelling about Germany (Fig. 6). The official purpose of his journey was the study and meeting of the then scholars, but the actual purpose was different. Already in Prague and then in Hamburg he met the envoys of the king of Navarra Henry who had united French Protestants and whom Charles Senior of Žerotín admired. The motivation of political negotiations was the effort at meeting personally Henry in south France. The meetings with the envoys had to take place in secrecy, because the then king of Bohemia and emperor Rudolf II Hapsburg had an inimical relation to Henry. The planned meeting in south France did not take place for political reasons and Charles Senior of Žerotín returned home (Odložilík, 1936). He left Bohemia on 7 June and up to the end of the month he travelled of today's Saxony, Thuringia and Saxony-Anhalt (see Fig. 6). The prevailing information about the clear weather points to a sunny and warm month, evidently average as for precipitation

Fig. 5. Graphical representation of the daily records of the weather of Charles Senior of Žerotín (see Supplement 1) in selected months of the period of 1588-1591. Explanations: H - hot day, W - warm day, C - cold day, F - frost, frosty day, w - warming, c - calm; 1 - clear weather, 2 - half clear, variable, 3 - cloudy, 4 - foggy, 5 - gloomy, 6 - rain, rainy, 7 - snowfall, 8 - showers, 9 - wind, 10 - surface frost, hoar-frost, x - missing observation. The slash divides information concerning the night, the morning (left part) and the afternoon, the evening (right part). The underlined symbol means a high intensity of the phenomenon. Local allocation of observations - see Supplement 1. Numbers in the last but one line mean the percentual share of days in the month for which daily weather records are available, in the last line the temperature interpretation (left) and the precipitation interpretation (right) of the extremity of the month: 1 for a warm or rainy month, 0 for an average month, -1 for a cold or dry month

	1588	1588	1588	1588	1588	1588
Day	Jan.	Feb.	Mar.	Apr.	May	Jun.
1	•/○ ↗	○	E○	○ ↗	W○	○
2	•/C ↗	○/•	● *	W○/•	○/○	W○
3	*/w	E○	W●	●• ↗	-/○	●•
4	○ ↗	○	○	● ↗	W○	●•
5	●	C● ↗	○/•	F○ ↗	○	●•/
6	*/○	w*/○	○	○	○	○
7	●•	w○	○ ↗	○	W○	W○
8	○	F●	○	F●	W○	•/
9	○ ↗	E○	○/•	○/•	○•	○
10	○c	F○	F○/•	●•/○	•/○	○
11	○*	○	F○	•/○	C●•	○
12	Wc	F○	○	○c	○	○
13	○ ↗	F●	•/E●	•	W○	○
14	F○	w○	w●•	•	○/○	•/○
15	E○	F●/w○	●•/○	●•	Wc	○/•
16	E○	○	W○	●	○	○/○•
17	≡/○	○	○	↗	○	○
18	Wc	F○ ↗	○/•	○	○	●/○
19	W○	E○	C○ ↗	F●	○	○
20	○	● *	W○	○	○	○
21	○	○/E●	W○	○	○	W○
22	W○	F*	○	○	H○	●
23	W○	F●	W○	○/○	H○/▽	○
24	○	w●	W○	○	W○	○
25	W○/•	*/●	○	F○	W○	○/↗
26	○/=	F●	F○ ↗	●•	●•	○/○•
27	○c	●/○	○	• ↗	○	W○
28	○	F○	○ ↗	●•	W○	•/○
29	○	○ *	○	○ ↗	○	○/▽
30	○		●/○	-/○	○	○
31	○ ↗		x		○	
(%)	100.0	100.0	96.8	100.0	100.0	100.0
T/P	1/0	-1/0	0/0	0/1	1/-1	1/0

○ 1 ○ 2 ● 3 ≡ 4 = 5 • 6 * 7 ▽ 8 ↗ 9 - 10

Fig. 5.

Day	1588					
	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	●•	●•/○	●/▽	○	F●	●•
2	○/	●•	●	○	F●	●•
3	○	•/	○/•	○	=○/?	●/○
4	●/▽	○/▽	○/•	=○	=C○/?	F●/
5	•/○	○/●	●	○	○/?	F○/?
6	●	●•	○	○	○	F○
7	●•	○/▽	●/▽	○	•/●	○/F/?
8	●/▽	●/▽	○	○	W●	●
9	○/●/▽	●	○	●/•	●	●
10	○	•/●	●•/○	○/?	●	●
11	○	●	●•/●/▽	○/?	●	F○/?
12	●•	•	○/?	•/○	•/●	F○/?
13	•	○/▽	○	○	●•/	F●•/
14	•	○	○	○	●/?	F●*
15	●	○	●•	●•/○	○	●•*/?
16	•/○	○	●	●•	●•	●•/○/c
17	○	○	○	●/○	●	●
18	W○	H○	○	○	●/○	●*
19	○	○	○/?	●	●	●
20	○	●	●/○	●/○	●	W●
21	○	●/▽	●•	●	●•	C○
22	●•/?	●•/●/▽	●•/	●	●	●/○
23	●•	•/○	x	●c	●	x
24	○/●•	○	○	●/▽c	●	●*
25	●/▽	•/	○	●/•	/?/●	•/E
26	○/▽	●•	○	○/●	●•/○	●*
27	●•	●•	○	•/○	●	F●
28	○/●•	●•/○	○	●	○	F○/?
29	●/▽	○	●/▽/○	●/○/•	○	F●•*/?
30	●•	●/▽	○	F●	=	E
31	●/▽	●•		●		E
(%)	100.0	100.0	96.7	100.0	100.0	100.0
T/P	-1/1	-1/1	0/0	0/0	-1/1	-1/1

○ 1 ● 2 ●• 3 = 4 = 5 • 6 * 7 ▽ 8 /? 9 _ 10

Fig. 5. (continued)

Day	1589	1589	1589	1589	1590	1591	1591	1591	1591
	Jan.	Feb.	Mar.	Apr.	Sep.	May	Jun.	Jul.	Oct.
1	F=	C○	W○	○	x	C● / 1	●●	x	○ / 1
2	C* / 1	C○	○	○	x	W○ / 1	x	x	○ / 1
3	C / 1	C=	●	○ / ●●	x	1	x	x	x
4	C*	=	W○	○ / ▽	x	x	x	H	x
5	C*	C / 1	● / ○	●	x	x	x	H○	x
6	F* / 1	C○	○	○ / 1	x	x	x	C○ cl / 1	x
7	C*	C○	○	C○ / 1	x	x	x	x	x
8	C●	w	●* / ○	○ cl / 1	x	x	x	H○	x
9	●	W○	○	●	x	● / 1 ▽	x	○ / ● / 1	x
10	=	C○	* / ○	○ / 1	x	x	x	○	x
11	○	C=	○	○ cl / 1	C○ / 1	● / 1	x	x	x
12	○	FC○	● / ●	x	W○	x	● / H○	x	●●
13	C●	C○	C○	● / 1	H○	x	x	x	C / ○
14	C○	F○	● / W○	●	H○	○ / ○ ▽	x	x	○
15	C○ / 1	=	W○	○	H○	x	C●● / 1	x	○
16	○	C○ / 1	W○	x	○	x	C● / 1	x	W○
17	* / 1 ○	○	○	x	●● / ○	x	w○ / 1	x	W○
18	* / 1	○	W○	x	W○	x	○ c	●●	○
19	C=	= /	● / 1	x	●	x	1	x	○
20	* /	○	○ / ●	x	●	x	● / 1 ●	○ / 1	C / 1
21	C●	○	● / ○	x	○	x	x	● ▽	C○ / 1
22	C=*	C○	●	x	○	x	x	x	—○
23	C* / 1	● / ○	○ / ●	x	—● / ○	H○	x	x	○ / ● / 1
24	C	w● / ○	○ / ●	x	C●● /	H○	x	x	●● / 1
25	C= / 1	F●*	○	x	●●	x	x	x	x
26	C / 1	C○	W○	x	W●	○	x	x	x
27	C○	●	○	x	F○	● / 1	x	●●	x
28	C / 1	x	○ / 1	x	F○	x	x	●●	x
29	w=		○ / 1	x	w○	x	x	● / ○	x
30	FC○		○ / ●	x	x	x	x	x	x
31	C○		W○			x		x	x
(%)	100.0	96.4	100.0	46.7	63.3	32.3	26.7	38.7	48.4
T/P	-1/1	-1/1	1/0	-1/1	1/-	0/0	-1/1	-1/1	1/-

○ 1 ● 2 ● 3 ≡ 4 = 5 ● 6 * 7 ▽ 8 / 9 — 10

Fig. 5. (continued)

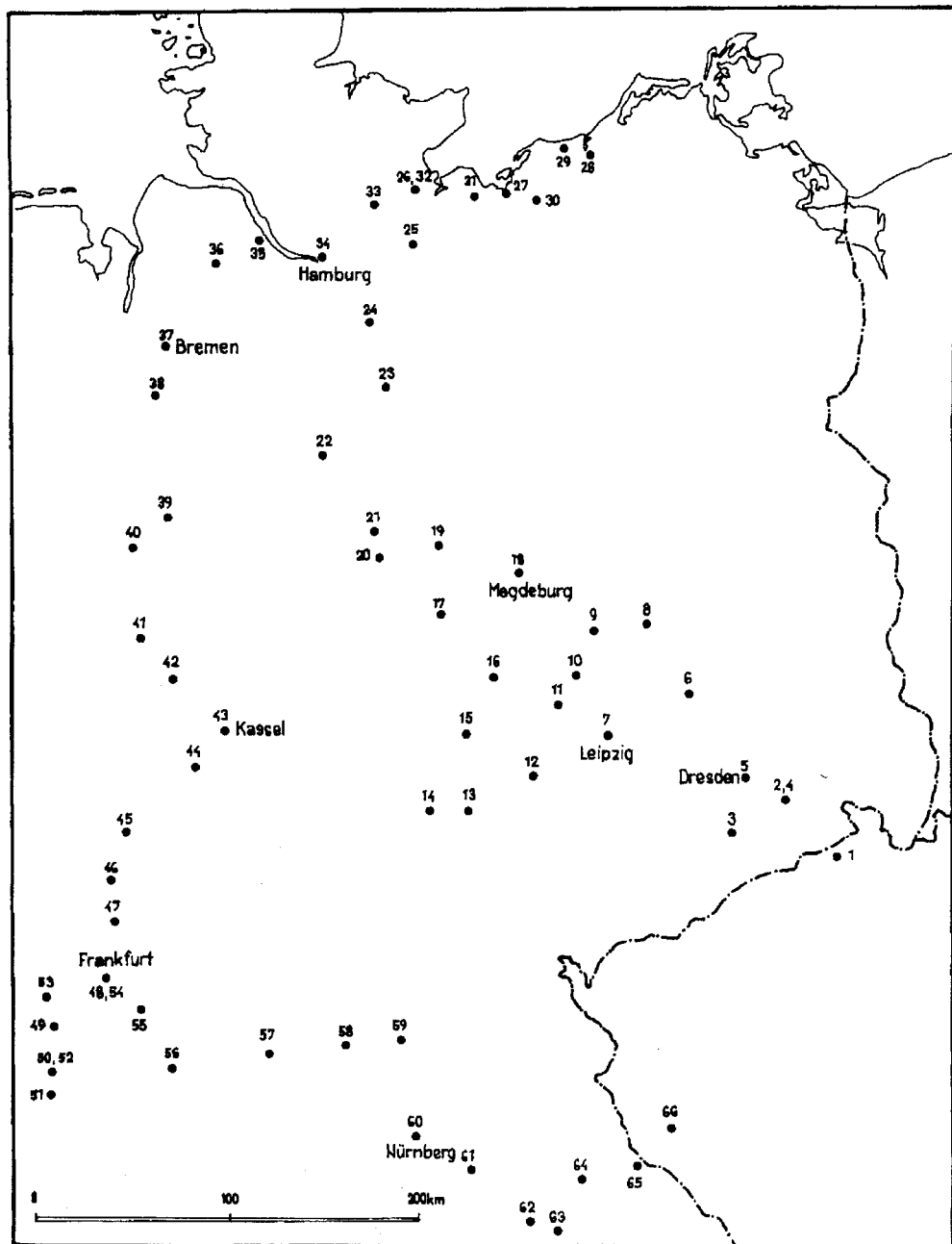


Fig. 6.

Fig. 6. Schematic representation of the journey of Charles Senior of Žerotín during his travel to Germany on 8 June - 3 September, 1588. Explanations: 1 - Děčín, 2 - Dresden, 3 - Freiberg, 4 - Dresden, 5 - Meissen, 6 - Torgau, 7 - Leipzig, 8 - Wittenberg, 9 - Dessau, 10 - Zörbig, 11 - Halle, 12 - Naumburg, 13 - Weimar, 14 - Erfurt, 15 - Artern, 16 - Mansfeld, 17 - Halberstadt, 18 - Magdeburg, 19 - Helmstedt, 20 - Wolfenbüttel, 21 - Braunschweig, 22 - Celle, 23 - Uelzen, 24 - Lüneburg, 25 - Mölln, 26 - Lübeck, 27 - Wismar, 28 - Rostock, 29 - Bad Doberan, 30 - Neukloster, 31 - Grevesmühlen, 32 - Lübeck, 33 - Bad Oldesloe, 34 - Hamburg, 35 - Stade, 36 - Bremerwörde, 37 - Bremen, 38 - Bassum, 39 - Minden, 40 - Herford, 41 - Paderborn, 42 - Scherfede, 43 - Kassel, 44 - Fritzlar, 45 - Marburg, 46 - Giessen, 47 - Friedberg, 48 - Frankfurt a. M., 49 - Oppenheim, 50 - Worms, 51 - Frankenthal, 52 - Worms, 53 - Mainz, 54 - Frankfurt a. M., 55 - Babenhausen, 56 - Miltenberg, 57 - Würzburg, 58 - Ebrach, 59 - Bamberg, 60 - Nürnberg, 61 - Neumarkt, 62 - Deuerling, 63 - Regensburg, 64 - Bruck, 65 - Waldmünchen, 66 - Horšovský Týn

(precipitation in ten days). In July he got as far as the Baltic, from where he continued to Hamburg and Bremen (Fig. 6). That month was already very rainy (twenty days with precipitation), particularly in its last decade, and also colder. A long period of clear and perhaps warm weather fell, according to daily records, only on 17-21 July. The rainy weather also continued in the first and in the last decades of August (again twenty days with precipitation). The month was evidently also colder, because continuous clear and perhaps warm weather is mentioned only for 14-19 August. During that month Charles Senior of Žerotín travelled from Bremen to the south to Hessen and to Bavaria from where he returned to Bohemia (Fig. 6). The above description of the summer pattern corresponds to daily weather records of David Fabricius at Resterhave and Leonhard III Treutwein at Fürstenfeld (Lenke, 1968) as well as to Glaser's (1995) interpretation of a cold and rainy weather in the whole Germany. Also Pfister (1988) evaluates in Switzerland all three summer months as cold and rainy. The described character of the summer is also in accordance with narrative sources from the Czech Lands. Thus, on 12 July a flood is described for České Budějovice (*Kronika budějovská*, p. 25) which evidently followed the rains in the first decade of July. In accordance with the daily records is also the report by Václav Kněžoveský (p. 24) that at Slaný with its surroundings it was cold with showers until 14 August and from 15 August to 1 September it was first warm for 3-4 days and then every day again rain and cold. Also further sources (*Pamětní kniha Litoměřic*, p. 227; *Matyáš Matuška*, p. 171) speak of frequent showers during harvest.

In the autumn months, in the daily records there is a mention of the temperature character of days only exceptionally. Practically only at the end of October and at the beginning of November the records mention frosty weather. A different interpretation of the temperature character of those months than the average one would therefore be rather speculative, even though e.g. Pfister (1988) states for Switzerland warmer September and October and an average November. On the contrary, in Bohemia one speaks about 3-4

days with frost after 1 September and cold until 26 September (Václav Kněžoveský, p. 25), but in October summer flowers are supposed to have been in blossom (Marek Bydžovský, p. 267). According to daily records it can be judged that the period of clear and evidently warm weather may have been between 24 September and 14 October, whereas before in September it was several times cloudy and rainy (eight precipitation days between 3 and 22 September). From the report by Rybička (1896) saying that grapes froze it is not evident whether the grapes froze already due to frosts in September (Václav Kněžoveský, p. 25) or only due to frosts mentioned in the daily records at the end of October and at the beginning of November. With respect to the cold and rainy summer, after which the grapes were probably kept longer in the vineyards, the latter term is more probable. Also from the point of view of precipitation conditions the interpretation of the average character of those months seems to be the most correct, even though Glaser (1995) characterizes autumn as wetter and Pfister (1988) interpreted November as the wetter month.

December, 1588 can, according to the daily records, be interpreted rather as cold and wet. After a cloudy and rainy weather at the beginning of the month and a frosty period between 4-7 December, from 11 December there prevail reports of a frosty weather (on eleven days) with snowfall (on seven days; on the whole, ten days with precipitation in the month). Whereas according to Andreas Baier (pp. 147-148) at Cheb there fell snow knee-high on 16-17 December and on the following day, after a rain there followed a flood, Charles Senior of Žerotín describes snowfall on 13-15 December in south Bohemia and on 18 December in Moravia. He mentions a warm day on 20 December, when, after a thaw, almost all the snow melted. A cold and snowy (ten days with snowfall) weather continued also in January, 1589, the cold weather extending until February which was, however, drier (only two recorded precipitation days). A further record by Václav Kněžoveský (p. 26) for Slaný about severe winter from 24 December, 1588 to 9 March, 1589 expresses on the whole the onset of a frosty and snowy weather and the overall cold character of January and February. Pfister (1988) interprets for Switzerland all three winter months as cold, December, besides, as wet and January and February as dry. The cold winter of 1588/89 is also mentioned for Silesia, Little Poland, Lithuania and Russia (Werchracki, 1939), but only moderately cold for Germany (Glaser, 1995).

In March, 1589 Charles Senior of Žerotín visited Austria on 19-27. As in that month mentions about frosts or cold (only 13 March) are missing and, on the contrary, the author often describes a clear and on eight days even warm weather, the month can be evaluated as warm and precipitation average, which differs from Pfister (1988), according to whose interpretation, in Switzerland March was average in temperature and dry. In the first half of April there prevailed dry weather according to the daily records, which would correspond with Pfister's (1988) interpretation of a drier April, whereas there are no mentions of the temperature character. In the Czech narrative sources, these months are only mentioned with the movement of ice in March at Nymburk (in Kulhánek, 1911), which is realistic after the preceding character of the winter.

Sporadic are records of September, 1590 (Munzar, 1984 does not mention them at all). On 11 September Charles Senior of Žerotín set out on a war expedition to France to help Henry IV. By the end of the month he, however, returned home, because his wife had got seriously ill (Dvorský, ed., 1904). The period of clear and warm weather on 12-22 September (on 13-15 the author speaks directly about great heat) was interrupted by rain on 19-20 September. From 23 to 29 September, when he was in Germany, he speaks of a cloudy and later even frosty weather. In the Czech Lands there was an earthquake on 15 September, 1590, preceded by a hot and dry weather, when brooks were drying up (Václav Březan I, p. 358; Kronika Frenštátu, p. 14). That would generally indicate a warm month, which is in accord with Pfister's (1988) interpretation for Switzerland.

The interpretation of the weather extremity in 1591 is, due to the torso-like character of the daily records of Charles Senior of Žerotín (Ipolyi, 1887) possible only on the basis of the chronicle summary of the character of some months. Thus, in May there were no heats, at the beginning of the month it was dry, at its end so rainy that meadows were soaked with water. There was a hope of a good cereal harvest. May can thus be interpreted as temperature and precipitation average. Czech narrative sources limit themselves only on a report of a frost on 16 May at Olomouc (J. Středovský, p. 40) and a cloud-burst on 31 May in the Litoměřice region (Pamětní kniha Litoměřic, p. 242). In Switzerland that month was interpreted as warm and precipitation average (Pfister, 1988).

From sporadic reports of June, 1591 (only on eight days) and the missing chronicle evaluation it is impossible to judge its extremity. On 21 July, after a long illness the first wife of Charles Senior of Žerotín, Barbora died (Odložilík, 1936). In that month, after the warm first quarter there followed a colder, cloudy, windy and rainy weather. Charles Senior of Žerotín says further in the evaluation of July that fruit perished, either rotting due to the moisture or it did not mature due to cold weather, and that the vine, due to lack of sunshine may not ripen. The rainy character of the above two months in the Czech Lands is, however, confirmed by the reports of downpours and floods on 1-3 and 21-24 June (Jan Nožič, fol. 9^f; Pavel Zlypivo, p. 60; Kronika Podolských, p. 241; Harrer, 1923; Marek Bydžovský, pp. 218, 268; Simon Hüttel, p. 311; Pavel Mikšovic, p. 54), the same as to 10 July about a flood lasting several days in Moravia (Marek Bydžovský, p. 268), about rains at the harvest time (Pamětní kniha Litoměřic, p. 244; Václav Březan II, p. 505) and about a wet summer (Pamětní kniha Litoměřic, p. 244). June and July are also interpreted as rainy by Pfister (1988) for Switzerland. June (together with May) is, however, characterized as warmer and July as temperature average.

On the other hand, September, 1591 was evidently sunny, but already with frosts (see also Pavel Mikšovic, p. 54), which, however, did not cause damage in the vineyards. The vineyards froze due to frosts on 1-2 October (Pamětní kniha Litoměřic, p. 244), which, however, Charles Senior of Žerotín does not mention. On the whole, September was rather warmer, as is also interpreted for Switzerland (Pfister, 1988).

On 2 October, 1591 Charles Senior of Žerotín set out from Náměšť nad Oslavou again on the postponed journey to France (Dvorský, ed., 1904). On 4 October he was at Brandýs nad Orlicí, on 8 October in Prague and on 10 October at Litoměřice. On 11 October he travelled by boat to Děčín, from where, on the following day he continued by

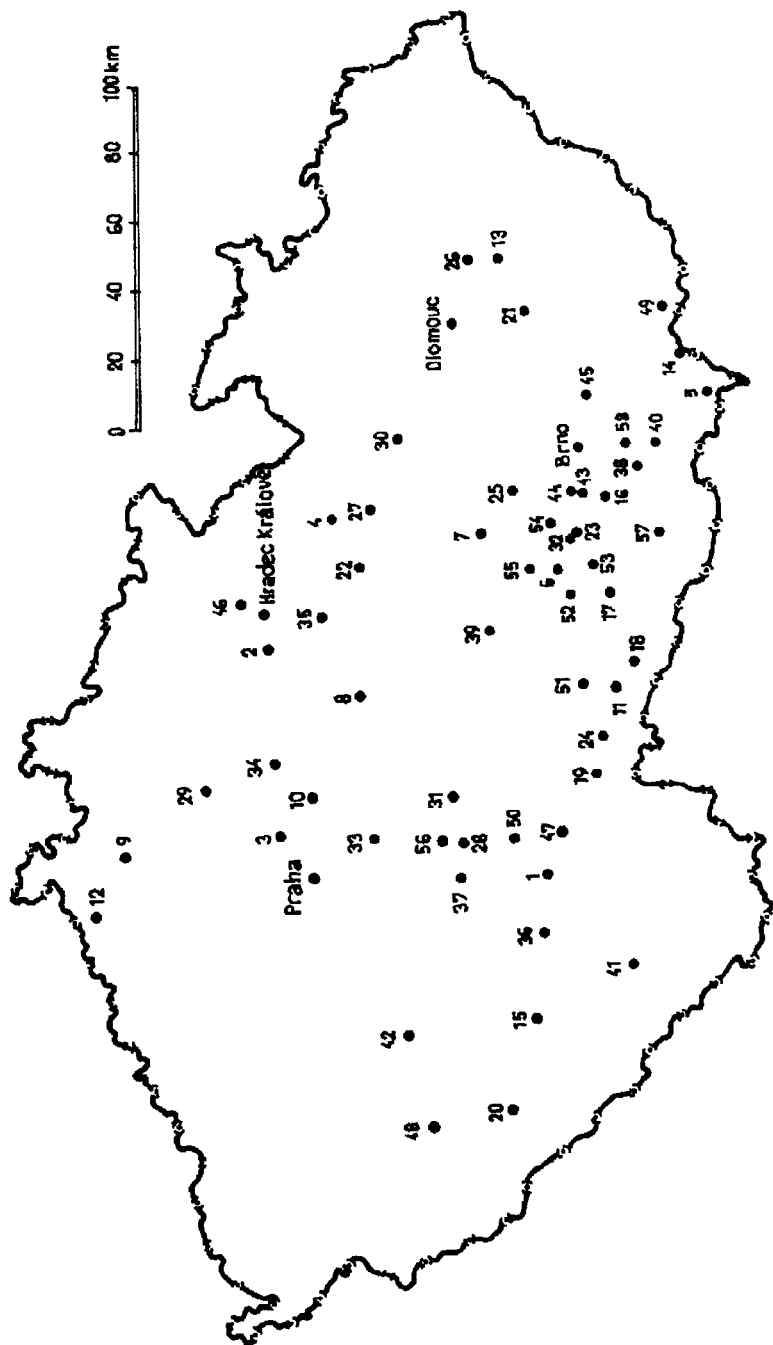


Fig. 7.

Fig. 7. A map of localities to which the daily weather records by Charles Senior of Žerotín relate. Explanations: 1 - Bechyně, 2 - Boharyně, 3 - Brandýs nad Labem, 4 - Brandýs nad Orlicí, 5 - Břeclav, 6 - Budišov, 7 - Bystrice nad Pernštejnem, 8 - Čáslav, 9 - Česká Lípa, 10 - Český Brod, 11 - Dačice, 12 - Děčín, 13 - Dřevohostice, 14 - Hodonín, 15 - Horažďovice, 16 - Ivančice, 17 - Jaroměřice nad Rokytou, 18 - Jemnice, 19 - Jindřichův Hradec, 20 - Klatovy, 21 - Kojetín, 22 - Košumberk, 23 - Kralice, 24 - Kunžak, 25 - Lomnice, 26 - Lipník nad Bečvou, 27 - Litomyšl, 28 - Miličín, 29 - Mladá Boleslav, 30 - Moravská Třebová, 31 - Načeradec, 32 - Náměšť nad Oslavou, 33 - Nespeky, 34 - Nymburk, 35 - Pardubice, 36 - Písek, 37 - Podhoří, 38 - Pohořelice, 39 - Polná, 40 - Pouzdrňany, 41 - Prachovice, 42 - Rokycany, 43 - Rosice, 44 - Říčany, 45 - Slavkov, 46 - Smiřice, 47 - Soběslav, 48 - Stod, 49 - Strážnice, 50 - Tábor, 51 - Telč, 52 - Třebíč, 53 - Valeč, 54 - Velká Bíteš, 55 - Velké Meziříčí, 56 - Votice, 57 - Žerotice, 58 - Židlochovice

boat to Dresden and on 13 October in the evening he was at Meissen (Brandl, ed., 1870; Dvorský, ed., 1904). From 12 October onwards there are his records about the weather during his week's stay in Saxony, from where he set out to Hamburg via Magdeburg and Lüneburg, where he arrived on 24 October, by which his records in that month end. During this period a mostly clear weather prevailed, which might point, in accordance with Pfister's (1988) interpretation for Switzerland to a warmer month. Charles Senior of Žerotín left Hamburg towards the end of October, and about 7 November he was at Stade (Dvorský, ed., 1904), from where he set on the journey on 30 November, and on 1 December he was on the high sea (Brábek, 1887). On 6 December he arrived to Dieppe in Normandy (Chlumecky, 1862). With those days are linked up also sporadic records of the weather without the possibility of climatic interpretation (Supplement 1). On 18 December he achieved the goal of his journey, the meeting with the French king Henry IV (Brábek, 1887). With his army he then participating in besieging Rouen. But, by getting acquainted with the French king and the conditions in his army his enthusiasm cooled and in mid-1592 he returned home disappointed.

CONCLUSION

From the point of view of climatic reconstruction in the preinstrumental period every material is precious that makes it possible to put together the mosaic of the weather character in that period. Daily and chronicle records of Charles Senior of Žerotín are thus, despite the relative brevity of the period recorded, incompleteness and localization of parts of the records outside the region of the Czech Lands, a valuable contribution to the analysis of the temperature and precipitation extremities of the individual months not only in the Czech Lands, but, with respect to a good agreement with interpretations from Switzerland (Pfister, 1988) and Germany (Glaser, 1995), in the whole central European region. They rank with the observations of Tycho de Brahe at Hven (1582-1597), David

Fabricius in east Frisia (1588-1613) and Leonhard III Treutwein at Fürstenfeld in Bavaria (1587-1593) (Lenke, 1968). The observations quoted complete suitably reports from the Czech narrative sources and are a valuable contribution for the reconstruction of the climate in the Czech Lands in the 16th century (see Brázdil et al., 1995).

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Supplement 1.

Interpretation of weather records by Charles Senior of Žerotín of 1588-1591. The records are dated according to the Gregorian calendar. In the case of journeys only the starting and the final places in the given day are indicated. Explanations: NnO - Náměšť nad Oslavou

January 1588 (Diarium, pp. 3-7):

NnO: 1. Weak rain at night, strong wind in the morning, clear. 2. Strong rain at night, colder wind. 3. Snowfall at night and in the morning, thaw in the afternoon. 4. Strong wind, clear. 5. Overcast. 6. Snowfall, towards the evening the sun appeared. 7. Overcast, rainy. 8. Variable cloudiness. 9. Clear, sharp and dry wind. 10. Calm, clear. NnO - Rosice: 11. Snow, clear, thunder. Rosice - Ivančice: 12. Calm, spring weather. Ivančice - NnO: 13. Half covered sky, sharp, gusty wind. NnO: 14. Clear, medium frost. 15. Clear, very frosty. 16. Clear, severe frost. 17. Dense fog, clear in the afternoon. 18. Calm, mild. 19. Clear, fine weather. 20.-21. Clear. 22.-23. Clear, pleasant. NnO - Rosice and back: 24. Clear. NnO: 25. Half covered sky, mild, weak rain at night. NnO - Židlochovice: 26. Morning clear, afterwards fog. Židlochovice - Břeclav: 27. Clear, calm. Břeclav: 28. Clear. Břeclav - Židlochovice: 29. Clear. Židlochovice - Rosice: 30. Clear. Rosice - NnO: 31. Clear, strong wind.

Character of the month (Diarium, p. 7):

With the exception of several days, a pleasant and clear month. Almost spring or autumn weather. Such weather has not existed for a long time. Sowing may have taken place [for February it is stated "seeds sown a month ago"].

February 1588 (Diarium, pp. 8-10):

NnO: 1. Clear. 2. Half covered sky. Weak snowfall at night, snow melted. 3. Clear, very frosty. 4. Clear. 5. Overcast, strong sharp wind. 6. Snowfall, frost yielded, in the evening the sun appeared. 7. Thawing of snow with sunny weather. 8. Overcast, frosty. 9. Half covered sky, strong frost. 10. Clear, frost. 11. Clear. 12. Half covered sky, frosty. NnO - Rosice: 13. Overcast, frosty. Rosice - Židlochovice: 14. Clear, frost yielded. Židlochovice - Břeclav: 15. Overcast and frosty in the morning, before noon clear and mild. Břeclav: 16. Clear. Břeclav - Pouzdrány: 17. Clear. Pouzdrány - NnO: 18. Clear, frosty, strong wind. NnO: 19. Half covered sky, severe frost. 20. Overcast, intense snowfall. NnO - Žerotice: 21. Clear in the morning, later overcast, great frost. Žerotice - NnO: 22. Frosty, snowfall. NnO: 23. Overcast, frosty. NnO - Třebíč: 24. Overcast, mild. Třebíč - NnO: 25. Snowfall at night, overcast during the day. NnO: 26. Overcast, frosty. 27. Overcast in the morning, afterwards clear. 28. Clear, frosty. NnO - Velké Meziříčí: 29. Variable, frequent snowfall.

Character of the month (Diarium, p. 10):

Frosty and disagreeable month, frequent snowfalls, frequent sharp wind. Frost, however, not unbearable, milder than is frequently the case.

March 1588 (Diarium, pp. 11-13):

Velké Meziříčí - NnO: 1. Clear, severe frost. NnO: 2. Overcast, intense snowfall. 3. Overcast, frost yielded. 4. Clear. NnO - Kralice and back: 5. Clear in the morning, snowfall in the afternoon. NnO: 6. Half covered sky. NnO - Lomnice: 7. Clear, strong wind. Lomnice - Moravská Třebová: 8. Clear. Moravská Třebová: 9. Variable, snowfall towards the evening. Moravská Třebová - Lomnice: 10. Clear and frosty in the morning, after intense snowfall. Lomnice - NnO: 11. Clear, frosty. NnO: 12. Clear. 13. Rain at night, overcast during the day, very frosty. 14. Overcast, rain, warming. 15. Overcast and rain in the morning, later clear. NnO - Kralice and back: 16. Clear, mild. NnO: 17. Clear. 18. Clear in the morning, later rain. NnO - Kralice and back: 19. Clear, mild frosty wind. NnO: 20.-21. Clear, mild. 22. Clear. 23. Clear, fine weather. NnO - Rosice: 24. Clear, pleasant. Rosice - Brno: 25. Clear. Brno: 26. Clear, frosty wind. 27. Clear. Brno - NnO: 28. Half covered sky, strong wind. NnO: 29. Clear. 30. Overcast, then clear.

Character of the month (Diarium, p. 13):

The beginning of the month frosty, like in February. The whole winter severe. End of month quiet and nice.

April 1588 (Diarium, pp. 13-15):

NnO: 1. Clear, strong wind, but not frosty. 2. Mild, variable, rain at night. 3. Overcast, all-day rain, strong wind. 4. Overcast, strong wind. 5. Clear, frosty wind. 6.-7. Clear. 8. Overcast, frosty. NnO - Velká Bíteš: 9. Variable, towards the noon rain. Velká Bíteš - NnO: 10. Overcast, rainy, clearing in the evening. NnO - Židlochovice: 11. Rain ceased, afterwards clear. Židlochovice - Říčany: 12. Clear, calm. Říčany - NnO: 13. Rainy. NnO: 14. Great rains. 15. Overcast, rainy. 16. Overcast. 17. Strong wind. NnO - Třebíč: 18. Half covered sky. Třebíč: 19. Overcast, frosty. Třebíč - NnO: 20. Clear in the morning. NnO: 21. Clear. 22. Half covered sky. 23. Overcast in the morning, after clear. 24. Half covered sky. 25. Half covered sky, frosty. 26. Overcast, rain. NnO - Třebíč: 27. Strong wind, rain. Třebíč - NnO: 28. Overcast, rain. NnO - Třebíč: 29. Half covered sky, strong wind. Třebíč - Telč: 30. Clear, frost in the morning.

Character of the month (Diarium, p. 15):

Variable April weather, alternating rain with sunshine. Incessant wind blowing partly from the north, partly from the south. Five times intense rain, in frosty mornings hoar-frost. Frequent rains and hoar-frost made great damage on fruit and above all wheat, particularly in less fertile places.

May 1588 (Diarium, pp. 16-18):

Telč - Jindřichův Hradec: 1. Clear, pleasant. Jindřichův Hradec - Bechyně: 2. Clear in the morning, overcast in the afternoon. Bechyně: 3. Clear, frosty in the morning. 4. Clear, pleasant. 5.-6. Clear. Bechyně - Načeradec: 7. Clear, pleasant. Načeradec - Čáslav: 8. Clear, pleasant. Čáslav - Pardubice: 9. Clear in the morning, weak rain during the day, clear in the evening. Pardubice - Brandýs nad Orlicí: 10. Strong rain in the morning, afterwards clear. Brandýs nad Orlicí - Litomyšl: 11. Cold, overcast, rain. Litomyšl - Brandýs nad Orlicí: 12. Clear. Brandýs nad Orlicí: 13. Clear, pleasant. 14. Clear in the morning, afterwards overcast. 15. Pleasant, calm. 16.-21. Clear. Brandýs nad Orlicí -

Košumberk: 22. Clear, very hot. Košumberk - Hradec Králové: 23. Clear, hot, downpour in the evening. Hradec Králové - Smiřice: 24. Clear, very warm. Smiřice - Nymburk: 25. Clear, pleasant. Nymburk - Prague: 26. Overcast, rain. Prague: 27. Clear. 28. Clear, pleasant. 29.-31. Clear.

June 1588 (Diarium, pp. 19-23):

Prague: 1. Clear. 2. Clear, pleasant. 3. Overcast, rainy. Prague - Mladá Boleslav: 4. Overcast, rainy. Mladá Boleslav - Česká Lípa: 5. Rain at night, in the morning temporary breaking up of the clouds. Česká Lípa: 6. Clear. Česká Lípa - Děčín: 7. Clear, pleasant. Děčín - Dresden: 8. The whole night and in the morning rain, afterwards stopped. Dresden: 9.-12. Clear. Dresden - Freiberg: 13. Clear. Freiberg - Dresden: 14. Rain at night, later clear. Dresden: 15. Clear, at noon rain. Dresden - Meissen: 16. Clear in the morning, overcast and rain in the afternoon, afterwards again clear. Meissen - Torgau: 17. Clear. Torgau - Leipzig: 18. Overcast in the morning, then clear. Leipzig: 19.-20. Clear. Leipzig - Wittenberg: 21. Clear, pleasant. Wittenberg - Dessau: 22. Overcast, but no rain. Elsewhere damage due to rain. Dessau: 23. Clear. Dessau - Zörbig: 24. Clear. Zörbig - Halle: 25. Clear, towards noon strong wind. Halle - Naumburg: 26. Clear in the morning, after overcast and rainy. Naumburg - Weimar: 27. Clear, pleasant. Weimar - Erfurt: 28. Rainy, later clear. Erfurt: 29. Variable cloudiness, showers. Erfurt - Artern: 30. Clear.

July 1588 (Diarium, pp. 23-30):

Artern - Mansfeld: 1. Overcast, rainy. Mansfeld - Halberstadt: 2. Clear in the morning. Halberstadt - Magdeburg: 3. Clear. Magdeburg: 4. Variable, showers. Magdeburg - Helmstedt: 5. Rainy in the morning, after clear. Helmstedt - Wolfenbüttel: 6. Overcast. Wolfenbüttel: 7. Overcast, rainy. 8. Variable, showers. Wolfenbüttel - Braunschweig: 9. Clear in the morning, then variable and rainy. Braunschweig: 10. Clear. Braunschweig - Celle: 11. Clear. Celle - Uelzen: 12. Overcast, rainy. Uelzen - Lüneburg: 13. Strong rain the whole day. Lüneburg - Mölln: 14. Night rain did not stop before noon. Mölln - Lübeck: 15. Half covered sky. Lübeck - Wismar: 16. Rainy in the morning, then clear. Wismar - Rostock: 17. Clear. Rostock - Bad Doberan: 18. Clear, pleasant. Bad Doberan - Neukloster: 19. Clear. Neukloster - Grevesmühlen: 20. Clear. Grevesmühlen - Lübeck: 21. Clear. Lübeck: 22. Half covered sky, very strong wind, mild rain. Lübeck - Bad Oldesloe: 23. Overcast, at times rain. Bad Oldesloe - Hamburg: 24. Clear in the morning, afterwards overcast, rain. Strong rain at night. Hamburg: 25. Variable, showers. 26. Mostly clear, strong rain in the evening. Hamburg - Stade: 27. Variable, mostly, however, rainy. Stade: 28. Clear in the morning, then overcast and rainy. Stade - Bremerwörde: 29. Variable, alternating downpours with moderate rain, clear towards the evening. Bremerwörde - Bremen: 30. Overcast, rainy. Bremen: 31. Variable, showers.

Character of the month (Diarium, p. 30):

Less warm than usual in this month, no hot days. Eight days incessant rains. On further days variable.

August 1588 (Diarium, pp. 30-35):

Bremen - Bassum: 1. Morning overcast and rainy, afterwards clear. Bassum - Minden: 2. Overcast, rainy. Minden - Herford: 3. Rain at night and up to 1-2 p.m. Herford - Paderborn: 4. Whole day showers, afterwards clearing. Paderborn - Scherfede: 5. Clear, overcast on rain towards the evening. Scherfede - Kassel: 6. Overcast, rainy. Kassel: 7. Clear, downpour in the evening. 8. Variable, showers. Kassel - Fritzlar: 9. Variable, clear in the evening. Fritzlar - Marburg: 10. Rainy in the morning, clear towards the evening. Marburg - Giessen: 11. Overcast. Giessen - Friedberg: 12. Great rain. Friedberg - Frankfurt a. M.: 13. Clear, at sunset a downpour for half an hour. Frankfurt a. M.: 14. Clear. Frankfurt a. M. - Oppenheim: 15. Clear. Oppenheim - Worms: 16. Clear. Worms - Frankenthal and back: 17. Clear. Worms - Mainz: 18. Clear, very hot. Mainz - Frankfurt a. M.: 19. Clear. Frankfurt a. M. - Babenhausen: 20. Overcast, rainy. Babenhausen - Miltenberg: 21. Variable, showers. Miltenberg - Würzburg: 22. Rain at night, showers during the day, clear towards the evening. Würzburg - Ebrach: 23. Rainy in the morning, later clear. Ebrach - Bamberg: 24. Clear. Bamberg: 25. In the morning a very strong rain which ceased in the afternoon. Bamberg - Nürnberg: 26. Prevaingly rainy, sometimes sunshine. Nürnberg: 27. Overcast, rainy. 28. Strong rain at night, morning overcast and rainy, clear in the afternoon. Nürnberg - Neumarkt: 29. Clear. Neumarkt - Deuerling: 30. Variable, showers. Deuerling - Regensburg: 31. Overcast, all-day rain.

Character of the month (Diarium, p. 35):

Not less rainy month [than July - author's note].

September 1588 (Diarium, pp. 35-38):

Regensburg - Bruck: 1. Variable with rain. Bruck - Waldmünchen: 2. Variable. Waldmünchen - Stod: 3. Clear in the morning, later until evening rain. Stod - Rokycany: 4. Clear in the morning, strong rain in the afternoon. Rokycany - Prague: 5. Overcast. Prague: 6. Clear. 7. Half covered sky, showers, strong rain towards the evening. 8. Clear. Prague - Český Brod: 9. Clear. Český Brod - Čáslav: 10. Overcast and rainy in the morning, clear in the afternoon. Čáslav - Polná: 11. Rain in the morning, showers in the afternoon. Polná - NnO: 12. Clear, stronger wind. NnO: 13. Clear. NnO - Třebíč: 14. Clear. Třebíč - NnO: 15. Overcast, rainy. NnO - Rosice: 16. Variable, clear towards the evening. Rosice - Ivančice: 17. Clear. Ivančice - Rosice: 18. Clear. Rosice - NnO: 19. Clear, stormy wind. NnO: 20. Overcast in the morning, afterwards clear. 21. Overcast, rainy. 22. Overcast and very rainy in the morning. NnO - Brno: 24. Clear. Brno: 25. Clear. Brno - NnO: 26. Clear. NnO: 27.-28. Clear. NnO - Židlochovice: 29. Overcast in the morning, shower in the afternoon, rain, clear towards the evening. Židlochovice - NnO: 30. Clear.

October 1588 (Diarium, pp. 38-41):

NnO - Třebíč: 1. Clear. Třebíč - NnO: 2. Clear. NnO: 3. Clear. 4. Dissipated fog in the morning, clear. NnO - Rosice: 5. Clear. Rosice - Slavkov: 6. Clear. Slavkov - Kojetín: 7. Clear. Kojetín - Dřevohostice: 8. Clear. Dřevohostice: 9. Overcast, rain in the evening. Dřevohostice - Lipník nad Bečvou and back: 10. Clear, strong wind in the evening and at night. 11. Clear in the morning, then strong wind followed by rain. 12. All-night rain,

afterwards clear. Dřevohostice - Lipník nad Bečvou: 13. Clear. Lipník nad Bečvou: 14. Clear. Lipník nad Bečvou - Olomouc: 15. Overcast in the morning, rain, later clear. Olomouc - Moravská Třebová: 16. Overcast, rainy. Moravská Třebová - Brandýs nad Orlicí: 17. Overcast in the morning, after clear. Brandýs nad Orlicí: 18. Clear. 19. Overcast. 20. Overcast in the morning, clear towards the evening. 21.-22. Overcast. Brandýs nad Orlicí - Boharyně: 23. Overcast, calm. Boharyně - Mladá Boleslav: 24. Variable cloudiness, showers, calm. Mladá Boleslav - Brandýs nad Labem: 25. Overcast, rain towards the evening. Brandýs nad Labem - Prague: 26. Clear in the morning, later overcast. Prague: 27. Rain at night, later clear. Prague - Votice: 28. Overcast. Votice - Bechyně: 29. Variable, rainy, in the evening the weather cleared up. Bechyně: 30. Overcast, mild frost. Bechyně - Soběslav: 31. Overcast.

November 1588 (Diarium, pp. 42-45):

Soběslav - Kunžak: 1. Overcast, frosty. Kunžak - Třebíč: 2. Overcast, frosty. Třebíč - NnO: 3. Clear, strong wind, heavy hoar-frost. NnO - Židlochovice: 4. Clear, frosty wind, heavy hoar-frost. Židlochovice - Ivančice: 5. Clear, less strong wind. Ivančice - NnO: 6. Clear. NnO: 7. Overcast, rain at night. 8. Overcast, mild. 9. Overcast. NnO - Brno: 10. Half covered sky. Brno: 11. Overcast. Brno - Pouzdrány: 12. Overcast, rain in the morning. Pouzdrány - Hodonín: 13. Overcast and rainy in the morning. Hodonín - Břeclav: 14. Half covered sky, wind. Břeclav - Pouzdrány: 15. Clear. Pouzdrány - NnO: 16. Overcast, rainy. NnO: 17. Overcast. 18. Overcast in the morning, then clear. 19.-20. Overcast. 21. Overcast, rainy. NnO - Ivančice: 22. Overcast. Ivančice - NnO: 23. Overcast. NnO: 24. Overcast. NnO - Kralice and back: 25. Overcast, strong wind at night, somewhat weaker during the day. NnO: 26. Overcast, rain, clear in the afternoon. 27. Overcast. 28.-29. Clear. 30. Dense fog.

December 1588 (Diarium, pp. 45-48):

NnO: 1. Overcast, rainy. 2. Overcast, heavy rain. NnO - Valeč: 3. Overcast in the morning, then clear. Valeč - Jaroměřice nad Rokytnou: 4. Overcast in the morning, frosty. Jaroměřice nad Rokytnou - Jemnice: 5. Clear, frosty wind. Jemnice - Valeč: 6. Clear, frosty. Valeč - NnO: 7. Clear, frosty wind in the evening. NnO: 8. Overcast. NnO - Ivančice: 9. Overcast. Ivančice - Třebíč: 10. Overcast. Třebíč - Dačice: 11. Clear, strong and frosty south wind. Dačice - Jindřichův Hradec: 12. Clear, strong and frosty wind. Jindřichův Hradec - Bechyně: 13. Overcast, frosty, snowfall at night. Bechyně: 14. Overcast, frosty, snowfall. Bechyně - Soběslav: 15. Overcast, strong wind, snowfall. Soběslav - Kunžak: 16. Morning overcast, strong wind, clearing in the afternoon, calm. Kunžak - Třebíč: 17. Overcast. Třebíč - NnO: 18. Overcast, snowfall. NnO: 19. Overcast. 20. Overcast, moist, almost all snow thawed. 21. Clear, mild frosty. NnO - Rosice: 22. Overcast in the morning, afterwards clear. NnO: 24. Overcast, snowfall. NnO - Kralice and back: 25. Rainy in the morning, then very frosty. NnO: 26. Overcast, snowfall. 27. Overcast, frosty. NnO - Kralice and back: 28. Clear, frosty wind. NnO: 29. Overcast, all-day snowfall, frosty wind. 30. Very frosty. 31. Very strong frost.

January 1589 (Diarium, pp. 49-51):

NnO: 1. Frost, intense cold yielded a bit, foggy. 2. Very cold, strong wind, snowfall. 3. Cold, bad weather, it cleared up slightly after noon. 4. Very cold, snowfall. 5. Cold, snowfall. 6. Frost, cold wind, snowfall. 7. Cold, snowfall. 8. Cold, overcast. 9. Overcast. 10. Foggy. 11.-12. Clear, fine weather. 13. Cold, overcast. 14. Clear, cold. 15. Clear, cold wind. NnO - Dačice: 16. Clear, not very cold. Dačice - Soběslav: 17. Snowstorm in the morning, after clearing. Soběslav - Bechyně: 18. Wind, snowstorm. Bechyně - Miličín: 19. Cold, foggy. Miličín - Podhoří: 20. Snowfall in the morning. Podhoří - Prague: 21. Overcast, cold. Prague: 22. Cold, snow, foggy. 23. Cold, cold wind, snowfall. 24. Cold, especially at night. 25. Foggy, cold wind. 26. Cold, wind. 27. Clear, cold. 28. Cold wind. 29. Foggy, warmer than in preceding days. 30. Clear, great frost, cold. 31. Clear, cold.

February 1589 (Diarium, pp. 51-54):

Prague: 1.-2. Clear, cold. 3. Foggy, cold. 4. Foggy. 5. Very cold, moderate wind. 6. Clear, cold. 7. Clear, very cold. 8. Warming, thaw. 9. Clear, warm. 10. Clear, cold. 11. Foggy, cold. Prague - Nespeky: 12. Clear, severe frost, cold. Nespeky - Bechyně: 13. Clear, not very cold. Bechyně: 14. Clear, severe frost. Bechyně - Tábor: 15. Foggy. Tábor - Prague: 16. Clear, very cold wind. Prague: 17.-18. Fine weather. 19. Foggy in the morning. 20. Clear. 21. Fine weather. 22. Cold, fine weather. 23. Overcast in the morning, then clear. 24. Rain in the morning, slight warming. Afterwards clear. 25. Rain, frost, then a little snow, slippery. 26. Clear, cold. 27. Overcast.

March 1589 (Diarium, pp. 54-57):

Prague: 1. Fine weather, warm. 2. Fine weather, clear. 3. Overcast. 4. Clear, warm. 5. In the morning a little rain, then fine weather. 6. Fine weather, clear. 7. Fine weather. 8. Rain with snow in the morning, afterwards moderate weather. 9. Fine weather. Prague - Český Brod: 10. Heavy snowfall in the morning, clear in the afternoon. Český Brod - Čáslav: 11. Fine weather. Čáslav - Polná: 12. Rain in the morning and at night, overcast. Polná - NnO: 13. Fine weather, clear, cold. NnO: 14. Overcast in the morning, clear and quite warm in the afternoon. 15. Clear, warm. NnO - Rosice: 16. Fine weather, warm. Rosice - Pohořelice: 17. Fine weather. Pohořelice - Neudorf: 18. Fine weather, warm. Neudorf - Idlersdorf: 19. Overcast, after clearing. Idlersdorf - Vienna: 20. Clear, rain towards the evening. Vienna: 21. Rain in the morning, then clear. 22. Overcast. 23. Clear in the morning, heavy rain in the afternoon. 24. Fine weather in the morning, rain in the afternoon. 25. Fine weather, clear. 26. Fine weather, pleasant. Vienna - Wilfersdorf: 27. Fine weather. Wilfersdorf - Velké Bílovice: 28. Clear, strong wind. Velké Bílovice - Židlochovice: 29. Clear, strong wind. Židlochovice - Rosice: 30. Clear in the morning, after overcast. Rosice - NnO: 31. Fine weather, warm.

April 1589 (Diarium, pp. 57-58):

NnO: 1. Clear, fine weather. 2. Clear. 3. Fine weather, clear, overcast and rain towards the evening. 4. Clear in the morning, shower towards the evening. 5. Medium fine weather. NnO - Židlochovice: 6. Clear, strong wind. Židlochovice - NnO: 7. Clear, strong cold wind. NnO: 8. Fine weather, calm in the morning, wind towards the evening. 9. Half covered sky. 10. Fine weather, strong wind. 11. Clear, calm, afterwards strong wind.

NnO - Budišov and back: 13. Overcast, windy. NnO: 14. Rain for the whole day (before it was dry). 15. Clear.

September 1590 (Diarium, pp. 59-73):

NnO - Třebíč: 11. Clear, strong and frosty wind. Before rain, strong in the mountains. Třebíč - Dačice: 12. Clear, moderate weather. Dačice - Tábor: 13. Clear, very hot. Tábor - Bechyně and back: 14. Clear, very hot. Tábor: 15. Clear, very hot. Tábor - Písek: 16. Clear. Písek - Horažďovice: 17. Overcast in the morning, rain, clear in the afternoon. Horažďovice - Prachatice and back: 18. Clear, pleasant. Horažďovice: 19. All-day rain. 20. Rain at noon and afterwards, stopped in the evening. Horažďovice - Klatovy: 21. Clear at night and during the day. Klatovy - Amberg: 22. Clear the whole day. Amberg - Nürnberg: 23. Overcast and frosty in the morning, after clearing, mild weather. Nürnberg: 24. Overcast in the morning, before noon rainy, over the day slightly cold. 25. All-day mild rain, towards the evening short sunshine. 26. Overcast, moderate weather. Nürnberg - Würzburg: 27. Clear, frosty. Würzburg - Babenhausen: 28. Clear, frosty. Babenhausen - Aschaffenburg: 29. Clear, frost yielded (preceding days frosty).

April 1591 (Ipolyi, 1887, pp. 4-5):

NnO: 23. Rapid wind. 24. Severe frost, hoar-frost, damage in crops, rapid wind, clear, snow thawed. 26. Strong wind, clear. 27. Clear, moderate weather.

May 1591 (Ipolyi, 1887, pp. 5-11):

NnO: 1. Ample rain at night, cold wind. 2. Clear, strong and warm south wind. (Windy in this year, spring cereal perished). 3. Wind, unusual weather for this time. 9. Clear in the morning, clouds and wind before noon, downpour in the evening (parched soil), earthquake. 11. Clear at night, from dawn to dusk rain, from the morning wind. 14. Before noon clear, variable and showers in the afternoon. NnO - Olomouc: 23. Summer day, clear and hot, dusty road. Olomouc - Litomyšl: 24. Same weather as on the preceding day. Brandýs nad Orlicí: 26. Clear. Brandýs nad Orlicí - NnO: 27. Variable cloudiness, strong wind.

Character of the month (Ipolyi, 1887, p. 12):

Windy month, practically no hot days, at the beginning of the month dry, towards the end rains and downpours, heavily soaked meadows, frost did not damage vineyards, hope of good harvest.

June 1591 (Ipolyi, 1887, pp. 12-19):

NnO: 1. Overcast, rain. 12. Mild rain in the morning, clear and hot during the day. 15. Cold in the morning, strong wind, overcast, rain. 16. Overcast, strong cold wind (wearing furcoats). 17. Variable cloudiness, warmer, wind weaker than on preceding day. NnO - Kralice and back: 18. Clear, calm. NnO: 19. Wind. 20. In the morning rain, wind, half covered sky in the evening.

July 1591 (Ipolyi, 1887, pp. 20-25):

NnO: 4. Hot. NnO - Strážnice: 5. Clear, hot. Strážnice - NnO: 6. Clear and calm at night, clear and strong cold wind during the day. NnO - Rosice and back: 8. Clear, very hot.

NnO: 9. Clear in the morning, rain in the afternoon, wind. 10. Clear. 18. Variable cloudiness, at noon mild rain. Kralice: 20. Clear, windy. Kralice - NnO: 21. Variable cloudiness, showers. NnO: 27.-28. Overcast, rainy. 29. Overcast in the morning, clear in the afternoon.

Character of the month (Ipolyi, 1887, p. 29):

Hot and sunny at the beginning of the month, parched soil, then almost incessant rains, windy. Fruits rotted due to moisture or did not ripen due to cold. Hope of good harvest, good flax and legumes. Unfavourable conditions for vine, it may not ripen.

September 1591 (Ipolyi, 1887, pp. 29-31):

NnO: 19. Pleasant day. 20.-21. Clear. 23.-24. Clear. Brno: 26. Clear, colder. Brno - NnO: 27. Like on preceding days.

Character of the month (Ipolyi, 1887, p. 32):

Clear and favourable month. Some days colder, night frost (hoar-frost), but did not damage vineyards. Ripening of vine.

October 1591 (Ipolyi, 1887, pp. 32-39):

NnO: 1. Clear, strong wind. NnO - Bystřice nad Pernštejnem: 2. Clear, wind, weaker in the morning. Děčín - Dresden: 12. Overcast, weak rain. Dresden - Meissen: 13. Clear, cold in the morning. Meissen: 14. Clear. Meissen - Torgau: 15. Clear. Torgau - Pirna: 16. Clear, warmer. Pirna - Meissen: 17. Same as in the preceding days. Meissen - Magdeburg: 18. Clear. Magdeburg: 19. Clear. Magdeburg - Lüneburg: 20. Cold strong wind. Lüneburg: 21. Clear, cold wind, less violent than on preceding days. 22. Clear, towards the morning mild frost. Lüneburg - Hamburg: 23. Clear in the morning, about noon change in the wind direction from south to west, rain towards the evening. Hamburg: 24. Overcast, rain, strong wind.

November 1591 (Ipolyi, 1887, p. 40):

Stade: 12. Overcast, moist, variable wind. 29. Strong wind. German coast: 30. Frost at night, overcast in the morning, clearing during the day, moderate wind.

December 1591 (Ipolyi, 1887, p. 41):

North Sea: 1. Clear. Rouen: 18. Clear, cold.

