

Anania Širakac'i's *k'nnikon* Reconsidered

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Abstract Armenian medieval sources record that the seventh-century mathematician Anania Širakac'i was commissioned with the creation of a perpetual calendar for the Armenians. These include Step'anos Tarōnec'i (eleventh century), who uses the term *k'nnikon* in reference to Širakac'i's work, the exact meaning of which has been matter of debate. Scholars have suggested that it was a synonym of 'chronicle', and that it may have been used to indicate Širakac'i's perpetual calendar. The present article explores this idea further, comparing evidence in Armenian, Syriac and Georgian that had not been taken into account before in this context, showing that *k'nnikon* was used to refer to an era based on an Easter cycle, a *computus*, and its use in Tarōnec'i's History may indicate Easter tables attributed to Anania Širakac'i.

Keywords Anania Širakac'i. K'nnikon. Classical Armenian. Seventh century. Calendar-making. Time-reckoning. Armenian Era. Roman Era. Paschal cycle. Easter cycle. Computus.

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1 Introduction

Anania Širakac'i is amongst the most-highly celebrated figures in the history of Armenian scientific tradition; however, the achievements and contribution of this seventh-century mathematician remain hard to grasp; this article proposes a re-assessment of Anania Širakac'i's activity and production. In particular, it presents a fresh analysis of medieval sources and shows that the word *k'nnikon*, associated with a commission he was responsible for at the time of the Armenian Catholicos Anastas, refers to a calendar, or, most likely, to an Easter cycle, a *computus*.

A key passage that needs re-examination in this discussion is the testimony of the eleventh-century historiographer Step'anos Tarōnec'i, where, to our knowledge, the earliest attestation of the term *k'nnikon* is found. As this article demonstrates, strong elements point at the identification of this term with an Easter cycle. Supporting evidence shall be provided by means of a comparison with time-reckoning terminology employed in Armenian, Syriac and Georgian sources, to show that the piece of work that may most probably be ascribed to Anania Širakac'i from testimonies is a festivity calendar. This might be seen in relation to the emergence of a new dating practice in the seventh century, that is the reckoning of years in an 'Armenian Era', whose starting point is the year 552-553 AD.

Our argument inherently challenges a view that identifies Anania's *k'nnikon* with a textbook for the teaching of the *trivium* and *quadrivium*, as described in Grigor Magistros' *Letter 21*, implying that what the mathematician had presented to the Catholicos and the bishops in the seventh century was a collection of books for the teaching of the seven *artes*. This interpretation is methodologically problematic and, in the light of our analysis of the meaning of *k'nnikon*, evidence in Grigor Magistros' letters invite for reconsideration, and may reveal new information in regard to both Anania Širakac'i's and Grigor Magistros' textual tradition and legacy.

2 Anania's Calendar in Medieval Sources

1.1 Presentation of the Sources: A Lost Calendar?

The primary source of information about Anania Širakac'i is the so-called *Autobiography*,¹ which, whilst certainly providing some information on the author's life, contains very little on his origins and none about his scholarly production. No other contemporary sources with such information survive other than internal references found in texts attributed to the same Širakac'i. Although no reference to a calendar is found here, we hence acquire information about Širakac'i's teacher Tychicos, who visited the major centres of learning of the time, including Alexandria, offering an explicit connection between Širakac'i and the computational tradition of the Roman-Byzantines.²

Medieval historians record information in regard to his career and production: the first mention of Anania 'Anec'i' (lit. 'from near Ani', referring to Širakac'i) is preserved by the Catholicos and historiographer Yovhannēs Drasxanakertc'i (ninth-tenth century)³ in a brief account of when the Armenian Catholicos Anastas (661-7) requested Anania to produce an "immovable calendar" (*anšarž tōmar*).

From this passage, it appears that what is meant by this expression is most likely a calendar in which the months would always fall in the same season, and so would the non-mobile feasts such as Christmas.⁴ Such calendar, Drasxanakertc'i records, has never been ap-

¹ *Ink'nakensagrut'iw*n (Autobiography) is preserved in two recensions, which are generally referred to as short and long (Abrahamyan 1944, 32; Berbērian 1964, 189-91). For the editions, cf. Patkanean 1877a, 1-4 (short); Abrahamyan 1944, 206-9 (long), both reprinted in Matenagirk' Hayoc' (henceforth MH) 2003 ff., 4: 591-7, apparently without further editing. The text was translated into Russian (Patkanean 1877b, preface); English (Conybeare 1897; Greenwood 2011); German (Bauer, Markwart 1929); French (Berbērian 1964); and Modern Eastern Armenian (Abrahamyan, Petrosyan 1979, 25-9).

² Anania's desire to study mathematics, the *Autobiography* reads, took him on a journey out of Armenia to find an instructor, first in Theodosiopolis and then in Trebizond. Here he was accepted as a student by Tychicos, and the text further tells of Tychicos' own journey and scholarly formation. The account ends with Anania's return to the motherland and his dissatisfaction as a teacher there. Cf. Greenwood 2011, 138-42; Berbērian 1964, 191-4.

³ Yovhannēs Drasxanakertc'i was a Catholicos of Armenia between the end of the ninth century and the beginning of the tenth. He wrote a *History of the Armenians* from the Deluge to his days, including the Arab invasions and the rise of the Bagratuni family (Hairapetian 1995, 224; Thomson 1997, 228).

⁴ The Julian and the Gregorian calendars, for example, obtain this result to different degrees of precision by means of leap years (a solar year lasts 365.24219 days, and the Julian calendar approximates it to 365.25 days). Such calendars may be seen as the repetition of cycles, and for this reason they are also called 'perpetual'. The approximation of the year of the Julian calendar eventually causes a disparity, too, as it runs ahead of the actual solar year. The Gregorian reform was an attempt to bring the approximation

proved of by the Church council during Anastas' lifetime nor adopted by later Catholicoi. He writes:

Իսկ Անաստասայ հայրապետին հոգացեալ վասն Հայկական տօմարի, զի թերեւս անշարժ գնա ըստ այլոց ազգաց մարթասցէ յօրինել. զի միշտ անշարժք լինիցին տօնք տարեկանաց կամ յեղափոխ յեղանակք ժամանակաց: Վասն որոյ եւ առ ինքն զԱնանիայ Անեցի կոչեալ որ բանիբուն այնմ արուեստի էր հմուտ, հրամայէ նմա ստեղծագործել զինդրելին իւր: Իսկ նորա ջան ի վերայ եղեալ եւ ըստ բոլոր ազգաց պայմանի անշուշտ յօրինեալ զկարգ Հայկական տօմարի. զի բարեձեւագունից ոմանց եւ զմերս կշռադատեալ մի կարօտասցուք զալ ի զուգաւորութիւն Հռովմայեցոց: Եւ մինչդեռ խորհէր մեծն Անաստաս ժողովօք եպիսկոպոսաց զեղեալսն հաստատել վախճան կենաց նմա ժամանէր, կացեալ յաթոռ հայրապետութեան ամս վեց: Անփոյթ զկնի եկելոցն պայմիկ արարեալ եւ զառաջին մշտախաղաց շրջագայեալ կարգ կալեալ: (Yovhannēs Drasxanakertc'i 1912, 92)

Patriarch Anastas took measures, moreover, concerning the Armenian calendar, intending to make it immovable on the example of other nations, so that the feast days and the times of the seasons' changes may always be fixed.⁵ For this reason he summoned to himself Anania of Ani, who was well versed and an expert in that art, and ordered him to create what he wished for. And he [i.e. Anania] worked hard on this and adjusted the order of the Armenian calendar according to the manner of all other nations, so that, making our [calendar] concord with other, better designed [ones], we would not need to run in union with the Romans.⁶ And

to a higher degree of precision, so that by means of skipping some leap years it obtains a solar year of 365.2425 days.

⁵ It appears that the Armenian Calendar in use at that time was based on a year of 12 months of 30 days each with the addition of 5 epagomenal, or intercalary days, which amount to a total 365 days ($12 \times 30 + 5$), and the start of its adoption in Armenia may have dated to the Achaemenid rule (Stern 2012, 179-81). Because the duration of a solar year is of 365 days and approximately 6 hours (365.24219 days), without a leap year the calendar would eventually cause months to shift from a season to another.

⁶ 'Romans' here most probably refers to the Byzantines. The opening of this passage suggests that the purpose of Anania's calculations was that of allowing Armenians to harmonise their movable calendar to those of other nations, therefore it seems to us that this remark on the Romans is out of place. In the *Discourse on Easter* attributed to Anania Širakac'i, the author speaks highly of the computation techniques of Alexandria, that is Roman too. It is possible that Drasxanakertc'i misinterprets the work carried out by Anania, or that, in his time of political instability, he manifests a bias in favour of a national (uniquely Armenian) calendar against the necessity to rely on a Roman one. According to the information presented by the same Drasxanakertc'i immediately above, however, Anania Širakac'i was asked to make the Armenian calendar perpetual (immovable), which would have resulted in allowing the Armenians to use the Roman *computus* for the dating of festivities, and arrange their calendar into perpetual

while Anastas was thinking of establishing those great changes through a council of bishops, the end of his life came about, after he had been on the patriarchal see for six years. Those who came after [him] neglected this [matter] and kept the former, ever-wandering system. (Author's transl.)⁷

It appears to describe a failed calendar reform: no traces are left of it. The old Armenian calendar based on the Persian model, that is 12 months of 30 days with 5 additional days, persisted into the modern times. Another attempt to reform the calendar was later made in the twelfth century, and it was likewise unsuccessful.⁸ It is possible that a reform was attempted and the details of its design were lost, and Drasxanakertc'i's *History* seems to have served as a source for later historiographers who record these events as well, without introducing significant variations, for example the thirteenth-century historian Kirakos Ganjakec'i.⁹

There is, however, one source which may reveal different information on this matter, suggesting that this new calendar might have been a calculation for the dating of Easter.

1.2 A New *Computus*?

Of particular significance is the witnessing preserved in the *Universal History* by Step'anos Tarōnec'i Asolik,¹⁰ dating to the start of the

cycles. We also note that such a negative reference to the Romans' *computus* is absent from other accounts of these events, for example Ganjakec'i's and Tarōnec'i's histories.

⁷ Cf. French translation by Mahé 1987, 199-200.

⁸ Step'anos had designed a new Armenian calendar with a leap year, but it was not adopted; cf. Orengo 2008, 209-10 fn. 19.

⁹ His *History of the Armenians* narrates events from the Armenians' conversion to Christianity to the middle of the thirteenth century; cf. Hairapetian 1995, 234. In regard to the immovable calendar he writes: Եւ յետ Ներսէսի առ զկաթողիկոսութիւնն տէր Անաստաս ամս վեց: Սա կոչեաց առ ինքն զմեծ վարդապետն Անանիա՝ ի Շիրակ գաւառէ, այր բանիբուն ի հանճարեղ, զիտող յոյժ ամենայն տոմարական արուեստին, զի կարգիցցեն անշարժ տոմար հայոց, որպէս այլոց ազգաց: Չոր արարեալ մեծաւ ջանիւ, եւ մինչ կամէին ժողովով հաստատել, վախճանի սուրբն Անաստաս: Անփոյթ եղեալ իրն զկնի եկելոցն, այլ առաջին կարգաւն վարէին: Kirakos Ganjakec'i 1961, 62, 8-16. (After Nerses, lord Anastas occupied the Catholicosate for six years [661-7]. Anastas summoned to himself the great *vardapet* Anania from the district of Shirak [a learned and brilliant man, and very knowledgeable in all the calendrical systems] to establish an immovable Armenian calendar, as other peoples had. Anania worked on this with great effort, until they were ready to adopt it through an assembly. But just then, the holy Anastas died. Those succeeding him as *kat'oghikos* neglected the matter and so they continued according to the former systems; translated by Bedrosian [1986]. Cf. also Orengo 2008, 209).

¹⁰ Historian active in the early eleventh century, his *Universal History* presents an account of human history from Creation to AD 1004-05. Cf. Greenwood 2017, 32.

eleventh century, who devotes part of book II to the sequence of patriarchs who succeeded one another on the Holy See. It offers notes as brief as their provenance and length of catholicosate, or as extensive as to record their activities and any contemporary people or events of relevance. From Tarōnec'i's *History*:

Իսկ Անաստաս խորհեալ Հայաստանայցս կարգել տոմար անշարժ ըստ այլոց ազգաց՝ եւ հրամայէ Անանիայի Շիրակացւոյ¹¹ կարգել զքննիկոնն¹² հրաշագան, յորում զտոմարս մեր կարգեաց անշարժ: Եւ Անաստասայ խորեալ ժողովով եւ եպիսկոպոսաւք հաստատել զքննիկոնն¹³ եւ վախճանի կացեալ յաթոռն ամս 2 (6): (MH 15: 702, 159-60)

Anastas intended moreover to establish an immovable calendar for us Armenians, on the example of those of other nations: and he commanded Anania Širakac'i to establish the wonderful *k'nnikon*, through which he made our calendar immovable. And Anastas intended to ratify the *k'nnikon* through a council and the bishops, and he died after holding the throne for six years. (Author's transl.)

In contrast with Yovhannēs Drasxanakertc'i's account quoted above, Step'anos Tarōnec'i introduces the term *k'nnikon* to describe what was being commissioned by the Catholicos. This has been interpreted in different ways in modern scholarship. One understanding of this term is that it refers to a chronicle or a calendar, which would be in line with Yovhannēs' testimony.

Our suggestion is that *k'nnikon* means something more specific, and that Step'anos Tarōnec'i's account ascribes to Anania some tool for the calculation of festivities that would determine the date of Easter.

Tables of a feast calendar attributed to Anania Širakac'i have been preserved by manuscript tradition; in particular we refer to the *532-Year Cycle*,¹⁴ which reflects a technique elaborated in Alex-

¹¹ *Širakec'woc'* in two witnesses.

¹² *Zk'nnikon*. The editors change it to *zk'rawnikonn* զբրաւնիկոնն (*zk'rōnikonn*), we restore reading from all manuscripts reported in the apparatus of the printed edition (A = M2865, thirteenth century; B = M3502; C = M4584; D = M3070; E = M1482; O = V869 from the second half of the seventeenth century). The editors justify their correction by referring to the *Nor Baḡirk' Haykazea Lezui* (henceforth NHBL) 2: 1009.

¹³ See note above.

¹⁴ *532 bolorak*; cf. Anasyan 1959, 744. Hewsens (1968, 41; 1992, 279) associated the title *Cycle 532 and the Calendar* to the Armenian *Tiezeragitut'iwn ew T'omar*. This might generate confusion because *Tiezeragitut'iwn ew T'omar* is the title of Abrahamyan's 1940 edition of the long recension of the *Cosmology* (10 chapters) and of 72 chapters on various calendrical matters (*Voprosy i resheniya* 'Problems and Solutions' in Orbeli's Russian translation from 1918), where no tables are included. Hewsens himself

andria to calculate the date of Easter.¹⁵ This cycle is a computation of Easter that would cover the years 552-553 to 1084-85 AD, starting from where the charts made by Andreas, brother of Magnus (fourth century) ended.¹⁶ Parts of them have been preserved in manuscripts and they are attributed to Anania Širakac'i. Four folios of this *computus* are preserved in manuscript M2679,¹⁷ and another copy of it was transcribed by Ēynatyan from M1999.¹⁸ Ēynatyan (2002b, 14) reports that most scholars do not believe Anania Širakac'i's tables have survived, and, in presenting the tables attributed to him from M1999 (twelfth century), the scholar comments that they must be the product of later interventions by Yovhannēs Imastasēr in the eleventh century (19-21). While proving the authenticity of these tables is, at least for the moment, beyond us, it is worth pointing out that such eventual re-elaboration, re-editing or even a falsification of such tables would have occurred around the same time as Step'anos Tarōnec'i's *Universal History*, opening the question of the reception, understanding and representation of Anania Širakac'i's figure in this period.

In any case, a noticeable piece of innovation does take place at the time of Širakac'i, and it may be the result of his response to the Catholicos' request: Armenian sources show a new dating system, called 'the Armenian Era', appearing from the seventh century. Its starting point corresponds to the beginning of a new Easter cycle's in AD 552-553, and its duration, 532 years, would be the same as the cycle. We explore the possibility that this may be related to the Anania Širakac'i's activity, and to an Easter *computus* that was also referred to as *k'nnikon* at least from the eleventh century.

translates the title *Tiezeragitut'iwn ew T'omar* as *Cosmography and Chronology* elsewhere in the same article (1968, 33 fn. 9).

¹⁵ This is a computing technique based on a 19-year long cycle. Cf. Warntjes 2007, 55 fn. 75. A 532-year table contains 28×19-year cycles, and its implementation is associated with Annianus (Mosshammer 2008, 199).

¹⁶ Andreas, brother of Magnus, wrote Easter tables covering a 200-year period from 353 to 552 AD; cf. Mosshammer 2008, 93.

¹⁷ *Non vidi*; after Abrahamyan 1944, 262. The abbreviation M indicates mss from the Mesrop Mashtots Institute of Ancient Manuscripts in Yerevan, Armenia. We refer to the same abbreviation system throughout the article; cf. Coulie 2020. M2679 is dated to AD 981; cf. Tēr-Vardanean 2013. From the surviving fragments, Abrahamyan (1944, 262-82) published a reconstruction of the rest of the chart, reprinted in MH 4: 635-68. This was translated into Modern Armenian by Abrahamyan and Petrosyan (1979, 174-249).

¹⁸ M1999 is composed of three manuscripts, the first two dating to the twelfth century, and the third to the thirteenth. The texts discussed and edited by Ēynatyan (2002a; 2002b, the latter presenting an English translation by Muradyan and Topchyan) are found in the first manuscript. According to Ēynatyan, the tables found in M1999 had been discarded by Abrahamyan as too jumbled to be of any use, but the data contained in the tables was sufficient to set the page-order right (21).

1.3 *K'nnikon* in *Letter 21* and *Letter 25* of Grigor Pahlawuni Magistros

Because of its occurrence in relation to *Letter 21* of Grigor Magistros's epistles, the word *k'nnikon* has also been attributed a meaning that would be similar to the Latin *summa*; an organic collection of works conceived with a didactic purpose. This is currently the most widely accepted interpretation of this term within scholarship, but, in our view, not the best one.

The epistolary collection of the erudite and statesman Grigor Pahlawuni Magistros (eleventh century) does in fact record information about Anania Širakac'i's production. Relevant passages are found in two letters sent to the contemporary Catholicos of the Armenians, Petros Getadarj: the first (*Letter 21*, cf. especially Muradyan 2012; MH 16: 270-1 sentences 33-7) describing a book for the teaching of several subjects, explicitly attributed to Anania Širakac'i, which Grigor Pahlawuni claims to be kept at the Catholicosate. The second relevant document is *Letter 25* (cf. especially Muradyan 2012; MH 16: 284 sentences 3-4) which Muradyan suggests to have been written in thanksgiving for the book, which Magistros confirms to have received (Muradyan 2012, 105-6), although it contains no further information on the book's content and no mention of Anania Širakac'i's name.

These letters call for a careful examination, as they may allow us to trace new connections in the history of ideas and of education in this period, which, for matters of space, shall await for a different occasion. What suffices to point out in this context is that very little is known about the history of Magistros' epistolary collection, and scholarship is silent in regards to who was responsible for its compilation and for assigning titles to the letters. The problem of editing is in fact a fundamental one when it comes to the question of Anania's *Great K'nnikon*, because this term was not used by Grigor Pahlawuni himself, but it is only found in the title of *Letter 21*. It is possible that it is found here due to an existing association between *k'nnikon*, i.e. Anania's computational endeavour as we argue, and Anania's name mentioned overtly in the body of *Letter 21*. Its presence here may therefore be of secondary importance, if not an accident altogether.

We further observe that the said title, mentioning the *Great K'nnikon*, brings additional support to our hypothesis that associates *k'nnikon* to a computational era. We suggest this inasmuch as the period covered by the following 532 years starting from AD 1085 designed by Yovhannēs Imastasēr in the eleventh century, that would be a second paschal cycle following the one starting in AD 552, is addressed as the 'New' or the 'Small' Armenian Era in the sources (cf. for example Kirakos of Ganjak and Mxitar Goš, quoted in Dulaurier 1859, 114), which distinguishes the second cycle from the preceding one, the 'Great'

Era, a distinction that could only occur after the eleventh century.¹⁹

Whoever gave titles to Grigor Magistros' letters must have therefore made an association between Anania Širakac'i, named in the letter, and what he was known to have created, namely the *Great K'nnikon*. The description of this collection of books ascribed to Širakac'i as found in Magistros' *Letter 21* and its possible follow-up, number 25, leave several open questions, and the extent to which they may add to our understanding of Anania Širakac'i's production, Grigor Pahlawuni's agenda and a wider context of the history of ideas, is yet to be investigated further.

1.4 *K'nnikon* and *K'ronikon* in Armenian Sources

Let us now come back to Tarōnec'i's testimony and to our suggestion that the term *k'nnikon* belonged to the semantic sphere of time-reckoning. We shall presently discuss attested uses of *k'nnikon* as a synonym or an alternative spelling or indicating something similar to *k'ronikon* (chronicle), and show how this, taking into consideration the complexity of both terms, may have referred to a calendar.

The term *k'nnikon* has been identified as an alternative spelling for *k'ronikon* (chronicle),²⁰ and this is evident in the discussed passage from Step'anos Tarōnec'i's *History* as pointed out in the notes to the Armenian text. Tarōnec'i's passage shows the reading *k'nnikon*, and the editors changed it to *k'rōnikon*,²¹ which usually translates as 'chronicle'. This choice is explained with reference to the NHBL, where *k'nnikon* is given as an alternative spelling for *k'ronikon*, and one may presume that the editors took these terms as synonyms and may have thus decided to present the readers with a simpler, straightforward term, although we do not dare to speculate on their reasons for this intervention.

What we shall note, however, is that previous manuscript tradition also attests a number of cases where the opposite happens, and compilers use *k'nnikon* where *k'ronikon* could be expected: Abgaryan has collected instances where copyists or list compilers used one term in place of the other, and further argues that alternative spellings that appear to be 'in between' these two words (see point 6 below) would demonstrate that *k'nnikon* and *k'ronikon* were used as synonyms (Abgaryan 1986, 26-33; cf. also Mahé 1987, 168-70).

¹⁹ The twelfth-century manuscript M1999 reports definitions of the two Armenian Eras, the Great and Small (Ėynatyan 2002b, 18).

²⁰ Cf. especially Abgaryan 1986; Mat'evosyan 1974. The NHBL dictionary indicates that *k'nnikon* is an alternative form for *k'ronikon* (chronicle), *žamanakagrut' iwn* (chronography, chronicle) but also *tomar* (calendar), and *tomaragirk'* (calendar-book) (NHBL 2: 1009 col. 1).

²¹ An alternative spelling for *k'ronikon* (NHBL 2: 1019 col. 2).

We shall give a brief account of Abgaryan's list of supporting evidence that identify *k'nnikon* with *k'ronikon*:

1. In two manuscript copies of the eighteenth-century list *Patmagirk' Hayoc'*, a scribe refers to Samuël Anec'i's *Chronicle*²² as *k'nnikon gawazanagirk'*: "Samuël the Priest [i.e. Anec'i], who made the *k'nnikon gawazanagirk'*".²³ *Gawazanagirk'* is a compound word from *gawazan* (rule), and *girk'* (book), which may translate as 'chronicle' or 'book of chronicles'. Anec'i's work is indeed a chronicle, modelled on the example of Eusebius of Caesarea's *Chronicon*, leaving no doubt that this instance of *k'nnikon gawazanagirk'* indicates a chronicle.
2. In copies of Vanakan Vardapet's *Book of Questions*, originally composed in the thirteenth century, Eusebius of Caesarea's *Chronicon* is referred to as *k'nnikon*: "And he [i.e. Eusebius] made the *Ecclesiastical History* and the *K'nnikon*".²⁴ Abgaryan only cites two witnesses here, the earliest of these dating to the fifteenth century, but states that there are more (which we presume later than the copies he cites).
3. In at least two manuscript copies of Vardan Arewelc'i's *Universal History*, which dates to the thirteenth century, Samuël Anec'i's *Chronicle* is referred to with the term *gawazan* in the accusative plural, i.e. 'the lines', 'the rules', 'the canons', and it is thought that Anec'i had followed the model of the *k'ronikon*, most likely referring to Eusebius' *Chronicle* or some later work of a similar kind: "Samuël the Priest Anec'i, who modelled the *gawazans* on the example of the *k'ronikon*".²⁵

Whilst in point 1 the *gawazanagirk'* is associated with *k'nnikon*, here the *gawazans* are said to be modelled on a *k'ronikon*, allowing us to infer that, if not synonyms, *k'nnikon* and *k'ronikon* do at least have a feature in common; something related to ruling or canons. The observation is further reinforced by Abgaryan's note concerning the 1861 edition of Arewelc'i's *Universal History*, indicating that both witnesses read "Samuël the Priest of the land,

²² Samuël Anec'i was an Armenian historian active in the twelfth century. His *Universal Chronicle* begins with the story of Adam and reaches the events of the year 1178-80 (Boyadjian 2016). Cowe describes Anec'i's *Chronicle* as an example of a "chronographic approach" (1997, 305).

²³ Սամուէլ երեց, որ արար զքննիկոնս զաւազանագիրքն (M2220, f. 292; M2271, f. 214; after Abgaryan 1986, 32). M2220 dates to AD 1789-90 and M2271 to AD 1724.

²⁴ Չեկեղեցական պատմութիւնն եւ զքննիկոն նա արար (M3074, f. 98r; M1254, f. 40v, "and other mss"; after Abgaryan 1986, 32). M3074 dates to the fifteenth century and M1254 to the seventeenth century.

²⁵ Սամուէլ երեց Անեցին, որ զգաւազանսն յօրինեաց Քրոնիկոնին (Vardan Arewelc'i's *Universal History*, ed. Emin 1861, 159).

who modelled the *gawazans* on the example of Anec'i's *K'nnikon*",²⁶ showing that the two words appear to have been used interchangeably in this instance.

4. Another occurrence comes from a manuscript copy of a commentary by Esayi Nč'ec'i.²⁷ In M5254 (AD 1280) Nč'ec'i cites a passage where Cyril of Alexandria refers to the *Chronicon* of Eusebius using the term *k'nnikon*: "But I searched in the first [book of] the *K'nnikon* and found...". (Author's transl.)²⁸ The same work is referred to as *k'ronikon* in another passage where Nč'ec'i cites Cyril of Alexandria, preserved in M5566 (fourteenth century). The citation, in reference to the Eusebian *Chronicon*, reads: "Many times I searched in the *K'ronikon*".²⁹
5. Abgaryan then cites two occurrences found in a manuscript list kept at the library of the Monastery of St John's, known as Amrdolu, compiled by Vardan of Bałēš (Bałišec'i) in the seventeenth century. An edition of this list, based on a manuscript referred to as 639 of the Holy See collection (Ējmiacin), was published in 1903,³⁰ and it reports: "105r. Book, a dictionary"³¹

26 Սամուէլ երէց աշխարհի, որ զգաւագանսն յօրինեաց Քննիկոնին անեցին (Emin 1861, 159 fn. 2). The copies used in this edition are one printed, unnumbered copy from Moscow and a manuscript from Tiflis dating to 1814, made from a fifteenth century manuscript and presented to the Rumyantsev Museum of St Petersburg (Emin 1861, VII). We point out that this citation appears to present a logical impossibility in stating that Samuēl the Priest, who is otherwise known as Samuēl Anec'i, modelled his work on Anec'i's. This is either the result of confusion or some transmission errors, or perhaps an indication that there was another chronicle by someone called Anec'i. Anania Širakac'i, as seen above, is referred to as 'Anec'i' in Yovhannēs Drasxanakerc'i's *History* (1912, 92), and this work could either be identified with a calendar or with a chronicle. For the contention that Širakac'i wrote a chronicle, cf. Abrahamyan 1944; Abgaryan 1986. Abrahamyan suggested that this might coincide with an existing anonymous chronicle, which he published in his anthology of works by Anania Širakac'i (1944, 357-99). This text was previously edited by Sargisean in 1904 as Anonymous, and it had also been suggested that the author responsible for it, or at least for part of it, is an otherwise unknown Pilon Tirakac'i/Širakac'i (Greenwood 2008, 249).

27 Active in the thirteenth century, associated with the Glajor Monastery and teaching institution.

28 Իսկ եւ յառաջին բնիկոննէն խնդրել գտի... (f. 59r; after Abgaryan 1986, 33 fn. 64).

29 Պագում անգամ յուսեցի ի Քրոնիկոնն (f. 8r; after Abgaryan 1986, 33). He invites comparison with M1241 (AD 1612), f. 7v (Abgaryan 1986, 33 fn. 63). It is unclear why Abgaryan did not compare the same sentence from the two sources.

30 Ter-Hakobian 1903. These examples are discussed in Mat'evosyan 1974, 73-4.

31 This reference to a *baragirk'* (dictionary) seems unusual for a collection of scientific or philosophical texts. It was probably used to indicate that it contained information on several topics, similar to the modern encyclopaedia. On this, we invite a comparison with Pseudo-Zeno's *On Nature*, a treatise translated into Armenian (probably in the seventh century) which includes discussion on cosmology, anatomy, medicine, morals, logic and grammar, but it is primarily a list of philosophical definitions (Stone, Shirinian 2000); cf. witnesses M529 (AD 1614) and M4669 (AD 1675) of Yovhannēs Erznkac'i's *On the Movements of the Celestial Bodies*, both recorded as 'dictionary' (Stepanyan, Topchyan 2001, 12).

in gold from Surb Hovhannēs,³² which is Anania Širakac'i's, which is a³³ *k'nnikon*".³⁴ Below, on the same list: "182r. Book, Anania's *k'nnikon* and many sayings of doctors and unknown commentaries".³⁵ Abgaryan, however, does not cite copies of the same list where *k'ronikon* is found in place of *k'nnikon*. He produces instead a reference from a second list, reported in a catalogue of unedited manuscripts³⁶ where he found this note: "Now, he wrote this *k'ronikon*, which Anania Širakac'i made".³⁷ The relevance of this comparison is that this note refers to a book kept at the Monastery of Balēš (Mat'evosyan 1974, 73-4; cf. also Mahé 1987, 177); one may therefore consider the possibility that this final citation describes one or parts of the two items on Vardan Bālišec'i's list, and that this is another example where *k'ronikon* and *k'nnikon* may be used as synonyms or as alternative spellings.

We remain however uncertain over what type of works these titles referred to, and what either of these words would actually describe: given that point 5 refers to texts or tables attributed to Anania Širakac'i, their inclusion in our argument becomes somewhat tautological. A scribe's note dating to the seventeenth century in absence of the item being described does not necessarily reveal to us the exact nature of that *k'nnikon* mentioned by Step'anos Tarōnec'i, but merely demonstrates that *k'nnikon* and *k'ronikon* came to be used as synonyms at least by then.

6. The last items on Abgaryan's list are examples of different spellings, seemingly the result of miscopying, which, the scholar argues, might demonstrate that the scribes confused the words *k'nnikon* and *k'ronikon* because they were synonyms. For example, in the title of *Letter 21* of Grigor

32 *Hovhannēs*in (Abgaryan 1986, 33). Ter-Hakobian (1903, 183) reads *Yovsin*, which might be an abbreviated form for *Hovhannēs*in.

33 Որ է բնիկն does not present any articles, and translates as "which is a *k'nnikon*", possibly indicating that this term described a specific type of work (like a 'commentary' or a 'hymnal'). However, one may also suppose that a determinative article is implicitly understood, "which is the *k'nnikon*", and interpret it as the name of one particular, and potentially well-known, text or collection of texts.

34 105a Գիրք ոսկով բառգիրքն է սուրբ Յովսին, որ է Անանիա Շիրակացւոյն, որ է բնիկն (Ter-Hakobian 1903, 183; cf. also Abgaryan 1986, 33).

35 182r Գիրք Անանիայի բնիկնն եւ բազում ասացուածք վարդապետաց եւ մեկնութիւնք անծանալք (Ter-Hakobian 1903, 188).

36 Մատենադարանք անտիպ ծեռագրացուցակներ (Catalogue of Unedited Manuscripts after Mat'evosyan 1974b, 74; cf. also Abgaryan 1986, 33).

37 Արդ գրեցաւ Կրօնիկոնս, զոր արարեալ Անանիայի Շիրակունոյ (Catalogue of Unedited Manuscripts, 133, *non vidi*; after Mat'evosyan 1974, 74).

Magistros' epistles, *k'nnikon* is spelled *k'nnokon*³⁸ in a manuscript and *k'nokon* in another witness held in Vienna.³⁹

It is most prudent to focus first on instances referring to works which can be identified with certainty. Conclusions which may be drawn from the examples above, points 1 to 4, are that the words *k'nnikon* and *k'ronikon* have been occasionally used interchangeably in reference to the *Chronicon* of Eusebius or to works of a similar kind and which emulate it, as, for example, the *Chronicle* of Samuël Anec'i. We also conclude that the earliest attested instances of such use of the two terms in reference to chronicles based on the Eusebian model date from after the thirteenth century. Abgaryan might therefore be correct in concluding that *k'nnikon*, being the same as *k'ronikon*, refers to a chronicle (1986). However, it seems to us that the meaning of both terms may hide a much wider complexity, and that the prominence of computations in relation to them has thus far not been given enough consideration in the study of Armenian literature.

1.5 The *Chronicon* and Paschal Cycles

Eusebius of Caesarea's *Chronicon* was no chronicle in the sense of a narration of historical events, but rather the combination of a Χρονογραφία (Chronography), an unrefined annalistic compilation (book I), and Χρονικοί Κανόνες (Chronological Canons) presenting historical events in tables that compared different year counts (book II). This is a clear warning that the line between chronicles and tables is hard to draw. Moreover, in relation to Eusebius of Caesarea's works, the term *krōnīqōn* in Syriac was also used to refer explanations of the computation of Easter (Debié 2015, 221-2), and not to the sole *Chronicon*.⁴⁰

In Armenian, although as we have seen both *k'ronikon* and *k'nnikon* found in relation to chronicles, including cases where they are used as synonyms (the NHBL lexicon, too, records this), *k'ronikon* does not appear to indicate paschal tables, whereas there are several instances where this meaning is conveyed by the term *k'nnikon*.

This use of *k'nnikon* is attested in medieval *miscellanea*, as we shall analyse shortly below, reinforcing a suggestion put forth by Mat'evosyan in his extensive studies on Anania's tradition: "*K'nnikon* is a calendar, a new era, regularity and a canon, law, order and confines" (Author's transl. 1974, 78).

³⁸ Langlois 1869, 37; after Abgaryan 1986, 33.

³⁹ Abgaryan 1986, 33.

⁴⁰ Cf. Mosshammer (2008, 145-8) on a traditional attribution of a 19-year cycle to Eusebius, which does not appear to be grounded on his works.

The occurrences we present come from two medieval *miscellanea* (M1999, twelfth-thirteenth century, and M5975, AD 1467), transcribed and published by Ėynatyan,⁴¹ and they clearly refer to the *computus* and to paschal tables.

The first extract (henceforth Misc1) is from M1999:

Թուական Յոռոմոց այսպէս արա՛.
Կա՛լ գՅայ Մեծ թուականն, ՅԴ (304) ի վերայ բեր՝⁴² Մեծ թուական է
Յոռոմայցոց: ՇԼԲ (532). ի բաց գնա՛⁴³ Փոքր թուական է Յոռոմի, որ
կոչի Քննիկոն:⁴⁴

For the Roman Era do this way:
take the year of the Great Armenian Era [AD 552-3] and add [subtract] 304; this is the year of the Great Roman Era [AD 248-9]. Subtract [add] 532; this is the Small Roman Era [AD 780-1], which is called *k'nnikon*. (Author's transl.)

This excerpt suggests that *k'nnikon* is a name for the Small Roman Era, that is a second 532-year cycle after the completion of the Great Roman Era, starting in the year AD 248-249, and is attested in Armenian, Byzantine and Georgian sources. Based on such information we suggest that the operations in the extract are inverted, as noted in the text and its English translation.⁴⁵ The same Misc1 continues: Վերադիր այսպէս արա՛. Կա՛լ զՔննիկոնն եւ Էրթ ԺԹ (19)⁴⁶ (For

⁴¹ For a partial diplomatic edition of manuscript M1999, cf. Ėynatyan 2002a, 140-247; 2002b, 27-319 for the edition with facing English translation. For manuscript M5975, cf. a partial diplomatic edition by Ėynatyan 2002a, 251-88; for the edition with facing English translation cf. Ėynatyan 2002b, 320-451.

⁴² Ի վերայ բեր (add). It should say 'subtract', for example ի բաց գնա.

⁴³ Ի բաց գնա (subtract). The text should say ի վերայ բեր (add).

⁴⁴ Ėynatyan 2002a, 183; 2002b, 146 drawing from M1999, f. 205v. Part of this quoted in Mat'evosyan 1974, 77.

⁴⁵ Cf. Mosshammer 2008, 266-70 on the calculations of the Roman Era's starting date. On the existence of two Roman Eras, one starting in 248-249 and the second starting 532 years later (a whole paschal cycle) in 780-781, cf. Mosshammer's discussion on the Georgian dating system (269). Cf. The English translation of the same extract in Ėynatyan 2002b, 151: "Calculate the Year of the Roman Era in the following way: take the year of the Great Armenian Era and add 304; this is the year of the Great Roman Era. Subtract 532; this is the Small Roman Era, which is called *k'nnikon*". The Roman Era is also mentioned in the *Chronicon Paschale*, a Byzantine calendrical text also known as *Chronicon Alexandrinum*, which included a chronicle from Adam to Emperor Heraclius, Easter tables and explanations on the *computus* (Mosshammer 2008, 266-8). On the *Chronicon Paschale* cf. 286-311. Georgian sources, however, do not seem to distinguish between a 'Great' and a 'Small' Era, and our corrections presume that the Great Roman Era precedes the Small in consistency with the use of 'great' and 'small' to indicate respectively the first and second cycles of the Armenian Era (one starting in AD 553, the second in AD 1085, both lasting 532-year; cf. Dulaurier 1859).

⁴⁶ M1999, f. 205v; after Ėynatyan 2002a, 183; 2002b, 146.

the epact, do it this way: take the *k'nnikon* and divide by 19; author's transl.). 19 is the minimal unit of a paschal cycle, and this citation confirms that *k'nnikon* refers to something that may be divided by 19: in this case we suppose that it is a 532-year-long cycle (that is 19×28), based on the quotation above.

We find information similar to Misc1 in Misc2, MS M5975:

Թուական այսպէս արա՛ւ.

Կա՛լ զՀայոց թուականն, ՅԴ (304) ի վերայ քե՛ր⁴⁷ եւ այն է: Եւ զըջանսն ՇԼԲ (532), ի բաց⁴⁸ երթ, որ մնայ Փոքր թուական է, որ կոչի Զննիկոն: Դարձեալ՝ կա՛լ զՀայոց Փոքր թուականն, ՄԻԸ (228) ի բաց երթ Զննիկոն է:⁴⁹

Calculate the year in the following way:

take the year of the Armenian Era and add 304, this is it. And subtract the 532[year] cycle; the result is the year of the Small Era,⁵⁰ which is called *k'nnikon*. Again, take the year of the Small Armenian Era and subtract 228; it is the year of the *k'nnikon*. (Author's transl.)⁵¹

These occurrences in medieval *miscellanea* allow us to theorise that, at least by the twelfth century, *k'nnikon* had become a way to indicate an era or a cycle, more specifically to the Small Roman Era. This is evidently anachronistic if applied to what Tarōnec'i records about Anania Širakac'i's work, as the starting point of this Roman Era is at the end of the eighth century, long after the departure of Catholicos Anastas and Širakac'i's activity, but one may nonetheless assume that its meaning might have also been used to indicate a term for an era or table more in general, and even one with a fixed duration of 532 years. In the case of Tarōnec'i it undoubtedly referred to something 'immovable', perpetual, which is a characteristic of such cycles. Širakac'i's *computus* would have also covered 532 years, like the Roman Era mentioned in the miscellanies.⁵²

⁴⁷ Ի վերայ քեր (add). It should say 'subtract', for example ի բաց գնաւ.

⁴⁸ Ի բաց (subtract). This does not make sense, and the text should say ի վերայ քեր (add).

⁴⁹ F. 15v; after Ėynatyan 2002a, 264; 2002b, 360.

⁵⁰ AD 780-781, that is the Roman Era in Georgian sources; cf. Mosshammer 2008, 268-70.

⁵¹ As in the previous excerpt, adding 304 would not be the correct operation here, one would need to subtract: the Great Armenian Era starts in 552-3, and one needs to subtract 304 in order to obtain 248-9, the start of the Roman Era. Similarly to the previous passage, the next operation should be adding 532 rather than subtracting. Finally, to obtain "the year of the *k'nnikon*" the number of years to be subtracted should be 304 years, and not 228. Cf. Ėynatyan's 2002b, 371.

⁵² This use of the word *k'nnikon* in Misc1 (M1999) had already been cited by Mat'evosyan in an article on the *k'nnikon* question (1974), where he suggests that the

The picture may become clearer thanks to parallels found in studies on Syriac and Georgian sources, where there are attestations of the terms *krōnīqōn* (Syriac) and *kronik'oni* ქრონიკონი (Georgian) found in relation to the *computus*. Debié has shown that, rather than strictly referring to chronicles alone, *krōnīqōn* was used in Syriac sources to describe the *computus*, treatises on the calendar, and explanations on the computation of Easter (Debié 2015, 229). This shift, or rather, this expansion of the possible meanings of the term might derive from the *Chronicon* par excellence, the above-mentioned fundamental work of Eusebius of Caesarea. Debié points out that, in Syriac, *krōnīqōn* was also used to refer to Eusebius' *computus* (221) and not just to his chronicle in the sense of 'history', or, rather, 'chronography'.⁵³ The breadth of the Eusebian production and the fortune of its legacy might be at the heart of the variety of meanings attributed to *krōnīqōn* through the Middle Ages. Debié further shows that the term continued to be used in Syriac for both the *computus* and for treatises around the *computus* (229), potentially generating confusion.

As mentioned in relation to Misc1 and Misc2, the Roman Era is not only attested in Armenian sources, but was used by Georgians, too. In Georgian the term *kronik'oni* ქრონიკონი or *kronik'oni* ქრონიკონი identifies a 532-year long cycle.⁵⁴ In Armenian sources, still in clear association to a 532-year-long computational era, we find the word *k'nnikon*.

1.6 Where Does *K'nnikon* Come From?

The emergence of the term *k'nnikon* remains an unresolved linguistic issue; we discuss here possible explanations for its formation.

As we have seen, Abgaryan proposed that *k'nnikon* was derived from *k'ronikon*, on the basis that scribal mistakes might have occurred through tradition and generated a variation. To show this, he includes evidence of 'hybrid' readings (*infra* point 6; cf. Abgaryan 1986, 27-33).

word might have indicated a calendar, and, in particular, something in the form of a table; cf. especially 77-8. However, Mat'evosyan does not state that this *k'nnikon* corresponded to the 532-Year Cycle attributed to Anania, nor to other specific texts.

⁵³ On the erroneous attribution of paschal tables based on the 19-year cycle to Eusebius cf. *infra* fn. 41.

⁵⁴ Cf. Abuladze 2008, s.v. "ქრონიკონი, ქრონიკონი". Mosshammer (2008, 269) calculates a starting date of AD 780-781 for a Georgian *k'ronikon* based on archaeological evidence, which allows us to calculate that the previous cycle would have begun in 248-9 (that is AD 780-781 - 532 years = AD 248-249). That is the same starting date as the Roman Era in Armenian sources, including Misc1 and Misc2 seen above. Cf. also Debié 2015, 212 fn. 38. According to the Dictionary of Classical Georgian (Abuladze 2008), the year 780-781 AD corresponds to the thirteenth reiteration of the cycle.

Markwart's suggestion was that it derived from the same root of the Armenian verb *k'nnel* բնութի (to examine) with the addition of the adjectival ending *-ikon* as found in Greek, forming some sort of an Armenian-Greek hybrid term to parallel the Greek *kritikon* κριτικόν⁵⁵ (capable of discernment, capable of judgement),⁵⁶ meant as the final result of a thought process: 'examination'. This hypothesis aligns with an interpretation of the *k'nnikon* on the basis of Magistros' *Letter 21*, i.e. as a collection of books on the different sciences, and with no special association with time-reckoning or chronology. Mahé objects that there appears to be no reason to form such a term with the Greek ending *-ikon* rather than the Armenian *-akan* (*k'nnakan*) (Mahé 1987, 168). In agreement with Mahé, we suggest that the Greek ending in *-ikon* would most likely point at the whole word being derived from Greek.

Mat'evosyan's hypothesis is that the etymology of *k'nnikon* is to be found in the Greek *kanonikon* κανονικόν, pointing at ruled tables related to the calendar. This connections to the 'ruling' is indeed very relevant: as an alternative to *k'ronikon*, one of Abgaryan's cited sources showed *k'nnikon gawazanagirk'* (point 1 above) and *gawazank'* (point 3 above) which point at the technical feature of tables, i.e. the ruling. Ruling is also a prominent feature of the Eusebian legacy, whose *Chronological Canons* were, in fact, partly tabular.

Classical Armenian presents orthographical variations for its loan from the Greek κανών: Լաւնոն, Լաւնուն, քաւնոն, քաւնուն.⁵⁷ Alongside offering the Greek equivalent κανών, the Latin translation in the NBHL show 'canon', 'regula', 'forma'. The adjectives քաւնոնիկոն and քաւնոնալաւն are then translated as κανονικός, -κη, -κόν in Greek and 'regularis' in Latin.⁵⁸

Starting from Mat'evosyan's proposal, we suggest that *k'nnikon* could be the result of an abbreviation, typical of copyists, where some vowels are omitted:

քաւնոնիկոն > քաւնոնիկոն > քննիկոն

One may in fact suppose that the *hi* and *no* of the last syllables would not be easily left out as they are reminders of a Greek suffix, atypical for Armenian (which would present *-ալաւն* for the most common formation of adjectives from a noun), so that their omission might have caused confusion. This might be how this term originated.

One further suggestion we would like to advance is that *k'nnikon* might be the result of a crasis of *k'ronikon* and *k'anonikon*. A similar

⁵⁵ Bauer, Markwart 1929, 429, after Mahé 1987, 168.

⁵⁶ Cf. Liddell, Scott 1940.

⁵⁷ NBHL 1: 1051 coll. 1-2; 2: 980 col. 2.

⁵⁸ NBHL 1: 1051 coll. 1-2; 2: 980 col. 2.

compound is attested in Syriac: *krwnnqnwn* (chrono-canon),⁵⁹ which is explicitly associated to a 532-year cycle⁶⁰ and to a “comput des années, des mois, de jeûnes et des fêtes”.⁶¹ As we have already pointed out, the Eusebian legacy is especially meaningful, not last because of the graphic arrangement of the canons, characterised by ruling, which provided a model to arrange chronologies and computational tables, such as the 532-year cycle. The second part of Eusebius' *Chronicon*, called Χρονικοί Κανόνες (Chronological Canons), could be at the origin of both the Syriac *krwnnqnwn* and of the Armenian *քննիկն k'nnikon*.

Another element in favour of this reconstruction is the starting letter of *k'nnikon*. Although, as we show above, Greek *kanōn* finds an Armenian translation both beginning with Է and with ք, the first would be more likely to transliterate a κ, while the latter, being aspirated, a Greek χ. The ք at the start of *k'nnikon* in Armenian might reflect a Greek χ, as in *chronos* (time). It is however to be noted that Armenian *k'nnikon* does not present a ր as we find in Greek *chronos* and the Syriac compound *krwnnqnwn*.

1.7 A New Era

Armenian medieval sources mention two Armenian Eras, a Great and a Small one, both 532-year long. The latter, dating to the eleventh century and attributed to Yovhannēs Imastasēr, starts in AD 1084-85 (Dulaurier 1859), coinciding with the completion of a previous 532-year cycle starting in AD 552-553.

This Armenian Era appears in Armenian sources from as early as the seventh century, corroborating the notion that computational tables may have served as a chronological reference in the reckoning of years, and allowing us to conjecture about an innovation occurring at this time, perhaps in relation to Širakac'i's activity.

The earliest attestation of this dating practice is in the seventh-century *Anonymous Chronicle*⁶² where the year “134 of the Armenian Era” is given as the date of a military defeat.⁶³ This era is further

⁵⁹ The starting letter in the Syriac transcription, *k*, is used for Greek χ, while *q* corresponds to Greek κ.

⁶⁰ From a manuscript copied by Moise of Mardin (Debié 2015, 211). He was active in the sixteenth century.

⁶¹ From the undated MS Paris, BNF, syriaque 13 (Debié 2015, 213).

⁶² Tentatively ascribed to Anania himself by Abrahamyan 1944, 357-99. On its attribution to P'ilon Tirakac'i/Širakac'i, cf. Greenwood 2008, 249. We maintain this text as anonymous.

⁶³ Cf. Abrahamyan 1944, 399; MH 5: 969; after Orengo 2008, 207.

referred to in an eight-century *Treatise on Councils*, where a sinod is dated to the year 175 of the Armenian Era, preserved in the *Girk' T'it'oc'* (Book of Letters),⁶⁴ and in an inscription dated to the second half of the eighth century, which dates the erection of a fountain to the year 232 of the Armenian Era (Greenwood 2004, 87).

The emergence of this dating system may help our understanding of Step'anos Tarōnec'i's passage: this attestation of newly designed *k'nnikon* could be a witness to a new *computus*, and its starting date came to be used as a year-reckoning tool from the seventh century onwards. In the light of all the elements converging to read Tarōnec'i's account as the witness of a new Easter cycle, it is inevitable to ask whether Drasxanaketc'i's passage may be narrating the same event, too, although using the term *tōmar* (calendar), still referring to a paschal cycle, rather than a substantial reform of the Armenian calendar, as one may interpret it. All accounts of the matter, however, refer that the mathematician's work was rejected, opening questions on the actual extent of its rejection and, on the other hand, on the possible means of its dissemination.

3 Concluding Remarks

This article presents a re-examination of medieval sources on Anania Širakac'i's activity; it shows that the term *k'nnikon*, associated with the mathematician's production, was used to refer to time-reckoning, and more precisely to a computational era or paschal cycle. The eleventh-century historiographer Step'anos Tarōnec'i records the request advanced by Catholicos Anastas to Širakac'i to reform the Armenian calendar to make it "immovable", and in this instance he refers to Anania's work as *k'nnikon*. Expanding on a suggestion advanced by Mat'evosyan, namely that *k'nnikon* was a way to refer to the calendar, we argue that the most probable meaning of this term is that of a *computus*, i.e. tables for the calculation of the Easter dates year after year until cycle's completion.

In support of this hypothesis, we propose a comparison with analogous terminology in Georgian and Syriac as well as making use of previously underexplored Armenian sources. In particular, we highlight the emergence of a new dating system, the Armenian Era, attested from the seventh century, which has the same duration as a 532-year paschal cycle and which begins right where previous Easter tables ended, in AD 552-553.

Our contention challenges a widely-accepted hypothesis that sees the *k'nnikon* as a structured collection of writings that was intended

⁶⁴ Cf. Polarean 1994, 479; after Orenko 2008, 207.

as companions to the *curricula* of *trivium* and *quadrivium*. This interpretation is based on *Letter 21* of Grigor Pahlawuni, also called Magistros (eleventh century), which is the only existing description of such a *summa* explicitly associated with Anania Širakac'i, referred to by the name *k'nnikon* in the letter title. Given that the origin of the letter titles in this collection is unknown, it seems to us that taking this association between *k'nnikon* and the textbook as core evidence of Širakac'i's activity and to read all other records in this light raises serious problems of methodology. While Magistros' letters deserve to be examined afresh, as they open a number of questions related to Anania's legacy and works allegedly compiled by him and lost, we here demonstrate that medieval records present *k'nnikon* consistently in association with computational eras. Whether this was the case in the seventh century, is not possible to establish from known evidence, but it appears that later records, such as Taronec'i's *History*, used it to refer to Easter tables attributed to Anania Širakac'i.

Abbreviations:

BNF	Bibliothèque nationale de France
NHBL	Nor Baġirk' Haykazean Lezui
M	Mesrop Mashtots Institute of Ancient Manuscripts
MH	Matenagirk' Hayoc'

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