Ishaq ibn Hunayn, Hunayn ibn Isḥāq, and the Third Arabic Translation of Euclid’s *Elements*

Gregg de Young

Science Department, The American University in Cairo, Cairo, Egypt

The generally accepted account of the Arabic translations of Euclid’s *Elements* as found in the introduction to Heath’s monumental English translation of this classic work, complex as that story seems, may be too simple. Although the two earliest Arabic translations, made by al-Ḥajjāj, either are lost or exist in only fragmentary manuscript form, there are numerous manuscript examples of the third translation, made by Ishaq ibn Hunayn and revised by Thābit ibn Qurra. A previous study outlined evidence that at least two different translation versions attributed to the efforts of Ishaq and Thābit exist among the surviving Arabic manuscripts. These manuscripts are also inconsistent in citing the name(s) of those who prepared the translation. This study surveys the available Arabic manuscripts and describes the patterns of translator ascriptions as they appear within these texts. Although the textual evidence is sometimes contradictory and confusing, there does not seem to be a compelling reason to doubt that Ishaq ibn Hunayn was the principal if not the only, translator involved in creating the surviving Arabic translation of the *Elements* which now exists in several distinct versions.

Les premières versions arabes des *Eléments* d’Euclide, préparées par al-Ḥajjāj ibn Yūsuf, existent uniquement en citations éparses dans plusieurs manuscrits. D’autres versions de traductions arabes survivent dans un certain nombre de manuscrits. Cette étude examine 15 manuscrits arabes complets ou partiels des *Eléments* et décrit les attributions aux traducteurs se trouvant dans ces manuscrits. L’évidence trouvée est parfois contradictoire et embrouillée car plusieurs traducteurs sont mentionnés. Le plus fréquemment mentionné est Ishaq ibn Hunayn, à qui on a attribué le mérite de cette traduction.

أوائل المترجمات لكتاب الأصول المعنوب إلى أفليديس والتي ترجمت على يد الحجاج بن يوسف كانت متأثرة متتالية في عدة مخطوطات عربية. وبعض المترجمات العربية الأخرى بقيت في عدة مخطوطات عربية قديمة بعضها كاملة وبعضها جزئي. وهذه المقالة تفحص خمسة عشر مخطوطًا عربيًا لكتاب الأصول مع نكر أسماء المترجمين التي يوجد في هذه المخطوطات. ولكنه هناك متناقضات عديدة لأن هذه المخطوطات تضم عدة أسماء للمترجمين وأكثرهم نكر؟ هو إسحق بن حنين وهو الذي نسب إليه الكثير من المؤرخين هذه الترجمة.

AMS 1991 subject classifications: 01A30, 51-03.

Key Words: Euclid, Ishaq ibn Hunayn, Hunayn ibn Isḥāq, Thābit ibn Qurra.

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According to the report of the bio-bibliographer, Ibn al-Nadîm, in his Fihrist, the Arabic/Islamic world first became acquainted with Euclid's classic systematization of Greek geometry during the reign of Caliph al-Manṣūr (136–158 A.H./754–775 A.D.) at the time when the Islamic intellectual tradition was just beginning to take shape. The commonly accepted story, repeated in Heath's introduction to his English translation of the Greek text [1926 I, 751, of how this seminal work made its way into Arabic is also derived from Ibn al-Nadîm. According to this report, the first Arabic translation was made by al-Ḥajjāj ibn Yūsuf ibn Māṭar [cf. Sezgin 1974, 225–226] under the patronage of Caliph Ḥārūn al-Rashīd (170–193 A.H./786–809 A.D.). Al-Ḥajjāj was commissioned to produce a second translation under Caliph al-Maʿmūn (198–218 A.H./813–833 A.D.).

A third translation was made by Ishāq ibn Ḥunayn (215–298 A.H./830–910 A.D.), son of the famous translator, Ḥunayn ibn Ishāq. Because this translation was later revised by the mathematician Thābit ibn Qurra, it is usually called the Ishāq–Thābit version. The historian, Philip Hitti, however, citing ibn Khallikān, attributes this translation to the efforts of Ḥunayn [Hitti 1970, 314]. This disagreement among the Arabic sources themselves as to the author of this third translation is the principal question considered in this survey.

Neither of the al-Ḥajjāj translations has come down to us in a complete or a pristine form. A unique and, unfortunately, incomplete manuscript preserved in the Leyden University Library, being a commentary on the Elements composed by the mathematician and astronomer Abū l-ʿAbbās al-ʿAbd al-Qādī Ḥātîm al-Nayrizî, who was active in the last half of the third/ninth century, dying apparently early in the fourth/tenth century [Sezgin 1974, 283–285], has long been thought to contain extensive quotations from the second of these two al-Ḥajjāj versions [al-Nayrizî 1893–1932]. These quotations, however, seem themselves to have been heavily edited by al-Nayrizî [Engroff 1980, 13–19]. A few brief quotations ascribed to al-Ḥajjāj and giving alternative formulations to several proofs are preserved in three Arabic manuscripts of Andalusian provenance: Escorial ms. arabe 907; Rabat, al-Mālik. 1101; Rabat, al-Mālik. 53 [De Young 1991]. These quotations appear to be authentic al-Ḥajjāj material—at least they do not contain all the "helping phrases" that Engroff has attributed to the editing of al-Nayrizî. Brief quotations ascribed to al-Ḥajjāj are also included in at least two other Arabic manuscripts of the Elements. An Arabic commentary on Euclid, now in Osmania University Library, Hyderabad, India, (Call Number: 150015015015), also contains references to and quotations ascribed to the translation of al-Ḥajjāj. Some of these quotations parallel those found in Andalusian tradition. Others appear to be unique to this manuscript.

In addition to this limited direct evidence on the nature of the al-Ḥajjāj translations, we have some secondary sources of information. Naṣīr al-Dīn al-Ṭūsī, in his influential Tahrīr (Recension) of the Arabic Euclid, maintained in the margin of his work an alternate set of proposition numbers drawn from the translation effort
of al-Ḥajjāj (which translation is not clear) and indicated differences in the ordering of propositions between al-Ḥajjāj and the Ishāq–Thābit translation tradition. In addition, Sabra discovered a marginal note in one of the manuscripts he used to establish the text of the geometry section of Ibn Sīnā’s Kitāb al-Shifā’ that describes a part of the alternate order of propositions reported to occur in the translation of al-Ḥajjāj [Ibn Sīnā 1976, 259; De Young 1984, 153].

The al-Ḥajjāj quotations in the surviving Andalusian manuscripts and the variations in the ordering of propositions that several sources indicate occurred within the al-Ḥajjāj translation of Books VII–IX correspond with what we find in the anonymous Arabic version of the Elements in St. Petersburg, Akademia Nauk ms. or. C 2145. (An edition of this Arabic version is in the final stages of preparation by the present author.) Thus, this St. Petersburg version sometimes seems to have an especially close tie to the lost al-Ḥajjāj translations [De Young 1984]. The tie is more apparent than real, however. The manuscript also contains most of the editorial notes ascribed to Thābit ibn Qurra, and, at the end of Book IX, contains a brief note explicitly attributed to al-Ḥajjāj (thus implying that at least some of the immediately preceding text might not be by al-Ḥajjāj). Moreover, the manuscript does not contain the additional cases attributed to al-Ḥajjāj in Book III, Propositions 24, 32, 34, 35, 36, (corresponding to propositions 25, 33, 35, 36, 37 in Heiberg’s Greek edition) and Book IV, Proposition 5 in the Andalusian manuscripts. Thus it would seem to be, at best, only indirectly related to the al-Ḥajjāj translations.

With the exception of the Leningrad manuscript, all the remaining manuscripts that I have been able to examine (15 in all), therefore, would seem to derive from the translation efforts of Ishāq ibn Ḥunayn. Earlier studies, based on Book V [Engroff 1980] and on Books VII–IX [De Young 1981], noted several peculiarities of this seemingly monolithic translation tradition [De Young 1984]. There seem to be two distinctly different translation families, as indicated by differences in terminology, use or avoidance of two interpolated definitions in Book VII, and variations in the order of both definitions and propositions in Books VII–IX. (Engroff found a parallel breakdown of manuscripts in his study of Book V [1980].) For example, one group of manuscripts uses the terms al-akthar or al-akbar to translate “the larger,” the remaining manuscripts use al-a′ṣam. Similarly, the first group uses the term al-aqall to translate “the smaller,” while the remaining manuscripts use the term al-asghar. The membership of these two groups changes as we proceed through the arithmetical books, but at the opening of Book VII, Group I comprises the following manuscripts: Copenhagen LXXXI; Istanbul, Fatih 3439/1; Dublin, Chester Beatty 3035; Teheran, Majlis Shura 200; Rampur, Raza Library, Arshi 200; Escurial, ms. arabe 907; Rabat, al-Mālik 1101. Group II comprises Uppsala University, Tornberg 321; Oxford, Bod. Lib., Thurston 11; Cambridge University, Add. 9.1075; Teheran, Danišgāh 2120; Teheran, Malik 3586 (the latter two clearly comprise a single complete text); and sometimes Oxford, Bod. Lib., Huntington 435 (a pastiche of several manuscripts, so that its character changes from time to time). Two additional manuscripts, the University of
Dunedan fragment and Rabat, al-Mālik. 53 are incomplete and do not contain the arithmetical books.

As mentioned above, the first group of manuscripts includes two interpolated definitions (numbers 15 and 16 in these manuscripts), which introduce the terms *mutabāyyan* (mutually incommensurable) and *mushtarik* (commensurable). This terminology replaces that used in Definitions 13 and 14 of the Arabic text (corresponding to Definitions 12 and 14 of Heiberg's Greek edition). In these more primitive definitions, we find the terminology *awwal 'inda al-akhar* (prime to each other) and *murakkab 'inda al-akhar* (composite with respect to each other).

These more primitive definitions occur in most of the first group of manuscripts, but they are preceded in two cases (Istanbul, Fatih 3439/1 and Copenhagen LXXXI) by the phrase *min iṣlah Thābit* (in the revision of Thābit). This appears to indicate that these definitions were not found in the original Ishaq translation but were added later by Thābit when he compared Ishaq's Arabic translation with the original Greek manuscripts as he knew them. If Klamroth's contention be accepted that Ishaq did not translate everything, but adopted the al-Ḥajjaj versions of the definitions and enunciations of the propositions [1881, 390–310], this tangled phenomenon becomes more comprehensible. Perhaps al-Ḥajjaj replaced the original Greek definitions with new ones (numbered 15 and 16 in most manuscripts). Ishaq, adopting the translations of al-Ḥajjaj, retained these new definitions in his translation. Thābit, however, noted that these new definitions were not literally true to the Greek, so he re-introduced the Greek versions (which now became numbers 13 and 14 in the Arabic manuscripts). Moreover, these Thābit-added Greek definitions are omitted from the Andalusian manuscripts and from the Leningrad manuscript, that is, from those manuscripts that seem to have the closest ties with the al-Ḥajjaj translation tradition. This also suggests that they were not included in the original al-Ḥajjaj Arabic translations. On the other hand, the apparently al-Ḥajjaj formulation in Definitions 15 and 16 is omitted from the second group of Ishaq–Thābit manuscripts. Perhaps this indicates an attempt on the part of the Arabic tradition to return to a more precise and literal rendering of the Greek into Arabic.

An alternative explanation may be that, when Ishaq realized that the definitions corresponding to definitions twelve and fourteen in the Greek tradition were missing from the manuscript with which he was working, he substituted the two which I have called interpolations. Then, when Thābit, using other Greek manuscripts, found the original versions, these were simply placed into the text for reference, but the interpolations were not removed because they had already begun to be standard mathematical terminology. They might, however, have been dropped from the minority of manuscripts making up the second Ishaq–Thābit group after Thābit inserted the more literal rendition of the Greek definitions.

Two manuscripts (Istanbul, Fatih 3439/1 and Copenhagen LXXXI) explicitly claim to contain, in Books XI–XIII, the second translation of al-Ḥajjaj. In the colophon to Book X in Istanbul ms. Fatih 3439/1, we find the additional statement that Ishaq translated only as far as the end of Book X. A comparison of these
texts with several Ishâq–Thâbit manuscripts indicates that there are no significant differences between the purportedly al-Hajjâj and the Ishâq–Thâbit versions of these stereometric books, either in terminology or in order of definitions, except that in the second definition of Book XI the manuscripts claiming to be the work of al-Ḥajjâj use the term nihayat while the Ishâq–Thâbit manuscripts use the term atrâf (both terms mean ends or extremities). There are no significant variations in either the enunciations or the order of propositions nor are there differences in style of proofs used, as indicated by a preliminary comparison of the proposition diagrams. These facts also seem to support Klamroth’s thesis that Ishâq did not retranslate the definitions and enunciations as he found them in al-Ḥajjâj but merely repeated them as his own [1881, 309–310]. (Of course, if Ishâq did not translate anything beyond Book X, this statement of Klamroth could still be applicable.) Whether or not we may wish to agree with this hypothesis, one thing is clear: if these stereometric books are indeed the work of al-Ḥajjâj, it is not the al-Ḥajjâj of the Leiden ms. 399/1, but that of the al-Ḥajjâj revealed in the quotations in the Andalusian manuscripts.

Ibn al-Nadîm, on whom Heath’s account is based, mentions only one translation by Ishâq. In the past, this dictum has generally been accepted uncritically. A survey of the manuscripts themselves, however, presents an intriguingly more complex image: a number of the manuscripts mention Ḥunayn ibn Ishâq as the translator of the treatise, rather than ascribing it to his son, Ishâq. How these variations in ascription compare to patterns of textual variations is not yet clear. In most cases, however, the patterns of ascriptions do not seem to parallel the two different manuscript versions of the Ishâq–Thâbit tradition already described.

Following the binary classification for these Arabic manuscripts outlined earlier (those containing the interpolated definitions in Book VII were labeled Group I and those omitting these definitions were labeled Group II—called Group A and Group B respectively in my earlier study [De Young 1984]), I shall begin this consideration of authorship attributions with the manuscripts classed as Group I. Escurial 907, which often seems related to the Chester Beatty, Teheran Majlis, and Rampur manuscripts, does not mention a translator in either the incipits or the colophons of the thirteen books. There are at least five occasions, however, when the text mentions the version of Ishâq, usually when reporting a contrast to the version of al-Ḥajjâj [De Young 1991]. So it seems the translator/editor had access to the translation of al-Ḥajjâj as well as that of Ishâq ibn Ḥunayn. Two additional Andalusian/Maghribi manuscripts, which were not included in the earlier studies but which seem to be closely affiliated with the Escurial version, shed little additional light on the identity of the translator. Rabat, al-Mâlik. 1101 contains no references to a translator in either the incipits or colophons of individual books. The incomplete manuscript, Rabat, al-Mâlik. 53, however, does contain one reference to a translator, Ishâq ibn Ḥunayn, in the incipit to book II. In addition, both contain nearly all the references to Ishâq and al-Ḥajjâj that are found in the Escurial manuscript.

The Chester Beatty, Teheran Majlis, and Rampur manuscripts form a closely
related subfamily of manuscripts. Teheran Majlis appears to have been copied from the Chester Beatty manuscript, probably fairly recently (the manuscript colophon is undated), because the copyist occasionally misread places where the ink has faded or been damaged in the Chester Beatty manuscript. Moreover, the microfilm of the Teheran manuscript does not display any of the typical damage that one associates with older manuscripts. The Rampur manuscript, produced in an elegant nasta’liq hand and apparently of South Asian provenance, seems textually closely related to the other two, but contains an extraordinary number of copyist errors such as repetitions of phrases and lacunae. The Teheran and Rampur manuscripts each introduce book I with a reference to the translation of Ḥunayn ibn Isḥāq and the revision by Thābit ibn Qurra. Because the Chester Beatty manuscript lacks the first folio or two, this citation is missing from that manuscript. We may presume, however, from the closeness of these three manuscript texts, that this ascription was originally present in the Chester Beatty manuscript also. Thus, it is all the more startling to find that all three manuscripts include, in the colophon to book I, the claim that the text was translated by Isḥāq ibn Ḥunayn. These are the only references to translators in these three manuscripts.

This contradictory evidence within these manuscripts is confusing. We do know, however, that Isḥāq sometimes worked with his father, Ḥunayn ibn Isḥāq, who directed the translation activities in Baghdad’s Bayt al-Ḥikma, in his translating work [Bergsträsser 1913, 75–76]. A Nestorian Christian, the elder Ḥunayn apparently preferred to carry out his translations in two steps: first, he translated the text from Greek into his native Syriac; then one of his collaborators, including his son, Isḥāq, would translate from Syriac into Arabic. (In the view of Ibn al-Qiftī, Isḥāq had a better command of Arabic than did his father [1903, 80].) This was not his only modus operandi, however, for Ḥunayn was also quite capable of translating from Syriac to Arabic, and from Greek to Arabic [Meyerhof 1928]. Only some relatively small fragments of a Syriac version of the Elements still exist. These have been edited, with a German translation, by Furlani [1924], who saw them as derived from the Arabic version of al-Ḥajjaj. Wright, whose catalog of the Syriac manuscripts in Cambridge University Library first described these fragments, speculated that “this version is . . . probably the work of Ḥonain ibn Isḥāk . . . .” [Sezgin 1974, 88]. Yet a third interpretation, by Baudoux [Murdoch 1974, 391], sees this Syriac material as prior to any Arabic translation and a possible source for Isḥāq’s translation work. More recently, Busard has noted [1983, 18–19] the close correspondence between these Syriac fragments, the second al-Ḥajjaj translation as purportedly preserved in part by al-Nayrizi, and the first Latin version of the Elements ascribed to Adelard of Bath. The curiously conflicting ascriptions of this Arabic translation version to both Ḥunayn and to his son Isḥāq, as outlined in this paper, may, perhaps, indicate that Wright’s attribution was not far wrong. Perhaps the Arabic version usually attributed to Isḥāq may, in fact represent a more collaborative effort than was previously suspected. Perhaps these references to both translators within the same document imply that this translation was produced by their joint efforts. On the other hand, one of these
references could be the result of a copyist's error in the exemplar from which this subfamily of manuscripts derives.

The remaining two manuscripts making up Group I are Copenhagen LXXXI and Istanbul, Fatih 3439/1. Neither manuscript is complete: Copenhagen begins with Book V, Fatih with the last folio of Book IV. The incipit and colophon of each of Books V–X in the Copenhagen manuscript explicitly link the translation to Ishāq ibn Hunayn in the revision by Thābit ibn Qurra. The Fatih manuscript provides less frequent mention of the translator. The colophon following Book V reports that it is the translation of Ḥunayn ibn Ishāq. Once again, however, we are startled to find the colophon following Book X referring to Ishāq ibn Hunayn: "Book X is [now] completed, and it is the last of what Ishāq ibn Hunayn translated and Thābit ibn Qurra revised." Both manuscripts claim to take Books XI–XIII from the second translation of al-Ḥajjāj. Again, the Copenhagen manuscript reiterates this claim in each incipit and colophon of these three books. The Fatih manuscript mentions al-Ḥajjāj as the translator only in the colophon to Book X and the colophon to Book XII. In the case of the third manuscript, Teheran, Malik 3586 (ms. Teheran, Danişgâh 2120, comprising six folios from Book VII is clearly a fragment that at one time became separated from the original Teheran Malik 3586 manuscript), the cataloger has reported that Books XI–XIII represent the work of al-Ḥajjāj, although a preliminary survey of the text does not offer any explicit support for that claim. Nevertheless, it is true that the colophon for each of the first ten books explicitly names Ishāq ibn Hunayn as translator and Thābit ibn Qurra as editor. Books XI–XIII, on the other hand, do not name a translator, although they continue to mention Thābit as editor. Since the text itself, however, does not assign these books to al-Ḥajjāj, this change is at best suggestive. The incipit to Book XV, which is universally recognized to be the work of Hypsicles, translated by Qustā ibn Luqā, is here claimed to be the translation of Ishāq ibn Ḥunayn in the revision of Thābit ibn Qurra.

A major fragment of the Elements (Books I–III, lacking the first folio or two) is now in the library of the University of Otago, Dunedin, New Zealand. The manuscript, apparently belonging to Group I, is fairly well preserved, but its colophon is undated, so that its age is unknown. The calligraphy, however, does not appear particularly antiquated. The manuscript is unusual in that the text of some propositions is written fully voweled. Following the colophon of Book III we find two owner/reader notes, both in hands different from that of the copyist. One is dated 872 and the other, in a typically Persian hand, is dated 934. Assuming that these dates refer to Hijrah years, they would correspond to 1467/1468 and 1527/1528 A.D. It is impossible to determine whether the manuscript may have once contained more of the Elements or whether this represents a kind of abridgement of the treatise. However, if these ownership marks do indeed indicate that the manuscript changed hands twice some four and a half centuries ago, the manuscript must have already existed in its shortened form at that time. (At least it seems improbable that two successive owner/readers would have indicated their use of the manuscript with notes placed within the text, rather than at the beginning or
the end of the manuscript.) There is only one reference to a translator, Ishāq ibn Hunayn, occurring in the colophon to Book II.

The second group of manuscripts described above exist in two loose subfamilies of texts. The first of these subfamilies consists of Oxford, Bod. Lib., ms. Thurston 11; Uppsala University, ms. Ö. Vet. 20; Teheran, Danişgâh 2120; and Teheran, Malik 3586. (Thurston 11 is the manuscript “O” used by Klamroth.) The Uppsala manuscript does not mention a translator in either the incipits or the colophons of the individual books, although nearly every time the copyist has included the statement that the work is the edition of Thābit ibn Qurra. (The exceptions are in the colophons of Books VI, X, XI, XII, and XIII, where Thābit’s name is omitted.) The two Teheran manuscripts, which together constitute a single complete treatise, mention in the colophon to each of the first ten books that this is the translation of Ishāq ibn Hunayn in the revision of Thābit ibn Qurra, but in Books XI to XIII no translator is mentioned, although Thābit is also cited as editor of these books.

The Thurston 11 manuscript does contain several references to a translator. As with the Group I manuscripts discussed above, this manuscript sends us mixed signals. This incipits to Books I, V, VII, and X specifically state that this is the translation of Ishāq ibn Hunayn in the revision of Thābit ibn Qurra. The same statement also appears on the title page to the manuscript. (This title page appears to be in the same hand as the manuscript. The earliest dated signature, not in the hand of the copyist, on this title page is 851 A.H./1447-1448 A.D.) In the colophon to Book I (the only colophon that explicitly mentions a translator’s name) we find the statement “the translation of Thābit ibn Qurra al-Ḥarrānī”. It may be that this is merely a scribal error—perhaps a line has been omitted. Or perhaps the scribe inadvertently wrote “translation” (naql) rather than “revision” (islâh) although how such an error could have been made is much harder to imagine. On the other hand, there is a tradition that Thābit himself prepared a translation. This had been reported in the Arabic bio-bibliographical tradition by Ibn al-Qifti [Kapp 1935, 65]. There also seem to be references to a Thābit translation in Gerard of Cremona’s Latin translation from the Arabic [Heath 1926 I, 94; Busard 1984].

Just as unusual is the incipit to Book IV. Here the copyist has named the translator Hunayn ibn Ishāq. Even if we were to discount the reference to Thābit as translator, it is more difficult to dismiss this reference to Ḥunayn. It is always possible that it does represent some sort of scribal error, but, if it really is an error, it seems to recur with surprising frequency in our manuscripts. The existence of similar attributions in apparently unrelated manuscripts seems to indicate that there may be some substance to this claim. In summary, this manuscript, too, sends us mixed signals as to the identity of the translator.

The second subfamily identified within the Group II manuscripts include Cambridge University Library Add. ms. 9.1075 and Oxford University, Bod. Lib., ms. Huntington 435. The Cambridge manuscript mentions the translator of Books I–XIII only once, in the colophon to Book II (as also found in the New Zealand fragment), where his name is given as Ishāq ibn Ḥunayn. (The colophon to Book XV names Qustâ ibn Lūqâ as the translator of the two appended Books XIV and
 XV.) By way of contrast, the incipit of each book (except Book II) mentions that the text has been revised by Thābit ibn Qurra, and that fact is reiterated in every colophon except those of Books II, V, XII, XIV and XV.

The ms. Hunt. 435 is more difficult to evaluate, in part because the manuscript as a whole is problematic: it seems to be a pastiche of at least six different manuscripts and exhibits a bewildering variety of lacunae and rebinding errors. The textual evidence is also difficult to interpret. The colophon to Book I (the first folio or two are missing) attributes the translation to “Ḥunayn.” This information is repeated in the incipit and the colophon to Book II, as well as in the incipit to Book III. On folio 191b, which is considerably misplaced because it contains the end of Book III, we find again the statement that Ḥunayn ibn Iṣḥāq translated it (that is, Book III). In Books IV–VI, no translator is mentioned, although in every incipit and colophon (except the abbreviated colophon to Book VI), we find references to Thābit as the one who revised the text.

Books VII–IX provide another ambiguous piece of evidence. The colophon to Book VII lists the translator (now using the term naqala rather than tarjamahu as in the earlier references) as Ishaq ibn Ḥunayn. However, someone—apparently the copyist—has written above the line following the name Ḥunayn ibn Iṣḥāq (as though it were intended as a correction to the text) ibn Iṣḥāq. It is possible that the “corrector” intended to make the name read Ḥunayn ibn Iṣḥāq, but it might also be possible that the original intention was to give a fuller designation to Iṣḥāq by including more of his father’s name—i.e., Iṣḥāq ibn Ḥunayn ibn Iṣḥāq. It is possible that the copyist—apparently the copyist—has written above the line following the name Iṣḥāq ibn Ḥunayn ibn Iṣḥāq (as though it were intended as a correction to the text) ibn Iṣḥāq following the name Ḥunayn. In the incipit to Book IX, we find again that the translator is called Ḥunayn ibn Iṣḥāq. This would at least bring these references into consistency with those in the earlier books.

But then, is the shift from tarjamahu to naqala of any importance? Tarjama, the simple verb form, means to translate or to paraphrase. It is always used in the sense of to interpret or to translate from one language to another. Naqala, on the other hand, is a more nebulous term. Its root meaning is to convey or to transfer. Thus, by extension, it can come to mean to translate or, perhaps, to paraphrase in another language, but it can also mean to transcribe, to quote, or even to copy.

It is tempting to see the usage of these two terms as descriptive of the two different approaches to translation that developed in the Arabic/Islamic world. The “ancient” tradition usually relied on a small number of manuscripts and tended to emphasize a very literal, word-by-word rendition of the Greek or Syriac [Peters 1968, 60]. The second approach is preeminently associated with Ḥunayn and his school of translators. In this approach, there was a concerted effort to acquire as many manuscripts as possible in order to establish a canonical text.
Then, when this process was completed, the translator would focus on subunits (usually sentences) of the treatise and attempt to render each thought into an equivalent Arabic expression without striving for an absolutely literal statement [Rosenthal 1970, 17]. This process, of course, usually gave a superior and more readable text and so it became the standard approach among the Baghdad translators. The usage of these terms in the surviving manuscripts, however, is almost as inconsistent as the names of the translators. For example, Copenhagen LXXXI uses *naqala* when naming either Ishāq or al-Ḥajjāj in Books V–XIII, but uses *tarjamahu* when naming Qusṭā ibn Lūqā as translator of Books XIV and XV. Of the other manuscripts, all use *naqala* except for Cambridge, ms. Add. 9. 1075 and Rabat, al-Mālik. 53.

Unfortunately, this terminology does not completely parallel the changing name of the translator. Had such a parallel existed, we should have been much more confident that there were indeed two different translators at work on these Ishāq-Thābit versions. At this moment, however, we are left with many unanswered questions: What are we to make of all this? Is Ibn al-Nadim’s version of the Arabic translation history incomplete? Who did make this Arabic translation? Why do we find so many textual variations that go beyond minor scribal inconsistencies? These puzzling questions are difficult to answer with any degree of certainty. On the one hand, we can say that we certainly find more manuscript references to Ishāq ibn Ḥunayn than to any other translator. But sheer weight of numbers is, surely, not the only criterion by which to evaluate the evidence. If we summarize the patterns of evidence outlined above and confine our attention to only the thirteen Euclidean books, we DISCOVER that (1) three manuscripts do not refer to any translator, (2) four manuscripts refer only to Ishāq ibn Ḥunayn, (3) three manuscripts refer to both Ishāq ibn Ḥunayn and to Ḥunayn ibn Ishāq as translators, although these two are never mentioned together within the manuscripts; in addition, there are the ambiguous references in Bod. Lib., Hunt. 435, (4) one manuscript contains references to Ishāq ibn Ḥunayn, Ḥunayn ibn Ishāq, and Thābit ibn Qurra as translators, (5) one manuscript refers to Ishāq ibn Ḥunayn, Ḥunayn ibn Ishāq, al-Ḥajjāj ibn Yūsuf ibn Maṭar as translators, and (6) one manuscript refers both to Ishāq ibn Ḥunayn and to al-Ḥajjāj as translators. Thus, apart from the ambiguous references in Bod. Lib., Hunt. 435, we find Ishāq ibn Ḥunayn cited as translator in nine of thirteen manuscripts, while Ḥunayn ibn Ishāq is cited as translator in six.

Although we find a small minority of manuscripts that refer only to Ishāq ibn Ḥunayn, we do not find any manuscripts that name only Ḥunayn ibn Ishāq as translator. I suggest that this implies that the person primarily responsible for the translation was Ishāq ibn Ḥunayn. Moreover, the references to Ḥunayn ibn Ishāq appear early in the various manuscripts—the latest reference is in a colophon to Book V (again, excepting the ambiguous references in Bod. Lib., Hunt. 435). I suggest that the references to Ḥunayn ibn Ishāq are too numerous to be mere copyist errors. Perhaps this translation, as in the case of some of Ḥunayn’s medical translations, was made in a two-step process: Ḥunayn translating at least the initial
books into Syriac and Iṣḥāq translating from Syriac (and in the later books, directly from the Greek) into Arabic. This rather cumbersome and complex procedure may also explain why Thābit was especially active in checking and comparing this translation to the existing Greek manuscripts. The other alternative would be to suggest that although the translation was made by Iṣḥāq ibn Ḥunayn, later copyists sometimes ascribed the work to the older translator because of the greater reputation of Ḥunayn ibn Iṣḥāq. But in that case, why are these citations scattered so inconsistently throughout the manuscript remains?

At any rate, we see that references to Thābit as editor far outnumber references to all the translators taken together. Engroff has argued that Thābit’s role was primarily editorial, since none of the comments specifically referred to Thābit in these manuscripts deal with the geometry of the Elements [Engroff 1980, 20–29]. On the other hand, if these early Arabic versions do represent more of a paraphrase than a literal translation, it is possible that Thābit’s contributions extend beyond the explicit statements analyzed by Engroff. At the present moment, however, we have no direct evidence on which to build an interpretation of any manipulation of the mathematical content of the text by Thābit.

REFERENCES


