THE ANNULAR ECLIPSE OF THE SUN OF 7 SEPTEMBER 1820 – A REPORT IN *TĀRĪḪ-I CEVDET*

Claudia Römer
University of Vienna

ABSTRACT

Aḥmed Cevdet Paşa (1823-1895), in the 6th section of the appendix to the 11th volume of his *Tārīḫ* (*Tārīḫ. Veḳāyıᶜ-i Devlet-i ᶜAlīye* (Istanbul, s.a.), 11, 311-312), under the heading of *Zāyiçe-i küsūf fī 1235 sene* "The horoscope of the solar eclipse of the year 1235 (1820)" describes the occurrence of the annular solar eclipse of 7 September 1820, which was visible in Istanbul as a partial eclipse of an obscuration rate of about 80%. Cevdet copied this chapter nearly literally from the third volume of the *Tārīḫ* of Meḥmed ᶜAṭāullāh Şānīzade (1770/71-1826; Meḥmed ᶜAṭāullāh Şānīzāde, *Tārīḫ*. (Istanbul: Ceride-i Havadis Matbaası), vol. 3, 1290 (1873), 126-127), where an astronomically fairly accurate account of the eclipse alongside an astrological comment is given under the heading of *vuḳūᶜ-i küsūf* "The occurrence of an eclipse". The article will first present the astronomical details of this eclipse as they are known today and compare them to the way Cevdet/Şānīzāde describe the progress and the main characteristics of the eclipse. Subsequently, their astrological discussion of this event will briefly be commented upon, also taking into account the combined astronomical and astrological interest in a celestial phenomenon like an eclipse in Ottoman writings of the 19th century. As an appendix, a transliteration and a translation of this section of Cevdet/Şānīzāde will be added with variants and other comments in the footnotes.

On 29 March 2006, Nenad Bey was in Vienna, visiting our institute. As we were going to have lunch, the sun was well visible. I had previously noted the details of the total solar eclipse to be observable in Turkey that day, which only was a partial eclipse in Vienna, and had taken eclipse glasses with me. Through them, we took turns looking at the eclipsed sun.

This eclipse belongs to the Saros series 139, which began on 17 May 1501 and which will end on 3 July 2763. It comprises a total of 71 eclipses, 16 partial eclipses, 43 total eclipses, and 12 hybrid ones.[1] In Vienna, the eclipse started at 09:43:48.5 UTC (11:43:48.5 CEST) and ended at 11:53:46.9 UTC (13:53:46.9 CEST) with

[1] A hybrid solar eclipse can be annular in some places and total in others, depending on whether the Moon is near enough to the Earth for its umbral shadow to touch its surface (total) or only the antumbral shadow passes its surface (annular). When neither the Moon's umbral nor the antumbral shadow hits the Earth, but its penumbral shadow, we see a partial eclipse (Five Millenium Catalog of Hybrid Solar Eclipses; https://eclipse.gsfc.nasa.gov/SEcat5/SEhybrid5.html. On the details of this eclipse, see https://eclipse.gsfc.nasa.gov/SEmono/TSE2006/TSE2006.html; Eclipse Predictions by Fred Espenak, NASA/GSFC Emeritus. A Saros series consists of eclipses with similar properties that recur roughly every eighteen years.

the maximum at 10:48:38.1 UTC (12:48:38.1 CEST).[2] Thus, we had the best opportunity to see it at lunchtime. Taking this memorable event we shared as a starting point, I would like to discuss the way *Tārīḫ-i Cevdet* describes an earlier eclipse, which was annular, but only partial in Istanbul.

The annular eclipse of 7 September 1820 has the following astronomical details: It belongs to the Saros series 122, which started on 17 April 991 and will end on 17 May 2235. Saros 122 comprises 70 eclipses, 28 of which are partial, 37 are annular, three total, and two hybrid.[3] Its obscuration rate for Istanbul was about 80%. In Istanbul, it started at 13.19.04.0 UTC (15.19.04.0 EET and ended at 15.48.58.8 UTC (17.48.58.8 EET) with its maximum at 14.38.03.4 UTC (16.38.03.4 EET).[4]

Aḥmed Cevdet Paşa (1823-1895)[5], in the 6th section of the appendix to the 11th volume of his *Tārīḫ*[6] relates the occurrence of the solar eclipse of 7 September 1820, copying it nearly literally from the third volume of the *Tārīḫ* of Meḥmed ᶜAṭāullāh Şānīzade (1770/71-1826)[7]. Cevdet often cites, among other authors, from Şānīzāde, a fact that he inconsistently acknowledges.[8]

Whereas Şānīzāde tells the story of the eclipse as an event of the year 1235 within the chronological order of years, Aḥmed Cevdet has it as an appendix, and adds another purely astrological discussion for the following year, without mentioning any eclipse.[9]

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2 https://eclipse.gsfc.nasa.gov/5MCSEmap/1801-1900/1820-09-07.gif. UTC = Universal Time, equals GMT = Greenwich Mean Time; CEST = Central European Summer Time.

3 https://eclipse.gsfc.nasa.gov/SEsaros/SEsaros122.html.

4 For the details for Istanbul, including a sketch of its maximum occultation rate there, as well as for a chart of the path of the eclipse, see https://eclipse.gsfc.nasa.gov/SEsearch/SEsearchmap.php?Ecl=18200907 and https://eclipse.gsfc.nasa.gov/5MCSEmap/1801-1900/1820-09-07.gif. When one clicks on Istanbul, a window pops up giving the detailed hours. Javascript has to be activated.

5 For an exhaustive evaluation of his work, see Christoph K. Neumann, *Das indirekte Argument. Ein Plädoyer für die Tanzīmāt vermittels der Historie. Die geschichtliche Bedeutung von Aḥmed Cevdet Paşas Ta'rīḫ*. Periplus Parerga I. (Münster – Hamburg: Lit, 1994).

6 Aḥmed Cevdet, *Tārīḫ. Veḳāyıᶜ-i Devlet-i ᶜAlīye*, vol. 11 (Istanbul, s.a.), 311-312 (pdf available at https://tarihvemedeniyet.org/2014/05/tarih-i-cevdet-ahmed-cevdet-pasa.html).

7 Meḥmed ᶜAṭāullāh Şānīzāde, *Tārīḫ*, vol. 3 (Istanbul: Ceride-i Havadis Matbaası, 1290 (1873)), 126-127. All four volumes are accessible at https://books.google.at/books/about/%C5%9Eanizade_tarihi.html?id=WEFbAAAAQAAJ&redir_esc=y. on Şānīzāde, see, e.g., Şânîzâde Mehmed Atâullah Efendi, https://islamansiklopedisi.org.tr/sanizade-mehmed-ataullah-efendi. – I would like to thank Dr Sabri Özmen for having drawn my attention to this chapter of the *Tārīḫ-i Cevdet*.

8 See, e.g., Christoph K. Neumann, *Das indirekte Argument*, 134, note 17, et passim for quotations from him as well as other authors. The fifth chapter of the appendix is the *Muḳaddime* of Şānīzāde's *Tārīḫ*, which has a heading indicating the source.

9 For Aḥmed Cevdet's endeavour to free himself from traditional annalistic history writing, see Christoph K. Neumann, *Das indirekte Argument*, Chapter "Methode und Praxis der Ta'rīḫ-i Cevdet".

In both texts, we can discern two parts. First the astronomical facts are given and subsequently an astrological explanation is added, without any apparent connection between the two parts. However, Şānīzāde only has as a heading *vuḳū^{c}-i küsūf* "The occurrence of an eclipse", whereas Aḥmed Cevdet's heading reads *Zāyiçe-i küsūf fī 1235 sene* "The horoscope of the solar eclipse of the year 1235 (1820)."[10] In both instances, astronomy and astrology are mixed together, albeit in two more or less distinct parts. Nevertheless, it seems that Aḥmed Cevdet's objective is more to bring the astrological aspects to the fore, whereas Şānīzāde includes the story into the course of events of the year 1235. Şānīzāde's text is more interspersed with poetry, whereas Cevdet only cites the final verse of Şānīzāde's text (see below). This is in line with Cevdet's idea of reforming history writing by getting rid of the old literary forms.[11]

Both authors put a reference to God's will and almightiness at the end of each part, the astronomical and the astrological one.

Şānīzade apparently calculated the exact dates and other properties of the eclipse, using the astronomical tables of the great French astronomer Cassini (1677 – 1756).[12] These tables contain not only detailed descriptions of the ephemerides of celestial objects, but also concise explanations on how to calculate the details of eclipses. One may assume that especially Chapters II-XI of this work, with the exception of Chapter VIII on lunar eclipses, will have been helpful to Şānīzāde:

> Chap. II. De l'Équation des Jours.
> Chap. III. Des époques des moyens mouvements du Soleil et de la Lune.
> Chap. IV. Des moyens mouvements du Soleil et de la Lune.
> Chap. V. Du vrai lieu du Soleil.
> Chap. VI. Du vrai lieu de la Lune.
> Chap. VII. Préparation au Calcul des Éclipses du Soleil et de la Lune.
> Chap. IX. Détermination de l'Éclipse du Soleil et de ses Phases.
> Chap. X. Déterminer la différence des Méridiens par les Observations des Éclipses du Soleil.

[10] The way of expressing the date is somewhat unusual, with *sene* coming after the number of the year. A *zāyiçe* comprised the astrological calculations that established the "felicitous hours" for various enterprises. It was based on tables (*zīc*, see below) that gave the details of the revolutions of the planets (Gül Şen, "Das Ereignis von Edirne (1703). Astrologie als Strategie zur Herrschaftslegitimation und Kontingenzbewältigung", *Das Mittelalter* 20.1 (2015): 136, citing Salim Aydüz, "Osmanlı Devleti'nde Müneccimbaşılık", *Osmanlı Bilimi Araştırmaları* 1 (1995): 176–177).

[11] Christoph K. Neumann, *Das indirekte Argument*, Chapter "Methode und Praxis der Ta'rīḫ-i Cevdet".

[12] Jacques Cassini, *Tables astronomiques du soleil, de la lune, des planètes, des étoiles fixes et des sattellites de Jupiter et de Saturne. Avec l'explication et l'usage de ces mêmes tables* (Paris: Imprimerie royale, 1740).

> Chap. XI. Déterminer les Lieux de la Terre qui verront une Éclipse du Soleil proposée ; et quels sont les endroits où elle paroîtra centrale ou partiale.[13]

Şānīzāde could not use the French orginal version of Cassini's work, but there was an Ottoman translation of it made in 1770 by Çınarī Ḫalīfezāde İsmaʿīl Efendi under the title of *Tuḥfe-i behīc-i raṣīnī*[14] *tercüme-i Zīc-i Ḳasīnī*. "The cheerful and stable gift, the translation of the Tables of Cassini." Çınarī Ḫalīfezāde İsmaʿīl Efendi added Logarithm Tables at the beginning.[15] This book, however, only started to be used as late as 1800.[16] The Cassini tables had been brought to Istanbul by Yirmisekiz Meḥmed Çelebi when he returned from his embassy to Paris (1720/21). Yirmisekiz Meḥmed Çelebi had visited the observatory of Paris and was shown a number of instruments as well as the telescope, through which he could see Saturn, Jupiter, and the Moon. For our topic here, what he says about the machine for simulating eclipses is interesting:

> ... Ce sont plusieurs cercles autour desquels on a marqué des chiffres et gravé le soleil et la lune . Lorsque ces cercles viennent à tourner une petite aiguille semblable à celle d'une montre et dont le bout est rond comme un aspre s'étend tantôt sur le soleil et tantôt sur la lune et, suivant qu'il couvre la lune totalement ou en partie on juge qu'un tel mois il doit y avoir une éclipse de lune de tant de pouces. Il en est de même pour le soleil. Un cercle donne à connaître qu'une telle année, qu'un tel mois, qu'un tel jour, il y aura une eclipse de soleil de tant de pouces.[17]

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13 Jacques Cassini, *Tables astronomiques*, Titres des chapitres Contenus dans l'Explication des Tables, partie non paginée (https://www.e-rara.ch/zut/doi/10.3931/e-rara-2518).

14 Nowhere in the secondary literature this title is given with diacritics nor is it translated into any other language. Therefore, my transliteration and translation of it base themselves on the entry *raṣīn* in *Yeni Redhouse*.

15 Aykut Kazancıgil, *Osmanlılarda Bilim ve Teknoloji,* (Istanbul: Etkileşim, 2007), 241.

16 Aykut Kazancıgil, *Osmanlılarda Bilim ve Teknoloji,* 89.

17 Gilles *Veinstein*, *Le Paradis des infidèles*: un ambassadeur ottoman en France sous la régence (Paris: Maspero, 1981), 149. This must be the machine invented by Ole Rømer (1644-1710), an earlier variant of which had been constructed by Philippe de la Hire (1640-1718), cf. ibid. note 222. This information was communicated to Gilles Veinstein by Jean-Pierre Verdet of the Paris observatory. It can also be found in Godin des Odonais, *Histoire de l'Académie royale des sciences, Tome I. Depuis son établissement en 1666 jusqu'à 1686*. (Paris: Gabriel Martin, Jean-Baptiste Coignard, Hippolyte-Louis Guerin, 1733), 317.
See also Marlene Kurz, *Ein osmanischer Almanach für das Jahr 1239/1249 (1824/1825)*, Islamkundliche Untersuchungen 276 (Berlin: Klaus Schwarz, 2007), 14-15.

Yirmisekiz Meḥmed Efendi also made acquaintance with Jacques Cassini. There are thirteen copies of Çınarī Ḫalīfezāde İsmaʿīl Efendi's work.[18]

The word *zīc* (see above) relates to

> the numerical tables and accompanying explanation sufficient to enable the practicing astronomer, or astrologer, to solve all the standard problems of his profession, i.e. to measure time and to compute planetary and stellar positions, appearance, and eclipses.[19]

It comes from Persian and was probably already in use in Pahlavī. It is derived from the similarity of the lines of the tables with the warp of a loom, which was its first meaning.[20] Today, about 200 *zīc*es are known.[21]

Şānīzāde/Cevdet discuss in detail the times when the different phases of the eclipse were visible from Istanbul, basing themselves on the amount of hours and minutes elapsed since sunrise. This seems to have been a typical way to define the exact times of the phases of eclipses, as this is also the method in an almanac of the same period edited by Marlene Kurz.[22]

Sunrise on the 7 September 1820 occurred at 5:43 local time[23]. However, all dates on the website given in note 23 are according to the Julian calendar. Therefore, we must look for the Julian date corresponding to the date of the eclipse. 7 September 1820 (Gregorian) corresponds to 26 August 1820 (Julian)[24]. On that day, sunrise occurred in Istanbul at 5:31.[25] The hour Şānīzāde/Cevdet give for the beginning of the eclipse is quite accurate, namely 9 hours and 42 minutes after sunrise. If we add this amount to 5:31, we get 15:13. From this, we have to deduct roughly five minutes (see note 23), which makes 15:08 as compared to 15.19.04.0 EET (see above). Their calculation for the maximum, however, does not seem to be

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18 Ekmeleddin İhsanoğlu, Ramazan Şeşen, Cevat İzgi, Cemil Akpınar, and İhsan Fazlıoğlu (eds.), *Osmanlı Astronomi Liteatürü Tarihi. History of Astronomy Literature During the Ottoman Period* (Istanbul : IRCICA, 1997), CLXXIII and CXCII, no. 82. See also Abdülhak Adnan-Adıvar, Osmanlı Türklerinde İlim, İkinci tabı (Istanbul: Maarif, 1943), 179-180.

19 Edward Stewart Kennedy, "A Survey of Islamic Astronomical Tables", *Transactions of the American Philosophical Society* 46, no. 2 (1956): 123.

20 Edward Stewart Kennedy, "A Survey of Islamic Astronomical Tables", 123.

21 David A. King, "Islamic Astronomy", in: Christopher Walker (ed.), *Astronomy before the Telescope* (London: British Museum Press, 1996), 150.

22 Marlene Kurz, *Ein osmanischer Almanach*, 126.

23 Local time of Istanbul in this period was UTC +1:55:52; cf. https://www.timeanddate.com/sun/turkey/istanbul?month=9&year=1820, last accessed 28 February 2020.

24 http://web.archive.org/web/20160719032828/http://www.ortelius.de/kalender/form_de2.php, last accessed 28 February 2020.

25 https://www.timeanddate.com/sun/turkey/istanbul?month=8&year=1820, last accessed 28 February 2020.

correct, as it occurred at 16:38 EET, which was 16:33 local time. According to the authors it was 5 hours and 58 minutes after sunrise, which equals 16:06 local time. The end of the eclipse is being given correctly – it occurred twelve hours and thirteen minutes after sunrise, that is 17:44 local time – if we add roughly 5 minutes, it makes 17:49 EET, which corresponds to the true end of the eclipse.

At maximum, the sun must have looked roughly as in fig. 1, if we follow the description the authors give, "Then, with the convex side of the Sun that was not covered turning towards the North-East, and its concave part turning to the South-West, it looked like the three or four-day crescent of the Moon." This is in line with its real aspect (see above note 4).

Fig.1

I will only briefly discuss the astrological part. Due to the precession of the Earth's axis, the Sun in its apparent movement through the Ecliptic during the year does not appear in the ancient constellations any more, but has moved one constellation further along the Ecliptic during the past 2000 years. In astronomy, this gradual change today has been taken into account by adapting star charts and tables every 50 years. Astrology, however, just as it continued to adhere to Ptolemy's geocentric system,[26] still worked (and has been doing so to this day) with the old dates of when the sun apparently enters the signs of the Zodiac. Thus, in 2020, e.g., the sun enters the constellation of Leo on 10 August, whereas it transits into the sign of Virgo on 22 August, and it enters the constellation of Virgo on 16 September, whereas it transits into the sign of Libra on 22 September.[27]

The original scientific discipline called *ʿilm an-nucūm* split into two branches as early as the 3rd/9th century, with *ʿilm al-hay'a*, astronomy proper, and *ʿilm aḥkām*

[26] Marlene Kurz, *Ein osmanischer Almanach*, 54. However, there were also independent non-ptolemaic geocentric approaches to explain the movement of the planets, see David A. King, "Islamic Astronomy", 149–150.

[27] For these dates, see Hans-Ulrich Keller, *Kosmos Himmels-Jahr 2020. Sonne, Mond und Sterne im Jahreslauf* (Stuttgart: Frankh-Kosmos, 2019), 174 and 194. For a mention of the sun passing through Virgo, see below.

[28] George Saliba, "Islamic Astronomy in Context: Attacks on Astrology and the Rise of the *Hay'a* Tradition," *Bulletin of the Royal Institute for Inter-Faith Studies*, 4/1 (2002): 25–46.

an-nucūm, astrology.[28] Astrology, based on concepts coming from outside the Islamic world, was regarded skeptically, but nevertheless was used by everyone.[29]

The *zīc*es served both astronomy and astrology:

> Although the zījes are amongst the most important sources for our knowledge of Islamic mathematical astronomy, it is important to observe that they generally contain extensive tables and explanatory text relating to mathematical astrology as well. Islamic astrological texts form an independent corpus of literature, mainly untouched by modern scholarship.[30]

However, in the 19th century, some almanacs and the *sālnāme*s lack a prognostics section, especially the ones that were written for Ottoman Egypt. This deliberate omission may indicate an endeavour of propagating mere modern science in its own right.[31]

Below, I will give the text in its form in *Tārīḫ-i Cevdet*, with notes on some words and technical terms, including the poetical parts Cevdet left out. In the translation, the poems left out by Cevdet will appear in brackets.

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Nūmero 6
Zāyiçe-i küsūf fī 1235 sene (sic)

ᶜabd-i ḳalīlü l-biżāᶜa zīc-i Ḳassīnīden üç defᶜa taḳvīm-i neyyireyn aḫẕ ederek bi-l-istivā[32] *hesābım muḳteżāsınca māh-i Zī l-ḥicceniñ yigirmi ṭoḳuzuncı pençşenbe güni ṭulūᶜ-i āfîtābdan ṭoḳuz sāᶜat ḳırḳ iki daḳīḳa mürūrında ḳurṣ-i ḳamer küre-i erż ile cirm-i şems beynine ġarbdan şarḳa ṭoġrı ḥaylūlete başlayub ḳameriñ zilli küsūf-i mezbūrda saṭḥ-i zemīnden istīᶜāb edebilecegi erāżīden erż-i Ḳosṭanṭīnīyede şems-i münīr ᶜuḳde-i ẕenbde inkisāfa āġāz yaᶜnī*[33] *żıyāᶜ-i münīrden ḳıṭᶜa-i meẕkūre-i erż maḥrūm olmaġa başlayaraḳ bidā'-i küsūf oldı. Ve ṭulūᶜ-i şemsden on sāᶜat elli sekiz daḳīḳa mürūrında on iki uṣbuᶜ farż olunur cirm-i şemsiñ on uṣbuᶜ ve altı cüzʿ uṣbuᶜı münkesif olmaġla vasaṭ-i küsūf oldı. Olvaḳt şemsiñ mestūr olmayan ḳıṭᶜası ṭaraf-i muḥ addebi şarḳ ve şimāl ve muḳaᶜᶜarı ġarb ve cenūb beynine müteveccih olaraḳ üç dört*

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29 Marlene Kurz, *Ein osmanischer Almanach*, 52; David A. King, "Islamic Astronomy", 152. On Bayezīd II's interest in astronomy and especially astrology, see Ahmet Tunç Şen, "Reading the Stars at the Ottoman Court", *Arabica* 64 (2017): 557-608.

30 David A. King, "Islamic Astronomy", 152.

31 Marlene Kurz, *Ein osmanischer Almanach*, 22–25.

32 Meḥmed ᶜAṭāullāh Şānīzāde, *Tārīḫ* 3, 126: *istiḳrā*, which makes more sense.

33 Meḥmed ᶜAṭāullāh Şānīzāde, *Tārīḫ,* 126: [*mışrāᶜ*] *ez-zanbu fī ṭ-ṭarf lā n-necmü fī ṣ-ṣaġar*

34 Meḥmed ᶜAṭāullāh Şānīzāde, *Tārīḫ,* 126: *cihān-i tārīk mī-bīnem ne-dānem * siyeh şüd rūz veyā şeb-rā seḥer nīst*.

günlük hilāl miṣāli görinür idi. Ve ẕülmet-i havā daḫı[34] *henüz şemsiñ ġurūbı ᶜaḳībinde oldıġı mertebelerde idi. Ve der ᶜaḳab incilāya başlayub yine ṭulūᶜdan on iki sāᶜat on üç daḳīḳa mürūrında tamāmen müncelī oldı ve-hüve ᶜalā külli şey'in ḳadīr. Çünki ḳāᶜide-i muḥāsibīn üzere ṭāliᶜ-i vasaṭ-i küsūf delv burcınıñ dört derece ve üç daḳīḳası olmaġla bi-t-tesvīye beyt-i s̱āliṣde rāciᶜan muḳābele-i behrāmda bulunan zuhal müdebbir-i küsūf olub cüz'-i ictimāᶜ-i ḥaḳīḳī sünbülenüñ on dört derece ve ḳırḳ yedi daḳīḳası olmaḳdan nāṣī müdebbiriñ şerīki ḫāne-i sābiᶜda bulunan ᶜuṭārid ve ḳamer daḫı müddebir-i mevzıᶜ-i küsūf olmışdur. Binā'en ᶜaleyh erbāb-i aḥkām-i nücūm küsūf-i mezbūruñ bürc-i ḳırān-i intiḳālide vuḳūᶜı sebebiyle eṣeri küsūfāt-i ᶜādīyeden aḳvā ve cümle aḥkāmından eşcār ve eṣmār nām te'līf-i muḫtārıñ şecere-i s̱āliṣesi şuᶜbe-i ḫāmisesiniñ s̱emere-i rābıᶜasından bu maḳūle küsūfuñ evāyil-i ḳırānda vuḳūᶜına dā'ir baḥs̱ u temhīd pek maᶜḳūl ve mücerreb ve ġāyetde raᶜnādur va-llāhu yaᶜlamu aḫfāyā* (*beyt*) *dü-rūze gerdişi yoḳdur bi-vafḳ-i ḫāṭır-ḫᵛāh*[35] *// ṭabīᶜat-i felek-i nā-bekārı biz biliyoruz*.[36]

No. 6
The horoscope of the solar eclipse of the year 1235 (1820)

This slave of little knowledge, taking from Cassini's tables the calendar of the two bright objects three times, and according to my own firm calculations,[37] on Thursday, the 29th of the month of Zī l-ḥicce,[38] the disk of the Moon started to come in between the globe of the Earth and the body of the Sun from West to East[39] nine hours

[35] *ḫāṭır-cū*: Redhouse, James W., *A Turkish and English lexicon: shewing in English the significations of the Turkish terms* (Constantinople: A.H.Boyajian, 1890), 822a: who seeks to captivate, affable, courteous.

[36] This verse could be identified as part of a ghazel by Yūsuf Nābī (1642-1712) by a search via Google. There is a version in modern Turkish transliteration without any diacritics, which has a partly mutilated text. This same version is repeated on several websites Mehmet Kurtoğlu, *Urfalı Nabi (Şair Nabi)* (Şanlıurfa: Şanlıurfa Valiliği İl Kültür ve Turizm Müdürlüğü, 2008), 49. https://edebiyatvesanatakademisi.com/nabi-siirleri/senincun-ettigimiz-ah-u-zari-biz-biluruz/58430. On Yūsuf Nābī, see Abdülkadir Karahan, "Nâbî", in *Türkiye Diyanet Vakfı İslam Ansiklopedisi*, vol. 32 (Istanbul: TDV, 2006), 258-260.

[37] Meḥmed ᶜAṭāullāh Şānīzāde, *Tārīḫ,* 126: "by my calculation inferred by induction", which is surely what is meant here.

[38] The date is erroneous. 29 Zī l-ḥicce 1235 corresponds to Saturday, 7 October 1820 (https://www.aoi.uzh.ch/de/islamwissenschaft/hilfsmittel/tools/kalenderumrechnung/hegira.html). We must assume that the month should be Zī l-ḳaᶜde. We are confronted here with one of the numerous inconsistencies with dates in Cevdet's work (cf. Christoph K. Neumann, *Das indirekte Argument*, 79, note 32), which, in this case goes back to Şānīzāde without Cevdet having been aware of the mistake.

[39] This is a correct statement, which is explained in Ahmad S. Dallal, *An Islamic Response to Greek Astronomy. Kitāb taᶜdīl Hay'at al-Aflāk of Ṣadr al-Sharīᶜa. Edited with Translation and Commentary*. (Leiden, New York, Köln: Brill, 1995), 217: "Note that the beginnings of immersion and of clearance in a lunar eclipse are from the east side (of the moon), whereas in a solar eclipse they are from the west side (of the sun), because they (i.e. the immersion and clearance) result from the movement of the moon".

and 42 minutes after sunrise. In Constantinople, one of the places where, during the aforementioned eclipse, the Moon's shadow was liable to occupy a part of the Earth's surface, the resplendent Sun started to be eclipsed at the descending node.[40] This means [– verse: the descending node is in the ninth mansion of the Moon,[41] not the star in the smallness (?) –] that the eclipse began as the abovementioned region of the Earth started to be deprived of the resplendent rays. Ten hours and fifty-eight minutes after sunrise, twelve digits[42] were cut off. The middle of the eclipse occurred when ten and one sixth digits were eclipsed. Then, with its convex side of the Sun that was not covered turning towards the North-East, and its concave part turning to the South-West, it looked like the three or four-day crescent of the Moon. The darkness of the air [I see the dark world and I do not know * if the day has become black or if there is no morning to the evening] was to the same degree as after sunset.[43] Afterwards it started to be bright, and twelve hours and thirteen minutes after sunrise it was completely bright. And He has might over everything.

According to the rule of the calculators, the ascendent[44] of the middle of the eclipse was four degrees and three minutes of the sign of Aquarius, and Saturn, which was retrograde in the third smoothed mansion[45] at the opposition of Mars, was the regent[46] of the eclipse. Therefore, the part of the true meeting was at four degrees and forty-seven minutes of the sign of Virgo.[47] Therefore, the companion of the regent, Mercury, which was in the seventh mansion, as well as the Moon were ascendents of the place of the eclipse. Based on this, the masters of astrology [said that] its effect was stronger than [that of] normal eclipses, because the afore-

[40] I.e., when the Moon crossed the Ecliptic from North to South.

[41] Alterf is also the star λ Leonis (Storm Dunlop, Will Tirion and Antonín Rükl, *Der Kosmos-Atlas Sterne und Planeten. Aus dem Englischen übersetzt von Richard Vogel* (Stuttgart: Frankh-Kosmos, 2005), 107; or, according to Paul Kunitzsch, *Arabische Sternnamen in Europa* (Wiesbaden: Harrassowitz, 1959), 55 κ Cancri + λ Leonis.

[42] *uṣbuᶜ*, "Finger", "inch", "Zoll". Marlene Kurz uses Zoll (*Ein osmanischer Almanach*, 126).

[43] This clearly is a reference to the phase of a solar eclipse when the light diminishes to a degree that resembles dusk, which is probable to have occurred at an occultation of 80%.

[44] "*Al-ṭāliʿ* is that point of the ecliptic which is rising over the horizon at a given moment, called the ascendent or horoscopus" (David A. King and T. Fahd, "al-Ṭāliʿ", in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, and W.P. Heinrichs. http://dx-doi-org.uaccess.univie.ac.at/10.1163/1573-3912_islam_COM_1161).

[45] "Various mathematical procedures were available for smoothing the lengths of the houses around the ecliptic (*taswiyat al-buyūt*)", see David A. King and T. Fahd, "al-Ṭāliʿ", in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, and W.P. Heinrichs. http://dx-doi-org.uaccess.univie.ac.at/10.1163/1573-3912_islam_COM_1161.

[46] The regent is "a planet whose ascendent is in one of the signs of the Zodiac". ("al-Ṭāliʿ", in: *Encyclopaedia of Islam*, Second Edition David A. King and T. Fahd, "al-Ṭāliʿ", in: *Encyclopaedia of Islam*, Second Edition, http://dx-doi-org.uaccess.univie.ac.at/10.1163/1573-3912_islam_COM_1161).

[47] At this time of the year, the Sun passes through Virgo, see above.

mentioned eclipse took place in the sign of the moving conjunction. Of all decrees, talking about and corroborating the occurrence of such an eclipse at the beginning of the conjunction[48] in the fourth fruit of the fifth chapter of the third tree of the exceptional composition called "The Trees and Fruits"[49] is very reasonable, proved and most exquisite. And God knows what is most concealed. (Verse) In accordance with him who is courteous, there is no change to this life // We know the nature of the useless fortune.

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[48] Due to their unequal velocities in orbit, the planets may be at various angles with respect to one another. In astrology, the three important angles or aspects are the conjunction at 0°, the opposition at 180°, and the square at 90° (Gül Şen, "Das Ereignis von Edirne (1703)", 128, citing Marlene Kurz, *Ein osmanischer Almanach*, 55-58). These meanings of the words opposition and conjunction are of course quite different from the ones current in astronomy.

[49] Ṣabḥīzāde [c]Abdul[c]azīz wrote *Terceme-i eşcār u esmār* in 1863. Ekmeleddin İhsanoğlu et al., *Osmanlı Astronomi Literatürü Tarihi*.vol 1, CXCI, no. 72. The original astrological work of the same title is by [c]Alī Ṣāh al-Ḫ[w]ārizmi (1226-1300), who lived in Bukhara (Ekmeleddin İhsanoğlu and Boris A. Rosenfeld, *Mathematicians, astronomers and other scholars of Islamic civilization and their works (7[th]-9[th] c.)*, (Istanbul, 2003, 239-240).

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