

Malewicz, Małgorzata Hanna

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Małgorzata Hanna Malewicz (Poland)

ASTRONOMICAL PHENOMENA IN CENTRAL
AND EAST-EUROPEAN
MEDIEVAL NARRATIVE SOURCES

In my previous study on the reflection of astronomical knowledge in medieval accounts¹ I have focused on the pertinent records in Polish annals and chronicles (11th to 15th centuries). Foreign sources were cited only to indicate borrowing. Czech and Russian sources were not amply considered, because medieval Polish annals largely depended on German sources, less so on Russian ones; their dependence on Czech sources is clearly traceable since Jan Długosz only, i.e. since the 15th century onwards.

This is by no means a pioneering study, as Russian annals have been studied before. A relatively full catalogu of the astronomical phenomena described in Russian sources dating back to 1000–1600 is available.² An analogous catalogu of Czech chronicles has been compiled by F. Link;³ some astronomical phenomena such as meteors and meteorites, recorded by early medieval Czech chroniclers have been studied by Umberto Dall'Olmo⁴, while a Polish translation of Czech chronicles supplies detailed commentaries by Maria Wojciechowska⁵ on every record of astronomical phenomena they contain. The present study, then, is not a repertory of the pertinent records in early medieval Polish, Czech and Russian chronicles (reflecting the contemporary astronomical and astrological knowledge as recorded by the chron-

¹ Małgorzata H. Malewicz, *Zjawiska przyrodnicze w relacjach dziejopisarzy polskiego średnio-wieczna*, Wrocław-Warszawa-Kraków-Gdańsk: Ossolineum, 1980.

² A. N. Vyssotsky, *Astronomical Records in the Russian Chronicles from 1000 to 1600 A. D.* (as collected by D. O. Sviatsky), „Medelande från Lunds Astronomiska Observatorium” Series II, 126 (1949), pp. 1–51.

³ František Link, *Astronomické zpravy v Kronice Vyšehradského Kanovníka*, „Československý Časopis Historycký” 11 (1961).

⁴ Umberto Dall'Olmo, *Meteors, Meteor Showers and Meteorites in the Middle Ages: from European Medieval Sources*, “Journal for the History of Astronomy” Vol. 9, Part 2, June 1978, pp. 123–134.

⁵ Maria Wojciechowska, *Kosmasa Kronika Czechów* (translation into Polish and commentary), Warszawa: PWN, 1968; the same author's *Kronikarze czeszy*, Warszawa: PWN, 1978.

iclers) but a supplement to previous studies presenting some features characteristic of the chronicles from these Slavic countries. However it should be pointed out (as in the previous study) that those characteristic features hardly yield to generalization. The special interest a chronicler may betray in any astronomical phenomena, more detailed accounts or comments, are certainly always indicative of his predispositions and fascinations rather than of his nationality or of the literary "school" he may have belonged to. For this reason, the present study deals above all with records from such sources where the chronological pattern of recording itself (*series temporum*, *series annorum*) forces the author to record systematically all phenomena he regards as significant in a given year or years. The present study concentrates mainly on sources written between A.D. 1000 and 1300 in order to have homogeneous research material; it would be a bit unfair to compare the contents of, e.g., 11th century sources with the 15th century *Annales* by Jan Długosz, as it would be disadvantageous to the earlier records.

The astronomical records in early medieval narrative sources I have studied and also the above-mentioned authors⁶ refer to such phenomena as eclipses of the Sun and the Moon, appearance of comets, planetary observations, observations of meteors and meteorites, auroras, solar or lunar halos, and finally observations of sunspots.

From 961 to 1300, Polish sources recorded four eclipses of the Sun: that of May 17, 961 (recorded in *Annales Ecclesiae Cracoviensis* and *Annales Poloniae Maioris*, probably borrowed from *Annalista Saxo*⁷), the partial eclipse of April 21, 1167, recorded in *Annales Cuiavienses II*⁸;) the partial eclipse of August 5, 1263, whose correct day and year were recorded in *Annales Ecclesiae Cracoviensis* and, afterwards, in *Annales Trascae*⁹) but with the wrong year (1262), in *Annales Poloniae Maioris*;¹⁰ the final solar eclipse recorded was the partial eclipse of May 25, 1267 (*Annales Trascae* and *Annales Poloniae Minoris II*¹¹). By comparison, the Czech sources recorded 9 solar eclipses over the same period. The first record, which, incidentally, is copied from *Annales Quedlinburgenses* and concerns the annular eclipse of October 21, 990, was made in *Cosmae Chronica Boemorum* and then repeated by *Monachus Sazavensis*.¹² The next record from the same source, i.e. *Cosmae Chronica Boemorum*, refers to the solar eclipse of September 23, 1092, though the chronicler gives the wrong date, namely September 20.¹³ Another record also from *Cosmae Chronica Boemorum*¹⁴ mentions the solar eclipse of September 11, 1124; that eclipse, according to the chronicler, was followed by a cattle and livestock

⁶ Cf. also Malewicz, op. cit., pp. 174–177 (list of studies on medieval chronicles).

⁷ Cf. *ibid.*, p. 29, and note 11 in it; *Aneks II*, p. 97 *ibid.*

⁸ Cf. *ibid.*, pp. 29 f, and notes 12 and 13. Cf. also *Aneks II*, p. 97 *ibid.*

⁹ Cf. *ibid.*, p. 31, note 23, and *Aneks II*, p. 97 *ibid.*

¹⁰ *Ibid.*, p. 31, note 24, and *Aneks II*, p. 97 *ibid.*

¹¹ *Ibid.*, p. 31, note 25, and *Aneks II*, p. 97 *ibid.*

¹² *MGH SS IX*, p. 149. Cf. Wojciechowska, *Kronikarze...*, p. 125, note 15.

¹³ *MGH SS IX*, p. 101. Cf. Wojciechowska, *Kosmasa...*, p. 306, note 70.

¹⁴ *MGH SS IX*, p. 125; Wojciechowska, *Kosmasa...*, p. 402, note 65.

plague, bees died, autumn and spring seeds failed to sprout. Two records, one in *Canonicus Wissegradiensis* and another in *Monachus Sazavensis*¹⁵ concern the solar eclipse of August 2, 1133, with the former giving a more detailed account:

“4. Nonas Augusti eclipsis solis mirum in modum apparuit, qui paulatim deficiens in tantum diminutus est, ut corona quasi crescentis lunae ad meridianam plagam perrexit, quae postea in orientem convertit, dehinc in occidentem, tandem in pristinum statum reformatum est.”

I quote this because *Canonicus Wissegradensis* is actually the only East-European historian giving exact descriptions of the phenomena observed. As a rule, information on solar eclipses in accounts are reduced to statements “Eclipsis Solis facta est”, supplying more or less accurate dates of the phenomenon mentioned.

The next record, in *Canonicorum Pragensium Continuationes Cosmae*,¹⁶ presumably refers to the solar eclipse of September 4, 1187. The year is given wrongly (1186), while the day is not mentioned at all. The pertinent record in *Cronica Przbiconis de Tradenina dicti Pulkaui*¹⁷ is equally erroneous, as it gives the wrong year 1186. In both cases the entry is laconic: “Eclipsis solis fuit. Mortalitas hominum facta est”, so we cannot be really sure that the eclipse of 1187 is the one meant. Thus, the record of the solar eclipse of June 23, 1191, in *Martini Oppaviensis Chronicon* is correct.¹⁸ Another three records of solar eclipses are found in *Canonicorum Pragensium Continuationes Cosmae*; concerning those of February 28, 1207 (no exact date given,¹⁹ of October 6, 1241²⁰ and of December 30, 1255.²¹ This completes the series of records of solar eclipses in Czech sources examined here.

The Russian sources in turn, provide rather ample records, as over the same period they mention 19 solar eclipses. A. N. Vyssotsky's catalogue gives a full list (including source data) of eclipses between 1000 and 1270.²² Additional data from the *Povest' vremennykh let* (a source dating back to the turn of the 10th century continued till 1117) are not covered by Vyssotsky's catalogue, perhaps because it is called a *svod* — a listing rather than a proper annal.

The first solar eclipse mentioned in *Povest' vremennykh let* occurred on May 25, 979.²³ It is of course not mentioned in Vyssotsky's catalogue as it comprises events from 1000

¹⁵ *MGH SS IX*, pp. 138, 157; Wojciechowska, *Kronikarze...*, pp. 67–68, and note 35 *ibid.* On the solar eclipse of August 2, 1133, cf. also Umberto Dall'Olmo, *L'eclisse di sole de 2 Agosto 1133*, “Coeleum”, Anno XLV, Vol. LXIII No. 11–12, pp. 233–243.

¹⁶ *MGH SS IX*, p. 166; cf. Malewicz, *op. cit.*, p. 30.

¹⁷ *Fontes Rerum Bohemicarum V*, p. 113.

¹⁸ *MGH SS XXII*, p. 470.

¹⁹ *MGH SS IX*, p. 170. Cf. J. F. Schroeter, *Spezieller Kanon der zentralen Sonnen- und Mondfinsternisse, welche innerhalb des Zeitraums von 600 bis 1800 n. Chr. in Europa sichtbar waren*, Kristiania, 1923, p. 120, and map 74b, p. LXXIV.

²⁰ *MGH SS IX*, p. 173. Cf. Schroeter, *op. cit.*, p. 123, and map 79a, p. LXXXIX.

²¹ *MGH SS IX*, p. 175. Cf. Schroeter, *op. cit.*, p. 124, and map 80a, p. LXXX.

²² Vyssotsky, *op. cit.*, pp. 7–14.

²³ *Powieść minionych lat (Povest' vremennykh let)*, translation and commentary by F. Sielicki, Ossolineum, 1968, pp. 264–265. This record is actually taken from the 16th-century Nikonov chronicle, cf. Sielicki, note 1 *ibid.* Cf. Schroeter, *op. cit.*, p. 101, and map 44b, p. XLIV.

to 1600 only. Other three eclipses — of May 21, 1091,²⁴ of March 19, 1113²⁵ and of July 23, 1115²⁶ — are recorded in that catalogue from other chronicles. Description of the solar eclipse of July 23, 1115, is typical for the Russian chronicler:

“The year 6623 [1115] ... That year there was a sign: the Sun disappeared and looked like the Moon, which the ignorant call eaten-up Sun. That year, too, Oleg Sviatoslavoyich died, in the month of August, on its first day...”²⁷ For the author of the *Povest'* solar and lunar eclipses, like all other celestial phenomena, are as a rule a *signum mali ominis*. Most Russian annal writers share this belief; phenomena of celestial mechanics are usually interpreted as “signs” in the chronicles. The comments by the author of the *Povest'* are rather interesting; the description of the Sun as “eaten-up” is derived from uneducated people with whom he has no intention to identify himself. At another place²⁸ he manifests his learnedness thus describing the eclipses:

“There are signs (sc. astronomical phenomena, eclipses for instance) in the Sun and in the Moon or in the stars not all over the world but in whichever land that sign will be that land will see it while another land will not see it...”

If we consider these remarks of the chronicler, we may venture to say that, while fully aware of what the eclipses really are, he puts his entries for didactic and moralizing reasons: eclipses are divine signs calling upon people to be more pious and to live decently.

While solar eclipses are recorded quite regularly, between the 10th and 13th century in East-European narrative sources, lunar eclipses are not much mentioned by Czech and Polish chroniclers. Moreover, no Polish source gives a single case of lunar eclipse till the end of the 14th century,²⁹ while throughout the 15th century such records are extremely scarce. Czech sources are more interesting, for they mention six lunar eclipses till the end of the 13th century: of March 24, 1122, recorded in *Cosmae Chronica Boemorum*;³⁰ the total lunar eclipse of November 9 (more exactly, of November 8), 1128, recorded in *Canonicus Wissegradensis*;³¹ of September 11, 1131, recorded by the same chronicler³² who gives two more mentions: one of the total eclipse of the Moon of March 4 (more exactly, of March 3) 1132³³ and another on the partial eclipse of February 22 (more exactly, of February 21), 1133;³⁴ the latter found in *Canonicorum Pragensium Continuationes Cosmae* and relating to

²⁴ *Povest'*..., op. cit., pp. 361–362. Cf. Schroeter, op. cit., p. 110, and map 58b, p. LVIII. Cf. also Vyssotsky, op. cit., p. 7.

²⁵ *Povest'*..., op. cit., p. 421. Cf. Vyssotsky, op. cit.

²⁶ *Povest'*..., op. cit., p. 425. Cf. Schroeter, op. cit., p. 112, and map 62b, p. LXII. Cf. also Vyssotsky, op. cit., p. 8.

²⁷ *Povest'*..., cf. Vyssotsky, *ibid.*

²⁸ *Povest'*..., op. cit. p. 421.

²⁹ Cf. Malewicz, op. cit., p. 28.

³⁰ *MGH SS IX*, p. 124.

³¹ *MGH SS IX*, p. 134, cf. Wojciechowska, *Kronikarze...*, p. 46, and note 11 *ibid.*

³² *MGH SS IX*, p. 136; Wojciechowska, *Kronikarze...*, p. 58–59 and note 24 *ibid.*

³³ *MGH SS IX*, p. 137; Wojciechowska, *Kronikarze...*, p. 61, and note 27 *ibid.*

³⁴ *MGH SS IX*, p. 138; Wojciechowska, *Kronikarze...*, p. 64, and note 32 *ibid.*

the eclipse of May 18/19, 1258.³⁵ Most valuable records are those of *Canonicus Wissegradensis* because as all information provided by that chronicler they are based on his own observations, so accurate that both the place and the time at which they were made can be identified.

The Russian chroniclers are more attentive to lunar eclipses: Vyssotsky's catalogue lists ten mentions of such phenomena that occurred between 1122 and 1291.³⁶ That list should be supplemented with the record from the *Povest' vremennykh let*, which relates a lunar eclipse that according to the chronicler occurred in 979:

"That year there was a sign on the Moon and on the Sun and in the stars, and there were great and horrendous thunders, and strong winds with gales, and numerous harms done to people and cattle, to forest and field animals."³⁷ The date of the phenomenon is imprecise: the record may refer either to the lunar eclipse of July 3, 977, or to that of May 2/3, 980.³⁸ The question is additionally obscured by the fact that the author mentions several phenomena ("signs") simultaneously, namely the solar eclipse of May 25, 979, a lunar eclipse, as well as signs seen "in the stars". What we have here is presumably an information cluster of events of different years: the solar eclipse mentioned above, the lunar eclipses of 977 or 980, and perhaps the appearance of Halley's comet in 989 (which is not mentioned separately by the author of the *Povest'*);³⁹ the multiplicity of "signs" occurring in a single year was, according to the chronicler, to augur calamities that ensued soon after. Presumably here we find a deliberate shift of the date of astronomical phenomena: it is likely that the year 979 was exceptionally abundant in various natural calamities, so the author of the *Povest'* wanted perhaps to remind retrospectively the reader about all "signs" of divine wrath causing those calamities and misfortunes.

As regards the appearance of comets, this kind of phenomenon invariably aroused the interest of annalists: comets were recorded by Polish and Czech and also Russian sources. Polish sources (until 1300) noted five comets, the first three records from foreign sources: of the comet of 940 (or 941) given in the *Annales Ecclesiae Cracoviensis* and in the *Annales Poloniae Maioris*⁴⁰ was from German sources;⁴¹ of the comet of 1057 given in the 15th century *Annales* by Długosz⁴² came from *Martini Oppaviensis Chronicon pontificum et imperatorum*, while the comet of May 1211 noted by Długosz⁴³ was from a Russian source. But two other comets — the one

³⁵ *MGH SS IX*, p. 177. Cf. Schroeter, op. cit., p. 242.

³⁶ Vyssotsky, op. cit., pp. 24–26.

³⁷ *Povest'...*, op. cit., pp. 264–265, and note 1 *ibid.*

³⁸ Cf. Schroeter, op. cit., p. 214.

³⁹ Cf. S. K. Vsekhsviatyky, *Fizicheskie kharakteristiki komet*, Moskva 1958, p. 92.

⁴⁰ *A. Ec. Crac.*, *MPH s. n. V*, p. 41; *A. Pol. Mai. MPH II*, p. 791.

⁴¹ Cf. Malewicz, op. cit., p. 34, and notes 38–41 *ibid.*

⁴² Cf. *ibid.*, pp. 36–37.

⁴³ Cf. *ibid.*, p. 37, and note 53 *ibid.*

seen for 80 days in the summer of 1264 (August 27 to October 6⁴⁴) and that of 1265⁴⁵ — were recorded in Polish sources from observation.

About the same number of comets were recorded in Czech sources, the first two entries — those of 942⁴⁶ and 989⁴⁷ — were from German sources. The next record in the *Martini Oppaviensis Chronicon*⁴⁸ and referred to the comet of 1957 (Długosz in his *Annales* was using the same source). The final mention was from the *Canonicorum Pragensium Continuaciones Cosmae*⁴⁹ recording Halley's comet of 1222.

Sviatsky and Vyssotsky, when analysing the Russian annals found altogether seven comets.⁵⁰ This list should be supplemented with other four entries from the *Povest' vremennykh let* on the Halley comet in: 911 (the chronicler gives the year 912),⁵¹ 989,⁵² 1066 and 1105. The author of the *Povest'* seems to push back deliberately the third date (to 1065) to stress the phenomenon's prophetic significance:

"The year 6573 (1065). ... In the same year there was a sign in the West, a huge star, issuing forth rays like bloodstreams, rising at dusk after sunset, and staying on for seven days. This augured ill, for then came many civil wars, pagans invaded the Russian lands, for this star was as though blood-coloured, signifying bloodshed."⁵³

The fourth mention in the *Povest'*, made on the basis of the *Hypatevsky Latopis*, mentions a comet in 1105: "That year, a tailed star appeared in the West, and stayed there for a month".⁵⁴ This comet is not mentioned in other sources, nor could it be identified from the catalogues now available.

By and large, arrivals of comets are recorded equally often in all three groups of sources studied: comets are as a rule treated as *signum mali ominis*. The greater frequency of Russian entries is simply due to the large number of sources and, consequently, to more regular records: unlike in Polish and Czech annals, the number of so-called "empty years" in chronicles, are few in Russian sources.

Special attention should be drawn to a next group of astronomical phenomena — planet observations. Over the period studied here, that is, between 1000 and 1300, such records can be found in Czech sources alone, above all in the *Canonicus Wissegradensis*. Polish sources contain no records of planetary observations at all, even toward the end of the 15th century, whereas Russian sources mention only

⁴⁴ Cf. *ibid.*, pp. 37–38, and *Aneks II*, pp. 99–100 *ibid.*

⁴⁵ Cf. *ibid.*, p. 38, and *Aneks II*, p. 100 *ibid.*

⁴⁶ *Cosmae Chron.*, *MGH SS IX*, p. 48.

⁴⁷ *Monachi Sazav.*, *MGH SS IX*, p. 149.

⁴⁸ *MGH SS XXII*, p. 467. This comet is not mentioned in Vsekhsviatsky's catalogue (cf. note 39).

⁴⁹ *MGH SS IX*, p. 171.

⁵⁰ Cf. Vyssotsky, *op. cit.*, pp. 32–34.

⁵¹ *Povest'*..., *op. cit.*, p. 234, and note 1 *ibid.*

⁵² Cf. note 39.

⁵³ *Povest'*..., *op. cit.*, p. 329, and note 1 *ibid.* Cf. also Vyssotsky, *op. cit.*, p. 33.

⁵⁴ *Povest'*..., *op. cit.*, p. 410, and note 1 *ibid.* The *Hypatevsky* chronicler dates this phenomenon for the year 1106, cf. Vyssotsky, *op. cit.*, p. 33.

the daylight visibility of Venus in 1331,⁵⁵ which does not properly fall into the chronological limits set for this article. Such records, incidentally, are rare not only in Polish, Russian or Czech sources, but in the otherwise ample information sources of medieval West Europe.

The first planet observation made and recorded by the Canon of Vyšehrad refers to the visibility of Venus on Christmas Day in 1130.⁵⁶ The laconic mention (“ipsa nativitatis die surgente aurora Lucifer ortus est”) ends with the statement that this is an exceptional phenomenon (“quod nunquam visum vel auditum fuit”) while, in fact, it recurs every eight years. According to J. Dobrzycki, this statement “rules its author out of the small elite of scientists educated in the mathematical astronomy received from the Moslem countries”.⁵⁷ The next mention, found in *Canonici Wissegradensis Continuatio Cosmae*, refers to the motions of the planets of Jupiter and Venus in 1131; this record is exact enough to fix the date the record was made — namely, 11 years after the observations.⁵⁸ The mention in *Canonici Wissegradensis* of an observation of Venus in 1136 reports also the appearance of a new star; in fact, this is again an observation of Venus and of Jupiter.⁵⁹ These two planets were also observed in 1137.⁶⁰ The last record from *Canonici Wissegradensis* refers to Venus and Saturn observed on April 23, 1141.⁶¹ This list is completed by another record from Czech sources, a less known mention of the visibility of Venus on April 5, 1283, found in *Annalium Pragensium pars III*:

“A.D. 1283... Sicut et in alio signo, videlicet in stella quae visa est Nonas Aprilis super cornu lunae lucidissimo splendens fulgore, quia sapientes et literati viri adventum sui principis et haeredis regni Bohemici Venceslai, qui morabatur apud Ottonem marchionem Bramburiensem, tutorem suum, praedixerunt”.⁶²

Even on European scale, the description in *Canonici Wissegradensis Continuatio Cosmae*, of yet another category of phenomena is a rarity: the chronicler describes the Sun-spots observed on July 24, 1139, which was possible owing to the pollution of the atmosphere by ashes carried by winds after the eruption of Vesuvius; the author admits he does not report his own observations but statements of those who had seen “as though a crack in the Sun” (“quasi fissuram in sole”).⁶³

This exhausts the list of “verifiable” phenomena, i.e., those that can be checked scientifically. Other phenomena (meteorites, auroras, halos) are of a local character, and their descriptions have to be simply taken by their own testimony; how credible they are can be checked only against sources from the same period and area.

⁵⁵ Cf. Vyssotsky, op. cit., p. 48.

⁵⁶ *MGH SS IX*, p. 134; Wojciechowska, *Kronikarze...*, p. 49, and note 14 *ibid*.

⁵⁷ Cf. Wojciechowska *ibid*.

⁵⁸ *MGH SS IX*, p. 137; Wojciechowska, *Kronikarze...*, p. 59, and note 24 *ibid*.

⁵⁹ *MGH SS IX*, p. 142; Wojciechowska, *Kronikarze...*, p. 81–82, and note 50 *ibid*.

⁶⁰ *MGH SS IX*, p. 144; Wojciechowska, *Kronikarze...*, p. 88, and note 57 *ibid*.

⁶¹ *MGH SS IX*, p. 147; Wojciechowska, *Kronikarze...*, p. 105, and note 80 *ibid*.

⁶² *MGH SS IX*, p. 207.

⁶³ *MGH SS IX*, p. 145. Cf. Wojciechowska, *Kronikarze...*, pp. 94–95, and note 66 *ibid*.

Meteors and meteorites are the first group in this category of phenomena. Polish sources never mention them. Czech sources are relatively abundant: altogether, there are 7 such entries. However, the first one, referring to a phenomenon of 998, described as “duo lapides igniti”,⁶⁴ seems to be taken from German sources.⁶⁵ The second one, from *Cosmae Chronica Boemorum*, mentions a meteor shower observed in the April of 1123.⁶⁶ A typical description of this kind of phenomena is fully quoted:

“A.D. 1123. ... Item in quadragesima fere per universum orbem aerae potestas quasi plurimae stellae, etsi non ceciderunt, visae sunt tamen cecidisse in terram, huic simile Dominus dicit in evangelio: Videbam Satanam, quasi fulgur de coelo cadentem (*Luc. 10, 18*)”. Next mentioned are observations of the very bright meteor seen on April 25, 1130 (recorded in *Monachus Sazavensis*)⁶⁷ and a similar phenomenon observed on October 15 the same year (*Canonicus Wissegradensis*).⁶⁸ A further record, also from *Canonicus Wissegradensis Continuatio Cosmae*, mentions the passage of a bright meteor leaving a reddish trail behind it, on February 26, 1138.⁶⁹ Chronologically earlier is the same author’s record of a big meteorite in 1135 which hit the Earth in the province of Thuringia.⁷⁰ This has not been observed by the author himself; the information seems to be rather heard than copied, as it is the only source information on this phenomenon in the *Canonicus Wissegradiensis*. The last record by the same chronicler is again chronologically earlier than other ones, for it refers to an observation made on November 9, 1128. It is not included in Umberto Dall’Olmo’s listing, but is quoted here in full as one of the most interesting descriptions of meteors’ observations:

“A.D. 1128. ... Eodem anno 5. Idus Novembris et Slavonice Prosince eclipsis lunae rubea; dicam quod quidam viderunt particulam quae remanserat iactantem se huc et illuc, donec defecit, et multae stellae circumdederunt eam, quarum una circumvolavit lunam, altera proiecit se ad aquilonem...”⁷¹

Those stars, “one of which was circulating the Moon, the other swept to the north”, were two meteors observed near the darkened Moon. This description is remarkable because it does not fit into the category of typical mentions of meteorite observations, where, as a rule, we have descriptions such as “falling stars” — when there are meteor showers, or “signs” or “dragons” — when passing meteors are described.

Russian sources generally do not diverge from the general pattern: the reader

⁶⁴ *Mon. Sazav.*, *MGH SS IX*, p. 149.

⁶⁵ Cf. *Annales Quedlimburgenses*, *MGH SS III*, p. 74. Cf. Dall’Olmo, *Meteors*, op. cit., p. 128.

⁶⁶ *MGH SS IX*, p. 126. This mention is not included on Dall’Olmo’s listing.

⁶⁷ *MGH SS IX*, p. 157. Cf. Dall’Olmo, op. cit., p. 130.

⁶⁸ *MGH SS IX*, p. 136. Dall’Olmo, *ibid.* Cf. Wojciechowska, *Kronikarze...*, pp. 55–56 and note 20 *ibid.*

⁶⁹ *MGH SS IX*, p. 144. Dall’Olmo, *ibid.* Cf. Wojciechowska, *Kronikarze...*, pp. 88–89, and note 59 *ibid.*

⁷⁰ *MGH SS IX*, p. 141. Dall’Olmo, *ibid.*

⁷¹ *MGH SS IX*, p. 134. Cf. Wojciechowska, *Kronikarze...*, p. 46, and note 11 *ibid.*

always comes across mentions of “signs on the sky” or of a “dragon’s” appearance. The records are relatively rare; Vyssotsky’s catalogue contains just five entries,⁷² while the *Povešt’ vremennykh let* mentions one passage of a meteor in 1091,⁷³ which is nearly identical with the first record in Vyssotsky’s catalogue. The entry can be considered as a classical one: “During the same year Prince Vsevolod was hunting big game (near Vyshogorod). As (the nets were ready and) the criers began to shout, an enormous serpent fell down from the sky and everybody was terrified”.

As regards the last group: records of optical phenomena in Nature, such as auroras, solar halos, lunar halos etc. These are either very laconic, such as “apparuit rubedo in caelo”, or else — which happens quite often, just as in the many West-European accounts — very extensive, colourful, and partly fantastic. Chroniclers mention castles or towns floating in the air, open skies etc.⁷⁴

Polish sources by the end of the 13th century mention auroras three times: in 1269, on January 20, 1270 and on January 1, 1277,⁷⁵ but each falls into the category of fantastic records (the first time “a war in the clouds” was observed, the next two records report that during the night “the sky opened” and a vrightness blazed up). A solar halo was recorded in Polish sources of the time only once, on January 19, 1271.⁷⁶

Czech sources provide more abundant material, astrometeorological phenomena are recorded nine times, auroras seven times (always laconical); a solar halo in March 1135 (*Canonicus Wissegradiensis*)⁷⁷ and an extraordinary rainbow on December 26, 1283 (the latter given by *Canonicorum Pragensium Continuationes Cosmae*).⁷⁸ As for descriptions of auroras, the first comes from *Cosmae Chronica Boemorum* and refers to 1095,⁷⁹ another five are for auroras observed by the author of the *Canonici Wissegradensis* on November 19, 1128,⁸⁰ February 14, 1132,⁸¹ May 11, 1138,⁸² October 14 and 16, 1138⁸³ and March 2, 1139.⁸⁴ The last record from *Canonicorum Pragensium Continuationes Cosmae* seems to refer to an observation of an aurora (the description is vague) on February 5, 1256.⁸⁵ The record is vague because, apart from the information about the “great brightness” seen in different parts of Bohemia, it also mentions a storm with lightnings at the same time, and one cannot be sure whether that “brightness” has been a real aurora or the light of thunderbolts during a storm, which is unusual at that time of the year.

⁷² Vyssotsky, op. cit., pp. 40–42.

⁷³ *Povešt’...*, op. cit., p. 361.

⁷⁴ Cf. Malewicz, op. cit., pp. 42–43.

⁷⁵ *Ibid.* Cf. also *Aneks II*, p. 104 *ibid.*

⁷⁶ *Ibid.*, pp. 45, 104.

⁷⁷ *MGH SS IX*, p. 141. Cf. Wojciechowska, *Kronikarze...*, p. 76.

⁷⁸ *Canonicorum Pragensium Continuationes Cosmae*, *MGH SS IX*, p. 207.

⁷⁹ *MGH SS IX*, p. 103.

⁸⁰ *MGH SS IX*, p. 134. Cf. Wojciechowska, *Kronikarze...*, p. 46, and note 11 *ibid.*

⁸¹ *MGH SS IX*, p. 137; Wojciechowska, *Kronikarze...*, p. 60, and note 26 *ibid.*

⁸² *MGH SS IX*, p. 144; Wojciechowska, *Kronikarze...*, p. 89, and note 59 *ibid.*

⁸³ *MGH SS IX*, p. 144. Cf. Wojciechowska, *Kronikarze...*, pp. 90–92, and note 61 *ibid.*

⁸⁴ *MGH SS IX*, p. 145; Wojciechowska, *Kronikarze...*, p. 93 and note 64 *ibid.*

⁸⁵ *MGH SS IX*, p. 175.

According to Vyssotsky's catalogue,⁸⁶ Russian sources contain five records of auroras appearing between 1000 and 1300. Additional information on astrometeorological phenomena is given by the *Povest' vremennykh let*, where, apart from the aurora observed in 1102 (which, incidentally, Vyssotsky's catalogue lists from three chroniclers — *Lavrentevsky*, *Niconovsky* and *Voskresensky*), the solar halo observed in February of that year is described:

"The year 6610 (1102) ... That year there was a sign on the sky, in the month of January, on its 29th day, for three days, like a glow of fire from the east and the south, and the west, and the north, and such a brightness stayed throughout the night, as though from a Moon in full. That year there was a sign on the Moon (sc. eclipse) in the month of February on its 5th day. In the same month, on its 7th day, there was a sign on the Sun: the Sun surrounded itself with three rainbows, and there were other rainbows with their backs to each other. And, beholding those signs, the faithful were praying to God in sighs and in tears to turn those signs into good signs: for some signs are well-aboding, while others are ill-aboding".⁸⁷

A similarly colourful description of solar and lunar halos is given by the author of the *Povest'* for 1104:

"The year 6612 (1104). ... That year there was a sign: the Sun was standing within a circle, and within the circle was a cross, and within the cross the Sun, and outside the circle on both sides two suns, and above the sun outside the circle a rainbow, with its horns pointing to the north; the same sign was also in the Moon, with the same appearance, in the month of February on its 4th, 5th, and 6th days, for three days at daylight, and at night-time, in the Moon, for three nights".⁸⁸

These two records, which are quoted because of their characteristic form, exhaust the list of astronomical and astrometeorological phenomena described in Polish, Czech and Russian accounts by the end of the 13th century.

Concluding, chronicles and annals from these three countries have been analysed. Sources differ in number, depending on the country of their origin. Notwithstanding this, the material studied allows to present several conclusions¹ concerning the mode of recording astronomical and astrometeorological phenomena by Polish, Czech and Russian annalists.

Polish and Czech chroniclers above all distinguish between natural and "miraculous" celestial phenomena; phenomena of celestial mechanics (eclipses) as well as halos fall into the category of natural phenomena. This is conveyed not only by the form of description but also — or even mainly — by the terms employed. The term *eclipsis* is used throughout (the one exception being a 12th-century Polish record, where the less technical term "*sol fuit obscuratum*" is used; cf. note 8). Next, records of eclipses are very rarely supplied with comments on natural calam-

⁸⁶ Vyssotsky, op. cit., pp. 40–42. The quoted catalogue does not include descriptions of halos.

⁸⁷ *Povest'...*, op. cit., p. 407.

⁸⁸ *Ibid.*, p. 410.

ities or cattle plagues following them; such comments are never found in Polish sources, while out of the many records from Czech sources only three associated solar or lunar eclipses with people or cattle plagues (cf. notes 14, 16 and 34). Equally remarkable is that both Polish and Czech sources use "technical" terms when recording comets; as a rule terms such as "cometa", "cometes stella" or "sidus simile cometarum" are used. Though this phenomenon was commonly regarded as an augury, the authors of sources rarely consider it as such. In Czech sources, there is but a single record of a comet associated with information that this was followed by a great incidence of human deaths and by a cattle plague, but this is taken from German sources (cf. note 47). Polish sources of the 10th and 11th centuries merely record the appearances of comets (from foreign sources). Throughout the 12th century, there is not a single record of such a phenomenon. 13th century Polish records associated comets with cattle plagues, and since mid-14th century onwards, this phenomenon was interpreted as an augury. A comet was then viewed as a prodigium, warning about the ruler's death, wars, natural calamities etc. The same applies to auroras and halos recorded by Polish and Czech annalists. While the Czechs describe them by the term *signum*, there is but a single instance of linking the aurora seen on October 14, 1138, with the death of Polish king Bolesław Krzywousty a few days later (cf. note 83). Till the end of the 13th century Polish sources abound in colourful and fantastic descriptions of auroras, as well as of halos, but only since the latter half of the 14th century augural significance is attributed to such phenomena.

Russian historians take an entirely different view of astronomical and astrometeorological phenomena. Above all, apart from five comet appearances (in 911, 1106, 1145, 1222 and 1264) recorded as a "big star", a "tailed star", a "star with blood-coloured tails", a "lance-shaped star" (one chronicler, *Novgorodsky IV*, uses the technical term "star called dokit" to describe the comet that was seen on September 15, 1222), the Russian annals use the term "sign" to describe any celestial phenomenon, practically without discriminating between simple phenomena of celestial mechanics or exceptional or local ones. This term preconditions the interpretation of such phenomena by Russian chronicle writers as augural. As a rule, the author implies that this is an evil sign and encourages the reader to strengthen his piety in order to reverse God's wrath from the faithful. The author of *Povest'* is especially keen on attributing an augural, if not ominous, significance to all celestial phenomena, though other Russian chroniclers share this view. Of the 46 astronomical and astrometeorological phenomena listed in Vyssotsky's catalogue, 11 records (five of solar eclipses, two of lunar eclipses, two of comets, and two of auroras) emphasize the augural significance of those phenomena. Presumably, this was didactic in its intent, a practice more common with Orthodox than Roman Catholic clergymen, for the authors of Czech, Polish and Russian chronicles alike represent the clergy (as did the whole intellectual elite in the early Middle Ages). Why Russian sources use practically no "technical" terms is hard to explain. True,

in this case we have the only group of sources examined here that were written in the Old Slavonic language, not in Latin. Yet it is unlikely that Orthodox clerics, who could use the Byzantine chronicles, did not take advantage of this possibility (the author of the *Povest'*, for instance, used Byzantine chronicles to associate Russia's history with world history and to correct an earlier svod; moreover, the record of events of 1065 is based on Hamartolos' chronicle),⁸⁹ or that did not work out their own terminology to describe phenomena whose mechanism did not seem unknown to them. Vyssotsky's argument in the introduction to his catalogue is not fully convincing, when he writes: "Finally, the records throw light on the development of human knowledge. For instance, in connection with the solar eclipse of April 19, 1064, the chronicler finds it necessary to cast doubt on the opinion that the sun was literally being eaten up, and yet the expression "the sun perished" was in use through most of the period with which we are concerned. Whereas in 1563 there is evidence of a definite understanding of a true cause of the solar eclipse "... as if the moon came under the sun..."⁹⁰ While the first sentence is certainly true — as, indeed, studies of records of natural phenomena allow to follow the development of science of the times, or at least to observe gradual penetration of scientific knowledge into narrative sources — it seems unjustified to say that the knowledge of early medieval Russian chroniclers was less than "ordinary", based on everyday observation of the world of nature. Earlier, I have pointed out that the author of the *Povest'* writes about a "sign" on the Sun (the solar eclipse on July 23, 1115 cf. note 27) emphasizing at the same time that only ignoramuses said "the Sun was as if eaten up". I think monks or brethren at Russian monasteries were ignoramuses neither then nor later; they must have doubtlessly been familiar with the mechanism of such "signs" appearing on the Sun or on the Moon. Perhaps they did not wish to convey their knowledge to a broader circle of profane people but preferred to retain it for a more exclusive group of "initiates" which would be in consistence with the rigorous hierarchy inherited from Byzantium.

Finally I would like to say a few words about the quality and quantity of early medieval Central and East-European sources. The reader has seen that Russian sources easily rank on top, for both the frequency and imposing number of records, but also perhaps due to their relations with Byzantine culture, as its scientific and literary traditions go back into a very remote past. From the point of view of this study, it is the Czech sources that afford the qualitatively best material, especially the *Canonici Wissegradensis Continuatio Cosmae*, where abundant and detailed observations are exceptional in contemporary Europe. Polish sources clearly lag behind Russian and Czech ones, mainly by the number of records; this can perhaps be explained by the relatively small number of extant narratives from before the end of the 13th century. Yet it seems that one more factor, namely, Poland's relatively

⁸⁹ *Povest'*..., op. cit., p. 329-330 Cf. also *ibid.*, p. 19.

⁹⁰ Vyssotsky, op. cit., p. 5-6.

late entry into the realm of European culture, and consequently, the much later habit of recording events and phenomena, may have contributed to this as well as the meager interest in the world of Nature, at least in the early Middle Ages. This gap was bridged up later, especially in the 15th century, when authors of Polish narrative sources became vividly interested in natural phenomena, when the Cracow astronomical school was emerging and flourishing.