

Preface

This book presents the first translation into a modern language of Gerard of Cremona's version of the Commentary of al-Nayrizi ("Anaritus") on Book I of Euclid's *Elements of Geometry*. The translation of the remainder of the Commentary will appear in due course.

The first account of the translation of Euclid's *Elements* from Greek into Arabic is given in the *List* or *Fihrist* (فهرست) of books compiled by Ibn al-Nadim in 987; this *List* was a register of every work, whether original or in translation, that was available at the time in the Arabic language:

Al-Hajjaj bin Yusuf bin Matar translated it¹ with two translations; one of the two of them is known as the *Haruni* [edition], and that is the first. And as for the second translation, it is known as the Mamuni [edition], and it is upon it that one relies. And Ishaq bin Hunain translated it¹, and Thabit bin Qurra al-Harrani overhauled it²... [Translated from the Arabic text in 45, 112].

This record, insofar as it concerns al-Hajjaj, is corroborated by a famous passage in the Preface to the Commentary of al-Nayrizi on Euclid's *Elements* contained in the manuscript Leiden 399.1:

This¹ is the book which Yahya bin Khalid bin Barmak ordered to be translated from the Roman tongue³ into the Arabic tongue at the hands of al-Hajjaj bin Yusuf Matar. And when Allah brought into his caliphate the Imam Mamun Abdullah bin Harun, the Commander of the Faithful, who delighted in learning and was enthusiastic about wisdom, who was close to scholars and beneficent unto them, al-Hajjaj bin Yusuf saw that he could find favor with him by correcting this book⁴, by summing it up, and by abbreviating it... [95, 25].

¹ the *Elements*. (Al-Hajjaj flourished around 786-833.)

² Ishaq's translation. (Ishaq died in 911, Thabit in 901.)

³ Greek, the language of the Eastern Roman Empire

⁴ his original translation

Tradition has thus handed down that there were four early editions of the Arabic *Elements*, the first translation by al-Hajjaj (“al-Hajjaj I”), the second, corrected, abbreviated edition by al-Hajjaj (“al-Hajjaj II”), the translation by Ishaq bin Hunain, and the revision of Ishaq’s version by Thabit bin Qurra (“Ishaq-Thabit”). It is therefore of interest to the learned to determine to which of these four possibilities a given manuscript of the Arabic *Elements* belongs, or whether that manuscript presents a mixed or hybrid edition. One way to determine this is to see if the manuscript contains I 45 and VI 12 (both said to be absent from al-Hajjaj’s versions according to Arabic tradition) and to examine the order of the propositions numbered VI 22-26 in Heiberg’s Greek edition. (All the Arabic editions, and the Latin editions translated from them, put VI 26 immediately after VI 24, of which VI 26 is the converse, but there is disagreement among the manuscripts as to whether VI 23 precedes or follows the pair VI 24, 26; it seems to be a sign of the al-Hajjaj tradition if VI 23 comes after VI 24, 26, and a sign of the Ishaq-Thabit tradition if it precedes those two propositions.)

There are twenty-two early Arabic manuscripts of the *Elements*. By *early* I mean that they present the *Elements* in a form anterior to that which we find in the thirteenth century edition of al-Tusi, whose version became the standard Arabic text. The earliest enumeration of such manuscripts that I could find, that of Sezgin in 1974 [114, 104], lists fourteen of them, namely, those numbered 1, 2, 5, 7, 8, 9, 11, 12, 13, 15, 16, 18, 19, and 21 below. Of these, all but #5 and #13 he assigned to the Ishaq-Thabit version. By 1980, one finds mention of 3, 4, 6, and 14 in [49]. By 1989, Folkerts [56] also lists 10 and 17, both of which he had not seen. Manuscripts 20 and 22 are first noted by Brentjes in 1993 [17] and 1996 [20, 203] respectively. The following list is given in order of antiquity. Unless it is stated otherwise, the manuscripts provide the complete text of the Arabic *Elements*.

1. Tehran Malik 3586 (954-955 A. D.)

This is a manuscript of the Ishaq-Thabit version of Books I-XV. (The Arabic Euclid includes the two spurious books XIV and XV.) Alas, when Engroff prepared an edition of the Ishaq-Thabit version of Book V for his 1980 doctoral dissertation at Harvard [49] under the direction of A. I. Sabra, he was unable to use this most ancient and valuable manuscript. His edition relied on ten manuscripts, those numbered 3, 4, 7, 8, 9, 10, 12, 13, 14, and 18 below.

This manuscript belongs to a famous private library built and funded by the donations of the late Hajj Hossein Malik. It has recently been relocated close to the Tehran Public Library, near to the Museum of Ancient Iran. Its telephone numbers are 011-98-21-672-6653 and 011-98-21-672-6613.

Tradition has sanctioned the spelling *Teheran*, which is incorrect since the **طهران** in **طهران** has no vowel.

2. Tehran Danishgah 2120 (954-955 A. D.)

This manuscript of the University of Tehran (*Danishgah*) contains a part of Book VII that is missing from manuscript 1 above. They are really two parts of the same manuscript.

3. Rampur Raza Library 'Arshi S. No. 3656 Accession No. 103 M (ca. 988 A. D.)

This manuscript is called 'Arshi 200 by Folkerts [56], who gives no date for it. Engroff examined it and placed it in his "A" category; that is, among those manuscripts which he felt were contaminated by readings from the al-Hajjaj translations (3, 7, 10, 12, 13, 18). Kunitzsch, however, argued that Engroff had gotten it wrong and that Engroff's "B" manuscripts (4, 8, 9, 14) provided the pure Ishaq-Thabit edition, whereas his "A" manuscripts were the contaminated

ones [86]; this is the prevailing opinion. Among Engroff's "A" manuscripts, the Raza Library manuscript is closest to Tehran Majlis Shura 200 and Dublin Chester Beatty 3055.

Imtiyaz 'Ali 'Arshi (1904-1981) was the Director of the Raza Library and the author of the *Catalogue of the Arabic Manuscripts in Raza Library, Rampur* (Raza Library Publications Series No. 17, 1975); our manuscript is described on pages 2-3 of volume 5. It is written in the *naskh* script on 213 folio pages (25.8 cm. by 16 cm.), with 19 lines to a page. Its condition is described as good, although it is worm-eaten and water-stained. It contains all fifteen books, with fourteen figures at the end of Book II drawn by Abu Sahl Waijan bin Rustam al-Kuhi (or al-Quhi); because that fellow is known to have been alive in 378 A. H., that is, 988-989 A. D., our manuscript is dated to the last quarter of the tenth century. It has been remargined, and is described as having gold and colored *جداول* (*jadawil*, lines ruled around a page).

4. Uppsala Universitetsbibliotek O. Vet. 20 (1042-1043)

This manuscript of the University Library was assigned by Engroff to the "B" family of Ishaq-Thabit manuscripts, that is, those which he felt were contaminated by readings from the al-Hajjaj translations. (See, however, the first paragraph of the preceding entry.)

According to Dr. Håkan Hallberg, Assistant Librarian of the University Library, this manuscript was given to the University Library in 1713 by Johan Bilberg, Bishop of Strängnäs, to whom it had earlier been given by Johan Gabriel Sparwenfeld (1655-1727), a scholar and diplomat who was the author of a Slavonic lexicon. Sparwenfeld had probably acquired the manuscript during a journey through Europe and Northern Africa from 1689 to 1694; it was one of over forty oriental manuscripts which he donated to the Library. For the life and scientific work of Sparwenfeld, see *Johan Gabriel Sparwenfeld and the Lexicon Slavonicum: His contribution to 17th century*

Slavonic lexicography by U. Birgegård (Uppsala, 1985) and *J. G. Sparvenfeld: Bidrag till en biografi* by C. V. Jacobowsky (Stockholm, 1932).

5. Leiden Bibliotheek der Rijksuniversiteit Or. 399.1 (September 8, 1144 A. D.)

This most famous and most important manuscript of the Arabic tradition of the *Elements* was the only one to be published [7] until 1994, when Brentjes published Book II from manuscript number 20 below [18]. Printed editions are otherwise not available, and, at the beginning of the third millennium, scholars are still working directly from the manuscripts. The Leiden manuscript contains Book I to the beginning of Book VII, with a big *lacuna* at the beginning of Book I. The text of Euclid is combined with the Commentary of al-Nayrizi (died *circa* 922 A. D.). See [95] for an English translation. Until 1980, this manuscript was believed to preserve the al-Hajjaj second edition, as the preface indeed claims, but in that year, in an important work that regrettably, and inexplicably, remains unpublished, Engroff challenged this received opinion [49]. He observed that 1) although the texts compiled by al-Nayrizi purport to come from several different authorities, Euclid, Simplicius, Heron, Thabit and others, the style and diction are uniform throughout, 2) the text of Euclid in the Commentary contains obvious interpolations, such as references in the proofs of III 32 and IV 10 to additions made to the *Elements* by later authors, and 3) the version of Euclid found in this manuscript does not appear to be an abbreviated edition. The current state of knowledge is reflected in the view of Sonja Brentjes, that the text of Euclid found in the Commentary of al-Nayrizi is not close to al-Hajjaj II; rather, it is a text *sui generis* compiled from a variant of an al-Hajjaj text, a variant of an Ishaq-Thabit text, Arabic translations of Greek commentaries, Arabic commentaries, and, most of all, al-Nayrizi's own comments. We may note here that although this manuscript follows the al-Hajjaj tradition in omitting I 45 and in the order VI 24, 26, 23 of those propositions (see page ii above), it does have VI 12.

The Librarian responsible for this manuscript is Dr. Hans van de Velde of the Department of Oriental Manuscripts. The oriental manuscripts of the *Bibliotheek der Rijksuniversiteit* belong to what is called the *Legatum Warnerianum* or Warner Legacy; they are so named after Levinus Warner (1619-1665), ambassador of the Dutch Republic to the Sublime Porte, whose bequest of over one thousand oriental manuscripts forms the core of the Library's oriental collections.

6. St. Petersburg Akademija Nauk Institut Vostokovedenija C 2145 (1188 A. D.)

A copy of this manuscript arrived too late to be fully integrated into Engroff's 1980 thesis, though he was able to comment on it nevertheless. This anonymous manuscript contains an ordering of propositions in Book VIII which mediaeval Arabic tradition associated with al-Hajjaj; furthermore, its proofs of VIII 20-21 are identified in manuscripts 11, 12, and 19 below as the work of al-Hajjaj. (See [43, 153].) It belongs to the Institute of Oriental Studies of the Academy of Sciences.

A collection of oriental books and manuscripts has been maintained in St. Petersburg since the time of Peter the Great; in 1818 it was incorporated as the Asiatic Museum, and in 1930 the name was changed to the Institute of Oriental Studies. When the main seat of this Institute was transferred to Moscow in 1951, the Leningrad branch retained the library of manuscripts, which, since 1956, has been located in the Novo Mihailovsky Palace, the palace built in 1861 by the Grand Duke Michael Nikolaevich, son of the Emperor Nicholas I. This particular manuscript was purchased for the Asiatic Museum in 1917 by V. A. Ivanov, who found it in Bukhara. The scribe, Mas'ud ibn Mohammed ibn Sa'id, finished it on August 11, 1188; it is written in a large and careful *naskh* script, with plentiful diacritical punctuation, but no vowel points. There are 280 folio pages, each 24 cm. by 17 cm. The author is indebted for this

information to Dr. Efim A. Rezvan, Editor in Chief of *Manuscripta Orientalia*.

7. Istanbul Süleymaniye Kütüphanesi Fatih Camii 3439.1 (1190-1191 A. D.)

This manuscript contains IV 14 – XV. It was assigned by Engroff to his “A” group, i. e., those which he thought followed Thabit’s recension of Ishaq’s translation; Kunitzsch, however, assigned all of Engroff’s “A” manuscripts to the category of texts contaminated with al-Hajjaj readings [86]. At the beginning of Book XI, there is an announcement that Books XI-XIII follow the al-Hajjaj version. This same announcement is found in the Copenhagen manuscript (#13 below).

This is a manuscript of the great Library of the Süleymaniye complex in Istanbul, whither it had been transferred from the smaller library of the *Fatih* or Victory Mosque, which commemorates the capture of Constantinople by the Sultan Mohammed II, the Conquerer, in 1453.

8. Oxford Bodleian Library Huntington 435 (12th Century)

This manuscript belongs to Engroff’s “B” family, where it is closest to the Cambridge manuscript. It starts with I 13. It is undated and copied by several hands. Dr. Colin Wakefield of the Department of Oriental Collections of the Bodleian Library tells me that on paleographic evidence, the oldest leaves, at the beginning of the manuscript, have been tentatively assigned to the twelfth century A.D.

With regard to Robert Huntington, Dr. Wakefield writes:

Robert Huntington was born in 1636 and was educated at Merton College, Oxford. He became chaplain to the Levant

Company at Aleppo in 1670 and remained in the Near East for over ten years, visiting Palestine and Egypt and building up a large collection of manuscripts (some 680 – mostly Arabic and Hebrew but also Syriac, Coptic, etc.) He died in 1701. Most of his collection came to the Bodleian Library.

9. Oxford Bodleian Library MS Thurston 3978.11 (1237-1238 A. D.)

This manuscript was assigned by Engroff to his “B” group. It was with this manuscript that Klamroth compared the Copenhagen manuscript in order to arrive at his hypothesis (see below) that Ishaq never translated Books XI-XIII, and that, consequently, the al-Hajjaj version of those books supplied the void [81].

According to Dr. Wakefield, the correct current designation of this manuscript is Thurston 11. William Thurston, a London merchant, gave five oriental manuscripts to the Bodleian Library in 1661; during the next twenty-three years, thirty-five additional such manuscripts were donated by unknown persons to the same Library. All forty manuscripts are called by the name of Thurston, although that fellow had no connection with the last thirty-five, to which later group our Euclidean manuscript belongs. It is not known by whom or where our manuscript was acquired. This information is contained in F. Madan’s *A Summary Catalogue of Western Manuscripts in the Bodleian Library at Oxford*, volume 2, part 2 (1937), page 798.

10. Dublin Chester Beatty Library Arabic 3035 (1270-1271 A. D.)

This manuscript was assigned by Engroff to his “A” group. It begins with I 39.

The American mining millionaire Alfred Chester Beatty (1875-1968) amassed, through his agents, a huge collection of art, including this Arabic manuscript of Euclid’s *Elements*, all of which he donated

to Ireland, whither he retired in 1950. Dr. Elaine Wright, Curator of the Islamic Collections, has informed me that the archives of the Library are not completely sorted, so it is not yet possible to determine how or where this particular manuscript was purchased; however, it is known that Mr. Beatty acquired most of his Arabic and Qur'an collections in Cairo, where he went on vacation every winter for twenty-five years.

The Library has a catalogue by Arberry, but it is not on-line. The entry for our manuscript is on page 13:

Tabrir Uqlidis: The *Elementa* of Euclid, translated by Ishaq bin Hunain (d. 298/910 or 299/911) and revised by Abu'l Hasan Thabit bin Qurra al-Sabi (d. 288/901) with *z'iyadat* or additional notes by Abu Sahl Wajjan bin Rustam al-Kuhi (fl. 380/990); folio pages 1-126a.

11. Rabat al-Khizanah al-Malikiyyah 1101 (1284-1285 A. D.)

This manuscript of the Moroccan Royal Library belongs to the "Andalusian group" of three manuscripts (11, 12, and 19), if we may adopt a name first used by De Young [44], who, like Engroff, wrote a Harvard doctoral dissertation under the supervision of A. I. Sabra. Only the most important, that of the Escorial (see below), was seen by Engroff. All three are of the Ishaq-Thabit version.

12. Madrid El Escorial Derenbourg 907 (13th Century)

When this manuscript was inspected by Engroff, he observed that it contained sixteen brief quotations from the al-Hajjaj version imbedded in what was otherwise a manuscript of the Ishaq-Thabit edition. These quotations involve three types of material: 1) alternate enunciations for the first nine propositions of Book II, 2) additional cases for III 24, 32, 34, 35, 36 (these correspond to III 25, 33, 35, 36,

37 of [71]), and 3) alternate proofs for VIII 20-21. The fact that this material differs from what is ascribed to al-Hajjaj in the corresponding places in the Leiden manuscript De Young explained, after Engroff, by rejecting the tradition that the Leiden manuscript presents the al-Hajjaj II edition of the *Elements* and by ascribing that manuscript's text to the editorial and compiling activity of al-Nayrizi [44]. It was not possible to solve the problem presented by this discrepancy by assigning the El Escorial readings to al-Hajjaj I (for the al-Nayrizi readings purport to be from al-Hajjaj II), because the text of Euclid incorporated in al-Nayrizi's Commentary does not really look like an abridged text. Furthermore, there is the additional complication, that the al-Nayrizi readings agree with some readings that are assigned in the other manuscripts to the Ishaq-Thabit version. Engroff decided that the most reasonable solution was to abandon the tradition that al-Nayrizi had preserved the al-Hajjaj II version. With this began the modern period of the criticism of the Arabic tradition of the *Elements*.

We also notice that De Young and Kunitzsch agree in ascribing Engroff's "A" manuscripts (of which this is one) to the class of Ishaq-Thabit manuscripts of the *Elements* contaminated by al-Hajjaj readings; this is the prevailing view today.

Hartwig Derenbourg (1844-1908) was the author of the catalogue of Arabic manuscripts in the Escorial, whence the sources for the history of the Crusades and of the caliphs were made known to the world.

13. Copenhagen Kongelige Biblioteket Mehren LXXX (13th Century)

This manuscript of the Royal Library, of Books V-XV only, was one of the three manuscripts consulted by Klamroth for his famous article of 1881 [81]. At the beginning of Book XI, there is the announcement, that the text of Books XI-XIII is taken from the edition of al-Hajjaj. (The same announcement is found in the

Istanbul manuscript.) When Klamroth compared the text of these three books found in the Copenhagen manuscript with that found in the Oxford Thurston manuscript (# 9 above), whose text of Books XI-XIII is ascribed to Ishaq and Thabit, he considered the differences to be so insignificant that he decided that Ishaq must not have translated these books at all, but rather that he must merely have taken over the al-Hajjaj version for this portion of the *Elements*. Kunitzsch, however, having examined the same differences, arrived at the opposite conclusion, namely, that some of them were most important and characteristic of the two different translations [86]. Engroff thought that the differences were of the same sort as those between his "A" and "B" families, and assigned the Copenhagen manuscript to the former, and the Oxford manuscript to the latter [49]. The current opinion is that the books XI through XIII of this manuscript offer the Ishaq-Thabit texts contaminated with al-Hajjaj readings, and not the pure al-Hajjaj I or II version.

August Ferdinand Michael van Mehren (1822-1907) was the author of the Library's 1851 catalogue, in which our manuscript was listed as Codex Arabicus LXXXI. Dr. Stig T. Rasmussen, Head of the Department of Orientalia and Judaica at the Royal Library, informs me that van Mehren was Professor of Semitic Languages at the University of Copenhagen from 1854 to 1898 and the author of books written in German, Danish, and French on Arabic rhetoric, geography, and philosophy. Our manuscript was bequeathed to the Royal Library by Otto, Count Thott (1703-1785), who had amassed a collection of thousands of manuscripts, most of them European, but seventy-six of which were oriental. Three thousand manuscripts, including all the oriental ones, were left to the Royal Library in his will. It is not known where he bought the Euclid manuscript, but it is considered probable that he had purchased it from a European book dealer.

What were formerly called the *Codices Arabici* are now more usually cited as belonging to the collection *Codices Orientales Bibliothecae Regiae Hafniensis*, the Oriental Codices of the Royal Copenhagen

Library. Egger, though, in his *Lexicon Nominum Locorum*, insists on *Havnia* or at least *Haunia* for Copenhagen.

14. Cambridge University Library MS Additamentum 1075 (13th century)

This manuscript is missing the first eighteen definitions of Book I. It was assigned by Engroff to his “B” group, in which it is closest to the Oxford Huntington manuscript (8 above).

From the middle of the nineteenth century, most of the Cambridge University Library’s new manuscript acquisitions, including, until about 1900, all oriental manuscripts, were assigned a number in the Additional Manuscripts (*Additamenta*) series. Since the beginning of the twentieth century, however, the oriental manuscripts have been numbered in other sequences, but our manuscript has retained its old class mark. The date is estimated on paleographic evidence to be of the thirteenth century A. D.; the script is a fine, clear old *naskh*. The manuscript is missing one or two pages at the beginning that contain the introduction of the translator; it takes up 234 folio pages, each 23.8 cm. by 17.2 cm. with 21 lines to a page. I am indebted for this information to Librarian Mark Muehlhaeusler, who refers us to E. G. Browne’s *Hand-list of the Muhammadan Manuscripts, including all those written in the Arabic character, preserved in the library of the University of Cambridge* (Cambridge, Cambridge University Press, 1900, volume I, page 9). The provenance of this manuscript is unknown; there do not seem to be any records for acquisitions reaching back that far.

15. Kastamonu MS 607 (14th Century)

This manuscript of the Archaeological Museum was not seen by Engroff before he wrote his 1980 dissertation, nor by Folkerts when he wrote his 1989 monograph. This is not surprising, as the city is in Paphlagonia, one of the most backward regions of Turkey. *Kastamonu*

is the corruption of the mediaeval *Castra Comnenon* ("Castle of the Comneni"); the place takes its name from its founder Manuel Comnenus, the father of the future Emperor Isaac I Comnenus (1057-1059), who built a great castle here on lands given to him by the Emperor Basil II, the "Slayer of the Bulgarians". In Ottoman times, it was known as *Kastamuni*. It was from this archaeological museum in a center of religious reaction that Atatürk announced the abolition of the *fez* in 1926.

16. Paris Bibliothèque Nationale MS Arabe 2500 (1401-1402 A. D.)

According to the information in the book of Sezgin [114, 104], this manuscript contains a fragment of the *Elements*, and it was included in the monograph of Folkerts [56, 28], where it was marked as one of the manuscripts that he had not seen. It is thus believed to be a later derivation of the *Elements*. However, Marie-Geneviève Guesdon, Curator in Charge of Arabic Manuscripts at the Bibliothèque Nationale, informs me that although this manuscript contains on folio pages 95 (verso) through 109 a text entitled *اوقليدس هندسة* (*Euclid's Geometry*), it is not a text of the *Elements*. Kunitzsch says that this manuscript offers merely an abbreviation of Book I [87, 205, note 3].

17. Dunedin Otago Museum De Beer Collection MS 8 (1468-1469)

This manuscript of the Otago Museum, on long-term loan to the University of Otago Library, is not listed by Sezgin. Folkerts marks it as one that he has not seen. It begins in the middle of Definition 10 of Book I and goes to the end of Book III, although the on-line catalogue mistakenly says that this is merely a manuscript of Book III. It is in the University's De Beer Collection of rare books. It is written in a clear *naskh* script with all the vowel points. This

manuscript first came to the attention of historians of science in 1980, when it was put on exhibit at a conference of the Australasian Association for the History, Philosophy, and Social Studies of Science (AAHPSSS) at the University of Otago and was noticed there by Professor G. J. Tee of the University of Auckland, who informed Engroff and De Young about it. The story of how it came to the antipodes is nicely told by Dr. Tee in the following report which was kindly sent to me by Dr. Jean Klemp, Special Collections Librarian of the University of Otago:

At the beginning of the manuscript there is an English inscription: *To my dear Sir, professor Dr. Rogers, as a memory of the help I received from him. Muhammed Abuhassan.* Being intrigued by that manuscript, I asked a librarian for further information. She checked on the origins of the manuscript and informed me that Dr. Lindsay Rogers was born in Dunedin in 1902, and he graduated in medicine from the University of Otago. During World War II, he served as a surgeon with Tito's partisans in Yugoslavia, and his memoir *Guerilla Surgeon* (1957) has been published in several editions. He was a professor of Surgery at Baghdad from 1945 to 1950, and he served as a surgeon with the Iraqi army during its first war against Israel. Presumably it was at Baghdad that the manuscript of Euclid's *Elements* was presented to him by Muhammed Abuhassan. Dr. Rogers returned to Dunedin in 1951 and presented the manuscript to the Otago Museum, which in 1953 deposited it on long-term loan in the Library of the University of Otago. Dr. Rogers died in 1962.

In a recent message to me, Professor Tee explained the circumstances of Dr. Rogers' death:

In 1962, he was physician to an American anthropological expedition in northwest New Guinea. Rogers and a member of the expedition (one of the Rockefeller clan) set out on a raft to cross a large river, but they were swept out to sea and disappeared.

The Rockefeller alluded to was Michael, the son of the Governor of New York, Nelson. His disappearance was one of the major news stories of November, 1962.

There are some remarks written in a later Persian hand in the right hand margin of the last page which have been misinterpreted by the cataloguers. These remarks, insofar as they are decipherable, seem to be:

... که حضرت سلیمانی

سلطان محمود شاه بن سلطان محمد شاه در ماه رمضان

سنة ۹۲۴ هجری از کتب مطروحات باین فقیر مسمی

بمیر حسین

منبه فرمودند

The catalogue entry says that these remarks indicate that one Fakir Masmy presented the manuscript as a gift to the Sultan Suleiman the Magnificent in 1516. However, Suleiman the Magnificent was not Sultan in 1516, and I do not know of any contemporaneous Sultan Mahmud Shah bin Sultan Mohammed Shah, whom the inscription mentions. Furthermore, *فقیر مسمی* (*faqir musamma*) does not look like a proper name, but rather a term of abasement: *[your] humble [servant] whose name is...* The best translation that I can offer is:

...when, in the month of Ramadan, in the year of the hijra 924, His Presence the Solomonic Sultan Mahmud Shah, the son of Sultan Mohammed Shah, made his attentive humble servant whose name is Mir Hussein aware of the discarded books...

At the bottom of the same page, there is another scribbled annotation illegible to me except for the year 872 A. H. (i. e., 1467-1468 A. D.) If these two dates contained in the marginal Persian remarks (i. e. 1468 and 1516) are deemed reliable, then we have a *terminus ad quem* for the age of the manuscript.

There is also an incorrect typewritten note to the effect that this manuscript was in the library of the Persian Sultan Mahmud in 844 A. H., i. e., 1440-1441 A. D., but the only Persian Sultan Mahmud that I know of lived four centuries before then.

18. Tehran Majlis Shura MS I'tisami 200 (15th Century)

This manuscript, which Sezgin called a splendid specimen, was assigned by Engroff to his "A" group. Within that group he found it to be close to the Rampur and Dublin manuscripts (3 and 10 in this list). He identified the Istanbul and Copenhagen manuscripts (7 and 13 in this list) as a second "A" subfamily, and put the El Escorial manuscript (12) in an "A" subclass of its own.

Majlis Shura Melli (National Consultive Assembly) was the name of the lower house of the Iranian parliament under the monarchy; it is now called the Majlis Shura Islami (Islamic Consultive Assembly). Its library is very extensive.

19. Rabat al-Khizanah al-Malikiyyah 5311 (1607-1608 A. D.)

This manuscript, together with the earlier Rabat manuscript (11 above) and that of El Escorial (12) form what was called by De Young the Andalusian family of Ishaq-Thabit manuscripts. It contains Books I-VIII.

20. Paris Bibliothèque Nationale MS Persan 169 (1500-1625 A. D.)

Sonja Brentjes discovered that this manuscript presents an al-Hajjaj II version of Book II; she published the text and translated it into German in 1994 [18]. The material is buried in a manuscript that otherwise contains mostly Persian texts. This was a major discovery, because it is the first substantial connected piece of the al-Hajjaj II edition to be found. It shows that the second al-Hajjaj version was truly an adaptation of the *Elements* and not a translation of it. The close agreement between the text of this manuscript and that of the al-Hajjaj readings in the Andalusian family of manuscripts mentioned above led Brentjes to suspect that they both descended ultimately from a common source, the al-Hajjaj II edition of the *Elements*.

Dr. Anne-Sophie Delhaye of the Bibliothèque Nationale tells me that this manuscript came from the collection of Melchisédek Thévenot (1621-1692) and was acquired for the Royal Library in 1712. Thévenot was one of the great travelers of the seventeenth century, whose position as Curator of the Royal Library allowed him to build an enormous collection of books and manuscripts on far away places. The meetings of the French *savants*, which took place in his apartments, eventually developed into the *Académie des Sciences*.

21. Kabul Kitabkhane-i Wizarat-i Ma'arif 297

I do not know of any scholar who has seen this manuscript, which may be lost on account of the turmoil in Afghanistan. Indeed, reporters in Kabul have observed that the contents of the National Museum have been looted. After what happened to the colossal statues of the Buddha, it is not reassuring that this manuscript belongs to the Library of the Ministry of Cultural Affairs. I do not know how complete it is, or was. Kunitzsch says that 297 is not the shelf-mark [87, 206, note 5].

22. Qom Library of the Ayatollah Marashi Najafi 6525 (undated)

The existence of this second Arabic manuscript of the Commentary of al-Nayrizi was announced by Brentjes in 1996 [20, 203]. It begins with the fourth definition of Book I and continues, with many *lacunae*, through Book V. Its text is in substantial agreement with that of the Leiden manuscript, much of whose early *lacuna* it fills up. Those parts that cover what is missing in the Leiden manuscript are being edited for publication by R. Arnzen of Cologne. This manuscript contains the same text of Euclid's *Elements* as the manuscript of Leiden; at one time, this was thought to be the al-Hajjaj II version of the *Elements*, but recent research has established that it is al-Nayrizi's own formulation of Euclid. (See page v above.)

The Grand Ayatollah Marashi Najafi (1897-1990) was a lover of learning; for a delightful account of a recent visit to this library, see [95, 30]. The Library maintains a web page with some pictures, including two of His Eminence (http://www.al-shia.com/html/eng/lib/lib-najafi_h.htm). It holds about a half million books and thirty thousand manuscripts. The elder son of the late Grand Ayatollah, Hujjatul Islam Dr. Sayyid Mahmoud Najafi Marashi, has been managing the Library for the past thirty years.

The following two manuscripts may also be noted at this point:

23. Paris Bibliothèque Nationale MS Hebreu 1382

This manuscript, though in the Arabic language, is written with Hebrew characters, a very common occurrence. As late as the nineteenth century, Leah, the mother of the composer Felix

Mendelssohn, used to write to her son in German but with Hebrew characters. T. Lévy is currently doing research on this manuscript.

24. Mumbai Mulla Firuz Collection R I. 6

Mumbai is Bombay, and the Mulla Firuz was a personality of the nineteenth century. This manuscript for the first time came to the attention of the learned world in a recent paper of Brentjes in *Centaurus* discussed on pages xxii-xxiii below. The following sentences are an extract from that article (pages 45-46):

MS Mumbai, Mulla Firuz Collection, R I.6 contains a variant of the *Elements* not only hitherto unknown, but different from all known Arabic versions of Euclid's work. It possesses essential features of the Hajjaj tradition such as the omission of I 45, III 36 (Greek III 37), VI 12 and the order of the Greek theorems VI 22-26...The manuscript breaks off after IX 29 and has long *lacunae* at the beginning of Books III and VIII and at the end of Book VI...It cannot have been compiled in the extant form before the first half of the tenth century. It is highly unlikely that it was compiled after 1300 since then the version of Nasir al-Din al-Tusi was prevalent. I assume that the progenitor of MS Mumbai, Mulla Firuz Collection, R I.6 was compiled in the tenth century, since it quotes explicitly only authors of the ninth and tenth centuries and since it is the first Arabic manuscript from the Muslim East which contains more than a brief extract from a version affiliated with the Hajjaj tradition – most of the extant Arabic fragments of this tradition are found in manuscripts of the Muslim West and the only known almost complete versions of this tradition are translations into Latin and apparently into Hebrew.

Most important for us is the fact that this manuscript quotes extensively from the Commentary of al-Nayrizi, and these excerpts are from the Euclidean portion of that Commentary, not from the additional matter.

Sezgin lists sixty authors of Arabic commentaries on Euclid's *Elements* [114, 105-115], but the only such commentary translated into Latin during the Middle Ages was that of al-Nayrizi. This translation, by Gerard of Cremona (1114-1187), is extant today through Book X. Since the two Arabic manuscripts (those of Leiden and Qom) together extend only to the beginning of Book VII and have *lacunae* of different lengths at the beginning of Book I, to get the whole Commentary of al-Nayrizi (at least through Book X) one needs both the Arabic and Latin versions. I translated the Arabic version of Book I in [95]; the Latin version of the same book is translated here. The Commentary of al-Nayrizi was one of the two main sources of Albertus Magnus when he wrote on the *Elements*, and it was also a source for Roger Bacon and Campanus of Novara. The first manuscript of the Gerard translation to be discovered in modern times was the Cracow manuscript *Bibliotheka Jagiellonska 569* (**K**), which was found by Maximilian Curtze and published by him in 1899 [40]; it is of the fourteenth century. Since the copyist who made this manuscript was a dunce, there are many omissions and other errors, and so it was a godsend when Paul M. J. E. Tummers found two better manuscripts, that of Madrid, *Biblioteca Nacional 10010* (**M**), a manuscript of the thirteenth or fourteenth century formerly in the library of the cathedral of Toledo, and that of the Vatican, *Biblioteca Apostolica Regimensis 1268* (**V**), a manuscript of the fourteenth century. Because all three manuscripts **K**, **M**, and **V** have a large number of common errors, it is likely that they all descend from a common ancestor. When errors are not in common to all three, **M** and **V** usually agree against **K**, so **M** and **V** are more closely related to each other than either is to **K**. In fact, Tummers proved that **V** was actually copied from **M**, and so is basing his edition of the Latin text on manuscript **M**.

I have worked from the Latin text edited by Tummers [131], which superseded the edition of Curtze [40]; nevertheless, since Curtze's Latin preface contains much interesting historical matter, and since his Latin notes provide helpful references to corresponding passages in the Commentary of Proclus [106 and 107], I have translated them into English in Chapter I and in the first part of

Chapter III below. (The references to Proclus are also included, of course, in the edition of Tummers [131].) Where I have occasionally added my own comments on those pages, such remarks are enclosed within brackets [. . .]. Curtze's notes to his preface are numbered with Arabic numerals 1, 2, 3, . . . ; my own notes to his preface are indicated by the lower-case Roman numerals i, ii, iii, . . . Curtze's notes to the commentary proper are numbered C1, C2, C3, . . . ; my own are numbered L1, L2, L3, . . . Whereas I have always transliterated the name of our commentator as *al-Nayrizi*, Curtze, in his preface and notes, gives it as *An-Nairizi* (or *an-Nairizi*), and I have accommodated his spelling to mine. The letter *l* of the Arabic definite article *al* is pronounced like *n* when it is followed by that letter, whence two methods of transliteration arose. Furthermore, since Arabic does not have majuscules and minuscules, whether one writes *An-* or *an-* is a mere convention; Curtze, however, uses both indiscriminately, once in the same sentence. On the other hand, the letter *y* in the commentator's name is certainly the consonant and not the *mater lectionis* or vowel letter *i*. When Curtze cites page and line numbers below, it is to those in his edition [40] that he refers. His account is of the Cracow manuscript, the first to be discovered and an inferior source. Tummers' account of the best manuscript, that of Madrid, is available in English [131] and need not be translated here.

For an historical introduction to the transmission of Euclid's *Elements of Geometry* in the Middle Ages, I refer the reader to Chapter I of my previous work [95], particularly sections 7 ("Al-Nayrizi") and 11 ("Gerard of Cremona").

In Chapter IV, I analyze the idiosyncrasies of Gerard's version of Book I of the Commentary by comparing it with the Arabic text of the Leiden manuscript which I translated in [95]. It is a matter of dispute whether al-Nayrizi wrote his Commentary in the form preserved in the Arabic of the Leiden manuscript or in the form that survives in the Latin of Gerard of Cremona. In 1996, Busard wrote:

After these observations, the question arises for me: Was al-Nayrizi really the author of the Commentary that is contained in the Leiden manuscript, or does this Commentary stem from

another person, who knew and made generous use of the text that is contained in **A** [the Gerard of Cremona version]? This question cannot be answered now, because the Arabic prototype of **A** is unknown, and **A** itself is unreliable [translated from the German of **33**, 176].

Brentjes argues in favor of the Arabic text in an article “Two comments on Euclid’s *Elements*? On the relation between the Arabic text attributed to al-Nayrizi and the Latin text ascribed to Anaritius” that has just appeared in *Centaurus*, vol. 43, no. 1 (2001), pp. 17-55. This paper appeared too late for its contents to be integrated into the discussion in Chapters III and IV below, but it presents additional evidence for the view maintained there, that the Arabic edition of the Commentary of al-Nayrizi as it appears in the Leiden and Qom manuscripts (i. e., with the text of the *Elements* integrated into it) is closer to what actually left the hands of al-Nayrizi than the Latin translation preserved in manuscripts **K**, **M**, and **V**. We may summarize the conclusions of Brentjes that most concern us as follows:

1. The Arabic text of the Commentary of al-Nayrizi as we find it in the Leiden and Qom manuscripts is, as a whole, the same as the Arabic text that was the progenitor of that translated by Gerard of Cremona. The original form of al-Nayrizi’s Commentary did indeed contain a text of the *Elements*; that text was al-Nayrizi’s own edition, and was combined with the additional comments to make one homogeneous work.
2. The Arabic source of Gerard’s translation differed a bit from the text of the Leiden manuscript, and, in fact, Gerard, on occasion, incorporated material from an Arabic source different from al-Nayrizi, for example, in the comments on II 12.
3. The three Latin manuscripts **M**, **V**, and **K** represent a version of Gerard’s translation that had already undergone some editorial changes since it left his hands; for example, the first folio page of Book VII had dropped out, and in **K** this fact is noticed by a remark of a later editor.

4. In fact, in general the extant manuscripts of Gerard's translations do not present them as they left his hands, but in a form that indicates the activity of editors.
5. On occasion, Gerard's Latin text transmits a form of excerpts from Heron's commentary fuller than the corresponding passages in the Arabic text.

Brentjes does not consider it possible yet to settle the question, whether al-Nayrizi's text of the *Elements* was present in the Arabic manuscript that Gerard translated, or, if it was present, who cancelled it, Gerard or a later editor.

Finally, with regard to the discussion of Furlani's Syriac fragment in [95, 37-38], I am able to provide the following additional information. In 1994, Brentjes made a detailed comparison between Furlani's fragment and the texts of Book I contained in Heiberg's Greek edition of Euclid [75] and the Arabic manuscripts Leiden 399.1 and Teheran Malik 3586 [18, 81-82]. In her opinion, both the Syriac fragment and Adelard I are variants in the al-Hajjaj tradition of Euclid, although they both contain elements of the Ishaq-Thabit tradition; there are many similarities, but the inspection of details leads one to notice differences as well. For example, in the enunciation of I 15, the Syriac fragment ends with the statement, "and these four angles are equal to four right angles", whereas Adelard puts this phrase at the end of the proof. Also, the Syriac rendering of I 17 begins, "As for any two angles of the angles of a triangle...", whereas Adelard I has, "Of every triangle, any two angles..." Examples like these can be multiplied without end. The Syriac fragment is to be found in the Cambridge University Library; its shelf number is Gg 2. 14.