

A REASSESSMENT OF THE LIFE AND MATHEMATICAL
PROBLEMS OF ANANIA ŠIRAKAC'I

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INTRODUCTION

Anania Širakac'i has long occupied a prominent place in Armenian historical memory. Although he does not feature in any surviving historical composition from his own lifetime, at the start of the tenth century Yovhannēs Drasxanakertc'i deemed him worthy of inclusion in his *History*¹. The single reference presents him as someone who was commissioned by the Catholicos Anastas Akořec'i (661-667) to establish a fixed calendar. According to Yovhannēs, Anania accomplished this task but Anastas died before it could be ratified by a church council, leaving the traditional revolving calendar in place. In a work which is dominated by Armenian kings, princes and clerics, the inclusion of a notice referring to someone who did not apparently fall into any of these categories is intriguing but apparently little more than that. After all, Anania had been commissioned by a Catholicos. But the fact that this solitary passage also presents Anania undertaking a project of reform which was never implemented comes as more of a surprise. Why highlight a failed initiative? These two curious features are out of step with the remainder of the composition. Quite why Yovhannēs decided to include this intrusive notice in the first place is unclear but it does suggest that Yovhannēs had a particular interest in this subject or a particular knowledge of Anania.

Almost a century later, Step'anos Tarōnec'i elected to include a summary of Yovhannēs' account of this episode in his *Universal Chronicle*². As its title implies, Step'anos was interested in comparative chronology, fusing Armenian history and historical time with world history. The issue of calendar reform is consistent with this central theme and so it may be

¹ YK, xx, p. 92 = YK-M, p. 106.

² ST, II.2, p. 99 = ST-D, p. 128.

that its content determined its retention rather than the association with Anania. Intriguingly however Step'anos did more than simply abbreviate the original passage. Not only did Step'anos maintain that Anania's revised calendar was titled the *K'nnikon*; he also described that work as 'astonishing' or 'admirable', implying that he knew it personally or at least had heard about its high reputation³. This tallies with another of the prominent themes explored by Step'anos in his *Universal Chronicle*, namely the inclusion of prominent Armenian scholars and usually a reference to one or two of their works⁴.

Unlike Yovhannēs therefore, Step'anos connected the historical Anania with a specific composition. Unfortunately, no text bearing this title has yet been found and only tantalizing references remain. Using a catalogue compiled by Vardan Bałiřec'i, Mat'evosyan demonstrated that two manuscripts containing the *K'nnikon* of Anania had once been located in the monastery of Saint John the Baptist, more usually known as Amrdol or Amrdolu, in Bałēř/Bitlis, in the second half of the seventeenth century, and in any case before 1704 when Vardan died⁵. Since neither has been located, it is impossible to tell whether or not they were independent witnesses of the same composition, nor whether either had retained anything approaching a complete text. According to Mat'evosyan, the final trace is preserved in a colophon attached to a short florilegium, recording that it had been copied from the end of the *K'nnikon* of Anania řirakuni, described as a useful treatise, in the town of Bałēř at the monastery of Saint John the Baptist by Grigor the priest, in memory of Tēr Vardan, theologian and orator, and his parents Ełia and Łarip. This suggests a particular interest in the *K'nnikon* on the part of Vardan Bałiřec'i himself but it does not reveal its character. Thereafter the trail goes cold.

Far from being deterred, however, scholars have expended considerable energy — and shown remarkable ingenuity — trying to reconstruct the structure, contents and inspiration of Anania's original *K'nnikon*⁶. This task is not as futile as it might appear from the above discussion.

³ *K'nnikonn hrařazan*; Malxasean corrected it to *k'rōnikonn*. For a full discussion of this controversial term, see Mahé (1987), p. 168-170.

⁴ This theme is identified by Step'anos at the start of book II: ST, II.1, p. 60 = ST-D, p. 96. Individual scholars appear throughout books II and III. For example the brief reference to 'P'ilon T'irakac'i who translated the *History* of Socratēs into the Armenian language' follows the Anastas passage: ST, II.2, p. 99 = ST-D, p. 128.

⁵ Mat'evosyan (1974a), p. 73. For Vardan and the monastery of Amrdol, see Thomson (2001), p. 109-117

⁶ See in particular Mat'evosyan (1974a), (1974b), (1981) and (1994); Petrosyan (1980) and (1983); and Mahé (1987).

Although no text of the *K'nnikon* has been discovered, an eleventh-century Armenian author, Grigor Magistros, provided a convoluted description of the *K'nnikon* in the course of a letter composed to the Catholicos Petros Getadarj in 1037⁷. Grigor's literary style is notoriously allusive, requiring a deep knowledge of both Greek and Armenian in order to establish a secure meaning. It is also capable of more than one interpretation. Nevertheless, preferring Mahé's reconstruction of the *K'nnikon* to that of Mat'evosyan, Grigor reveals that Anania's composition, 'the great *K'nnikon*', comprised a theological discourse on divine teachings followed by a thorough examination of each of the four scientific arts, specifically arithmetic, music, geometry and astronomy, that is the *quadrivium*⁸. Each discipline was treated in the same fashion: a theoretical treatise supported by a body of additional texts and extracts which applied or illustrated the principles set out in the treatise. According to Grigor, these supplementary materials were derived from the works of Chaldeans, Greeks and every nation, and so in many cases, would have required translating into Armenian at some stage. They were likened, conceivably by Anania himself, to tiny particles, grains of pollen which he, like the industrious honey-bee, had hoarded in 'this hive', that is the *K'nnikon* itself⁹. The image conveyed by this simile is that the *K'nnikon* contained both theoretical and practical texts, each of which had been selected and then carefully filed away in its rightful place. The systematic organization of the *K'nnikon* reflected the segmented honeycomb of the hive, its individual cells contributing to the whole structure.

Grigor's letter offers a highly rhetorical impression of the *K'nnikon*. This reveals something of the work's inspiration, ambition and wealth of supporting materials; it does not however provide a specific record of its contents. As a consequence, scholars have turned to the multitude of mathematical and scientific texts preserved in Armenian, both original compositions and translated texts, whether complete, extracted, epitomized or fragmented, and have endeavoured to reconstruct the *K'nnikon* through them. This collection of heterogeneous material was described by Mahé as 'une poussière d'opuscules hétéroclites' and the contention which underlies this memorable phrase, that what survives of the *K'nnikon* is fragmentary, the debris of a complex literary composition, is very attractive¹⁰. In the

⁷ GM, p. 4. See Mat'evosyan (1994) for a thorough analysis.

⁸ Mat'evosyan (1974a), Mahé (1987), p. 170-176 and GM, p. 8.

⁹ GM, p. 8.

¹⁰ Mahé (1987), p. 176.

course of this intensive search, several original compositions have come to be associated with Anania Širakac'i, some as a result of historic attribution, others on the basis of modern scholarly assessment, even when this has required the text to be reassigned to Anania from someone else¹¹. Other texts have been identified as translations or adaptations from known works from Antiquity and late Antiquity¹². In these cases, the role of Anania, as translator or editor, has been much harder to determine with any degree of certainty¹³. Extending the above simile, the *K'nnikon* may once have contained the pure honey of human knowledge but, much like a bees' nest, it was also fragile and ephemeral. Once fractured, it has been virtually impossible to reconstruct.

Before setting out the particular aims of this paper, it may be helpful to take a step back and reassess the current state of Širakac'i studies. Since Patkanean published his *Mnac'ordk' banic'* in 1877, Anania Širakac'i has attracted a good deal of attention from a number of prominent Armenian scholars¹⁴. Their interests have ranged widely, from chronology, geography and cosmography to the principles adopted when translating from Greek into Armenian. That the body of materials attributed to Anania could accommodate so many different approaches and disciplines attests its extraordinary scope. It may also be the case that studying the works of the 'father of Armenian science', as Anania came to be dubbed, resonated with twentieth-century political beliefs and offered a suitable subject for academic research in ways that works on medieval theology or Biblical exegesis did not. Anania came to be projected as a national hero from the distant Armenian past, linking and affirming past and present identities. Xrlopyan even went so far as to argue that Anania was an enemy of the Church whose career was spent battling against its obscurantism¹⁵. Although few would agree with this proposition today, the consistent

¹¹ For example, the attribution of the *Cosmography* to Anania has not been challenged. By contrast, the *Geography* previously attributed to Movsēs Xorenac'i is now considered to be a work of Anania, exploiting the lost geographical text of Pappus of Alexandria. For a survey of this debate, including Abrahamyan's decisive contribution (Abrahamyan (1944), p. 150-200, see Hewsen (1992), p. 7-15.

¹² For fragments from the *Elements* of Euclid, see Mat'evosyan (1980).

¹³ Abrahamyan (1944) p. 175-182 illustrates this instability neatly, listing a mass of different texts and confidently asserting or rejecting their attributions to Anania. Such certainty seems misplaced. It is quite possible that Anania was responsible for the original translation or was otherwise involved in their transmission, but that such texts were revised or simply appropriated by later scholars, losing their original attribution in the process.

¹⁴ Patkanean (1877).

¹⁵ Xrlopyan (1964), p. 182.

promotion of Anania as a seventh-century Armenian polymath seems to have had several unintended consequences.

In the first place, there has been little interest in setting Anania in the wider context of intellectual currents across the Late Antique Middle East. Of course, the relative dearth of recent studies or translations of his works into languages other than Russian or Eastern Armenian has prevented scholars who have no knowledge of these languages from assessing Anania's broader significance for the history of science and mathematics or for the transmission and adaptation of learning between Antiquity and the medieval world. Moreover the two important editions of texts attributed to Anania were prepared by Abrahamyan and published in Erevan in 1940 and 1944¹⁶. Inevitably these were not distributed widely, posing an additional challenge for those with the linguistic competence to read them. But it may also be the case that integrating Anania into this broader history of ideas ran the risk of diminishing his status as heroic Armenian scientist, one deemed worthy of the honour of being one of the six figures represented on the exterior of the Matenadaran in Erevan. Instead of being treated as an isolated polymath, Anania and his works need to be studied generally in the context of contemporary academic trends across the East Roman Empire, and more specifically in the short-lived burst of intellectual activity in Constantinople during the reign of Heraclius.

A second unintended consequence has been the tendency to associate every medieval Armenian mathematical, scientific or cosmographical text, whatever its character, with Anania and his *grand projet*. Of course the putative structure of the *K'nnikon* requires a plethora of such texts and extracts. But did every such work preserved in Armenian feature in the *K'nnikon*? Abrahamyan for one seems to have recognized this potential problem and reattributed several texts to later scholars¹⁷. Yet some of the works consistently attributed to Anania seem too short or too mundane. For instance, the pedagogical value of the set of eight itineraries all starting or passing through historic Armenia and titled *Mtonač'ap'k'* seems very limited, yet this has been interpreted as one of the geographical texts associated with the study of geometry within the *K'nnikon*¹⁸. That it was subsequently grouped with other geographical texts, most

¹⁶ Abrahamyan (1940) and (1944).

¹⁷ See fn. 13 above. On the other hand, Abrahamyan reclaimed for Anania the *Tables of the Movements of the Moon* (*Lusni parberašrjannerē*) which he had himself previously attributed to Yovhannēs Imastasēr: see Abrahamyan (1962).

¹⁸ For the text, see Abrahamyan (1944), p. 355-356; tr. Manandian (1965), p. 160-170; tr. Hewsen (1992), p. 320-321; partial translation and analysis, Greenwood (2006), p. 140-147.

notably the *Ašxarhac'oyc'*, has been convincingly demonstrated by Mat'evosyan through his meticulous codicological research¹⁹. This however does not prove an original association between them or with the *K'nnikon*. Indeed it remains unclear quite how this short and very practical text contributed to the teaching or advancement of the science of geometry. Instead of associating it with the *K'nnikon*, it would make greater sense to compare it with other itineraries from Antiquity²⁰. Moreover while some texts may never have been incorporated within the *K'nnikon*, others may have been added subsequently. Conceivably the *K'nnikon* was a fluid compilation, whose contents fluctuated over time, reflecting the interests and resources of different teachers and practitioners. The capacity of this compilation to develop has not perhaps been sufficiently stressed.

One further consequence merits brief attention. Such has been the focus on the intellectual achievement and legacy of Anania Širakac'i that he has become almost completely divorced from his contemporary social and cultural environment. The historical context in which he was operating has largely been ignored. When did Anania undertake instruction in Trebizond? What were his scholarly ambitions and how did they change over time? In what social and intellectual context did he operate after returning from Trebizond? Who were his pupils and what was his academic legacy? In focusing so much attention on Anania the scientist, there is a sense in which the historical Anania has been sidelined.

This study is not intended to provide a thorough reassessment of Anania's scholarship or the structure or content of the *K'nnikon*. It is focused instead upon one of the short mathematical texts attributed to Anania, his *Problems and Solutions*, and offers an English translation of, and commentary on, all twenty-four problems²¹. Although Orbeli published a Russian translation in 1918 and Abrahamyan and Petrosyan a modern Armenian translation in 1979, the majority of the problems have never been translated and there has been no analysis of the work as a whole²². Admittedly individual problems have been translated and studied in publications over the course of the twentieth century but these have been selected in the context of wider research projects. For instance, Manandian

For its incorporation in the *K'nnikon*, see Mahé (1987), p. 181 and 187. For a complete study, see Petrosyan (1972).

¹⁹ Mat'evosyan (1979), p. 167.

²⁰ For instance, the fourth-century *Tabula Peutingeriana* (TP) or the late seventh-century *Ravenna Anonymous* (RA).

²¹ Abrahamyan (1944), p. 227-232.

²² Orbeli (1918); Abrahamyan and Petrosyan (1979)

discussed problem 23 in his much-cited monograph on commerce in medieval Armenia but he did so only because of its metrological significance²³. Garitte examined problem 8 in the course of his meticulous commentary on the *Narratio de rebus Armeniae* because it appeared to reflect a separate tradition surrounding the murder of the *marzpan* Surēn in 572 CE²⁴. Tēr-Lewondyan referred briefly to problems 2 and 18 in his influential article on seventh and eighth-century Armenia, but only insofar as the first traces a commercial route from Bahl to Širak and the second describes the manufacture of silver vessels²⁵. Mahé translated problem 1 in the context of a short preface, first discovered by Tēr-Mkrtč'ean and established by Mat'evosyan, which may have introduced the treatise on arithmetic²⁶. As will be demonstrated, studying the whole text opens up new layers of meaning which cannot be gained from examining individual problems.

However, in order to be able to set this text in its proper historical and intellectual context, we must first establish the life and academic background of its author. Therefore the remainder of this paper is divided into two sections. The first provides a fresh study of the historical Anania Širakac'i; the second assesses this mathematical composition.

The Life of Anania Širakac'i

The principal source for the life and career of Anania Širakac'i is the text which is commonly known as his *Autobiography*. Two recensions of this text exist. The shorter and later version was published by Patkanean in 1877 and translated into English via an intermediate (and unacknowledged) Russian translation by Conybeare in 1897²⁷. In 1944 Abrahamyan published the longer original version and it was on the basis of this edition that Berbėrian produced his French translation in 1964²⁸. In 1974 Mat'evosyan published a slightly revised edition of the text and Mahé translated a short extract from this into French²⁹. Mat'evosyan reprinted

²³ Manandian (1965), p. 125.

²⁴ Garitte (1952), p. 185. The murder of Surēn appears at §77 in the text; for a French translation, see Mahé (1994-1995).

²⁵ Tēr-Lewondyan (1984), p. 201.

²⁶ Mahé (1987) p. 181-182 and p. 195-196; Tēr-Mkrtč'ean (1896) and Mat'evosyan (1974b), p. 76-78

²⁷ Patkanean (1877), p. 1-4; Conybeare (1897), p. 572-574.

²⁸ Abrahamyan (1944), p. 206-209; Berbėrian (1964), p. 191-194.

²⁹ Mat'evosyan (1974b), p. 73-74; Mahé (1987), p. 195 and fn. 201 and 202.

his version of the text in 1988³⁰. In addition to this text, three short colophons have also been preserved, apparently composed by Anania himself³¹. These supply some useful historical information, as do the brief notices in the later historical compositions, discussed previously.

The following translation of the *Autobiography* is based principally on Abrahamyan's edition, although it includes one very significant phrase preserved only in Patkanean's shorter recension and also takes into account Mat'evosyan's revisions.

I, Anania Širakac'i, from the village of Anēank', consumed the entire body of literature of our Armenian nation and became well-versed in the divinely-inspired Scriptures. Day by day, I would illuminate the eyes of my mind, in accordance with the expression of the Psalmist³². In everything I would pay attention to the blessing of the wise and those who sought after wisdom, as Solomon had commanded: 'Acquire wisdom and strive to oppose ignorance by calling the creator [of ignorance] darkness'³³ and 'You who have rejected knowledge, I shall reject you also'³⁴. And being frightened by these threats, I wanted to attain blessing once more and I desired to pursue philosophy³⁵. I was particularly lacking in the science of mathematics³⁶, since I reckoned that nothing could be worked out without numbers, esteeming [this science] the mother of all knowledge. Since no-one could be found in this country of Armenia who knew philosophy, and not even books of the sciences could be found anywhere, therefore I made my way to the country of the Greeks. When I arrived in Theodosiopolis³⁷, I met there a very intelligent man, well-versed in ecclesiastical literature, who was called Etiazaros. He explained to me that there was a mathematician in the country of Fourth Armenia³⁸, and his name

³⁰ Mat'evosyan (1988), nos. 27.

³¹ Mat'evosyan (1988), nos. 24, 25 and 26.

³² For this sentiment, see Ps. 118.18 and 118.38. References to the OT are to the numbering in Zōhrapean's edition of the Armenian Bible.

³³ Reminiscent of Proverbs 4.7 and 4.19.

³⁴ Based on Proverbs 1.20-33.

³⁵ Philosophy: *imastasirut'iwn*.

³⁶ Science of mathematics: *aruest hamarotut'eann*.

³⁷ See Garsoïan (2004) for a recent study of the frontier and Garsoïan (2006) for a study of Theodosiopolis. Evidently Theodosiopolis/Karin did not fall within Anania's understanding of what constituted Armenia.

³⁸ Fourth Armenia: *ašxarh Ć'orrord Hayoc'*. Hewsens (1992), p. 17-27 defines the provinces of Byzantine Armenia and how they altered over time. After 536, Fourth Armenia was consistently applied to the districts of the former Armenian satrapies, with Martyropolis as its administrative centre. Hewsens (1992), p. 155-156 traces further developments after 591, including the incorporation of Amida and the temporary partition of the province.

was K'ristosatur. And when I travelled, I found the person he had told me about. When I had spent a period of six months with him, I realized that he did not have a complete understanding of the subject. Consequently I hastened to make my way to Constantinople when I happened to meet some of my friends who were making their way back from there. They said to me, 'Why are you undertaking a journey of such length? Isn't it the case that Tychikos, the master of Byzantium is close to us³⁹, on the shore of Pontus, in the city called Trebizond, a man filled with wisdom, who knows both the Armenian script and language and is celebrated among kings?' I asked them, 'How do you know this?' And they said, 'We have seen many follow this path, all heading for him, from many different regions, because of his powerful intellect. Just now, one of our fellow sea-travellers was Philagrios, a deacon of the patriarch of Constantinople, who was bringing many young men to him for instruction. When we arrived at Sinope⁴⁰, we met our friends and parted from him; we have travelled overland but if you hurry, you will find Philagrios still there⁴¹. When I heard this, my heart filled with joy I praised God, the foresighted provider, who is ready at hand to satisfy the desire of his servants, just as [Scripture] says: 'Look and you shall find.'⁴² And I went and found him in the martyrrium of St Eugenios⁴³ and I recounted my journey to him. He received me with joy and said, 'I thank God, who has sent you in search of knowledge so that you can take this science back to the see of St Grigor⁴⁴. And I am even more joyful that that country will be instructed by me, because in my youth I lived there for several years for my benefit in the land of Armenia. I rejoice at the coming of knowledge to it since at that time there was ignorance in it.' And the Lord allowed me to find favour with that man. And he loved me as his son and he imparted to me all his thoughts, to the point that all my fellow-pupils were envious of me, those who were from the royal court⁴⁵. I spent eight years

³⁹ Master of Byzantium: *vardapet Biwzandac'woy*.

⁴⁰ In the province of Paphlagonia on the Black Sea.

⁴¹ Philagrios: *PLRE* Philagrios 3 and 6; see below for further discussion.

⁴² Matt. 7.7.

⁴³ St Eugenios was martyred under Diocletian: Martin-Hisard (1981). Trebizond later developed as the site of his cult: Rosenqvist (2005), p. 32-34. This is the earliest reference to the association between St Eugenios and Trebizond.

⁴⁴ See of St Grigor: *vičak srboyn Grigori*. An ecclesiastical definition of Armenia based on the jurisdiction founded by St Grigor the Illuminator at the start of the fourth century. This lends some variety to the narrative. The following sentence employs 'the land of Armenia', *yerkrin Hayoc'*.

⁴⁵ From the royal court: *i dranēn ark'uni*.

with him and I gained a complete knowledge of the science of mathematics. I also gained some instruction in the other [sciences]. I became well-versed in many books which had not been translated into our language. For he had everything to hand, books that were available and those that were secret, profane and scientific works, historical narratives and medicinal and chronological works⁴⁶. Why should I name them individually, for there was not a book that could not be found beside him? Through the favour of the Holy Spirit he had an extraordinary gift for translating, such that when he wanted to translate books written in Greek, he did not hesitate like other translators but he used to read out in Armenian as if it had been written in Armenian. But since I do not want you to be ignorant of the merits of this most learned man, allow me to inform you by way of a story how he came to learn this language of ours and how he came to be instructed in such sciences.

This man was from the province of Pontus, from the city of Trebizond. During his youth he was enrolled in the staff of John, general of the emperor Tiberius, who spent several years in Armenia until the time of the emperor Maurice⁴⁷. And he learned our language and script. Then when the Persian army attacked the Greek army, which occurred near to Antioch, it so happened that he was wounded in the battle and escaped to Antioch and all his possessions were plundered. And when he had been ill for several days, and feeling anguish at the loss of his possessions, he asked God for a cure for his wounds and he swore an oath, that 'If you will graciously grant me a healthy life, I shall not amass earthly treasures but I shall pursue the treasure of knowledge, as the expression of the wise one says, 'Seek instruction and not silver, knowledge rather than pure gold'⁴⁸. And God granted his requests. When he had recovered, he went to the holy city of Jerusalem and stayed there for a month before moving on to Alexandria. He studied there for three years and then travelled to Rome where he spent a year before going to Constantinople.

⁴⁶ Books that were available... chronological works: *yaytnik' ew gaṭtnik', artak'ink', aruestakank' ew patmagirk', bžškakank' žamanakagirk'*. See Mahé (1987), p. 171-173 and especially fn. 86. Wolska-Conus (1989), p. 22 suggested that the 'secret books' comprised works on astrology and alchemy and this notion has been developed by Magdalino (2006), pp. 38-46.

⁴⁷ Lemerle (1964), p. 197-199 argued that this was John Mystakôn: *PLRE* Ioannes Mystacon 101. For further discussion, see below.

⁴⁸ Proverbs 8.10. The wise one, *imastunn* is Solomon, traditionally identified as the author of Proverbs. It is entirely appropriate that a text focused on the acquisition of knowledge should draw extensively from Biblical wisdom literature, and specifically Proverbs.

There he encountered a celebrated figure, *a master from Athens, city of philosophers*⁴⁹. He stayed with him for instruction for 10 years⁵⁰ and when he had achieved a complete knowledge in philosophy, he returned to his own place. Although the patriarch⁵¹ and the officials of the city implored him not to depart from there, he did not heed them, having pity for his own land, in accordance with what is written. He went and adopted a life of truth. Now a few years later the master died and none of his pupils were found to be of the same level in order to succeed to his position. They begged the much-missed Tychikos to come and take his place. At the same time, he was also ordered by the king. But he refused, saying 'I have covenanted with the king of heaven not to remove myself from here'⁵². So as a result, they used to come to him for instruction from there. But I believed that in his foresight, God had prepared him for the purpose of spreading knowledge among us.

And so I, this humble Armenian, learned this powerful science from him, which is desired by kings, and I introduced it to our country, without anyone's assistance, entirely through my own effort and with the aid of prayers to St Grigor, even though no-one was grateful or recognized my labour, because our people does not love learning or knowledge, since they are idle and lazy. For when I came, many rushed to me for instruction but having mastered a little, they left me and departed. Rather than staying to complete the discipline, they reckoned what little they had learned to be sufficient for the conduct of their lives. And a little while after leaving me, they began to teach what they did not understand and to proclaim themselves as masters, a title which they did not merit. These

⁴⁹ The phrase in italics is found in Patkanean (1877), p. 3: *or vardapet ēr at'enac'woc' k'atak'in*. By way of comparison, Abrahamyan (1944), p. 208 lines 24-25 reads as follows: *or vardapetiēr imastasirac' k'atak'in*, who taught the philosophers of the city. Mat'evosyan (1988), p. 20 and line 3 retains this reading. Clearly the two phrases are directly related. This translation treats Patkanean's edition as preserving the original reading, with Abrahamyan and Mat'evosyan reflecting a corrupted version of the same phrase. Confusingly, Berbérian (1964), at p. 193, simply conflates the two variants. I have preferred Patkanean's text at this point and omitted the alternate reading.

⁵⁰ The text here has two possible meanings. It can be read as *žams oč' sakaws*, that is 'for a considerable time', as Berbérian (1964), p. 193. However it can also be read as *Žams [oč' sakaws]*, that is 'for 10 years', with the qualifying adjective a later gloss from an uncomprehending scribe who read *žams*, that is 'time'. Given that the text defines in specific terms the time that Tychikos spent in Jerusalem, Alexandria and Rome, and following Mat'evosyan (1988), p. 20 and line 4, I have preferred the second reading whilst not excluding the first.

⁵¹ Undoubtedly patriarch Sergios, in office between 18 April 610 and 9 December 638.

⁵² This clever response enables Tychikos to disobey a direct imperial command.

hypocrites, full of vanities, appear to have the impression of wisdom and demand to be addressed by men as ‘rabbi’. Moreover they have accused me of ignorance, those who had been moulded by me; if I had possessed wickedness like them, I would not have opened my mouth for the sake of instructing anyone and especially not for ungrateful ones. But since I recall the expression of the Lord who said ‘Vengeance is mine and I shall exact it’⁵³, and also ‘Put my gold out to money-managers and when I come, I shall collect with interest’⁵⁴, therefore I did not turn away anyone who wanted to learn, and in the future I shall not turn them away. I leave this as an everlasting monument⁵⁵ for you who shall come to this country after me, those who love learning and desire meaning and knowledge. And glory, honour and power to Christ, the one who grants gifts, now, always and for ever and ever, Amen.

Although this text is usually cited as the *Autobiography* of Anania, it does not fit easily into any modern definition of that genre. We are not told when Anania was born, nor his family circumstances, nor where he was living or what he was doing at the time he wrote this text, nor what he had written up to that point. Instead the self-portrait is focused on his education and his academic career. Thus it is less an autobiography, more a statement of academic pedigree such as one might find in a preface, recording where Anania had travelled in pursuit of knowledge, which disciplines he had mastered, and under whom he had studied⁵⁶. Evidently this final element was particularly important. Lemerle observed that the text is ‘une double biographie,’ tracing the life of both Anania and his teacher, Tychikos of Trebizond⁵⁷. Anania was anxious to establish not only his own academic credentials but also those of his teacher Tychikos, to whom almost a third of the text is devoted. It was only through Tychikos that Anania could associate himself with the principal centres of learning in late Antiquity, namely Constantinople and Alexandria; he did not claim

⁵³ Rom. 12.19; Heb. 10.30.

⁵⁴ Mat. 25.27 with gold, *zoskid*, for silver, *zarcat’d*.

⁵⁵ The structure and meaning of this puzzling sentence has attracted considerable debate. Following Mahé (1987), p. 178-179, it seems to be commending the thing which is eternal — conceivably the *K’nnikon* itself — to those for whom it has been compiled, namely the future *vardapets*.

⁵⁶ Mahé (1987), p. 178 argues convincingly that the *Autobiography* in fact possesses ‘toutes les caractéristiques d’une préface’. Rather than seeing the text as a remarkable early medieval witness to self-knowledge and self-discovery, it makes much better sense to interpret it as a preface to a major work from which it has become detached.

⁵⁷ Lemerle (1964), p. 195.

to have travelled there in person. Extending Lemerle's contention, there are good grounds for arguing that it is in fact a triple biography because some attention is also given to the unnamed 'master of Athens' resident in Constantinople who trained Tychikos. His identity is discussed below. Such a chain of academic authorities enabled Anania to hold himself out as someone who had been schooled in the traditions of higher learning and philosophy practiced in Constantinople, even though he had never set foot in the imperial capital.

The cause of Anania's sensitivity over his academic pedigree emerges at the end of the text. Anania reveals that former pupils were holding themselves out as masters — fraudulently in his view, since they had an incomplete knowledge and did not merit that title — and were accusing him of ignorance. Quite how they had managed to avoid this taint of ignorance themselves given their tuition under Anania is not explained. This text therefore has a defensive quality to it, fending off recent criticisms from former pupils and accusing them of wrongdoing in return⁵⁸. In this respect, the *Autobiography* resembles the *Letter* of Łazar P'arpec'i, appended to his *History*, in which the historian sought to defend himself against a range of accusations from slanderous monks⁵⁹. Whilst the rights and wrongs of the parties cannot be determined, Anania seems to be describing a squabble among academics, with all sides querying the others' qualifications and experience. That there should be such scholarly rivalry in Armenia at this time is very intriguing in its own right, for it suggests both a demand for educated men on the one hand and a competitive aspect to securing patronage and sponsorship on the other. But when was 'this time'?

Anania tells us nothing about his origins in this text other than that he came from the district of Širak, to the north of the river Araxes and to the west of Mt Aragac', a district which had been inside Persarmenia, that is Sasanian-controlled Armenia, for much of late Antiquity⁶⁰. The

⁵⁸ The late twelfth-century chronicler Samuel Anec'i identifies five pupils of Anania: Hermon, Trdat, Azaria, Ezeikiēl and Kirakos. He records under the year 712 CE that these pupils all went to Jerusalem and confessed two natures of Christ but that on their return, the true *vardapet* Anania refused to receive them. They in turn accused him of heresy wherever they went: SA, p. 85. No other trace of these pupils has yet been discovered. The year allocated to the notice looks impossibly late and the confessional dimension may well be contrived. The above text does not hint at this reason. On the other hand, the *Autobiography* confirms that Anania did have pupils, so Samuel's notice may not be entirely fanciful.

⁵⁹ ŁP p. 185-204 = ŁP-T, p. 247-266.

⁶⁰ Hewsen (2001), maps 55 and 65.

name of his home village is given as Anania in the text but this is surely a simple copying error, for one of the colophons and Samuel Anec'i both describe Anania as coming from the village of Aneank' in Širak, which may be a plural form of Ani⁶¹. We learn from another colophon that Anania's father was called Yovhannēs Širakac'i⁶². Berbérian suggested that he may have been related to the noble house of Kamsarakan, which controlled Širak in the seventh century, on the grounds that different members of this family feature in Anania's writings, including his *Problems and Solutions*⁶³. This remains unproven but seems unlikely. There is no overlap between the usual names associated with the Kamsarakan house — Nerseh, Hrahat and Sahak — and Anania and his father Yovhannēs which might afford even weak evidence for such a connection⁶⁴.

Nevertheless there are two pieces of evidence which do reveal something about Anania's background. Firstly, as Malxasean surmised, in order to travel and study outside Širak for such a long period — at least nine years — Anania must have had private means of some kind to support himself⁶⁵. One intriguing feature of the text is that Anania was at pains to stress that he had undertaken his academic career without the assistance of, or at the behest of, anybody else. This puts him at odds with other seventh and early eighth-century Armenian scholars whose activities can be traced through colophons. We know for example that Dawit' Tarōnac'i translated the *Girk' Pahoc'* of Basil of Caesarea from Greek into Armenian in the city of Damascus, at the command of Hamazasp *curopalates* and *tēr Mamikonēank'*⁶⁶. According to the final notices in Sebēos's *History*, Hamazasp Mamikonean was appointed prince of Armenia and *curopalates* by Constans II in the first months of 655 and there are strong grounds for believing that he was killed in the aftermath of the first *fitna* in late 660⁶⁷. Dawit' completed his commission for Hamazasp between 655 and 661. It is therefore appropriate to find that Hamazasp was described by Sebēos as 'a lover of reading and learning'⁶⁸. Another

⁶¹ Mat'evosyan (1988), no. 24: *Es Ananiē Širakac'i i [g]ełj Anenic'*; SA, p. 84: *zmec vardapetn Anania yAnēic' gełjē*.

⁶² Mat'evosyan (1988), no. 25: *...es Ananiay ordi Yovhannisi Širakaywoy...*

⁶³ Berbérian (1964), p. 189.

⁶⁴ Greenwood (2004), p. 64-68 and A.7, A.12 and A.13.

⁶⁵ Malxasean (1961), p. 169-170.

⁶⁶ Mat'evosyan (1988), no. 23. The colophon is preserved in Matenadaran 822 (1285 CE), at fol. 156a. See Uluhogian (1981). Ananean (1982) published one of the homilies by Basil of Caesarea translated by Dawit' Tarōnac'i, *On the Nativity of the Saviour (Homilia in Sanctam Christi Generationem)*.

⁶⁷ Sebēos, p. 175, ll. 9-12 = Sebēos-T, p. 153.

⁶⁸ Sebēos, p. 174, ll. 30-31 = Sebēos-T, p. 151: *ēnt'erc'asēr ew usumnasēr*.

better-known colophon sheds some light on the activities of two Armenian scholars and their sponsors. It records that abbot Grigor Jorap'orec'i had translated the *History of the Life of Saint Sylvester* eighteen years before P'ilon Širakac'i translated an abridged version of the *Ecclesiastical History of Socrates Scholasticos*⁶⁹. Since P'ilon included a synchronism which equates to the year 695/6, evidently Grigor undertook his commission in 677/8. Grigor is described as the interpreter of the late Nerseh, prince of Virk' and son-in-law of the Kamsarakank'. According to the *Anonymous Chronicle*, the prince of Virk' was killed in battle against the Khazars on 10 August 685⁷⁰. P'ilon composed an extensive eulogy to lord Nerseh, *apiwhipat* and *patrik*, again suggesting a specific commission from the head of the Kamsarakan house⁷¹. Unlike these three figures, Anania does not identify any sponsor or supporting institution. The very fact that Anania could spend almost a decade studying suggests that he had private wealth to sustain him.

The other piece of evidence about Anania's family background has not previously been noted. Anania records in the second of his mathematical *Problems* that it was one of his relatives who had been mustered to Bahl and who sold fractions of an enormous pearl in various places and at different rates on his journey home⁷². Since Armenians were periodically summoned for military service on the eastern frontier of the Sasanian Empire, Anania seems to be envisaging one of his relatives responding to such a call to arms⁷³. Whether he did actually serve in this capacity or engage in such commercial transactions on his route back to Širak is less significant than Anania's attitude towards this possibility. Evidently he was completely at ease with a relative acting in this way, implying that such a journey was conceivable even if it did not actually happen. In summary therefore it seems that Anania came from an Armenian family of some means, perhaps from the lesser nobility in Širak, who served the house of Kamsarakan, but not the princely house itself.

⁶⁹ Mat'evosyan (1988), no. 29. For a translation and further discussion of this colophon, see Thomson (2001b), p. 10-11 and p. 35-40. Abbot, *abas*.

⁷⁰ *Anon. Chron.*, p. 80 and Abrahamyan 1944, p. 399.

⁷¹ Mat'evosyan (1988), no. 28. For a translation and further commentary, see Thomson (2001b), p. 9-11, 35-40 and p. 228-229.

⁷² AS, p. 227-228.

⁷³ See for example the later career of Smbat Bagratuni. According to Sebēos, Smbat was sent by Xosrov II against the K'ushans and after a series of military actions, defeated their king in single combat and pursued the fleeing K'ushans as far as their capital, Bahl, plundering Harew (Har'ev), Vatagēs (Bādḡīs), Toxorostayn (T'ocharistan) and Tałakan (Taleqān) along the way: Sebēos, p. 101-103 = Sebēos-T, p. 49-53 and p. 183-189, which dates these campaigns to 614 and 615. The geographical precision is significant.

The contention that Anania was not commissioned or directed to undertake his training outside Armenia but travelled on his own initiative is supported by the haphazard route he followed in his quest for instruction in the science of mathematics. He went first to Theodosiopolis, ‘in the country of the Greeks’, where he met Eliazaros, who directed him to a mathematician in Fourth Armenia named Christosatur⁷⁴. Even after the emperor Maurice’s reorganization of the four Armenian provinces in 591, Fourth Armenia still broadly corresponded to the territories of the former satrapies or *gentes* which had been incorporated into the provincial network at the start of Justinian’s reign⁷⁵. It is possible that Anania went to one of the major cities located in this province, Martyropolis or Amida. He was there for only six months because it soon became obvious that Christosatur did not have a complete grasp of the subject. Therefore Anania resolved to travel once more, this time to Constantinople, on what would have been the third leg of his quest. However a chance encounter with friends prompted him to change his plans. It is at this point that the lives of Anania and Tychikos coincide. Crucially, it is only through this intersection that a secure chronology can be established for the life and education of Anania.

As the text indicates, the unidentified friends told Anania about the scholarly reputation of Tychikos. So powerful was his intellect that he attracted many pupils from different regions to himself in Trebizond, on the coast of the Black Sea. Indeed one of their fellow sea-travellers had been none other than Philagrios, deacon of the patriarch of Constantinople, who was conveying many young men to Tychikos for instruction. Anania’s friends had disembarked at Sinope and continued their journey overland but they advised Anania that if he hurried he would find Philagrios still there, which I take to mean Trebizond, rather than Sinope⁷⁶. Therefore Anania’s friends had travelled by ship from Constantinople to Sinope. They must have met Anania somewhere fairly close to Trebizond since they described Tychikos as ‘close’ and reckoned that Anania had a chance of meeting Philagrios there. On the other hand, it had to be somewhere inland. Arguably Anania was travelling north to the coast, to travel by sea to Constantinople and his friends were returning eastwards, to Şirak. This meeting prompted Anania to alter his plans and he went to

⁷⁴ Fourth Armenia stretched from the southern branch of the Upper Euphrates, the Arsanios/Aracani river, to the upper Tigris and its tributaries: Hewsen (1992), p. 154-157; Hewsen (2001), p. 84-89 and map 65.

⁷⁵ Adontz (1970), p. 24-37 and p. 127-141.

⁷⁶ Sinope: in Paphlagonia, on the Black Sea coast.

Trebizond instead, where he spent the next eight years under instruction from Tychikos.

Leaving Anania to one side for the moment, let us turn to the career of Tychikos. Tychikos was a native of Pontus, a region which had been under Roman control since the first century BCE and the era of Mithradates and Pompey. The text reveals that in his youth, he had served on the staff of John, general of the emperor Tiberius, who spent several years in Armenia until the time of Maurice. In his thoughtful study, Lemerle proposed that this general should be identified as John Mystakon, *magister militum per Armeniam* in the reign of Tiberius and briefly *magister militum per Orientem* in the first two years of Maurice's reign, until he was replaced at the end of 583⁷⁷. This seems entirely plausible. On the other hand, Lemerle places the next episode in the career of Tychikos — in which he was wounded in a battle near Antioch, lost all his possessions and dedicated his life to learning in the event that he was restored to health — in the context of the Persian campaign of 606 which resulted in the submission of Antioch⁷⁸. There are strong grounds however for reinterpreting this notice as a reference to the failed counterattack undertaken by Heraclius in 613. Sebēos' *History* records a hard-fought encounter outside the city of Antioch: 'the blood of the soldiers flowed copiously by the city of Antioch. There was a terrible tumult and conflict and immense slaughter amidst the chaos.'⁷⁹ If Tychikos was born c. 560, he would have been in his late-teens when he joined the staff of John Mystakon and just over the age of fifty in 613.

According to Anania, following his recovery, Tychikos went to Jerusalem where he spent a month before moving on to Alexandria where he spent three years. Alexandria fell to the Persians in 619 and so it is unlikely that it was this event which prompted his departure to Rome, in c. 617. On the other hand, the Persian threat may already have been apparent. Following this revised chronology, Tychikos would have been in Rome in 618 and in Constantinople from 619⁸⁰. We then reach a critical question: how long did Tychikos stay in Constantinople studying with the eminent master from Athens? According to Abrahamyan, followed by Berbērian, the text reads *žams oč' sakaws*, that is 'for a considerable time'⁸¹. However,

⁷⁷ Lemerle (1964), p. 197-199.

⁷⁸ Lemerle (1964), p. 199-201.

⁷⁹ Sebēos, p. 114, ll. 33-35 = Sebēos-T, p. 68 and p. 206.

⁸⁰ *Chron. 724*, p. 146 = *Chron. 724-P*, p. 17: 'AG 930 In June of the same year Alexandria was captured'. See also Kaegi (2003), p. 91.

⁸¹ AS, p. 208, l. 26; Berbērian (1964), p. 193.

following Mat'evosyan, it can also be read as *Žams* [oč' *sakaws*], that is 'for 10 years', with the qualifying adjective a later gloss from an uncomprehending scribe who saw only *žams*, that is 'time'⁸². If we accept that Anania did specify the time Tychikos stayed in Constantinople, it follows that he left the city in 629.

Even if this reading is rejected, nevertheless a date for his departure can be established from Anania's narrative. It is accepted that from 622 until some time after the conclusion of the war with Persia in spring 628, perhaps as late as mid 631, the emperor Heraclius spent long periods away from Constantinople on campaign. In his absence, the city and the government were in the care of a regency council, consisting of the patriarch Sergios, the *magister officiorum* Bonos and other leading figures⁸³. Therefore when Anania states that it was the patriarch of Constantinople and city officials who attempted to dissuade Tychikos from returning to Trebizond, unsuccessfully as it turned out, it suggests that Tychikos left Constantinople at a time when Heraclius was away and the council was in control.

Viewed in isolation, this argument might seem unconvincing; the failure to mention the emperor hardly proves he was away on campaign. When assessed in the light of the following narrative however, it becomes more persuasive. Anania reveals that a few years later, the celebrated scholar resident in Constantinople died. None of his immediate pupils were deemed to be of the same calibre as their master and so Tychikos was invited to return to Constantinople and take his place. The text does not specify who invited Tychikos, although it would seem to be easiest to imply the patriarch Sergios and his circle once more. On this occasion, however, the emperor was also involved, dispatching a separate letter commanding Tychikos to return. This reference to the intervention of Heraclius is significant for two reasons. Firstly it provides another chronological marker. After the conclusion of hostilities with Persia in March 628, Heraclius was involved in a complex set of political and theological initiatives in the Near East whose chronology is not secure but which seem to have kept him away from Constantinople almost continuously until the middle of 631, when he celebrated a triumph⁸⁴. It seems very unlikely that Heraclius would have become personally involved in this affair unless he

⁸² Mat'evosyan (1988), p. 20, l. 4.

⁸³ *PLRE* Bonus 5. For their appointment on 5 April 622 by Heraclius, see Theoph. 303 = Theoph-MS, p. 435. For their role in the siege of Constantinople in 626, see *CP*, p. 715-726 = *CP-W&W*, p. 168-181 and esp. fn. 461.

⁸⁴ Nik. c.19 and p. 185-186.

was back in Constantinople. Therefore I would contend that Tychikos was not invited to return to Constantinople before summer 631 at the earliest.

The personal intervention of Heraclius in this appointment is entirely consistent with his commitment to, and promotion of, higher education in Constantinople. One of the strongest pieces of evidence for his involvement in this program of intellectual revival — in which the patriarch Sergios also played a prominent role — appears in the highly rhetorical Dialogue between History and Philosophy which prefaces the *History* of Theophylact Simocatta. Philosophy maintains that she had been ostracized from the royal colonnade under Phokas but had been brought back by Heraclius⁸⁵. This has usually been interpreted as an allusion to the arrival and establishment of the philosopher Stephen of Alexandria as a teacher in Constantinople⁸⁶. Although he has been described as a very shadowy figure, a meticulous study by Wolska-Conus offers a much sharper outline of his contribution to the intellectual life of both Alexandria and Constantinople⁸⁷. She argues persuasively and on several grounds that Stephen of Alexandria and Stephen of Athens, previously treated as two separate figures, should be viewed as one and the same person. Therefore the eminent master from Athens described by Anania as instructing Tychikos in Constantinople was none other than Stephen of Alexandria. Just as Heraclius was instrumental in Stephen's original appointment, he also tried to persuade Tychikos to return to Constantinople and succeed his master.

Through this text therefore, Anania established his academic pedigree, to Tychikos and ultimately back to Stephen of Alexandria. It is in this broader intellectual and philosophical context, of Stephen of Alexandria, Heraclius and Sergios in Constantinople, that Anania should be studied. This is not the occasion to explore the relationship between the corpus of texts attributed to Stephen of Alexandria and those attributed

⁸⁵ TS, Dialogue (5) = TS-W&W, p. 4 and fn. 7.

⁸⁶ In reply, History avers that she was saved by the 'great high priest and prelate of the universal world' who 'brought me to life, raising me up, as it were, from a tomb of neglect': TS, Dialogue (8-9) = TS-W&W, p. 4. This is an unequivocal reference to the role of the patriarch Sergios in sponsoring historical compositions. It is striking that Philosophy described the patriarch as 'my oldest friend and most familiar treasure'. This implies a close relationship between Sergios and Stephen of Alexandria. The despatch of pupils by Sergios for instruction under Tychikos in Trebizond should therefore be interpreted as continuing an existing programme of tuition previously agreed by Sergios and Stephen for young clerics.

⁸⁷ For doubts, see Wilson (1983), p. 46-47. See now Wolska-Conus (1989) and especially Magdalino (2006), p. 28-48.

to Anania, the lost library of Tychikos in Trebizond serving as the intermediary between them. Nevertheless it is highly significant that Stephen taught arithmetic and astronomy within the much broader syllabus of the *quadrivium*⁸⁸. He composed an introduction to the commentary of Theon of Alexandria on the *Tables* of Ptolemy, adapting them for use in Constantinople⁸⁹. Indeed it is highly likely that the emperor himself was involved in this composition in some way because several of the manuscripts attribute this to Heraclius himself. Internal references suggest that this was composed ‘in the seventh indiction (1.ix.618–31.viii.619), during the ninth year of Heraclius (5.x.618 – 4.x.619)⁹⁰. Magdalino has suggested that Heraclius had a particular interest in astronomy, and perhaps astrology as well⁹¹. In the light of the promotion of learning and philosophy by Heraclius, Anania’s quest for advanced instruction in the art of mathematics becomes less surprising than it might at first appear. When Anania describes this powerful science as ‘desired by kings’, this may be an implicit reference to Heraclius’ own enthusiasm for higher education.

This leads us back to the question of when Anania travelled to Trebizond. Following the chronology proposed above, he would have arrived there at some point after mid-631, that is, after Tychikos had refused the invitation to return to Constantinople. On the other hand, it seems unlikely that students would have been dispatched to Trebizond after patriarch Sergios died on 9 December 638 and was buried four days later⁹². By this date, the Empire was engaged in a desperate struggle to defend its beleaguered eastern provinces from Arab attack. The identity of the deacon Philagrios may offer one final chronological clue. A Philagrios was appointed to the key fiscal office of *sakellarios* after the death of the previous incumbent Theodore Trithyrios at the battle of Yarmūk on

⁸⁸ Wolska-Conus (1989), p. 11-17. The *Life* of Basil I records that ‘Stephen the Mathematician’ supplied the horoscope which predicted the circumstances of Heraclius’ death: *VB*, p. 338. See also Magdalino (2006), p. 46 and fn. 72, which cites a short astronomical text preserved in *Vat. gr.* 2210, edited by Schoene (1875), col. 63: ‘And from Diocletian until the 7th year of the reign of Constantine, great grandson of Heraclius, under whom Stephanos the philosopher of Alexandria interpreted the astronomical tables, 392 years’. Magdalino’s translation unfortunately omits the crucial phrase ‘of Alexandria’ but this appears in the text cited in the footnote.

⁸⁹ Tihon (1981), p. 608; Wolska-Conus (1989), p. 11-12.

⁹⁰ Wolska-Conus (1989), p. 12 and fn. 31 and Magdalino (2006), p. 35. If one accepts the chronology proposed above it is striking to observe that Tychikos arrived in Constantinople in the same year, 619.

⁹¹ Magdalino (2006), p. 34-46.

⁹² *De. Cerim.*, p. 630: ‘On the thirteenth of December, a Sunday, 12th Indiction [638], Sergios the Patriarch of Constantinople was buried’.

20 August 636⁹³. The contemporary chronicler John of Nikiu reveals that Philagrios was 'beloved' in Constantinople whilst Kaegi has sought to connect Philagrios with generous endowments to churches at the end of Heraclius' life⁹⁴. If Philagrios the deacon and Philagrios *sakellarios* were one and the same, the sea-voyage journey described by Anania would have had to have taken place before autumn 636 at the latest.

Even if the transfer of Philagrios from the service of patriarch Sergios to the office of *sakellarios* remains speculative, this revised chronology places Anania's quest for mathematical instruction firmly in the 630s and almost certainly between 631 and 638. This differs from both Lemerle, who argued that Anania began his course of instruction with Tychikos between 620 and 630, and Mahé, who suggested that Anania began his quest in 648 and reached Trebizond in 651; it concurs however with Zuckerman who argued in favour of the early 630s⁹⁵. Mahé's contention relies on an obscure phrase in one of the colophons, dated on other grounds to the year 660, which may refer to 'the eleventh year of my journey'⁹⁶. It could however be translated as 'in the eleventh rotation' or 'revolution'. Quite aside from the uncertain meaning of this clause and whether or not the start of his journey should be equated with the start of Anania's quest for instruction, in 651 Tychikos would have been in the region of ninety years old. This seems too late. Conversely, Lemerle's dating is also problematic, on different grounds, for the 620s witnessed years of intense campaigning by Heraclius, predominantly in the Caucasus. It is possible that Anania travelled to Theodosiopolis, then Fourth Armenia and finally Trebizond during this decade without interruption. However neither the description of the voyage from Constantinople to Sinope by Persarmenians from Širak, nor the shepherding of students from Constantinople to Trebizond by Philagrios, fit easily into such a period of bitter conflict⁹⁷. They sit more comfortably within a peaceful era. It is also worth noting that there is little evidence to suggest that Persarmenians sided with and assisted Heraclius

⁹³ Kaegi (2003), p. 275-276.

⁹⁴ JN-C, c. 119.21-24; Kaegi (2003), p. 276. Kaegi's argument depends however on a difficult passage in John of Nikiu's *Chronicle*.

⁹⁵ Lemerle (1964), p. 201-202; Mahé (1987), p. 159, fn. 1; Zuckerman (2002), p. 257-258. Recently Mosshammer (2008), p. 249, proposed that Tychikos took up residence in Trebizond between 600 and 620 with Anania studying with him 'sometime thereafter'; this is unsubstantiated.

⁹⁶ Mat'evosyan (1988), no. 24: '...i metasanerordi šrjagayut'eann, i ŽT' [19] *ami {K}jostandianos...*' Zuckerman (2002), p. 259-261, distinguishes Anania's eight-year stay with Tychikas from the eleven years of travel apparently referred to in this colophon.

⁹⁷ 'Persarmenian': Armenians from those districts which had historically fallen under Persian suzerainty. By 622, Byzantine influence had not apparently operated over these districts for fifteen years.

during his eastern campaigns. His strategy from the start depended upon drawing in Turkic support. This resulted in the sack of Partav and then Tiflis in 627 by Turkic forces and the devastation of many other districts in Iberia, Albania and Armenia as well⁹⁸. This would hardly have endeared Heraclius to the local elites, so reducing the probability of Persarmenians travelling to and from Constantinople before the end of the war.

By contrast the transformed conditions of the 630s provide a fitting context for Anania's search for knowledge. The last great war of Antiquity was over. In its immediate aftermath, Heraclius sponsored a series of initiatives across the Near East designed to bring about reconciliation between the different Churches, adopting a new Christological formulation and promoting the unifying symbol of the Cross of Christ⁹⁹. The recovery of the True Cross from Persia and its triumphal restoration to Jerusalem on 21 March 630, in the presence of Heraclius, had a central role to play in this radical ecclesiological programme¹⁰⁰. Sebēos preserves a remarkable fragment of a letter, apparently sent to Heraclius by the Armenian Catholicos in response to the arrival of a letter from Jerusalem reporting the reinstatement of the True Cross¹⁰¹. That the letter was addressed to Heraclius implies that the announcement of its restoration was made by the emperor. Two years later Heraclius was himself involved in negotiating a rapprochement, if not an outright union, with the Armenian Church¹⁰². The discussions took place in Theodosiopolis and the Catholicos Ezr was persuaded to sign up to the plan; whether he was induced or duped, as some later commentators asserted, need not concern us here. Crucially, the two churches were no longer divided along confessional lines. Anania's discussions with Eliazaros in Theodosiopolis and his instruction in Trebizond alongside young clerics from the patriarchate of Constantinople seem entirely consistent with this changed ecclesiastical atmosphere. Anania's own views at this time cannot be determined although there are grounds for arguing that he later came to view the Imperial church with antipathy¹⁰³.

⁹⁸ Howard-Johnston (1999), esp. p. 22-26 and p. 40-41; Kaegi (2003), p. 142-144.

⁹⁹ Thierry (1997); Whitby (1998); Drijvers (2002); and Kaegi (2003), p. 192-198 and p. 213-217.

¹⁰⁰ Mango (1985); Flusin (1992), I, p. 98-99 and II, p. 293-309; Sebēos-T, p. 226-227

¹⁰¹ Sebēos, p. 118 = Sebēos-T, p. 72-73. For a short description of the ceremony itself, see Sebēos, p. 131 = Sebēos-T, p. 90-91.

¹⁰² Sebēos, p. 131-132 = Sebēos-T, p. 91-92 and p. 228; Mahé (1993), p. 468-471; Garsoïan (1999), p. 385-390; Greenwood (2008), p. 339-340.

¹⁰³ Apart from the disdain towards the clergy of St. Sophia's, expressed in Problem 3 (discussed below), Anania's treatises on calculating the dates of Epiphany and Easter,

Crucially, several other indicators point to an expansion of Byzantine authority eastwards during this decade, into districts which had traditionally fallen under Persian influence and control. The boundary between the two great powers was redrawn twice between 628 and 630, both times in favour of Byzantium. The final agreement, negotiated at Beroea between representatives of Boran and Heraclius, revived the frontier previously established in 591 between Maurice and Khusro II; this had involved substantial Persian concessions, the price for backing against the pretender Bahram Chubin¹⁰⁴. This redefinition of the respective sectors was one element. The surviving Armenian inscriptions from this decade reveal a concerted attempt to integrate the Armenian elite into the political orbit of Constantinople through the distribution of imperial titles. The Mren inscription records that Dawit' Saharuni was honoured with the important titles of *patrikios* and *curopalates*¹⁰⁵. No less significant was the grant of the minor title of *elustrillustrios* to Grigor, the founder of the modest church at Ałaman, for this indicates a systematic down-reach into the ranks of the lesser nobility¹⁰⁶. These same inscriptions are dated using regnal years of Heraclius, and this feature, in conjunction with the presence of epithets applied to the emperor, together confirm that imperial correspondence circulated in Armenia during this decade¹⁰⁷. Both the dates and the epithets were lifted from imperial protocols. A further gauge of Byzantine interest in Armenia during this decade may be found in the distribution of silver hexagrams, reflected in hoards and stray finds during archaeological excavations¹⁰⁸.

This is the changed political context in which Anania resolved to embark on his search for instruction in mathematics. Thirty years had passed since the teachers and intellectual resources within the Byzantine Empire had last been available and accessible to Armenians from beyond the frontier. Anania therefore seized the opportunity. Nevertheless two questions remain outstanding. Why was he so interested in mathematics? And what did he hope to gain from his long years of study, aside from

preserved separately but originally a single discourse, both anticipate counter-arguments proposed by 'the Greeks': Abrahamyan (1944), p. 283-291 (tr. Terian (2008), p. 141-154; and Abrahamyan (1944), p. 292-299 (tr. Conybeare (1897).

¹⁰⁴ Howard-Johnston (1999), p. 26-29.

¹⁰⁵ Greenwood (2004), A.7 and p. 72-73.

¹⁰⁶ Greenwood (2004), A. 4 and p. 71.

¹⁰⁷ Greenwood (2004), p. 42-47.

¹⁰⁸ Mousheghian (2000) lists both stray finds from the excavations at Dvin and several important hoards, notably the two hoards from Dvin (p. 107-133); the Koš hoard (p. 164-165) and the Šamšadēn hoard (p. 193-194).

private satisfaction? Neither can be answered with any confidence but three contentions may be advanced, albeit tentatively.

One interpretation of Anania's mathematical interest is to place it in an ecclesiastical context, arguing that he was aware of the importance of mathematics for paschal calculations as well as calendrical reform and universal chronology¹⁰⁹. He subsequently composed a treatise on calculating the correct date for the Nativity and for Easter, the basis for his 532 year cycle of Easter calculations, set out in twenty-eight tables, each of nineteen years¹¹⁰. Together they confirm that Anania applied his knowledge in this direction. This does not however prove that such projects were in view from the start; rather it reveals the ends to which he was able to put his mathematical training and abilities. Indeed although the historical tradition records that he was commissioned by Catholicos Anastas to create a fixed calendar — an event which may be associated with the discrepancy between the imperial and the Armenian Churches over the correct date of Easter in 665 — there is no evidence of prior ecclesiastical direction or encouragement. Anania may have ended up in the service of Catholicos Anastas but it is not at all clear that this was what he envisaged when he set out on his quest.

A second approach is to accept Anania's testimony at face value, that he recognized an absolute lack of mathematical experience and competence within Armenia and was inspired to remedy this. Anania emerges as someone who mastered the four mathematical sciences which collectively made up the *quadrivium* in order to teach this body of knowledge to his own pupils in the future. In support of this, it is worth noting again how much stress is placed in the *Autobiography* on Tychikos' conspicuous talents as a translator from Greek into Armenian. It may therefore be the case that Anania saw himself from the outset as someone who could forge an academic career, an Armenian 'master' who could bridge the gap between distinct intellectual cultures, attracting pupils to himself for tuition in the higher disciplines. If this were the case, Anania seems to have enjoyed some success, for he himself refers to 'many' rushing to him for instruction.

The third contention is more speculative. Far from being the disinterested scholar, it is possible that Anania was initially inspired to seek instruction in the higher disciplines not because he wanted to transmit

¹⁰⁹ Mosshammer (2008), especially p. 245-277, which assesses and contextualises Anania's output.

¹¹⁰ See above fn. 103 and Mahé (1987), p. 165-167.

these to future generations but because he wanted to obtain preferment in the service in the Byzantine state. With Sasanian Persia convulsed by civil war, and Heraclius taking conspicuous interest in extending imperial influence and control eastwards across Armenia, including the district of Širak, a career in the imperial administration appeared to be a highly attractive prospect, a means of advancement other than through military service. Mastering sophisticated modes of thought and analysis across several intellectual disciplines may have offered one route into the institutions of the Byzantine state, one that did not rely on family background or patronage. As someone who was thoroughly proficient in both Greek and Armenian, Anania may even have been envisaging a role in the expanded provincial administration.

If so, Anania's ambitions were quickly thwarted by circumstances outside his control. The extension of Byzantine influence across Armenia proved to be ephemeral and his long years of study turned out not to be the passport to advancement and success in imperial service¹¹¹. Nevertheless his time with Tychikos qualified Anania as a teacher in his own right and he was able to attract pupils to himself. This is not to say that Anania remained content with his lot. His frustration is clearly visible at the end of the *Autobiography*, where he criticises his pupils for leaving before they had completed the full course of study, for setting themselves up as masters in their own right — and so in competition with him — and even accusing him of ignorance. Yet the very fact that Anania had pupils in the first place is striking, for the contemporary historical context would not appear to have been conducive to such academic training, let alone academic rivalries. The first Arab raid into Armenia in late 640 may not have been decisive from a strategic perspective but it ushered in two decades of instability and unpredictability, of campaign and counter-campaign¹¹². We shall return to the issue of Anania's legacy below.

Whatever the original motivation underlying Anania's pursuit of mathematical knowledge, by the time he had completed his studies with Tychikos, he was confronted with radically changed circumstances. The

¹¹¹ The Byzantine defeat at Yarmūk on 20 August 636 and the invasion of Egypt by 'Amr b. al-'Aṣ in late 639 represent two critical moments.

¹¹² The first Arab raid into Armenia occurred in the autumn of 640, with Dvin being captured and plundered on 6 October 640 after a five day siege: Sebēos, p. 138-139 = Sebēos-T, p. 100-101. The sequence of campaigns to early 655 may be traced through Sebēos p. 138-147 and p. 162-177 = Sebēos-T, p. 100-113 and p. 132-154. A description of the final expulsion of Byzantine forces in the immediate aftermath of the first *fitna* may be preserved in Łewond p. 12-14 = Łewond-A, p. 53-54, recording a battle and a Byzantine defeat on the banks of the Euphrates.

intellectual climate in Constantinople had also transformed. The deepening crisis in the Near East, with cities and provinces falling out of imperial control and the military seemingly powerless to halt the Arab forces, curtailed the short but highly significant intellectual revival under Stephen of Alexandria. As we have seen, in the immediate aftermath of Stephen's death, the patriarch Sergios was prepared to ferry students to study under Tychikos in Trebizond but one suspects that this was a temporary solution which ended after his death in December 638. As Magdalino has observed, only Maximus the Confessor continued to reflect something of this Alexandrian system of thought and instruction¹¹³. Significantly Maximus argued that a true knowledge of God began with a contemplation of the universe, that understanding the natural world was as important as understanding Scripture for any student of theology. There would therefore seem to be merit in comparing the cosmology of Anania Širakac'i with that of Maximus, his immediate contemporary.

This however is not the only potential comparative study that should be undertaken involving Anania. Ideally, any broader study of intellectual history in the seventh century should also explore the works and thought of Anania Širakac'i in comparison with those of Theodore of Tarsus, archbishop of Canterbury between 668 and 690. This suggestion might seem surprising but it has been proved that Theodore spent time in Constantinople as a young man. According to Lapidge, 'the entire complexion of scholarly interests in [Theodore's] Canterbury biblical commentaries implies that he did indeed study there [in Constantinople]'¹¹⁴. Moreover Lapidge has identified a precise parallel between a discussion on lunacy in Theodore's second series of Gospel glosses and Stephen of Alexandria's *scholia* on the *Prognostica* of Hippocrates¹¹⁵. He has also discerned other correlations between their compositions, as well as noting Theodore's evident expertise in medicine, computus, astronomy and astrology, mirroring Stephen's capacities in these disciplines. It is very tempting to speculate that Theodore himself was a pupil of Stephen. We have seen that Anania was a pupil of a pupil of Stephen. Intriguingly therefore it may be possible to trace the influence of Stephen of Alexandria by comparing Latin texts

¹¹³ Magdalino (2006), p. 37 and p. 42-43.

¹¹⁴ Lapidge (1995), p. 8-19, at p. 17. Theodore's awareness of Persian culture, reflected in his Biblical commentaries, seems to reflect first-hand experience, gained in his youth during the Persian occupation of Syria; he had been born in Tarsus in 602. It is therefore likely that Theodore studied in Constantinople while Tychikos was also studying there, 619-629.

¹¹⁵ Lapidge (1995), p. 18.

attributed to Theodore of Tarsus with Armenian texts attributed to Anania Širakac'i. This opens up a range of possibilities: what did they retain, what did they develop and what did they discard of Stephen's original teachings¹¹⁶?

Having touched briefly on the intellectual legacy of Stephen of Alexandria, let us now turn to consider Anania Širakac'i's intellectual legacy. As with Stephen, this can be gauged in two ways, in terms of pupils and in terms of scholarly compositions. Anania does not identify any of his troublesome former pupils by name; as we have seen, the late twelfth-century chronicler Samuel Anec'i is the first to name Anania's pupils: Hermon, Trdat, Azaria, Ezekiēl and Kirakos¹¹⁷. They are otherwise unattested. The colophons cited above refer to three scholars from the second half of the seventh century: Dawit' Tarōnac'i, abbot Grigor Jorap'orec'i and P'ilon Širakac'i¹¹⁸. Aside from the fact that the texts translated by Dawit' and abbot Grigor betray clerical interests, their education and careers remain obscure. On the other hand, more is known about P'ilon Širakac'i. Not only did he translate the *Ecclesiastical History of Socrates Scholastikos* (known as the Shorter Socrates or SII) in 695/696 for Nerseh Kamsarakan; I have argued elsewhere that he was also responsible for the compilation known as the *Anonymous Chronicle*¹¹⁹. It is striking that Part I of this composite work seems to be related to the chronography compiled at the very start of the fifth century by Annianus of Alexandria¹²⁰. Part II consists of a synoptic ecclesiastical history, extending from the foundation of the Church down to the Council *in Trullo*, whose eighteenth and final session concluded on 16 September 681¹²¹. It displays a surprising interest in the affairs of the Alexandrian church down to the fifth century. Although speculative, this Alexandrian dimension could be connected to the chain of scholars outlined above, linking Anania, Tychikos and Stephen of Alexandria. P'ilon's name was clearly inspired

¹¹⁶ It also follows that direct correspondences between the two bodies of material may reflect a common origin, namely lost works attributed to or used by Stephen himself.

¹¹⁷ See above, fn 58.

¹¹⁸ The district of Tarōn was located to the west of Lake Van whilst Jorop'or was to the north of Sevan. For the amendment of P'ilon's name from T'irakac'i, to Širakac'i, see Thomson (2001b), p. 38.

¹¹⁹ Thomson (2001b); for his role in the compilation of the *Anonymous Chronicle*, see Greenwood (2008b), p. 249.

¹²⁰ *Anon. Chron.* p. 1-34 Abrahamyan (1944), 357-378; Greenwood (2008b), p. 212-225 and p. 250.

¹²¹ *Anon. Chron.* p. 35-80, Abrahamyan (1944), 378-399; Greenwood (2008b), p. 225-248 and p. 250-254.

by Philo of Alexandria, the first-century Jewish philosopher¹²². Like Anania, he came from Širak; unlike Anania, his connections with the Kamsarakan family amounted to specific sponsorship. Although none of these observations proves that P'ilon was one of Anania's pupils, collectively they support this contention.

Reviewing the above, one further proposition emerges. In the second half of the seventh century, there were several centres of intellectual activity across Armenia, each linked to different noble houses. Dawit' Tarōnac'i was commissioned by the *curopalates* Hamazasp Mamikonean between 655 and 661; abbot Grigor Jorap'orec'i was sponsored by Nerseh prince of Virk' in 677/8; and P'ilon Širakac'i by Nerseh Kamsarakan *apiwhipat* and *patrik* in 695/6. Of Anania's career we know only of his commission from Catholicos Anastas, between 661 and 667, although the proximity to the Kamsarakan house attested in the *Problems and Solutions* suggests an association with that noble house as well. This contention, that academic interests were not confined to the Catholicosate but were promoted by several prominent noble houses, is corroborated indirectly by Anania himself. He criticised his former pupils for offering instruction when they were unqualified to do so. This implies a competition for pupils as well as a demand for educated men. That the colophons reflect a diversity of sponsors may be another expression of this lively intellectual climate.

The challenges of trying to establish exactly which texts Anania composed, which he compiled and then determining their state of preservation have been discussed above. It seems highly likely that he assembled a large collection of materials during his extended stay with Tychikos in Trebizond with a view to using this body of knowledge on his return to Armenia. His appreciation of Tychikos' gift for translating from Greek into Armenian is significant, for it suggests that he considered this to be particularly important. The original form of this collection took and how it developed remain obscure. It retained the title of *K'nnikon* and its attribution to Anania into the eleventh century, when Grigor Magistros described it. That the compilation resurfaced in this context in this period is not coincidental. Grigor was a noted Armenian scholar from a prominent Armenian family who came to enjoy a very successful career in the service of Byzantium. As in the 630s, the first half of the eleventh century witnessed significant expansion eastwards by the Byzantine empire,

¹²² A number of Philo's works were translated into Armenian and have been preserved. For a complete list of these, and accompanying secondary literature, see Thomson (1995), p. 75-76 and Thomson (2007), p. 177.

both in terms of provincial administration and episcopal oversight. In the person of Grigor Magistros, Anania's vision of a career in imperial service was eventually realized; the irony is that the two were separated by four centuries.

Anania's Problems and Solutions

Having reconstructed the life of Anania, we come to the final part of this study, Anania's *Problem and Solutions*. The following translation derives from Abrahamyan's edition, which is based on two versions of the text, one preserved in Matenadaran 699 (A) and the other in Matenadaran 3078 (E); both manuscripts are sixteenth-century miscellanies¹²³. It is clear from the critical apparatus supporting Abrahamyan's edition that, with one exception, the differences between the two versions are minor and do not present significant semantic or philological concerns. Furthermore it is encouraging to find that seventeen of the twenty-four problems generate the solution supplied. Mathematical problems are very sensitive to alteration, with the slightest numerical change preventing resolution of the equation. Of the seven problems which cannot be solved, four of them are entirely consistent with the other seventeen problems in terms of their character, geographical context or association with the Kamsarakan family¹²⁴. Only the final three problems are of a different mathematical nature; problems 22 and 24 can only be solved using an algorithm whilst problem 23 involves manipulating large numbers¹²⁵.

The major discrepancy between the two versions occurs at the start of the text. Abrahamyan derived his short title, *Ananiayi vardapeti Širakunwoy yałags harc'man ew lucman*, from manuscript A although it is striking

¹²³ Abrahamyan (1944), p. 227-232.

¹²⁴ The seven problems: problems 7, 12, 15, 21, 22, 23 and 24. Of these, problem 12 lacks a specific dram value which has clearly dropped out. It can be solved if someone, conceivably the first person narrator who commissioned the boat, contributes 3 drams. Problem 15 has been slightly corrupted but it is possible to get very close to the given answer, without being able to identify exactly what has been changed. Problems 7 and 21 are not capable of resolution in their present form. The final three problems are discussed below.

¹²⁵ Mahé (1987), p. 168, fn. 62 asserts that the algorithm producing the solution for problems 22 and 24 is unknown. The answer to problem 22 however reveals five pairs of answers which when added together, equal 20. So the first and tenth amounts total 20, as do the second and ninth, the third and eighth, the fourth and seventh and the fifth and sixth. The fact that each of these calculations still works — revealing incidentally that they were devised around multiples of 11 — demonstrates remarkable precision on the part of the copyists and supports the contention that this text has undergone minimal alteration or corruption.

that even A lacked *vardapeti Širakunwoy*; in truth this is Abrahamyan's title. The title and introductory sentences preserved in E were therefore relegated to the notes. In my view however, far from being problematic, this introduction offers vital insight into the original purposes and inspiration behind the text. It needs to be treated as part the original composition. It is composed in the first person, conceivably by Anania himself, and directed at 'you', by which I understand the author to be referring to present and future pupils. In fact the introduction even defines the subject matter: *yałags bažanmac' ew apac'uc'ic'*, 'fractions and equations', far more precisely than the otherwise vague *yałags harc'man ew lucman*, 'problems and solutions'. It is highly practical, recalling three useful questions from many which had previously been posed by Anania's original teacher (presumably Tychikos) but which needed to be borne in mind by any prospective mathematician. But even more than this, this introduction implies that it was providing worked examples, demonstrating how one went about answering this type of mathematical problem. If so, the text originally comprised much more than simply the questions and numerical answers; it also contained the sequence of mathematical procedures and calculations which generated each solution. At some stage in the course of transmission, this working was lost and with it the original purpose behind the composition, namely as a series of problems to illustrate principles and approaches discussed previously. As it is, the title reveals that this text was to be found *yałags kata[r]man hamarotut'eann*, that is at 'the end of the Arithmetic'. This suggests that these practical examples appeared at the end of a much longer work on Arithmetic, conceivably the title given to one of the sections in the *K'nnikon*. Finally it is worth noting that if one combines the attribution, *Ananiayi*, with the last four words of E's introduction, *yałags harc'man ew lucman*, one is left with the title found in A. This cannot be coincidental. E therefore preserves the original opening; A's title is a simple but drastic abridgement of this. For all of these reasons, the translation set out below prefers E's title and introduction.

Of Anania concerning the end of the Arithmetic and various questions¹²⁶

[227] He said everything wisely; however a few from many [sayings]: 'What is the derivation? What is the elucidation? What is the multiple?' And everything about fractions and equations, you were in need of a

¹²⁶ The language of this introduction is extremely technical. So *ëndunelut'iwn*, derivation; *bac'adrut'iwn*, elucidation; *bazmapatik*, multiple.

summary of these notions. Through making a demonstration, I shall try [to supply this] by means of a few [examples] in the manner of an introduction through a treatise, passing over errors¹²⁷ for the sake of coinciding properly with the most profound. So from here, straightaway, concerning problems and solutions:

Problem 1. I heard from my father that in the time of the Armenian wars against the Persians, Zawrak Kamsarakan performed very brave deeds¹²⁸. And in the space of one month, on three occasions he attacked the Persian forces and killed half of the force on the first occasion and coming up in pursuit he killed a quarter of the force on the second occasion and an eleventh on the third. And the survivors escaped and fled to Naxčavan, 280 in number¹²⁹. Now we must work out from those who survived, how many there were before the slaughter.

Problem 2. One man from my relatives was summoned to Bahl and found a valuable pearl¹³⁰. Returning home, he reached Ganjak¹³¹ and sold half of the pearl for fifty drams per grain¹³². And coming to Naxčavan, he sold a quarter of the pearl for seventy drams per grain. And arriving in Dvin he sold one twelfth of the pearl for 50 drams per grain; and when he came to us in Širak, he had left 24 grains of this pearl. Now, work out from that which remains [228] how many [grains] was the pearl and how many drams the value of the pearl?

Problem 3. Likewise, I heard from the master [*vardapet*] that thieves entered the Markianos Triklinos [the Dining Hall of Marcian] and stole three-quarters of the treasure¹³³. And when the treasurers entered, they

¹²⁷ E reads *zař ceruneac' anc'anelov* but perhaps it should read *zařaceanc' anc'anelov*.

¹²⁸ Zawrak Kamsarakan: otherwise unknown member of this princely house.

¹²⁹ Naxčavan: a city on the Araxes which was clearly fortified by the middle of the seventh century; see Sebēos, p. 174 = Sebēos-T, p. 150, where it features alongside Dvin and Karin/Theodosiopolis as a major centre for operations and hostilities in 655. The Persians are depicted retreating to a fortified base.

¹³⁰ Bahl: *šahastan* of the K'ušans; see Sebēos, p. 103 = Sebēos-T, p. 52.

¹³¹ Ganjak: *šahastan*, in Atrpatakan, south east of Lake Urmia.

¹³² *Dram*, Armenian transliteration of Persian *drahm* or *drachm*, the Sasanian silver coin; grain, *hat*.

¹³³ Although no room of this name is recorded, or has been located, in the Great Palace in Constantinople, *Triklin* is a straightforward transliteration of the Greek *triklinos*, a dining or ceremonial hall, which is applied to at least six structures within the Great Palace; see Dagon (1996), Plan 2, following Vogt's reconstruction: the Triklinos of the Scholae (6), the Triklinos of the Excubitors (8), the Triklinos of the Candidati (9), the Triklinos of the Nineteen Couches (14), the Chrysotriklinos (built by Justin II) (25) and the Triklinos of Justinian II (33). It is possible that this chamber was later renamed; the

found 421 *kendinar* and 3,600 *dahekan*¹³⁴. Now work out from that which remained, how much in total was the treasure?

Problem 4. The salary of the clergy of St Sop'ia [is as follows]: the deacons receive a fifth and the priests receive a tenth and the bishops receive 240 *litr*¹³⁵. And 2000 *litr* the other clergy. Now work out in total, how many *litr* is the salary?

Problem 5. The salary of the cavalry is divided as follows: one quarter to the nobles, one eighth to the senior men and 150 *kendinar* to the rest of the cavalry¹³⁶. Now work out in total how many *kendinar* are there?

Problem 6. There was a lettuce in my garden¹³⁷. And a Roman entered for the purpose of refreshment and he ate a fifth and a fifteenth part of the lettuce. And having realized the gluttony of the man, I threw him out and entered and examined it. And I found 110 roots. Now work out in total how many roots had the lettuce and how many roots did the Roman eat?

Problem 7. I was at Marmēt, in the ostan of the Kamsarakank¹³⁸. And when I went to the edge of the river which they call Axorean, I saw shoals of fish and I had them cast a net. And they pulled together a 1/3 and 1/7 of the shoal. And those which escaped from the net were gone in the twinkling of an eye. And having crossed, I found forty-five. Now work out through these in total how many fish were there in the shoal?

Problem 8. In the time of the rebellion of Armenians against the Persians, when Zawrak Kamsarakan killed Surēn, one of the Armenian *azatk'* sent a messenger to the king of the Persians to bring him the bad news¹³⁹.

problem envisages that it was being used as a treasury, a long way from its original function. It may also be entirely fictitious. Marcian (25.viii.450–27.i.457) was emperor at the time of the Council of Chalcedon, known to and rejected by many Armenian clerics; Marcian's notoriety from an Armenian perspective may explain the attribution.

¹³⁴ *Kendinar*, the Armenian transliterated form of centenarium, a weight equivalent to a hundred Roman pounds, in this context of gold. *Dahekan*, a gold coin, in this context, a nomisma. There were 72 *nomismata* in a Roman pound of gold.

¹³⁵ *Litr*, again transliterated form of liter, the Roman pound.

¹³⁶ Salary of the cavalry, *h'og spayic'n*; nobles, *patuaworac'n*; senior men, *awagac'n*.

¹³⁷ Lettuce, *hatar*. Evidently this description does not match a lettuce but a root vegetable such as a radish.

¹³⁸ Marmēt: at the confluence of the rivers Araxes and Axurean; hence problem 10 below. *Ostan*: of Persian origin, denoting royal land but in an Armenian context, perhaps domain or estate.

¹³⁹ Surēn: the victim, variously *hazarapet* or *marzpan* of Armenia and named Čihovr Všnasp (ST, II.2, p. 84 = ST-D, p. 116) came from one of the leading noble families,

And he travelled fifty miles [*mton*] a day. And 15 days later, Zawrak Kamsarakan found out and he sent men in pursuit to seize him and they travelled at 80 miles a day. Now work out in how many days did they reach him?

Problem 9. The hunt of the Kamsarakank' was at Gēn and it had seized much game. And part of the hunt was given to me to carry, one wild boar. And since it was huge in size, I weighed it and found its intestines $\frac{1}{4}$ of the whole weight and the head $\frac{1}{10}$ and feet a $\frac{1}{30}$ and teeth $\frac{1}{90}$ and the rest 212 *litr*. Now work out in total how many *litr* was the wild boar?

Problem 10. A cuttle-fish was caught at Marmēt on the river Erasx. And I weighed it and I found its head a quarter of the whole weight and its tail $\frac{1}{6}$ [229] and its body 140 *litr*. Now work out in total how many *litr* was it?

Problem 11. A merchant passed through three cities. And in the first they levied a duty¹⁴⁰ and removed a half and a third of his goods. And in the second city they worked out what he had and they removed a half and a third. And in the third city they worked out the rest and they removed a half and a third. And when he came to his house, 11 *dahekans* were left. Now work out in total how many *dahekans* did he have?

Problem 12. I wanted to make a boat and my courtiers¹⁴¹ were there and there was nothing else. And I said to my relatives, 'Give to me each one something small which I shall make the boat'. One gave $\frac{1}{3}$ of the weight [*kšroyrn*], one gave $\frac{1}{4}$, one a $\frac{1}{6}$ and one a $\frac{1}{7}$ and one a $\frac{1}{28}$ [and X contributed 3 drams]¹⁴². And I received and built the boat. Now, work out in total how many drams was the boat?

Problem 13. One of my pupils collected wonderful apples at Xar¹⁴³ and came to present them to me. Three groups played a trick on him and the first group took away a half and a quarter of the apple[s] and likewise the

arguably of Parthian origin (Pourshariati (2008), esp. p. 59-70); it is not a personal name. This problem is based upon the revolt of 572, see below. *Azat* is often translated as 'noble' but it derives from the Middle Persian *azād*, indicating one's free, as opposed to non-free, legal status.

¹⁴⁰ Duty, *baž*.

¹⁴¹ Courtiers, *dramkunk'*.

¹⁴² By inserting this phrase, the equation works and produces the solution supplied at the end of the text.

¹⁴³ Xar: unknown but it could be a variant of Kars, in Vanand, the district to the west of Širak. Xarberd, the fortress of Xar, in the district of Anjit in Fourth Armenia seems too far away.

second, a half and a quarter and likewise the third. And he brought the remainder to me, 5 apples. Now work out in total, how many [apples] were there?

Problem 14. There was some wine in a large jar¹⁴⁴. The following day, three marble vessels were made ready¹⁴⁵. And I commanded the wine to be decanted. And one carried a third and one a sixth and the other a fourteenth and they removed the remainder to other vessels and it was 54 jugs¹⁴⁶. Now work out in total how much [wine] was there?

Problem 15. I had a fine horse. I sold [it] and with $\frac{1}{4}$ of the proceeds I bought a cow, and with $\frac{1}{7}$ a wild goat and with $\frac{1}{10}$ an ox; and with 318 dahekan, I took sheep. Now work out in total how many dahekan [was the horse worth]?

Problem 16. I built a church. I had one stone-cutter who cut 140 stones a day and after 39 days of work, I had another stone-cutter and he cut 218 stones per day. And when he was equal to him, the church was finished. Now work out in how many days did he reach parity?

Problem 17. A boat was travelling full of wheat. And a whale¹⁴⁷ gave chase to the boat and the passengers were afraid and they threw out half the wheat. And on day 2, they threw out a fifth part of the remainder and on the third day, $\frac{1}{8}$, on the fourth, a $\frac{1}{7}$. Then they reached a haven and there remained 7,200 [baskets]¹⁴⁸. Now work out in total how much [wheat] was there?

Problem 18. I had one *apaṭarē*¹⁴⁹. I broke [it] and made other vessel[s]. I made one third into a *mesur* and I made a quarter into another *mesur* and a fifth I made into two *bažaks* and a sixth I made into two *skuteṭs*¹⁵⁰. [230] And I made one *skawaṛak*¹⁵¹ out of two hundred and ten drams. Now work out in total, how many [drams in weight] was the *apaṭarē*?

¹⁴⁴ Large jar, *karasi*.

¹⁴⁵ Three marble vessels, *t'akoykk' kčēay erek'*. For *vardiw*, I have read *vatriw* but the meaning is not clear.

¹⁴⁶ Vessels, *amans*; jugs, *p'as*.

¹⁴⁷ Whale, *kēt* but more commonly *ketos*. This problem is based on the familiar Biblical story of Jonah; see Jonah 2.1 where the Lord sent a great whale, *kitin meci* to swallow Jonah and Jonah was in the stomach of the whale, *p'or kitin*, for three days.

¹⁴⁸ It is only from the solution that the measure of weight, *kayt'*, basket, is given.

¹⁴⁹ *Apaṭarē*, a container for holding water. This is a compound Middle Persian word, *āb* meaning water and *gīr*, from *grifian*, to hold or contain.

¹⁵⁰ *Mesur*, a large metal vessel; *bažak*, a drinking vessel; *skuteṭ*, a plate.

¹⁵¹ *Skawaṛak*, a plate. This is also a Middle Persian word, *kabārag*.

Problem 19. A man went into three churches and in the first he entreated God, 'Give to me as much as I have and I will give to you 25 *dahekan*. Likewise in the second he gave the 25 and likewise in the third. And he had nothing left. Now work out, how much did he have in the first?

Problem 20. The camp of Nerseh Kamsarakan lord of Širak and Aršarunik' was set up at the foot of the mountain which they call Artin¹⁵². And during one night many herds of wild asses entered. And since the hunters were not skilled, they ran and told him in the village of T'alín¹⁵³. And he went with his brothers and the *azatk'* and they arrived and massacred the animals. And the animals were completely trapped. And they killed a quarter with arrows. And they saved the young, which was 1/12. And 360 died from the lance. Now work out in total how many were there?

Problem 21. Nerseh Kamsarakan son of Aršawir and homonymous ancestor of this Nerseh, defeated the Bahlilčik' in battle and captured very many of them¹⁵⁴. And on arriving at the royal court, he presented to the king of the Persians the usual [share?] of the prisoners¹⁵⁵. And having counted the usual [share?], he offered to the son of the king a 1/7 part. And being dismissed by them he turned to his country. And he went to the house of the *garikpet*¹⁵⁶ and was greatly honoured by him, not as a *naxarar*¹⁵⁷, but as one of the kings. And he gave him 1/8 of the prisoners. On coming to the *spasayapet*, whom they call the *xoravarán*¹⁵⁸, and being honoured even more by him, he gave him 1/12 of the prisoners.

¹⁵² Artin: in Širak, approximately 12 kilometres west of Mastara, 15 kilometres north-west of T'alín.

¹⁵³ Village of T'alín, *i geaw'n T'alín*. The problem envisages Nerseh Kamsarakan staying in T'alín and not the camp itself. The Kamsarakan house was closely associated with T'alín and founded at least two churches there: see Greenwood (2004), p. 74 and A.12.

¹⁵⁴ *Bahlčac'n*, the inhabitants of the city of Bahl. For Armenian involvement in such a campaign at the start of the seventh century, see Sebēos, p. 103 = Sebēos-T, p. 52. See also problem 2 above.

¹⁵⁵ *zhasarak gerwoyn*, the usual share of the prisoners. The meaning of this phrase is not clear but it seems to imply that Nerseh gave the king his reserved portion first and that this did not count for the purposes of resolving the equation. If this is translated as 'half the prisoners', the equation cannot be solved.

¹⁵⁶ For *garikpet*, read *darikpet*, the transliterated form of the Middle Persian *darigbed*, master of the palace. See Gyselen (2002), p. 56-57 and p. 113-115.

¹⁵⁷ For use of this term in Sasanian Persia, see Gyselen (2004) and Gignoux (2004), p. 41-43.

¹⁵⁸ *Spasayapetn zor xorawarann koč'en*, again the transliterated form of the Middle Persian *spāhbed xwarwārān*, the general of the west: Gyselen (2001), p. 35-45. For a useful recent summary of Sasanian bureaucracy, see Daryaee (2003).

And having moved on, he arrived in his own country and his younger brother Hrahat presented himself before him and he gave to him $1/14$ of the prisoners. And having moved on, the Armenian *azatk'* presented themselves before him and he gave to them $1/9$ of the prisoners. Arriving at Vałaršapat, he gave to the holy churches $1/16$ of the prisoners¹⁵⁹. And when his elder brother Sahak came, he gave him $1/20$ of the prisoners. And there were 570 people left. Now work out in total, how many were there?

Problem 22. Pharaoh the king of the Egyptians used to celebrate the day of his birth and it was customary for him to give on that day to 10 *naxarars* according to the tenth rank 100 large jars [*karas*] of wine mixed with incense. Now divide that according to the 100th degree.

Problem 23. I had a warehouse in which there were 200 baskets [*kayt'*] of barley. Mice entered and ate all the barley. I caught one of the mice and I rebuked [it]. He confessed and said, 'I only had 80 grains [*haf*]'. So work out in total how many grains were there altogether in the warehouse and how many mice ate [them]?

Problem 24. There were three fountains in the city of the Athenians of equal size and three pipes came to [each] fountain. One pipe because it was fast-flowing filled the basin of the fountain in one hour. The second, smaller than it, filled it in two hours. And the third, even smaller, filled in three hours. Now work out, if the pipes were combined together, in what fraction of an hour will they fill the basins?

- Solution to problem 1: Before the massacre, there were 1760 cavalry.
 Solution to problem 2: The pearl was one hundred and forty-four grains and the value of the pearl was 6720.
 Solution to problem 3: The treasure was 1686 *kendinar*.
 Solution to problem 4: The salary of the clergy was 3200 *litr*.
 Solution to problem 5: The salary of the cavalry was 240 *kendinar*.
 Solution to problem 6: The root of the lettuce was 150.
 Solution to problem 7: There were in total 420 fish.
 Solution to problem 8: They arrived in 25 days.
 Solution to problem 9: The wild boar was 360 *litr*.
 Solution to problem 10: The cuttle fish was 240 *litr*.

¹⁵⁹ Vałaršapat (also called Nor K'alak' and today Ĕjmiacin), the principal devotional centre of the Armenian church by virtue of its association with St Grigor the Illuminator. In the middle of the seventh century, it had three major religious sites: the holy *Kat'olikē* or Cathedral, the church of St Hrip'simē and the church of St Gayanē. The Cathedral and St Hrip'simē both had religious communities attached to them; see Garsoian (1999), p. 279-280.

- Solution to problem 11: The merchant had 2376 *dahekan*.
- Solution to problem 12: The boat was 42 drams.
- Solution to problem 13: There were 320 apples.
- Solution to problem 14: There were one hundred and twenty six jugs [p'as] of wine.
- Solution to problem 15: The price of the horse was six hundred and sixteen *dahekan*.
- Solution to problem 16: The stone-cutter reached parity in 70 days.
- Solution to problem 17: The bread in the ship was 24,000 baskets [*kayt'*].
- Solution to problem 18: The *apaṭarē* was 4200.
- Solution to problem 19: There were 21 $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{8}$ *dahekan*.
- Solution to problem 20: There were in total 2160 asses.
- Solution to problem 21: There were in total 2240 prisoners.
- Solution to problem 22: 1. 1, $\frac{1}{2}$, $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{55}$
 2. 3, $\frac{1}{2}$, $\frac{1}{10}$, $\frac{1}{40}$, $\frac{1}{88}$
 3. 5, $\frac{1}{3}$, $\frac{1}{15}$, $\frac{1}{44}$, $\frac{1}{60}$, $\frac{1}{66}$
 4. 7, $\frac{1}{5}$, $\frac{1}{20}$, $\frac{1}{44}$
 5. 9, $\frac{1}{11}$
 6. 10, $\frac{1}{2}$, $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{22}$, $\frac{1}{30}$, $\frac{1}{33}$
 7. 12, $\frac{1}{2}$, $\frac{1}{10}$, $\frac{1}{22}$, $\frac{1}{30}$, $\frac{1}{33}$, $\frac{1}{55}$
 8. 14, $\frac{1}{3}$, $\frac{1}{10}$, $\frac{1}{15}$, $\frac{1}{22}$
 9. 16, $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{22}$, $\frac{1}{55}$
 10. 18, $\frac{1}{12}$, $\frac{1}{22}$, $\frac{1}{33}$, $\frac{1}{44}$
- Solution to problem 23: There were in the warehouse 8,294,000 grains and there were 100.3.6000.800 mice, the consumers of the barley.
- Solution to problem 24: The combined pipes fill the basins in 20, 4, $\frac{1}{6}$, $\frac{1}{16}$ and $\frac{1}{18}$ of an hour.

Although there is no colophon attached to this text, it was noted above that the title preserved in E attributes it to 'Anania' as well as associating it with the end of another composition entitled '*Hamaroṭut'iw'n*' or The Arithmetic. Three features of the text also support its association with Anania Širakač'i. In the first place, six of the problems introduce a member or members of the princely house of Kamsarakan. This noble family controlled the district of Širak throughout the seventh century but was displaced in the last quarter of the eighth century and thereafter disappears from view¹⁶⁰. Problems 1 and 8 present Zawrak Kamsarakan playing a

¹⁶⁰ For the death of Nerseh Kamsarakan on campaign near Darband in 784, see Lewond p. 161 = Lewond-A, p. 144.

leading role in the Armenian rebellion of 572; problem 20 mentions the camp of Nerseh Kamsarakan lord of Širak and Aršarunik¹⁶¹; whilst problem 21 gives the ancestry of ‘Nerseh Kamsarakan, son of Aršawir and homonymous ancestor of this Nerseh’ in the context of service to the Persian king. The foundation inscription on the church at Mren, dated to between January 638 and February 641, states that it was built during the headship (*tanutērut’iwn*) of Nerseh, lord of Širak and Ašarunik¹⁶¹. The foundation inscription at T’alin, dated to before 695, opens by naming its sponsor: ‘I Nerseh *apohipat patrik* lord of Širak and Ašarunik...’¹⁶². This is the same Nerseh to whom P’ilon Širakac’i appealed in the colophon attached to his translation and adaptation of the *Ecclesiastical History* of Socrates Scholastikos: ‘Lord Nersēh, *apiwhipat patrik*, you who are a builder of churches’¹⁶³. Although it is not possible to identify the Nerseh referred to in problem 21, this mathematical text is firmly located in the context of the Kamsarakan supremacy; no other Armenian noble house features.

Secondly, several of the problems are associated with — and sometimes located very precisely within — the district of Širak. In problem 2, the final destination of the merchant is described as ‘us in Širak’. Problems 7 and 10 both refer to Marmēt, the first locating it on the banks of the Axurean river and the second on the Araxes. Since Marmēt is located at the confluence of these two rivers, both are correct. Although both Gēn and Xar remain unidentified, the mountain of Artin and the village of T’alin mentioned in problem 20 are both located firmly in Širak. Such specific knowledge of the toponyms and topography of the district of Širak — including where the Kamsarakan lords went hunting and what they hunted there — suggests that its author knew the region extremely well. By contrast, no other places in historic Armenia feature in the text, aside from the passing references to Naxčavan and Dvin in problem 2 and Vałaršapat in problem 21.

Problem 3 supplies a further indirect connection to Anania. It contemplates the theft of a vast sum of gold from the Markianos Triklinos (the Dining Hall of Marcian) whose location within the Great Palace in

¹⁶¹ Greenwood (2004), p. 64-68 and A.7.

¹⁶² Greenwood (2004), A.12.

¹⁶³ Mat’evosyan (1988), no. 28: *ov tēr Nersēh Kamsarakan apiwhwpat patrik, or ekelec’eac’ es šinot...* For a full translation and further commentary, see Thomson (2001b), p. 9-11, 35-40 and p. 228-229. The use of the plural churches is striking as only one church at T’alin, dedicated to the Holy Mother of God, retains an inscription identifying Nerseh as its founder; see previous footnote. Zuckerman (2002), p. 261-265 seeks to establish this Nerseh Kamsarakan as Anania’s patron, using the problems as historical sources. I am less confident in making this identification or exploiting the problems in this way.

Constantinople is implied. The author of the problem does not assert any personal knowledge of the Great Palace or familiarity with Constantinople. Instead this problem, or at least its context, is attributed to 'the master'¹⁶⁴. In trying to establish the identity of this *vardapet*, it is very significant that Tychikos was described by Anania as 'the master of Byzantium' in the *Autobiography* discussed above, and that Tychikos had been taught there by an unnamed 'master from Athens'¹⁶⁵. Whether the *vardapet* referred to in problem 3 is Tychikos or Stephen of Alexandria, this incidental detail fits perfectly into the career of Anania proposed above. Moreover it is striking that problem 22 is given an Egyptian context and problem 24 an Athenian backdrop. Both of these problems are of a different order and character to the rest. Why include two such problems requiring different mathematical skills? Although incapable of proof, it is possible that these two problems were composed by someone else and were tacked on to the end of Anania's set of questions. Their Egyptian and Athenian contexts connect neatly to the figure of Stephen of Alexandria, whose Athenian associations were probed and accepted by Wolska-Conus¹⁶⁶.

Stepping back from the minutiae of each problem, one of the surprising features of the text is how little the world of the east Roman Empire and Constantinople impinges. Only three problems, clustered at the start of the list, are situated in a Roman context. In their different ways, all three reflect the great wealth of the Empire. Problem 3 envisages vast reserves of gold amassed and stored within the complex of the Great Palace. This tallies with Magdalino's observations on the concentration of financial 'ministries' in the north-east quarter of the Great Palace from the seventh century and the reuse or adaptation of ceremonial structures to house them¹⁶⁷. The Markianos Triklinos is otherwise unattested¹⁶⁸. Problem 4 contemplates the vast salaries paid to the ranks of clerics in St Sophia's in Constantinople; again the assumption is that the imperial Church is extraordinarily wealthy. Problem 6 imagines a greedy Roman who gorges himself on lettuces in a garden until ejected by the Armenian owner. This problem therefore articulates the views of a contemporary across a

¹⁶⁴ AS, p. 228, line 3: *i vardapetēn*.

¹⁶⁵ AS, p. 207, line 10: *Tiwk'ikos vardapet Biwzandac'woy*. For the *vardapet* of Athens, see above fn. 49.

¹⁶⁶ Wolska-Conus (1989), esp. p. 17-20 and p. 82-89.

¹⁶⁷ Magdalino (2007), I, p. 42-45. The Great Palace is described as a 'worthy predecessor to the Kremlin'.

¹⁶⁸ See above, fn. 132 for a discussion of this name.

range of issues: the insatiable greed of Romans; their rapacity, showing a disregard for the property of Armenians; the temporary character of the Roman occupation of Armenian territory, idealized as a fruitful garden, an earthly paradise; the eventual expulsion of the Roman by the Armenian owner. All three problems express an overwhelming sense of disdain towards the imperial government and the imperial Church in Constantinople. There might be extraordinary wealth stored in the Great Palace but three quarters of it is stolen. The ecclesiastical hierarchy of St Sophia's is defined not in terms of its spirituality but in terms of its size and worldliness. The greedy Roman might break into the garden but his pleasure is short-lived. The humour revealed in problems 3 and 6 is very much at the expense of the Romans. Overall a clear antipathy towards the empire and the imperial church can be detected. There is no interaction between Armenians and Romans aside from the Armenian who suffers at the hands of the Roman and then ejects him violently. Whether this reflects the attitude of Tychikos or Anania is hard to tell; as noted previously, problem 3 indicates that it was based on the experience of the master. This antagonism contrasts with the attitude displayed towards Sasanian Persia, which is familiar and relaxed. Armenians are shown serving Sasanian interests on distant frontiers, attending upon the Persian king and others at court, travelling and trading their way back to Širak, all without apparent hostility or resentment. The differences between the two experiences of imperial control could hardly be more extreme¹⁶⁹.

The majority of the problems reflect the everyday circumstances and experiences of a member of the local elite in Širak. Two problems are set in the context of a hunting expedition, one [9] in pursuit of a wild boar, the other [21] rounding up herds of wild asses and seizing their young, presumably for domestication. Two problems record the exercise of fishing rights at Marmēt, the first in terms of numbers of fish caught on the river Axurean [7], the second in terms of the weight of a cuttle fish caught in the Araxes [10]. A third problem [17] envisages wheat being transported by boat. It is clearly based on the familiar Biblical story of Jonah and the whale but it subverts the original by having the cargo of wheat thrown overboard rather than Jonah¹⁷⁰. As such, it may be reflecting a local or regional transport network. The exploitation of rivers across historic Armenia both for their produce and their communication potential has

¹⁶⁹ For the deep impression of Sasanian Persia upon all aspects of early medieval Armenia, see Garsoïan (1976); Ead. (1981), Ead. (1996) and Greenwood (2008c).

¹⁷⁰ Apart from the overall context, the use of *kēt* for whale deliberately echoes Jonah 2.1.

received little scholarly attention. A little-heralded notice in the *History of Atuank'* attributed to Movsēs Dasxuranc'i refers to the passage of trade and to those who fished the great rivers of the Kur and the Araxes¹⁷¹. Movsēs adds that both activities were assessed for tax in drachms in accordance with the census of the Persian kingdom; intriguingly this is dated by Movsēs to the second year of Artašir/Ardaxsīr III, from 17 June 629¹⁷².

Two of the problems are set in a domestic context. The first [14] envisages decanting wine from a large vessel to smaller vessels apparently made of marble. The second [18] gives an idea of the range of silver vessels in everyday use. It records the melting down of one very large silver container, called an *apaṭarē*, into two smaller vessels, both called a *mesur*, two goblets, *bažak*, and three plates, two identified as *skutets* and one as a *skawaṛak*¹⁷³. As noted previously, Tēr-Łewondyan cited this simply as evidence for the manufacture of silver vessels in Armenia¹⁷⁴. In fact, this problem has a number of other significant aspects to it. By solving the problem, it is possible to work out the weights of all the vessels in drachms; these can then be compared with archaeological finds¹⁷⁵. Although nothing approaching the weight of an *apaṭarē* has been found, large silver plates have been unearthed which come close to the figures given¹⁷⁶. More

¹⁷¹ MD/K II.16, p. 166-167 = MD/K-D, p. 104: *Na ew zanc' vačarac' ew zkart'ėnkēc's jknorsut'ean mecamec getoc'n Kuray ew Erasxay zamenayn čšdiw pahanjēr, ew zdidrak'maysn ęst sovort'ean ašxarhagrın Parsic' t'agaworut'eann.*

¹⁷² Artašir/Ardashīr III succeeded his father in October 628 and was assassinated by Shahrvarāz on 27 April 630. Drams of Ardashīr III minted in year 2 and year 3 of his reign have been discovered; his second year ran from 17 June 629.

¹⁷³ See fns. 148-150 above for these terms and the Middle Persian origin of at least two of them, *apaṭarē*, a water-container of unknown design and *skawaṛak*, Middle Persian *kabārag*, for plate.

¹⁷⁴ Tēr-Łewondyan (1984), p. 201.

¹⁷⁵ The *apaṭarē* weighed 4200 drachms, approximately 16.8 kilos of silver (16,800g); one *mesur* weighed 1400 drachms, approximately 5.6kg (5,600g) and the other *mesur* weighed 1050 drachms, 4.2 kg (4,200g); the two *bažaks* weighed 425 drachms each, approximately 1.7kg each (1,700g); the two *skutets* weighed 350 drachms each, approximately 1.4kg each (1,400g); and the single *skawaṛak* weighed 210 drachms, approximately 840g.

¹⁷⁶ Harper (2006), p. 167 offers a useful summary of the range of shapes and weights of Sasanian silver vessels; she lists ewers, vases, plates, hemispherical bowls and elliptical bowls. Vickers (1995), p. 182-184 provides a table of Sasanian silver vessels, their weights and weight inscriptions. It includes plates, ewers and bowls. One bowl (NY MMA Brunner (1974), no. 4) had a drachm inscription of 296 and an actual weight of 1,225.7g, which is of the same order as the *skutet*. One ewer (Cleveland 66.21 Brunner (1974), no. 14.b) had a drachm inscription of 393.5 and an actual weight of 1,589g, which is of the same order as the *bažak*.

importantly, the principle of using the drachm as the unit of weight for a silver vessel is confirmed through material evidence. As Frye and Brunner noted, some Sasanian vessels possess dotted Middle Persian inscriptions recording their weights in tetradrachms and drachms¹⁷⁷. Vickers has argued that Sasanian silversmiths followed in a long tradition of manufacturing silver vessels in ‘round figures’ which corresponded to contemporary currency standards. For Vickers, the disparity between the notional weights in the inscriptions and the actual weights of the vessels were not caused by fluctuations in weight values but rather through the use of worn coins¹⁷⁸. Evidently Anania was familiar with the practice of defining silver vessels in terms of their drachm equivalent.

Five problems however require specific attention. Problems 1 and 8 both contemplate the revolt of Zawrak Kamsarakan against the Persians. In the first, he is represented defeating Persian forces on three occasions, with the survivors numbering 280 fleeing to Naxčavan. In the second, Zawrak is credited with responsibility for killing Surēn. The inclusion of this detail allows us to contextualize the problem because a range of sources confirm that the murder of the *marzpan* of Armenia Surēn played a key role in the Armenian uprising of 572, encouraged if not provoked by Justin II as part of a wider offensive against Khusro I¹⁷⁹. These sources however consistently record the leadership of Vardan Mamikonean in the revolt. One of the fragments written by the late sixth-century historian Theophanes of Byzantium reports that the Armenians slew Surena through the actions of Vardan, whose brother Manuel he had killed¹⁸⁰. His contemporary, the ecclesiastical historian, Evagrius records that the Armenians massacred their governors and then united with the Roman empire, Vardanes having precedence among them by virtue of his birth, reputation and military experience¹⁸¹. The *Narratio de rebus Armeniae*, dating from the start of the eighth century and composed in Greek, asserts simply that a certain Vardan killed the Persian tyrant Suriēna¹⁸². Step‘anos Tarōnec‘i goes even further, stating that Vardan son of Vasak executed the *marzban*

¹⁷⁷ Frye (1973) and Brunner (1974). Harper (2006), p. 167 notes that the principle of using vessels as collateral for loans was recognised in Sasanian law. It is highly likely that silver vessels inscribed with their drachm-weights were employed in this capacity.

¹⁷⁸ Vickers (1995), p. 178-184.

¹⁷⁹ See Garitte (1952), p. 175-190 and Greatrex and Lieu (2002), p. 137-141.

¹⁸⁰ Theo.Byz. 3 = Theo.Byz.-W, p. 52-54.

¹⁸¹ Evagr. V.7, p. 203 = Evagr.-W, p. 264.

¹⁸² *Narratio* §77 and p. 183-187.

Surēn on Tuesday 22 February 572¹⁸³. How therefore should we understand problem 8 and the role of Zawrak Kamsarakan?

Three solutions may be advanced. The first is simply to accept the version given by the majority of the sources and acknowledge that Vardan Mamikonean played the leading role in the murder of Surēn. Whilst this clearly works from a historical perspective, it does not offer any interpretation of problem 8. Kogean is the only scholar to have preferred the evidence of problem 8, perhaps unsurprising in a study devoted to the Kamsarakan family¹⁸⁴. A second line of approach is to try and reconcile the traditions, perhaps with Zawrak actually killing Surēn and Vardan leading the uprising. This is unsatisfactory however because the near-contemporary accounts all highlight the role of Vardan Mamikonean in the murder. There is however a third possibility, that problem 8 is significant not because of its historical accuracy but because it exemplifies an important historiographical process in operation, namely the appropriation and reworking of the past for contemporary purposes. It offers an important reminder that the Armenian past was essentially plastic, a body of traditions that could be adapted in order to establish or promote the interests of one noble house over its rivals. The past was as congested and as contested as the present. The desire for prominent ancestors produced contradictory versions of the same event. As Thomson has indicated, the *History of the House of Artsrunik'* gives a very individual view of the Armenian past, one in which members of that princely family play a far more prominent role than is accorded to them in other surviving histories¹⁸⁵. The historiographical significance of problem 8 therefore lies not in its specific detail but in its demonstration of the flexibility of the Armenian historical past. Replacing a Mamikonean with a Kamsarakan represents a straightforward appropriation. One is left to wonder how prevalent this practice may have been, the extent to which different versions of the past were constructed for contemporary political purposes, with the sponsor's ancestors being inserted into the narrative and the previous protagonists being displaced or excised from the record. Returning to problem 1, it is worth recalling that a passage in the *History of Lewond* reports an Arab raiding party being defeated in Vaspurakan and 280 survivors fleeing to take refuge in a church¹⁸⁶. Is the correspondence between

¹⁸³ ST, II.2, p. 84-85 = ST-D, p. 59-60.

¹⁸⁴ Kogean (1926), p. 125-126.

¹⁸⁵ Thomson (1985), p. 21-24 and p. 33-34.

¹⁸⁶ Lewond p. 26-27 = Lewond-A, p. 61.

the two passages merely coincidental or was Lewond recycling an earlier tradition?

Problem 2 on the other hand stands out for quite different reasons. It describes how one of Anania's relatives was summoned, presumably on military service, to Bahl and how he sold fractions of a huge pearl at certain places on his return journey, specifically at Ganjak, Naxčavan and Dvin. Evidently Anania had no difficulty in depicting one of his relatives serving in the Sasanian army in the east. I have argued elsewhere that such service reflected a normal state of affairs, that the well-known episodes of brave Armenian rebellion against an oppressive Sasanian state, whether in 450/451 or 572, were in many ways atypical, dramatic but brief moments of tension which disrupted their otherwise harmonious and mutually beneficial relationship¹⁸⁷. Sebēos portrays Smbat Bagratuni conducting campaigns against the K'ušans in the second decade of the seventh century, for which he was richly rewarded¹⁸⁸. This image, of a loyal Armenian commander serving the Sasanian state in this theatre recurs in problem 21, discussed below. But if Anania was prepared to depict his relative in military service, he was also prepared to present him engaging in commercial transactions in the major cities through which he passed on his return journey back to Armenia. Several important assumptions underlying this problem should be noted. The transactions were for value, expressed in terms of drachms per grain. The prices varied from market to market, implying an internal market within seventh-century Iran with fluctuating prices, rather than a rigid state-controlled economy operating price controls. It is significant that this route, Ganjak — Naxčavan — Dvin, also occurs in one of the eight itineraries previously attributed to Anania and discussed above:

From Duna to Naxčewan — 70 miles, from there to Ganjak Šahastan — 120, from there to Tisbon — 370, from there to Akoła — 60, from there to Bsra — 140, from there to the Parsahanean sea — 20¹⁸⁹

This problem therefore supplies a commercial context for this itinerary, or at least part of it. It also reveals something about the internal commercial

¹⁸⁷ Greenwood (2008c), p. 6-8.

¹⁸⁸ For the whole campaign, see Sebēos, p. 100-103 = Sebēos-T, p. 49-53.

¹⁸⁹ AS p. 355, lines 14-16 = Hewsén (1992), p. 321. Tisbon is Tisifōn/Ctesiphon; Akoła is Aqūla, an early name for Kūfa; Bsra is Bašra; the Parsahanean Sea is the Persian Gulf. The references to Aqūla and Bašra provide a *terminus post quem* of 638 for this itinerary. See *EI* s.v. al-Kūfa, where it is suggested that its name may derive from the Syriac 'Aqūla. The absence of any reference to Baghdad likewise provides a secure, if distant, *terminus ante quem*, of c. 762.

networks within the Sasanian empire. To this incidentally may be added the evidence from problem 11 which envisages the same duty being levied on a merchant travelling through three cities¹⁹⁰. Whilst prices might differ, it seems that the levy, determined as a percentage of the goods, was imposed consistently. Even if the percentage is impossibly high, the underlying principle seems clear.

Problem 21 merits serious attention. Again this sets the problem in the context of an Armenian noble returning from Bahl, although on this occasion the noble is named as Nerseh Kamsarakan and he is portrayed returning as a victorious military commander. The problem records on whom he attended during the course of his return journey and how many prisoners of war he gave to them. This problem therefore establishes a hierarchy of recipients, four Persian and four Armenian. The Persian sequence is the king, the king's son, the *garikpet*, a slight corruption for *darīgbed*, and the '*spasayapet* whom they call *xoravaran*,' whose identity we shall discuss shortly. Understandably Nerseh presented himself to the king first and offered him his usual share. From an historical perspective however it is very significant that Nerseh is also represented attending upon one son, conceivably the preferred heir. More important still is Nerseh's attendance upon the *darīgbed*, the master of the royal court, and the *spasayapet xoravaran*, an Armenian transliteration of the Middle Persian *spāhbed xwarvārān*, that is the general of the west. The inclusion of *zor... koč'en*, 'whom they call', indicates that Anania recognized that this was a foreign word; a similar phrase is found in the *Ašxarhac'oyc'* in exactly the same circumstances¹⁹¹. Anania therefore seems to be articulating a fundamental principle, that Armenian nobles in Sasanian service were required, or thought it prudent, to pay attendance upon not only the king and his son but also the head of the palace and one of the four military commanders of the Sasanian empire¹⁹². On the basis of meticulous sigillographic analysis, Gyselen has recently confirmed the existence

¹⁹⁰ Duty, *baž*.

¹⁹¹ AŠX, p. 40 = Greenwood (2008c), Appendix I.

¹⁹² See also Sebēos, p. 132 = Sebēos-T, p. 92 and fn. 568. The great prince of Atrpatakan, named Xořox Ormizd [Farrukh Hormozd] sent his brother the *darik'pet* to winter in Dvin and arrest the *aspēt* Varaztiroc' Bagratuni. According to Sebēos, Farrukh Hormozd later became *hramatar*, a transliteration of *framādār*, and sought to consolidate his power by marrying queen Bor [Būrāndukht] but was killed in the attempt: Sebēos, p. 130 = Sebēos-T, p. 89. Pourshariati (2008), p. 183-219 stresses that the other sources all have Farrukh attempting to marry Azarmūdukht. Whilst the chronology of events remains contentious, Sebēos confirms that these offices were current in c.630.

of these four commanders¹⁹³. This however is the first unequivocal reference to one of these generals in an Armenian text. Intriguingly three of the four figures visited by Nerseh also appear, in the same sequence, in the Middle Persian text *Sūr ī Saxwan*, recently studied and translated by Daryae¹⁹⁴. This comprises a formal blessing for use at a banquet. After praising the deities, the sequence runs: *Šāhān Šāh*, King of Kings; *pūs ī wāspuhr ī šāhān*, the sons of the king; *wuzurg framādār*, the chief minister; *xwarāsān xwarwarān nēmrōz spāhbed*, the commanders of the east, west and south. The hierarchy recorded by Anania therefore corresponds to that preserved in the *Sūr ī Saxwan*.

One potential counterargument to the above is to question whether an Armenian noble had ever enjoyed such a prominent command. The *History attributed to Sebēos* contains a very full account of the career of Smbat Bagratuni under Khusro II, whose loyalty and success were richly rewarded¹⁹⁵. He was granted the title *Xosrov Šum*, ‘Joy of Khusro’, and his son *Javitean Xosrov*, that is ‘Eternal Khusro’¹⁹⁶. After his final campaign, Smbat attended upon Khusro II in triumph, travelling on an elephant sent to him by Khusro II and then on a fine horse from the royal stables. He became ‘the third *naxawar* in the palace of king Khusro’ and remained there until his death¹⁹⁷. Whilst it seems very unlikely that this problem is based on an actual historical episode, it is rooted in a recognizable reality, with Armenian nobles fighting on distant frontiers and attending upon the Sasanian king in the course of their journey home. This reciprocal arrangement, of military service in exchange for recognition and material reward, characterized the longstanding ties between the Armenian elite and the Sasanian state.

Of the four Armenian beneficiaries of Nerseh’s largesse, it is striking to note that his younger brother, Hrahat, received a larger number of prisoners than his older brother, Sahak. In a society where lordship depended upon personal qualities and attributes rather than primogeniture, seniority in age did not always determine political precedence. Quite why Anania decided to portray Nerseh favouring Hrahat over Sahak will never be

¹⁹³ Gyselen (2001), p. 35-45.

¹⁹⁴ Daryae (2007).

¹⁹⁵ Sebēos, p. 94-104 = Sebēos-T, p. 43-54 and p. 181-189.

¹⁹⁶ Sebēos, p. 101 and p.103 = Sebēos-T, p. 49 and p. 53.

¹⁹⁷ Sebēos, p. 103-104 = Sebēos-T, p. 53-54: *ew ēr na errorr naxarar i tačari t’agaworut’eann Xosrovay ark’ayi...* See also Gyselen (2004). This reference indicates the ongoing use of the title *naxarar* to denote status at the Sasanian court. This may modify the interpretation of several seals bearing this title; rather than designating a tier of provincial administration, could they not be articulating status at the centre?

known but it could be reflecting an actual relationship. Interestingly it was the middle brother, Nerseh, who is depicted entering Sasanian service. This reflects the actual experience of the Albanian prince, Juanšēr. He too was a second son who entered Sasanian service in late 637 at the instigation of his father Varaz Grigor and who fought at the battle of Qādisiyya in January 638¹⁹⁸. Whilst Nerseh rewarded his two brothers, he also allocated prisoners to the *azatk'* directly. Successful lords not only remembered their immediate relatives; they rewarded their supporters as well. In the relentlessly shifting world of rival lords and broken promises, it was important to consolidate the loyalty of the elite to one's cause. Nerseh is also represented endowing the churches of Vaḫaršapat rather than a local foundation in Širak. This action may be reflecting the contemporary prominence of these foundations as well as a desire to be associated with them. On the other hand, it is rather surprising to find Anania imagining churches being endowed with prisoners of war. Were they intended for sale or settlement on church estates? It seems that in Anania's mind, prisoners were simply assets to be distributed across a wide spectrum of parties which were expected to produce political or spiritual dividends for the donor.

Collectively and individually therefore, the *Problems and Solutions* of Anania Širakac'i constitute a rich source for seventh-century history whose value has not been sufficiently recognized. The degree to which any of the problems reflects an actual event or episode is less significant than the assumptions which underlie them. Whether or not a pearl could be sold for fifty drachms per grain in Ganjak is incapable of proof but it does show that Anania had no difficulty envisaging a market in Ganjak for low volume, high value items from central Asia, with prices being reckoned in silver coins and according to weight. This problem may not be describing a journey from Bahl to Širak, although precedents for this have been cited, but it reveals knowledge of a commercial route connecting opposite ends of the Sasanian empire, in which prices were not controlled but fluctuated from place to place but in which the same duty was levied on commercial goods at every city through which the merchant passed.

Nevertheless there is one issue outstanding. Is it possible to determine when Anania compiled this set of problems? It was argued above that Anania did not begin his eight years of study with Tychikos before mid-631 but that he would have had to have started by 638. There is no reason

¹⁹⁸ MD/K II.18, p. 173 = MD/K-D, p. 109-110.

however why he could not have drafted them while still studying with Tychikos. Problem 3 may offer a further snippet of information. It seems to be contemplating a context in which Širak had been occupied by the Romans but that they had since been expelled. Once more, this cannot easily predate 631 when Heraclius renegotiated the position of the frontier and Širak was absorbed within the empire once more. The fact that this problem also contemplates their ejection may provide a further clue, for in 652 T'ēodoros Rštuni repudiated his allegiance to Constans II and expelled his erstwhile Roman allies from much of Armenia, including Širak. This interprets problem 3 in metaphorical terms, with the garden representing Armenia. On the other hand, the inclusion of the correct form of the titles in Middle Persian, albeit in Armenian transliteration, in problem 21 implies that this text cannot postdate 660 by much since this Sasanian hierarchy had disintegrated at least two decades before. The absence of any reference to Arab campaigning does not hold much significance either way for the dating of the text; arguments from silence are notoriously problematic. Moreover, the impact of those raids is likely to have been local and temporary. In the aftermath of the first *fitna*, Mu'āwiya was content to leave the Armenian elite in place, operating through a single client, Grigor Mamikonean, and setting a nominal tribute of five hundred *dahekan*¹⁹⁹. It was only after the sudden irruption of the Khazars in 685 and the attention paid to Armenia by Justinian II during the second *fitna* that greater oversight and intervention was deemed necessary²⁰⁰.

CONCLUSION

This study began by re-examining the present state of Širakac'i studies and outlining several possible directions for future research. Whilst it has not attempted to address all of these issues, several propositions have been advanced. It has been argued that Anania did not emerge or operate in an intellectual vacuum. As a pupil of Tychikos, he represents the last witness to the brief revival in the study of philosophy and the mathematical sciences fostered by Stephen of Alexandria and promoted by Heraclius and the patriarch Sergios in Constantinople. Only through comparison with the works of Theodore of Tarsus (a pupil of Stephen) and the fragments attributed to Stephen of Alexandria himself will it be possible to determine the

¹⁹⁹ Łewond p. 14 = Łewond-A, p. 54.

²⁰⁰ Greenwood (2008a), p. 341-347.

extent to which Anania reflected this Constantinopolitan milieu and the degree to which he modified or rejected it. A revised chronology for Anania's eight years of study in Trebizond under Tychikos has been proposed, one which locates its starting date firmly in the 630s and almost certainly between mid- 631 and 636. A specific historical context has been defined, one which associates Anania's quest for advanced learning with the extension of Byzantine control eastwards, across districts of northern and central Armenia, including Širak. Whatever Anania's original ambitions may have been, they appear to have been compromised by the dramatic collapse in the Byzantine position across the Near East. This may account for the tone of his so-called *Autobiography*, a mixture of frustration and disappointment. That Anania entered the service of Catholicos Anastas and applied his learning to the advantage of the Armenian Church is not in doubt; whether this was his original plan is harder to determine. Finally the equations attributed to Anania under the title *Problems and Solutions* have been analyzed, collectively and individually. Although the problems do not record actual events or real figures, they offer significant new insights into the attitudes and assumptions of a mid-seventh century scholar from Širak and the world in which he lived. The lifestyle of the elite is largely familiar, dominated by hunting, fishing and feasting at a local level and by military service to the Persian king. The interest in commercial networks and levies however is decidedly atypical and offers a new dimension through which to assess both seventh-century Armenia and the commercial history of the late Sasanian Empire.

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Abbreviations:

<i>CSCO</i>	<i>Corpus Scriptorum Christianorum Orientalium</i>
<i>EI</i>	<i>Encyclopaedia of Islam Second Edition</i> , ed. P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs (Leiden, 1960-2009)
JECS	Journal of Early Christian Studies
JRAS	Journal of the Royal Asiatic Society
LM	Le Muséon
<i>PLRE</i>	<i>Prosopography of the Later Roman Empire Vol. III 527-641</i> , ed. J. Martindale (Cambridge, 1992)
<i>TM</i>	<i>Travaux et Mémoires</i>

Sources:

<i>Anon. Chron.</i>	<i>Ananun Žamanakagrut'iwn</i> , ed. B. Sargisean (Venice, 1904)
AS	Anania Širakac'i, <i>Anania Širakac'u Matenagrut'yuně</i> , ed. A.G. Abrahamyan (Erevan, 1944)
AŠX	<i>Géographie de Moïse de Corène d'après Ptolémée</i> , éd. A Soukry (Venice, 1881)
<i>Chron. 724</i>	<i>Chronicon Miscellaneum ad AD 724 pertinens, CSCO Scr. Syr 3-4</i> , ed. and tr. J.B. Chabot (Paris, 1903)
<i>Chron. 724-P.</i>	<i>The Seventh Century in the West-Syrian Chronicles</i> , tr. and comm. A. Palmer (Liverpool, 1993)
<i>CP</i>	<i>Chronicon Pascale</i> , ed. L. Dindorf (Bonn, 1832)
<i>CP-W&W</i>	<i>Chronicon Paschale 284-628 AD</i> , tr. and comm. M. Whitby and M. Whitby (Liverpool, 1989)
<i>De Cerim.</i>	<i>De Cerimoniis aulae byzantinae</i> , ed. J.J. Reiske (Bonn, 1829)
Evagr.	Evagrius, <i>Ecclesiastical History</i> ed. J. Bidez and L. Parmentier (London, 1898)
Evagr.-W	<i>The Ecclesiastical History of Evagrius Scholasticus</i> , tr. and comm. Michael Whitby (Liverpool, 2000)
GM	Grigor Magistros, <i>T'it'erě</i> , ed. K. Kostaneanc' (Alexandrapol, 1910)
JN-C	John of Nikiu, <i>Chronicle</i> , tr. R.M. Charles (Oxford, 1916)
Lewond	<i>Lewondeay vardapeti Patmut'iwn</i> , ed. K. Ezean (St Petersburg, 1885)
Lewond-A	<i>History of Lewond The Eminent Vardapet of the Armenians</i> , tr. and comm. Z. Arzoumanian (Philadelphia, 1982)
ŁP	<i>Łazaray P'arpec'woy patmut'iwn Hayoc' ew t'utt' ar Vahan Mamikonean</i> , ed. G. Tēr Mrktē'ean and St. Malxasean (Tiflis, 1904; repr. Delmar NY, 1985)
ŁP-T	<i>The History of Łazar P'arpec'i</i> , tr. and comm. R.W. Thomson (Atlanta GE, 1991)
MK/D	Movsēs Kafankatuac'i/Dasxuranc'i, <i>Patmut'iwn atuanic' ašxarhi</i> , ed. V. Arak'elyan (Erevan, 1983)

- MK/D-D *The History of the Caucasian Albanians by Movses Dasxuranc'i*, tr. C.J.F. Dowsett (London, 1961)
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- RA *Ravenna Anonymous Cosmographia* (Uppsala, 1951)
- SA *Samuēli k'ahanayi Anec'woy Hawak'munk' i groc' patmagrac'* (Vaġaršapat, 1893)
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- ST-D *Histoire Universelle par Etienne Aġogh'ig de Daron. Premiēre Partie*, tr. and comm. E. Dulaurier (Paris, 1883)
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- Theoph.-MS *The Chronicle of Theophanes Confessor*, ed. and tr. C. Mango and R. Scott (Oxford, 1997)
- TP *Tabula Peutingeriana, Die Petingerische Tafel*, ed. K. Miller (Stuttgart, 1962)
- TS Theophylact Simocatta, *History*, ed. C. de Boor; re-ed. P. Wirth (Stuttgart, 1972)
- TS-W&W *The History of Theophylact Simocatta*, tr. and comm. M. Whitby and M. Whitby (Oxford, 1986)
- VB *Vita Basilii* in Theophanes Continuatus, *Chronographia*, ed. I. Bekker (Bonn, 1838), book V, 211-353
- YK *Yovhannu Kat'otiku Drasxanakertc'woy Patmut'iwn Hayoc'*, ed. M. Emin (Moscow, 1853; repr. Tiflis, 1912; repr. Delmar NY, 1980)
- YK-M *Yovhannēs Drasxanakertc'i, History of Armenia*, tr. and comm. K.H. Maksoudian (Atlanta, 1987)

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