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The Mountains of the Moon: A puzzle of the Ptolemaic Geography

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ΙΝΣΤΙΤΟΥΤΟ ΙΣΤΟΡΙΚΩΝ ΕΡΕΥΝΩΝ
ΤΟΜΕΑΣ ΒΥΖΑΝΤΙΝΩΝ ΕΡΕΥΝΩΝ
ΕΘΝΙΚΟ ΙΔΡΥΜΑ ΕΡΕΥΝΩΝ



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THE MOUNTAINS OF THE MOON

A PUZZLE OF THE PTOLEMAIC *GEOGRAPHY*

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THE MOUNTAINS OF THE MOON
A PUZZLE OF THE PTOLEMAIC *GEOGRAPHY*

Introduction

The quest for the sources of the Nile had been -already since the antiquity- a major issue regarding the exploration of Africa by both locals and foreigners. This shall not make us wonder, if the importance of the river is taken into account, not only from a strictly economical point of view but also from a political, historical and cultural one (fig. 1).

Claudius Ptolemy (1st-2nd c. A.D.) was the first, who would slide over the mythological basis in interpreting the whole phenomenon, providing particular data regarding the sources of the river; those data are really important, regardless the fact that they are second-handed¹.

Of course, the specific quest was not of high priority for Ptolemy himself; we'd rather say that his interest on physical Geography was limited. However, he introduces the *Mountains of the Moon* in the whole debate, linking them permanently with the river. From then on, this knowledge would consist the actual basis of the quest, being updated from time to time.

This very point leads to two main questions: a) Which are actually the *Mountains of the Moon*? b) Which had the *Mountains of the Moon* been for Ptolemy himself?

The first question has already got an answer: since we must identify the *Mountains* with a specific physical feature, and taken into account that the whole phenomenon is a result of a complicated hydrological system², the

1. Older writers provide similar information, which is considered valid from a scientific point of view. Ptolemy was just the first who tried to find their exact location on the map, also describing the whole phenomenon in any available detail.

2. It is so far proved with no doubt that the Nile is the outcome of at least seven river drainage systems (Main Nile - White Nile - Blue Nile - Little Abai - Bahr el Jebel - Victoria Nile - Kagera' system). See K. M. BARBOUR, *Africa and the Development of Geography*, *The*

Ruwenzori Mountains are considered by the scientists the most likely option (fig. 2). However, the second question remains a puzzle, and this is what the present paper deals with.

The reason for dealing with this issue was a more careful reading of the original text of Ptolemy's *Geography* regarding the actual sources of the Nile. We must confess that the initial idea was to criticize the identification of the *Mountains of the Moon* with the Ruwenzori, for the benefit of another view –also familiar to the scientists– that attributes the Ptolemaic term to Kilimanjaro (fig. 3). However, this idea proved meaningless during the study, shifting the focus to an overview of the Nile's quest throughout time.

The quest for the sources of the Nile

As mentioned above, Nile is a key-point at least for the specific part of Africa. It is a living legend, being traced within the tradition of numerous local civilizations of that area (fig. 4). The quest for its sources became an issue of great importance, not only for reasons of a simple geographic interest but mainly for the need of management of natural resources. The importance of the river itself, its great length, as well as many barriers alongside its route –whether physical or not– made this quest one of the greatest in history. And –let us not forget– it was less than two centuries ago that the science provided the first reliable answers on that.

There are numerous references on the issue throughout the ancient literature, both direct and indirect³, and it is really interesting to watch this

Geographical Journal 148, No. 3 (Nov. 1982), 317-326, especially 318 (Stable URL: <http://www.jstor.org/stable/633149>).

3. See: Hellanicus, Kadmus, Hecataeus, Ephorus, Theopompus, Herodotus, Thales, Anaxagoras, Kallisthenes, Euripides, Democritus, Agatharchides, Aristotle, Diodorus Siculus, Flavius Arrianus, Pseudo-Plutarchus, Strabo, Aelius Aristeides, Flavius Philostratus, Theophylactus Simocatta. Of great importance is the *Historical Library* by Diodorus Siculus (1st c. B.C. – 1st c.A.D.) where he summarizes the views of many before him, also criticizing them, and proposing that the sources (that nobody has seen) lay far beyond Ethiopia, in a distant land, inaccessible due to the extreme heat. He also stresses that no Greek had access to direct information, neither those who provided them (Diod. Sic., *Ιστορική Βιβλιοθήκη* 1.37.1-1.41.10, ed. P. BERTRAC, Paris 1993, 82-94). From the rest references, only Herodotus' could be distinguished; According to that, only the Nasamones had seen the sources themselves, who said that the river springs from a great lake in the hinterland (Diod. Sic., *Ιστορική Βιβλιοθήκη*, 1.37.11).

“dialogue” that got developed through the ages. Despite any disagreements, almost all the ancient writers adopt a “mixed” view, which moves between a metaphysical (dating back to the Egyptian priesthood) and a more empirical dealing with that. At this point it is important to note that the ancient Greeks tried to find out the real cause of the whole phenomenon called “the Nile” rather than the location of its actual sources. Their dispersed efforts to indicate a more specific location remain fuzzy and lack any serious documentation. However, even this way, their testimonies are important, and it gets more interesting when moving forward through time: later writers believe that the Nile begins from mountains deep in the Ethiopic land, even if they do not agree on the technical details (snow melting, heavy rains etc.)⁴. However, it is always a group of mountains that nobody has seen, as the land of Nile was considered unreachable from a point on. This area would be noted as *incognita* and *unexplored* until its actual exploration in the 19th century⁵ (fig. 5, 6).

4. Indicatively: According to Aristotle, in Photius, *Βιβλιοθήκη*, cod. 249 (ed. R. HENRY, *Photius, Bibliothèque VII*, Paris 1974, 134; cf. *Fragmenta varia* 6.34.246.2-6.34.246.13, in *Aristotelis qui ferebantur librorum fragmenta varia*, collegit V. ROSE, Leipzig 1886 [repr. 1967], 193) strong winds that blow annually, push the clouds to the mountains, thus causing heavy rains and flooding from which the Nile rises.- According to Anaxagoras (5th c. B.C. - *Testimonia* 91.65-91.72 in H. DIELS-W. KRANZ, *Die Fragmente der Vorsokratiker*, 6th edition, Berlin 1952, 322-323), what gives birth to the Nile is the huge amounts of snow melting on the Ethiopian mountains. - According to Democritus (5th - 4th c. B.C. - in Diod. Sic. *Ἱστορικὴ Βιβλιοθήκη*, 1.39.1.-1.39.4), the snow at the north of the earth melts every summer, creating clouds which, being pushed by the winds, get trapped among high mountains all over the world (the highest of which are located around Ethiopia, he believed). Then, they cause heavy rains which create the river.- Finally, according to Flavius Arrianus (1st - 2nd c.A.D.) (*Ἰνδική*, 6.4.2.-6.9.7, in *Flavius Arrianus II. Scripta Minora et Fragmenta*, edidit A. G. ROOS, Leipzig 1967, 13-14), Nile is a result of heavy rains in the area of the Ethiopian mountains.

5. A characteristic example is a map dated in 1535; in the specific region one can read: “*Haec pars Africae antiquioribus mansit incognita*”: see G. W. B. HUNTINGFORD, *Azania, Anthropos*, 35/36, H. 1./3. (Jan. - Jun., 1940/1941), 208-220 (Stable URL: <http://www.jstor.org/stable/40459714>). We must not forget that until the 19th century the penetrations of Europeans in that area were not only few but also of a small scale. However, serious cartographic attempts were not rare. Especially during the 18th century, when -due to the Great Discoveries- Ptolemy had been out-of-date (the Renaissance had not dealt with the African interior, thus maintaining the Ptolemaic “cartographic type”- [see F. RELANO, *Against Ptolemy: The Significance of the Lopes-Pigafetta Map of Africa, Imago Mundi* 47 (1995), 49-66, especially 49 (Stable URL: <http://www.jstor.org/stable/1151302>)], the map-makers leave this part of Africa blank on purpose, preferring the gap from a controversial

An essential change came with Claudius Ptolemy; he refers to the sources of the Nile within his *Γεωγραφικὴ Ὑφήγησις* (*Geography*), by transferring third-party information. In specific, he draws information from Marinus of Tyre who, in turn, was based on the testimony of a merchant called Diogenes⁶. Among his references to the sources of the Nile, the following are the most important:

Ἐπειτα καὶ κατὰ τὸν μεταξὺ τῶν Ἀρωμάτων καὶ τῶν Ῥαπτῶν πλοῦν, Διογένη μὲν τινὰ φησι τῶν εἰς Ἰνδικὴν πλεόντων ὑποστρέφοντα τὸ δεύτερον, ὅτε ἐγένετο κατὰ τὰ Ἀρώματα, ἀποσθῆναι ἀπαρκτία, καὶ ἐν δεξιᾷ ἔχοντα τὴν Τρωγλοδυτικὴν ἐπὶ ἡμέρας εἴκοσι πέντε παραγενέσθαι εἰς τὰς λίμνας, ὅθεν ὁ Νεῖλος ῥεῖ, ὃν ἐστὶ τὸ τῶν Ῥαπτῶν ἀκρωτήριον ὀλίγω νοτιώτερον (Γεωγρ. Ὑφήγ. 1.9.1.12 κ.ε.)⁷.

Καὶ μὴν καὶ τὸν Νεῖλον ποταμόν φησιν ἀκολούθως τῇ ἀληθείᾳ γραφήσασθαι, ἐξ οὗ πρῶτον ὁρᾶται παραγινόμενος, ἀπὸ μεσημβρίας πρὸς τὰς ἄρκτους μέχρι Μερόης ὁμοίως δὲ καὶ ἀπὸ τῶν Ἀρωμάτων ἐπὶ τὰς λίμνας, ἐξ ὧν Νεῖλος ῥεῖ, πλοῦν ἀπαρκτία συντελεῖσθαι, τῶν Ἀρωμάτων ἀνατολικωτέρων ὄντων τοῦ Νεῖλου παμπόλλω. (Γεωγρ. Ὑφήγ. 1.15.11.1 κ.ε.)⁸.

Τοῦτον μὲν οὖν τὸν κόλπον περιοικοῦσιν Αἰθίοπες Ἀνθρωποφάγοι, ὧν ἀπὸ δυσμῶν διήκει τὸ τῆς Σελήνης ὄρος, ἀφ' οὗ ὑποδέχονται τὰς χιόνας αἱ τοῦ Νεῖλου λίμναι, καὶ ἐπέχει μοίρας τὰ πέρατα τοῦ τῆς Σελήνης ὄρους ... νζ° νότ. ἰβ L' καὶ ... ξξ° νότ. ἰβ L · (Γεωγρ. Ὑφήγ. 4.8[9] .5.4 κ.ε.)⁹.

depiction. This trend is a pattern, especially after d'Anville (1727). See F. LYNAM – M. LETTS – J. W. CROWFOOT – R. A. SKELTON – E.G. R. TAYLOR – O. G. S. CRAWFORD – MR. BECKINGHAM – T. PHILIPPS, Some Medieval Theories about the Nile: Discussion, *The Geographical Journal* 114, No. 1/3 (Jul. - Sep., 1949), 24-29, here 25 (Stable URL: <http://www.jstor.org/stable/1789986>).

6. The story of Diogenes is really interesting: that merchant, probably poorly informed about the monsoons (which the Greeks and the Romans delayed to be aware of – see also notes 33 and 34), got pushed by the winds and found himself navigating across the eastern coast of Africa; that was actually an unintentional move from the first to the second major naval route in the area [see also L. CASSON, Rome's Trade with the East: The Sea Voyage to Africa and India, *Transactions of the American Philological Association* 110 (1980), 21-36 (Stable URL: <http://www.jstor.org/stable/284208>)].

7. Text according to the newest edition and commentary by A. STUCKELBERGER-G. GRASSHOFF, *Ptolemaios Handbuch der Geographie*, v. 1, Basel 2006, 76.

8. Ed. STUCKELBERGER-GRASSHOFF, v. 1, 99-100.

9. Ed. STUCKELBERGER-GRASSHOFF, v. 1, 468.

Καὶ μὴν καὶ παρὰ τῶν ἀπὸ τῆς Ἀραβίας τῆς εὐδαίμονος διαπεραιουμένων ἐμπόρων ἐπὶ τὰ Ἀρώματα καὶ τὴν Ἄζανίαν καὶ τὰ Ραπτὰ, ταῦτα δὲ πάντα Βαρβαρίαν ἰδίως καλούντων, μανθάνομεν τὸν τε πλοῦν μὴ ἀκριβῶς εἶναι πρὸς μεσημβρίαν, τὴν δ' ἀπὸ τῶν Ραπτῶν ἐπὶ τὸ Πράσον διαπεραιώσιν πρὸς ἀνατολὰς καὶ μεσημβρίαν καὶ τὰς λίμνας δὲ, ἀφ' ὧν ὁ Νεῖλος ῥεῖ, μὴ παρ' αὐτὴν εἶναι τὴν θάλασσαν, ἀλλ' ἐνδοτέρῳ συχνῶ· (Γεωγρ. Ὑφήγ 1.17.6.1 κ.ε.)¹⁰.

From the first three citations one realizes that the lakes where the Nile begins from are located near the coastal zone of Rhapta, while in the last one Ptolemy declares that those lakes are located in the hinterland! This fact rather enforces the proposal of some scholars that *Geography*, in its widely known form, was not always an autonomous work. In specific, the last (8th) book, which provides the instructions for illustrating the text with maps, seems to be an earlier work, based mainly on Marinus of Tyre; however, let us not forget that Marinus is strictly criticized by Ptolemy in the rest of books of *Geography*. Thus, it is possible that one of those two proposals (the scholars believe it is the one locating the lakes at the coastal zone) does not reflect the views of Ptolemy's scientific maturity.

We do not know in details the development of this issue after Ptolemy, until the Age of Discovery. However, studying the cartographic tradition, we can say that there had been some real “action”, especially from 9th -10th and mainly after 13th century, with the “rediscovery” of the Ptolemaic *Geography* by Maximos Planoudis and its subsequent spread to the West.

Nevertheless, the quest enters its essential phase after the age of Discovery and, in particular, during the “modern” exploration of Africa, which began conventionally in 1788 with the founding of the *African Association*. That formation aimed to the exploration of the continent, actually in terms of discovering and providing fresh natural resources for the British commerce. For some western countries, Africa became an extension of their vital space.

The exploration of the Nile and its sources is the result of successive missions of the British, within a period from 1854 to 1878 (date of the publication of Henry Morton Stanley's book “*Through the Dark Continent*”)¹¹.

10. Ed. STUCKELBERGER-GRASSHOFF, v. 1, 102.

11. H. M. STANLEY, *Through the dark continent, or The sources of the Nile around the*

The quest for the sources of the Nile was actually constant. The British needed nearly thirty years for that, with the full support of the state and several populous missions. Before them, in 1770, Bruce, a Scotch explorer, had been looking for the sources in that part of the river which is today known as the *Blue Nile*¹². More than a century ago, Pedro Paez, a Portuguese Jesuit, had also reached the same area ("*História da Etiópia*")¹³.

Burton and Speke, under the support of the *Royal Geographic Society*, discovered Tanganyika Lake in 1854, which they considered the source of the river. A few years later (1862), during the same expedition, Speke discovered Lake Victoria. He, together with Grant, soon discovered the Great Lakes area, during an effort to find Victoria's link to the river (fig. 7). The discovery of the connection between Victoria and Albert Lakes -which Speke had missed- was an achievement of Samuel and Florence Baker, during their expedition on the north-south axis.

However, despite all that success, the achievements of the explorers were not always welcome. Thus, soon after them, David Livingstone was sent back in order to confirm the older hypothesis that Tanganyika was the actual source. Finally, Stanley, a non-professional explorer, managed through his expeditions to fill the gaps of the quest and put the whole issue on its real basis.

It is now generally believed that, 10-15 million years ago, large scale tectonic transformations caused the creation of a highland with huge basins in it. Then, 8 million years ago, those basins started getting filled with water; they are the lakes of George, Edward, Albert and, "recently" (1 million years ago) Victoria (fig. 8). At the end of the ice age, a large-scale flooding of Victoria created a river which, under the interference of the rest lakes, formed the so-called *White Nile*, one of the river's two major branches.

great lakes of equatorial Africa, and down the Livingstone river to the Atlantic ocean, v. I, New York 1878.

12. J. BRUCE, Esq. of Kinnaird, *Travels to Discover the source of the Nile, in the years 1768, 1769, 1770, 1771, 1772 and 1773*, Edinburgh 1790.

13. P. PÁEZ, (1620), *História da Etiópia*. First published as part (v. 2 & 3) of Beccari's "*Rerum Aethiopicarum Scriptores occidentales Inediti*" (Rome, 1905-17). Published separately under the same title in 1945 by Sanceau, Feio and Teixeira.

The *Mountains of the Moon*

Ptolemy was the first who named the *Mountains of the Moon*, identifying them as the source of the Nile. From then on, the term became an axiom itself. Thus, whoever managed to locate the specific mountains would have solved the puzzle regarding the sources of the river. Within the whole quest, one can distinguish three main cases in which that term has been used on purpose, in an attempt to get identified with a real physical feature (fig. 9).

The first attempt was made by Bruce, who identified Amedamit (in the Ethiopian Mountains) as the *Mountains of the Moon*. Moreover, he tried to enforce his view with the remark that the specific Ethiopian mountain had the shape of a half-moon, thus trying an etymological connection. The same area also attracted Crawford, who tried to attribute the Ptolemaic term to the Abuna Yosef Peak.

Then, a more systematic quest followed by the British. Stanley, although he realized that the answer to the issue of the sources should be more complicated than the identification of a single mountain, he started looking for the *Mountains of the Moon* in a different area: at the Ruwenzori range, west of the Great Lakes, in Uganda.

The answer was not considered given, even in the 20th century. A more specific dispute arose, which dealt with a choice between Ruwenzori (J. Oliver Thompson, (*“History of Ancient Geography”*)) and Kilimanjaro (G.W. B. Huntingford, *“Periplus of the Erythraean Sea”* - Harry Johnston and Gervase Mathew).

The *Mountains of the Moon*, as a term, look more like a title than a name; a title, used to be given wherever the scientists believe they locate the Ptolemaic mountains, in their attempt to discover the sources of the Nile¹⁴. However, the distances among all those locations proposed so far are quite big and the puzzle seems to be still unsolved. Therefore, what needs further research is the location of the *Mountains of the Moon* for Ptolemy himself, regardless the official answer about the real sources of the river.

14. The speculation that got developed gave an almost metaphysical scent on the whole issue. Nile got thus related to Eden, while -except for relevant texts of imaginary literature (like *Travels*, by Sir John Mandeville in the 14th c.)- special maps were designed, illustrating this specific view (see also comments by CRAWFORD in: LYNAM et AL. [as in. n. 5 above], 27).

Ptolemy and his geography

Ptolemy's major contribution to geography are the detailed instructions for map-making, according to his own scientific standardization. Moreover, the "gazetteer" of placenames he created is of great importance. The latter was made on the basis of the division of the earth in meridians and parallels (360 and 7, respectively), according to Hipparchus, three centuries ago.

In this point, it seems crucial to underline that Ptolemy himself was barely interested in physical geography, at least in the terms of a modern concept. This is obvious even after a single look at the structure of all the eight books of *Geography*, seven of which consist actually an extensive theory of geography. In specific:

i: A theory for map-making as well as a critic to Marinus of Tyre, who was his major source.

ii: Theory of geography: ways for calculating meridians and parallels as well as a description of the *Ecumene* (starting from the west).

iii-vi: Description of the *Ecumene* (continues)

vii: Completion of the description of the *Ecumene* and of the cartographic theory as well.

Only the eighth book is somehow different, providing a more "applied" perspective: instructions for dividing the world in map sheets, as well as additional texts. However, this very point, together with some "mistakes" on placenames and their description, has led some scholars to the theory that the original *Geography* consisted only of the seven first books, while the eighth was initially autonomous, being added to the rest later. In specific, it is now believed that it is actually an older work, based entirely on Marinus of Tyre, while the "actual" *Geography* is supposed to be a work of Ptolemy's maturity (ca. A.D. 150) (fig. 10).

Although that work of Ptolemy was not unfamiliar, its preserved manuscripts do not date before the 13th c.. What we know about it from earlier times is scattered in works of various writers (of Byzantine, Arabic and Armenian origin)¹⁵. The "rediscovery" of Ptolemy is attributed to

15. See B. ΤΣΙΟΤΡΑΣ, *Η εξηγητική παράδοση της Γεωγραφικής Υφηγήσεως του Κλαύδιου Πτολεμαίου: οι επώνυμοι σχολιαστές*, Athens 2006, 44-46. Milestones in the history of *Geography* throughout the non-Greek-speaking world: Armenia (5th c.), Syria (6th-7th c.), Arabia (9th c.). Furthermore, from the later influence of that work throughout the Greek and Greek-speaking world, we mention indicatively: Ammianus Marcellinus (A.D.

Maximus Planoudis, a famous scholar of the Palaeologan era. His mathematic skills, astronomic knowledge and geographic interests pushed him to look for manuscripts of *Geography* which, as he stated, “was lost for uncalculated years”¹⁶.

From both what came next and his own handwritten notes we can assume what really happened: Planoudis located a copy of that work, however without illustration. He managed to draw his own maps¹⁷, based on Ptolemy’s instructions, as referred in the Cod. Ambr. A119¹⁸. The book attracted the attention of the emperor Andronicus II, who ordered a copy

330-400), Pappus of Alexandria (late 3rd – early 4th c.), Moses Chorenus [7th c. – indirect relation, via the work of Pappus; Moses –also known as Ananias Shirakaze- is our reference to Pappus as well; see also: L. BAGROW, The Origin of Ptolemy’s Geographia, *Geografiska Annaler* 27 (1945), 318-387, here 325 (Stable URL: <http://www.jstor.org/stable/520071>)], Marcianus from Heraclea (5th - 6th c.), Symeon Seth (11th c.), Eustathius of Thessaloniki (12th c. – he includes verbatim the preface of *Geography*), Ioannis Tzetzis (12th c. – he criticizes Ptolemy for his mistakes). Of course, we could not exclude Maximus Planoudis (13th – 14th c.) and Plethon (14th – 15th c.) as well.

16. In a manuscript which belonged to Planoudis himself (with non geographical works) an autograph hexameter poem is found (lines 28-31 – transcription and restoration by Ag. Tselikas): Ἔργον ἀτὰρ τόδε τηλίκον οἶον / νηρίθμοις ἐτέεσι κεκευθμένον οὔποιτ’ ἐραστοῦ / ἔμμορον, ὅς φιλόγαλον ἔχων κέαρ ἐς φάος αὐτὸ / ἧσι φιλοφροσύνησιν ἐφωρμῆθη προσηνεγκεῖν. Furthermore, in an epigram by Planoudis [ed. by C. F. A. NOBBE, in the first edition of *Geography*, *Claudii Ptolemaei Geographia*, I, Leipzig 1843, XXI; cf. S. KUGEAS, *Analekta Planudea*, *BZ* 18 (1909), 117] one can see the importance of *Geography*: it says that this rediscovered knowledge shaded any other relevant knowledge of its time: Ἦδε γεωγραφίη δὲ νεώτατον ἄρτι φανεῖσα/ πάσαις ταῖς προτέραις ζοφερὴν ἐπέθηκε καλύπτριν.

17. Much has been said about the authorship of the *Geography*’s maps and the role of Planoudis. In general, it is believed that Planoudis is the creator of the twenty-six maps accompanying the Ptolemaic text, which, until then included only one world map (attributed by the scholars to Agathodaimon, an engineer from Alexandria). Indicatively, see: L. O. TH. TUDEER, On the Origin of the Maps Attached to Ptolemy’s *Geography*, *JHS* 37 (1917), 62-76 (Stable URL: <http://www.jstor.org/stable/625456>); A. DILLER, The Oldest Manuscripts of Ptolemaic Maps, *Transactions and Proceedings of the American Philological Association* 71 (1940), 62-67 (Stable URL: <http://www.jstor.org/stable/283114>); BAGROW, The Origin of Ptolemy’s *Geographia* (as in n. 15); E. POLASCHEK, Ptolemy’s “*Geography*” in a New Light, *Imago Mundi* 14 (1959), 17-37. Cf. E. FRYDE, *The Early Palaeologan Renaissance* (1261-c.1360) [The Medieval Mediterranean 27], Leiden-Boston-Köln 2000, 254-257.

18. A. MARTINI - D. BASSI, *Catalogus codicum Graecorum Bibliothecae Ambrosianae* (Milano 1906), 43-44, no. 43.

for himself by the patriarch of Alexandria; that copy was later found in Vatican. It seems to be the luxurious Vat. Urb. Gr. 82 (fig.11). This is the starting point of *Geography's* new era: the manuscript got copied¹⁹ and translated²⁰, while a bit later, typography became a critical means for its expansion (fig.12-13).

This “rediscovery” of the Ptolemaic book is contemporary with the monastic cartography of the Middle Ages in the West, as well as the introduction of the first Portulan maps (fig. 14). From then on, *Geography* will survive, either in its original form or modified with new data from the new discoveries; it will not be out-of-date until the 17th-18th centuries, during the scientific geographic expeditions of the colonialism.

The cartographic tradition

As stated previously, despite the fact that parts of *Geography* have been traced within the works of many authors, the preserved manuscripts are not dated before the 13th century (just four of the nearly fifty copies known today). As for the illustrations, only sixteen of them include maps²¹.

It is generally believed that the first maps of the work we have today had been drawn by Planoudis himself. The important thing is that, although the scholars agree that Ptolemy had for sure drawn maps in his career, *Geography* -at least in its known form- had never been illustrated before Planoudis. Therefore, we must keep in mind that text and illustrations should be considered as different issues and studied separately - not as a whole.

19. The spread of *Geography* to the western world begins with Planoudis. So far, a number of about fifty Greek codices have been found, dated back to the next two centuries after Planoudis. [see also: L. NAVARI, Ο Κλαύδιος Πτολεμαίος, η «Γεωγραφική Υφήγησις» και το πτολεμαϊκό πρόβλημα, in A. TSELIKAS (ed.), «Κλαύδιος Πτολεμαίος, Γεωγραφική Υφήγησις: ελληνικός κώδικας 388 της Μαρκιανής Βιβλιοθήκης της Βενετίας», εισαγωγικά κείμενα, Athens 1998].

20. The Latin manuscripts of *Geography* begin with the translation by Manuel Chrysoloras - Jacopo d'Angelo, in 1406, while the first printed version is the one of Vicenza in 1475 (see NAVARI, Κλαύδιος Πτολεμαίος, 47).

21. S. A. CHRYSOCHOOU, The Cartographical Tradition of Ptolemy's Geographike Hyphegesis in the Palaeologan Period and the Renaissance (13th-16th century) [Examining the cartographical data in the 16 illustrated Greek MSS of the *Geographia*], Diss. Royal Holloway College, London University, Hellenic Institute, History Department 2010.

Looking back to the cartographic tradition before and after Ptolemy –always regarding the quest for the sources of the Nile- we can distinguish the following major types:

i) The “ancient Greek type”:

Among the various cartographic depictions of the world made by the ancient Greeks one can distinguish that made by Dionysios Periegetes (ca. 405 B.C. – fig. 15). Despite the external form he gave to the known world, a good effort for realistic rendering had been made. In our case, Nile is depicted with a shorter route, starting far northern, somewhere into undefined massifs around Ethiopia, which seems to agree with the general beliefs of the Greeks on that issue (see also note no. 3).

The same principals seem to be followed by the famous *Orbis Terrarum* by Agrippa and Augustus (1st c. B.C. – 1st c. A.D. – fig. 16), at least as we know it through its Middle-Ages copies. It depicts the earth’s surface and the known world the same way. However, despite its abstractive character, an important detail is given regarding the Nile: the river appears divided in two major parts (*Blue* and *White Nile*), each of which comes from mountainous areas, while the latter (*White Nile*) has two branches itself. This seems to be a later addition to the original map, if we accept what is generally believed about the relation of Romans with science (the Romans, as a non-mathematical nation had not been attracted by geography²², which demanded excellent mathematical skills as well as a trend for research, far beyond the “utilitarianism” they had generally shown through their preference for technical works).

ii) The “Arabic” type:

Ptolemy’s works got translated into Arabic in the 9th century. The major mathematical minds of the Arabic world soon realized their importance. Al-Khuwarizmi (9th c. – fig. 17) was the one who made a complete world map, based mainly on Ptolemy, whom he partially reviews²³.

22. J. J. O’CONNOR- E. F. ROBERTSON, The history of Cartography, in *JOC/EFR*, August 2002 (MacTutor History of Mathematics – URL: <http://www-history.mcs.st-andrews.ac.uk/HistTopics/Cartography.html>). Also: BAGROW, *The Origin*, 330.

23. In the work of Al-Khuwarizmi entitled *Surat al-ard* (ca. 830-840) the Ptolemaic text has been modified in many points. However, the only copy of that work that has been found includes just four maps [see: BAGROW, *The Origin*, 328, as well as: H. V. MZIK, *Ptolemaeus und*

What's interesting with Arab geographers regarding the specific issue, is that the information they provide is often original, due to the geographic knowledge they had obtained through the development of commercial activities and the extension of land and sea routes²⁴. Thus, the tradition initiated with Al-Khuwarizmi seems to combine successfully Ptolemaic and contemporary geographic knowledge, introducing at the same time a special cartographic typology.

The same tradition is followed by *Tabula Rogeriana*, Al-Idrisi's famous work (middle 12th century)²⁵ (fig. 18,19). It is a world map designed for king Roger of Sicily, Al-Idrisi's patron. Beyond this map, more known works of this geographer use the same typology.

Another example is the famous *Book of Curiosities*, (fig. 20) a copy of an 12th-13th century work originally dated in the 11th century²⁶. In this book, the depiction of the Nile is annotated in detail (fol. 42a).

Beyond the specific typology mentioned above, what is also interesting in all those maps of Arabic origin is their cartographic details. Usually, those die Karten der arabischen Geographen, *Mitt. d. k. k. Geogr. Ges.* 58 (1915), and IDEM, Osteuropa nach der arabischen Bearbeitung der *Γεωγραφικὴ Ἐπιπένησις* des Klaudios Ptolemaios von Muhammad ibn Musa al-Huwarizmi. *Wiener Zeitschrift f. d. Kunde des Morgenlandes* XLIII (1936), 161-193]. Except for Ptolemy's influence on Al-Khuwarizmi, it is believed that his map reflects much of the famous world map of Al-Ma'mun (early 9th c.), which is considered as the first official cartographic product of the Arabs, which, unfortunately, has not survived. See: C. ISSAWI, Arab Geography and the Circumnavigation of Africa, *Osiris* 10 (1952), 117-128, esp. 118 (Stable URL: <http://www.jstor.org/stable/301811>), and R. W. BRAUER, Boundaries and Frontiers in Medieval Muslim Geography, *Transactions of the American Philosophical Society*, New Series, 85, No. 6 (1995), 1-73, esp.1 (Stable URL: <http://www.jstor.org/stable/1006658>).

24. Of course, this does not make it impossible for the early Arab geographers to be aware of more maps. For example, Mas'udi, the Arab writer (A.D. 947), states that he had seen himself maps by many cartographers prior to him, from whom he distinguishes Marinus, Ptolemy and the designer of Al-Ma'mun's map (see: BAGROW, *The Origin*, 328).

25. Abu Abdallah Muhammad ibn Muhammad ibn Abdallah ibn Idris (A.D. 1100-1165). He lived in the court of King Roger of Sicily. He designed on his behalf a world map, also known as the famous *Tabula Rogeriana*. Beyond that map, he wrote the first Arabic geographic essay entitled *Kitab nuzhat al-mushtaq fi'khtiraq al-'afaq*. See: M. TOLMACHEVA, The Medieval Arabic Geographers and the Beginnings of Modern Orientalism, *International Journal of Middle East Studies*, 27, No. 2 (May, 1995), 141-156, esp. 142-144 (Stable URL: <http://www.jstor.org/stable/176089>).

26. J. JOHNS - E. SAVAGE-SMITH, *The Book of Curiosities: A newly discovered series of Islamic maps*, *Imago Mundi* 55 (2003), 7-24, esp. 7.

details relate to elements not included within the Ptolemaic text, at least in that extent; therefore, one can conclude that all this is a later knowledge derived from direct information. Nile is depicted as coming from the *Mountains of the Moon*, however through a specific hydrological complex: two same-sized lakes where each branch of the river ends and a third at the center, which collects all the water, forming the *White Nile* which starts its route to the north²⁷.

iii) The “Planoudean” type:

The cartographic tradition initiated with Planoudis has been traced in some of the illustrated manuscripts of *Geography*. The peculiarity is that the sources of the river are depicted according to Ptolemy’s instructions (through lakes from the melting snow of the *Mountains of the Moon*), however with no visible link between the lakes and the mountains, which are precisely located and annotated. Finally, the lakes are equal in number to the river’s major branches (fig. 21-22).

iv) The “western” type:

The Latin copies of *Geography* show a remarkable resemblance in terms of cartographic typology. Although the first copy of the Ptolemaic

27. Despite what is generally believed about the contribution of the Arabs in cartography, an important detail must be highlighted: Except for the two major world maps by Al-Khuwarizmi and Al-Idrisi –which show a confirmed Ptolemaic influence- the Arabic contribution was not actually of such a large scale; this has its roots to a confusion regarding the appeal of this nation to the mathematics. It seems that the Arab geographers were in fact divided in two categories: the theoretical and the empirical ones. The first category usually belonged to the courts of their times and, despite their great background, they did not get involved in map-making but rather in writing theoretical essays. On the contrary, the second category, which had essential access to actual geographic information mainly through commerce, did not have either the capability or the means for designing accurate maps and promote them (see R. W. BRAUER, *Geography in the Medieval Muslim World. Seeking a basis for comparison of the development of the natural sciences in different cultures, Comparative Civilizations Review* N. 26, Spring 1992, 75-76). Furthermore, what is considered as applied Arabic geography is rather a description of cities and networks (which are depicted in the form of single lines linking inhabited places - “linear cartography” - see: BAGROW, *The Origin*, 337 and 339; TOLMACHEVA, *The Medieval Arabic Geographers*, 143 and BRAUER, *Boundaries*, 13). Finally, regarding the actual information on those maps and its origin, it is believed that they come from earlier geographers as well as eyewitnesses. However, the journey in the Arabic world seldom aims to fresh knowledge about distant places (see: BRAUER, *Geography in the Medieval Muslim World*, 82); thus the information is random, selective and focused mainly –as foretold- on inhabited places.

work that arrived in the west was Vat. Urb. Gr. 82, the “western” type is typologically different, especially regarding the way the lakes link to the mountains.

This detail was first located in the Arabic maps (fig. 23). However, despite its huge success in the West, the *Geography* had arrived there with a big delay: it was already the end of the 15th century. Soon, the great discoveries shall mark the beginning of a new era in geography and cartography. This fact will be obvious also in the few late copies of *Geography*, in terms of both the geographic data and the cartographic typology as well²⁸.

The development of the geographic knowledge-a comparison of the cartographic types

It seems that the initial geographic information got updated following a typical “linear” development, especially after the Arab geographers. However, although the initial “ptolemaic” type lacked any illustration, the geographic knowledge itself is quite precise. Moreover, although the major spread of the Ptolemaic work takes place under Planoudis, more precise information pre-existed in maps before the 13th century.

Therefore, regarding the issue of the geographic knowledge itself -as it gets depicted on maps- the contribution of others, prior to Planoudis (probably Arabs), seems to be more essential; for the information of the original work appears quite updated and enriched in the 14th century²⁹.

Planoudis depicts an already updated geographic knowledge on his maps, thus updating himself the Ptolemaic work as a whole, in the integrated form (text and illustrations) it got spread to the West from then on. Of course, as nobody could put Planoudis’ mathematical genius under question,

28. Even then, Ptolemy shall not be out-of-date. It is of great importance that even the famous Waldseemüller’s maps (1507 and 1516) depict the area the same way, thus adopting the Ptolemaic type. (Fig. 24 – See also RELANO, *Against Ptolemy*, 51-52).

29. Although Ptolemy was commonly accepted as the indisputable geographic authenticity for ages, it is a fact that some of the earlier archived geographic knowledge was not adequately incorporated in his work. For example, neither the views of many Greeks on this issue (Herodotus, Eratosthenes) neither critical details of the *Periplus* (see also R. CASSON, *The Periplus Maris Erythraei*, Princeton 1989, 134) neither finally the reports of the officers sent by Nero can be traced in the Ptolemaic work. So, it is possible that this information updated the geographic knowledge at a later time.

we assume that he (Planoudis) also updated himself much of the pre-existing data³⁰.

Nevertheless, regarding our focal point, that is the identity of the *Mountains of the Moon* for Ptolemy himself, the cartographic tradition does not have much to offer. The reason is that, what maps depict –either approximately or in detail– is the current view on the quest of the sources, regardless Ptolemy’s intensions.

The contribution of the metric tools

The difficulty in “interpreting” the cartographic depictions of *Geography* made necessary the contribution of modern tools and methods of precise measurement and calculation. However, the results still leave crucial questions unanswered.

The attempt for locating the *Mountains of the Moon* using precise coordinates had no result so far. After all, it is a common secret that the calculation of the geographic longitude tantalized the geographers for long, while the first calculations are full of errors.

Nevertheless, modern geographers tried new calculation methods, in an attempt for a “scientific” interpretation of the Ptolemaic measurements. E. Livieratos³¹ has calculated the Ptolemaic degree as the 8/10 of the actual one. This factor results a longitude at 30.50 and latitude at 20 degrees, for the *Mountains of the Moon*, according to Ptolemy³². However, such values deflect a lot from the mountains proposed. Thus, the question still remains open, even from this point of view.

Additional data

More data enriching the whole issue come from sources contemporary to Ptolemy, as well as from modern research.

Regarding the ancient sources, one must confess that they are actually

30. Following note no. 15, we should point out that, despite the lack of copies of the *Geography* among the Byzantine scholars (according to Planoudis), the work itself was well-known. This is obvious if taking into account all those commentators of the *Geography*, in an unbroken line, almost up to Planoudis himself.

31. E. LIVIERATOS, *Χαρτογραφία και χαρτών περιήγησις*, Thessaloniki 1998, 90.

32. Long. 57⁰ –67⁰, Lat. -20⁰ which is (in modern values): Long. 27, 5⁰ ως 35,5⁰, Lat. -2⁰. Dr. N. Mostratos’ contribution to those calculations was critical; we thank him.

dispersed and selective, thus making it almost impossible to form an adequate research basis.

A reference to those authors has been made above. What, however, is important here is a latent but general belief that the sources of the Nile are located at a great lake, in which adequate water resources have been gathered from elsewhere³³. That lake seems to be located far within the unexplored Ethiopic territory.

Of great importance is, however, another ancient source, a little before Ptolemy: the *Periplus Maris Erythraei*. It is attributed to an unknown author of the 1st century A.D.³⁴. The importance of this work –which has already been a field for thorough research itself- is that it consists a “technical” manual for maritime commercial activities. Its aim is to provide clear instructions for navigation within the Indian ocean (fig. 25), together with a “pack” of geographical data for the merchants (harbours, stations, goods, local population etc), while the framework is always the commerce between Rome and India. The work is very important for an additional reason: it is the first detailed historical reference for the region of Eastern Africa and especially the area south of Somalia up to Rhapta, the “farthest” known point to the south (fig. 26).

Regarding our issue, the *Periplus* provides us a lot of important data, which could be concluded to the following:

33. The idea of the Nile’s beginning from a lake (which, previously, had collected the water from many different sources) seems wide-spread already since the antiquity (see: Diod. Sic. *Ιστορ. Βιβλιοθήκη*, 1.32.1.1-1.32.5.1 and 1.37.1-1.42.1.). Moreover, some scholars, like Aristotle (*Anim. Hist.* viii 2) and Pliny (*Hist. Nat.* v 10, vi 35), link those lakes with the Pygmean territory, in the hinterland (see: H. SCHLICHTER, Ptolemy’s Topography of Eastern Equatorial Africa, *Proceedings of the Royal Geographical Society and Monthly Record of Geography, New Monthly Series*, 13, No. 9 Sep., 1891, 513-553, mainly 536). This information seems to be of old origin, somehow connected to the ancient trade of slaves, see also: C. M. KUSIMBA, Archaeology of Slavery in East Africa, *The African Archaeological Review*, 21, No. 2 (Jun., 2004), 59-88, esp. 60 (Stable URL: <http://www.jstor.org/stable/25130793>).

34. Many scholars have questioned the identity of the author (who is traditionally considered to be Arrianus). However, nothing is sure, although many indications propose that he was a Greek-speaking Egyptian (not a Greek from Alexandria). Moreover, as for the time of the writing, is it believed to be between 40 and 70 A.D. [see: K. MEGALOMMATIS (ed.), *Ανωνύμου (Αρριανού ως φέρεται) Περίπλους της Ερυθράς Θαλάσσης*, Athens 1994, 92-93].

i) The geomorphology of the coastal zone in the area of the gulf of Rhapta was quite different in ancient times; many rivers poured there and a complex of water bodies covered a vast area, a little north of the city which was a famous trading post of its era³⁵.

ii) The amount and the species of the trading goods that reached Rhapta for exportation testify a trade with the hinterland of Eastern Africa³⁶.

iii) Although a few references pre-exist³⁷, Greek and Romans began knowing the area and its peculiarities (monsoons and naval routes) only after the age of Augustus³⁸.

iv) At the same time, another route -via tributaries and minor roads of the hinterland- was active, linking the African coastal zone with the lakes area to the west and then with Egypt to the north, through Abyssinia³⁹. Although not the first option, this route was always active⁴⁰, especially

35. See: *Periplus*, chapter 15. More scholars agree that a huge transformation of the Azanian coast had taken place during all those centuries. For example, A. WINK, From the Mediterranean to the Indian Ocean: Medieval History in Geographic Perspective, *Comparative Studies in Society and History* 44, No. 3 (Jul., 2002), 416-445, [Stable URL: <http://www.jstor.org/stable/3879375>] (for the major area of the Indian ocean). As for the transformation of the hinterland, as a result of major climatic change, see: E. NILSSON, Ancient Changes of Climate in British East Africa and Abyssinia. A Study of Ancient Lakes and Glaciers, *Geografiska Annaler* 22 (1940), 1-79, esp. 2, 5 (Stable URL: <http://www.jstor.org/stable/519977>).

36. The cases of ivory and rhino horn are characteristic: both animals come from the savannahs of the interior (see: *Periplus* chapters 4, 16. Also: SCHLICHTER, Ptolemy's Topography, 515).

37. Indicatively: Onesicritus, Eudoxus from Cyzicus, Hippalus and Aristovoulos, who seem to be aware (see also: CASSON, *Periplus*, 224).

38. It is generally believed that this had been a slow process, especially because of the domination of the Yemenites in those seas, which started to decline only after the campaign of Aelius Gallus [see: *Periplus*, 75. Also: J. THORLEY, The Development of Trade between the Roman Empire and the East under Augustus, *Greece & Rome*, Second Series, 16, No. 2 (Oct. 1969), 209-223, here 212 ff]. (Stable URL: <http://www.jstor.org/stable/642851>).

39. MEGALOMMATIS, *Περίπλους*, 27.

40. See: J. MILLER, *The Spice Trade of the Roman Empire*, Oxford 1969, 146 and 150-156, where an ancient trade route is mentioned, from Rhapta to the Great Lakes and then to Northeastern, towards the Nile. The same route, however reversed, has been traced by other scholars [D. A. WELSBY, The Kingdom of Kush. London: 1996, 70 and F. A. CHAMI, Graeco-Roman Trade Link and the Bantu Migration Theory, *Anthropos*, 94, H. 1./3. (1999), 205-215, esp: 206-209 (Stable URL: <http://www.jstor.org/stable/40465703>). It seems that this second route is older, prior to the A.D. 1st c., when the Romans moved

when navigating via the primary roads was impossible for many reasons⁴¹.

In addition to all the above, the current research could lighten up the whole issue, though indirectly, however quite convincingly. For example, archaeological finds support the theory about a gradual transportation of technological knowledge from the hinterland towards the coast of Eastern Africa, accompanied with corresponding tribal movement⁴². This factor is considered of great importance, as it makes more than possible a respective spread of information, at least on issues of everyday life.

From all the above it seems that a general geographic knowledge of the whole area was possible among the locals –though late for the Greeks⁴³

the center of the commerce to the Red Sea. This route is connected to the Bantu migration theory (Fig. 27), from the Great Lakes towards the coast during the last centuries B.C., which is supported by evidence of a corresponding spread of know-how regarding pottery and blacksmithing [see: D. L. SCHOENBRUN, Cattle Herds and Banana Gardens: The Historical Geography of the Western Great Lakes Region, ca AD 800-1500, *The African Archaeological Review*, 11: Papers in Honour of Merrick Posnansky (1993), 39-72, (Stable URL: <http://www.jstor.org/stable/25130559>)]. As for older times, an analogous spread of know-how (for stone tools this time) has been traced, towards the eastern coast [see: P. ROBERTSHAW, Archaeology in Eastern Africa: Recent Developments and More Dates, *The Journal of African History* 25, No. 4 (1984), 369-393, mainly 372, 378-390 (Stable URL: <http://www.jstor.org/stable/181222>)].

41. See: G. S. P. FREEMAN-GRENVILLE, *The East African Coast. Selected Documents from the First to the Earlier Nineteenth Century*, Oxford 1975, and CHAMI, Graeco-Roman Trade, 211. The communication of the Red Sea with the eastern coast of Africa became harder during the fight between the Sassanids and the Axoumites. Thus, the ancient route through the Great Lakes area became a real option for the merchants.

42. Linguistic and archaeological evidence (pottery and iron tools of specific types) do support this migration from the center of the continent towards the coast, especially the eastern one [see note no. 40. Also: P. R. SCHMIDT, *Iron Technology in East Africa: symbolism science and Archaeology*, Bloomington 1997 and C. BREEN -P. J. LANE, Archaeological Approaches to East Africa's Changing Seascapes, *World Archaeology*, 35, No. 3, Seascapes (Dec., 2003), pp. 469-489, (Stable URL: <http://www.jstor.org/stable/4128321>), mainly 475.

43. It has been proved that, the Greeks, even when they navigated the Red Sea along with the Egyptians who had an excellent knowledge of that area, knew actually just a little about the interior (see: MEGALOMMATIS, *Περίπλους*, 148). That ignorance, together with the influence of elements from the Egyptian mythology, gave the African interior a rather metaphysical view, often present in ancient writers [see: T. SZEPESSY, Die Aithiopika des Heliodoros und der griechische sophistische Liebesroman, *Acta Antiqua Academiae Scientiarum Hungaricae* 7 (1957), 241-259].

long before the Augustan era. However, it seems unlikely that a thorough understanding of more complex phenomena (like the hydrological system of the Nile) was possible, although core knowledge must be pre-existed.

Under this spectrum, it makes not surprise that Diogenes the merchant (mentioned by Marinus of Tyre) got easily this very important information about the sources of the Nile (although it seems that a misunderstanding about that had occurred at the meanwhile).

Therefore, it is very likely that the geomorphology of the specific part of Azania, combined with a third-party information that the river began from a lakes' complex, caused a confusion about their actual position; a confusion that became the main pattern for long, transmitted later to Diogenes in that version.

Conclusion

Before trying to answer the initial question, we should wonder whether Ptolemy had something specific on his mind when talking about those mountains or not. We should wonder if he just repeated an information he got, without having any picture of the area and its physical features (high mountains, great lakes, marshes, floods, drainings etc.). The answer seems obvious: Ptolemy needed to provide specific coordinates for the placenames and the physical features he planned to include in his "database"; if no detailed description was given to him, he had to calculate the coordinates himself, based on any available information (direct or third-party) he managed to acquire.

Nevertheless, regardless the actual location of those mountains, the initial information itself seems to be accurate: we have high, snow-covered mountains which feed a complex of great lakes from which Nile begins. It is a logical scheme, which, as we know today, is true in general.

If we follow more the Ptolemaic text than its illustrations⁴⁴, the *Mountains of the Moon* seem to be located rather in the hinterland, although

44. This distinction is necessary, as the later addition of the maps to the original text is considered as a fact. Moreover, we should not forget the difficulty regarding the right calculation of Longitude, not only in the era of Ptolemy but also later. This point must be a good explanation for the deviation in the depiction of the *Mountains of the Moon*, in comparison to the textual description [see: O'CONNOR-ROBERTSON, English Attack on the longitude problem, in *JOC/EFR*, April 1997 (URL: <http://www-history.mcs.st-and.ac.uk/history/HistTopics/Longitude2.html>).

–as we’ve seen– a different version is also known. This is probably the main reason for the conflict about its identification either with Ruwenzori or Kilimanjaro.

It seems that the scientific community repeated the same old mistake. For the actual question is not the identification of any of the above mountains to the Ptolemaic term, as this is rather meaningless; Ptolemy himself, not only was not aware of the distinction between them, but he had no idea of what that area looked like. His text provides a third-party information by Diogenes. And, though the logical scheme is valid, it simply applies to a wrong place.

The belief in the existence of great lakes in the African hinterland, where great rivers came from, seems to be old and spread throughout Eastern and Western Africa as well. This is obvious if we look carefully at maps (later that the “western” type of *Geography*) which differ from the “Ptolemaic” type, thus reflecting some older traditions of the local tribes⁴⁵ (fig. 28). Early Portuguese maps of Western Africa⁴⁶ depict the area in a different way, while it seems that the locals were the ones who provided all the relevant information to those cartographers (this is clearly stated in diaries of some of those cartographers) (fig. 29-31).

Nevertheless, even that way, we should admit that locating the *Mountains of the Moon* in the hinterland –and, in particular, in the region of the Great Lakes– raises some questions (regardless its scientific correctness). For it is quite unlikely that the ancient inhabitants of that whole region –split into different territories, often hostile to each other) had full supervision of the area, let alone of the actual route of the Nile⁴⁷ or knowledge of the complicated hydrological factors related to its sources.

It is more possible that the Ptolemaic term referred to a wider region from Kilimanjaro up to Ruwenzori, where snow-covered peaks⁴⁸ and

45. An interesting case is that of Giacomo Gastaldi, whose map of 1564 not only does not locate the sources of the Nile at the *Mountains of the Moon* but it does not even mention them. On the contrary, Gastaldi adopts an alternative view of a big central lake, which is the source of every big river in Africa (see: RELAÑO, *Against Ptolemy*, 54), echoing perhaps a local tradition.

46. The maps of Lopez-Pigafetta, at the end of the 16th century (1591), are a characteristic example (see: RELAÑO, *Against Ptolemy*).

47. This plausible question has tantalized the scholars since the 19th century, after the whole issue got a more scientific basis (see: SCHLICHTER, *Ptolemy’s Topography*, 535).

48. An important detail has to be noted here: It is possible that the translation of the

numerous water bodies (being often changed due to flooding and draining) formed an entire area where all the elements of an older legend were present.

Moreover, the unquestionable movement of population from the hinterland towards the coastal zone could enforce pre-existed rumors, thus enforcing the confusion about the mountains' actual location, at the same time. The *Mountains of the Moon*, despite their widely acceptable identification to Ruwenzori, seem to be rather a place of the myth –almost metaphysical⁴⁹ (fig. 32), which retains its mystery, leaving back the old question unanswered.

term *Mountains of the Moon* in Greek was wrong from the beginning; the term, in some local dialects, means “moon” and “white” (thus “snow-covered”?), at the same time. This has to be related somehow with a detail provided by Aristotle: the starting point of the river is a mountain called «Ἄργυρος» (silver) (see: SCHLICHTER, Ptolemy's Topography, 540).

49. See: LYNAM et AL [as in n. 5], 24, 27.



Fig. 1: Africa and the Nile (detail - source: Microsoft Corp.)



Fig. 2: The Ruwenzori mountains (source: wikimedia.org).



Fig. 3: Kilimanjaro (source: eightup.co.uk).



Fig. 4: Depiction of Apis (Hapi), God of the Nile (drawing based on a carving on the outer wall of Dendera Temple, near Qena, Egypt)



Fig. 5: Map of Africa (1813) depicting the *Mountains of the Moon* as a sierra, diving the continent in two parts, thus showing the limits of the explored world [Full title: *Africa. J. & G. Menzies sculpt. (Drawn & engraved for Thomson's New general atlas, 1813)*].



Fig. 6: Map of Africa (1839), showing the insufficiency of information regarding the interior, mainly around the Equator [Full Title: *Map of Africa. Engraved to Illustrate Mitchell's School and Family Geography. No. 14. (with) Map of Liberia. No. 15. Engraved by J.H. Young. Entered ... 1839, by S. Augustus Mitchell ... Connecticut.*].

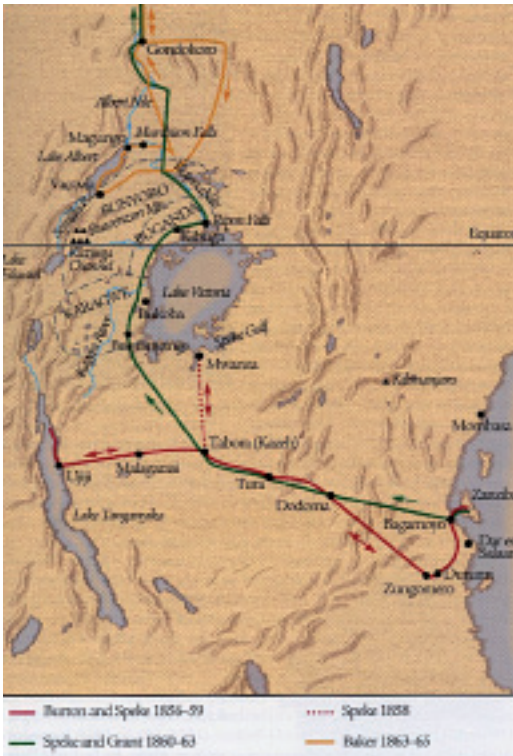


Fig. 7: The journeys of Speke, Burton, Grant and Baker in the area, in 1856 -1865 (John Hanning - source: Spekewww.ntz.info).

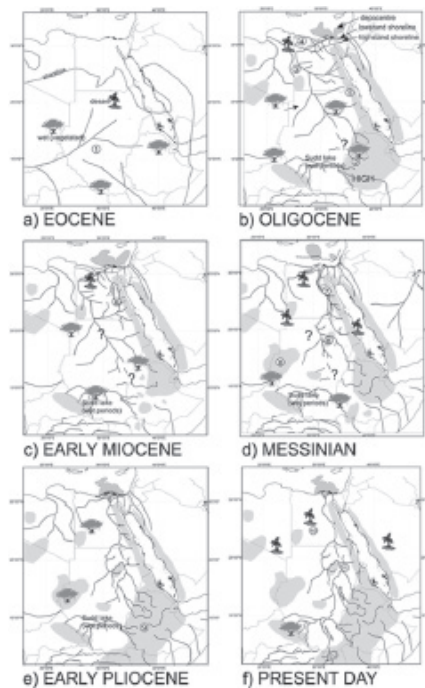


Fig. 8: The development of the Nile’s drainage system (source: Duncan S. Macgregor, 2012, p. 29) “The development of the Nile drainage system: integration of onshore and offshore evidence (*Petroleum Geoscience*, Vol. 18, 2012, pp. 417 –431)”



Fig. 9: Morphological map of Africa, indicating the major mountains (map by Aaron Maizlish, 2004 - source: vidiani.com).



Fig. 10: Detail from cod. Marc. gr. 388 (a manuscript containing the text of *Geography*) with the coordinates of the *Mountains of the Moon* (photographic reproduction of the codex in: ΤΣΕΛΙΚΑΣ, Αγ. (ed.), 1998, «Κλαύδιος Πτολεμαίος, Γεωγραφική Υφήγησις: ελληνικός κώδικας 388 της Μαρκιανής Βιβλιοθήκης της Βενετίας», Athens: Militos).

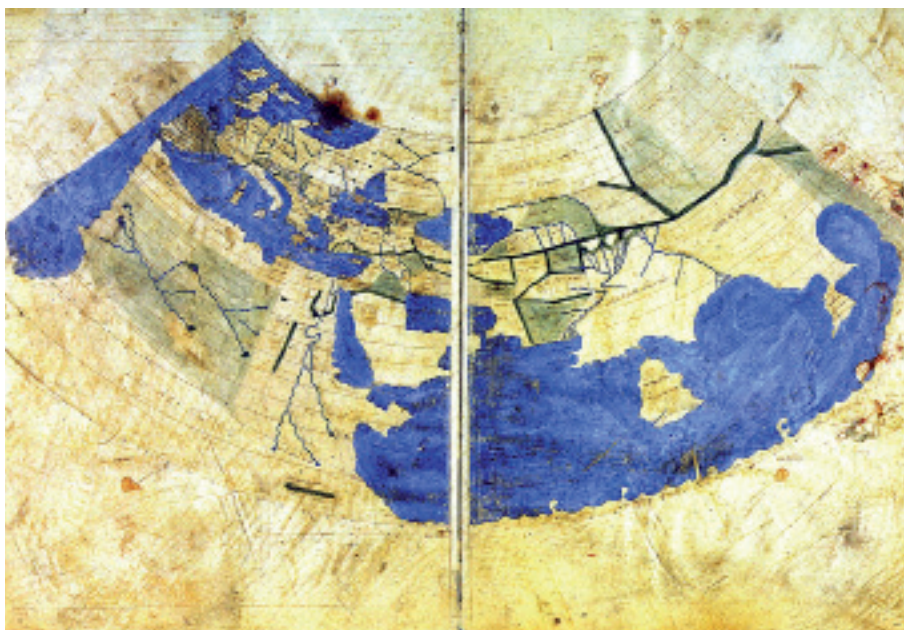


Fig. 11: The world map of the cod. Urb. gr. 82 (source: Wikipedia Commons).



Fig. 12: The world map in the first Latin version of *Geography* (Jacopo d'Angelo, f.158 – source: BNF / Gallica permalink: <http://gallica.bnf.fr/ark:/12148/btv1b55002486w/f158.item>).



Fig. 13: A Latin version of *Geography* (Johannes Schnitzer, 1482 - source: Wikimedia Commons).



Fig. 14: The famous Hereford *Mappa Mundi* - ca. 1290, a typical sample of the western cartography of the Middle Ages (source: Wikipedia Commons).



Fig. 15: The world, according to Dionysius Periegetes (ca. A.D. 124 – source: Wikimedia Commons)



Fig. 16: The famous *Orbis Terrarum* by Augustus – Agrippa, as preserved through its middle-ages-copies (drawing based on Erwin Raisz's reconstruction of the original roman map).

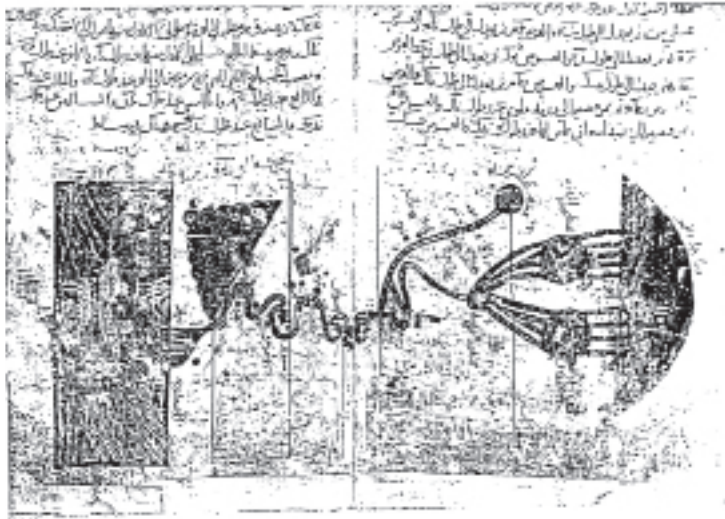


Fig. 17: Map of the Nile, according to Al-Khwarizmi (copy of A.D. 1037 – source: R. W. BRAUER, *Boundaries and Frontiers in Medieval Muslim Geography, Transactions of the American Philosophical Society, New Series, Vol. 85, No. 6 (1995), 1-73, American Philosophical Society*)



Fig. 18: *Tabula Rogeriana* by Al-Idrisi (source: Wikipedia.org)



Fig. 19: World map, after Al-Idrisi (copy of 1456 A.D. - source: Wikipedia Commons).



Fig. 20: Map of the Nile, from the famous *Book of Curiosities* (copy of 13rd c.A.D.; detail - Bodleian Library, MS Arab. c90, fol. 48a – Reproduced with permission from the Bodleian Library, Oxford).



Fig. 21: Detail from the world map in cod. Marc. gr. 388, depicting the lakes of the Nile and the *Mountains of the Moon* (photographic reproduction of the codex in: ΤΣΕΛΙΚΑΣ, Αγ. (ed.), 1998, «Κλαύδιος Πτολεμαίος, Γεωγραφική Υφήγησις: ελληνικός κώδικας 388 της Μαρκιανής Βιβλιοθήκης της Βενετίας», Athens: Militos).

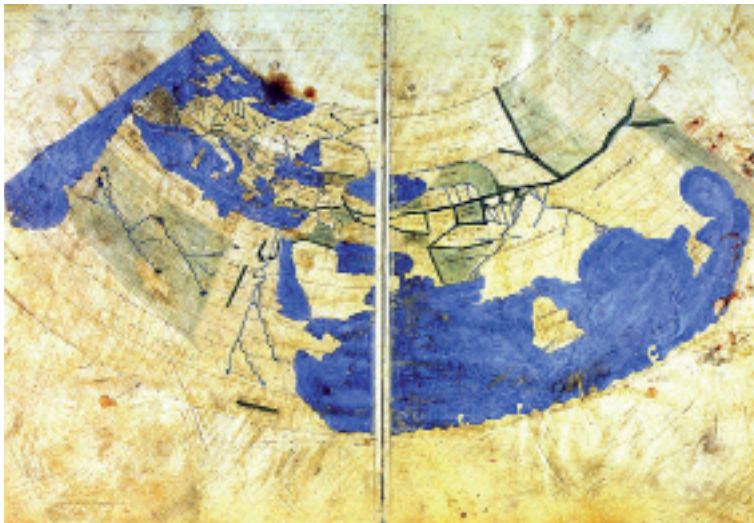


Fig. 22: The world map of cod. Urb. gr. 82.



Fig. 23: The world map in the manuscript of Ulm (1482 - source: Wikipedia Commons).



Fig. 24: Africa. Detail from Waldseemüller's map (1507 - source: Wikimedia Commons).

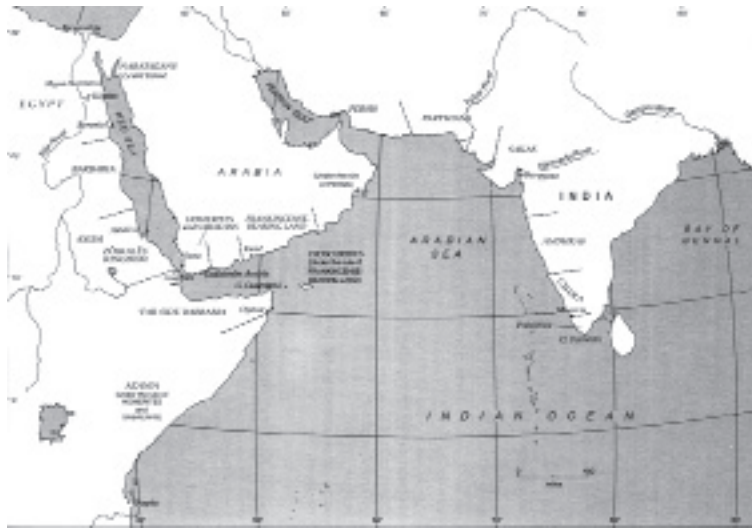


Fig. 25: The political geography of the area, in the age of *Periplus* (source: L. Casson).



Fig. 26: Map of Azania, indicating ancient and modern sites (source: G.W.B. Huntingford).

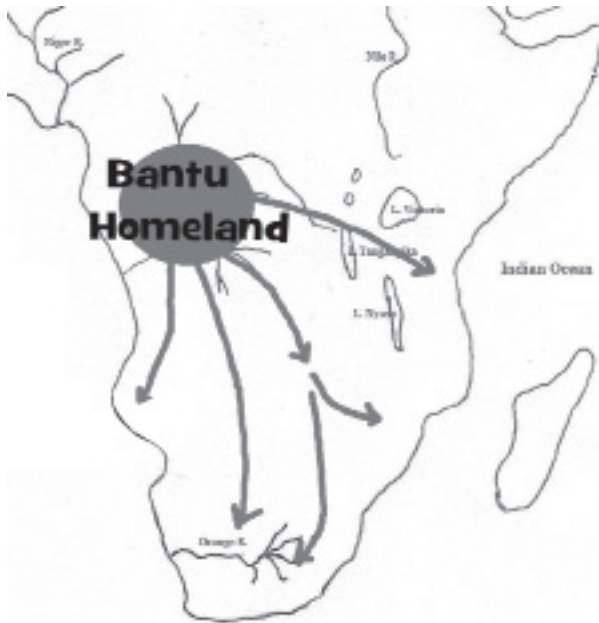


Fig. 27: The Bantu migration in Africa
(source: Ngomapublishing.cdlib.org).



Fig. 28: Map of Africa by Gastaldi (1564); detail (source: World Digital Library).



Fig. 29: Map of Africa by Lopez-Pigafetta (1591 - source: Courtesy of Department of Special Collections and University Archives, Stanford University Libraries).



Fig. 30: *Cosmographia Universalis* (H. Bunting, 1581 - Full title: “Die eigentliche und warhafftige gestalt der Erden und des Meers. *Cosmographia universalis*”). - source: National Library of Australia - <http://nla.gov.au/nla.map-rm2430> - No. MAP RM 2430 1581).



Fig. 31: Africa, according to Bünting (Full title: *Africa Tertia Pars Terrae* – Magdeburg 1587 – source: Bayerische Staatsbibliothek).



Fig. 32: *The Mountains of the Moon as reservoirs of Africa*, according to Kircher (Kircher, Athanasius. “*Hydrophilacium Africæ præcipuum, in Montibus Lunæ situm, lacus et flumina præcipua fundens, ubi et nova inventio originis Nili describitur.*” *Mundus subterraneus . . .*, Amsterdam, 1665. Historic Maps Collection. Department of Rare Books and Special Collections. Princeton University Library.).

THE MOUNTAINS OF THE MOON
A PUZZLE OF THE PTOLEMAIC *GEOGRAPHY*

The quest for the sources of the Nile had been -already since the antiquity- a major issue regarding the exploration of Africa by both locals and foreigners. This makes no surprise, if the importance of the river is taken into account, not only from a strictly economical point of view but also from a political, historical and cultural one.

Since Ptolemy introduced the *Mountains of the Moon*, the whole issue got a more stable basis; the quest had a specific aim from then on. Those mountains, either existing or product of a false translation tantalized the researchers for ages. On the other hand, the difficulties of such a risky expedition helped the Ptolemaic authority remain unchanged within the cartographic depictions long after the Age of Discovery.

This paper aims only to outline the framework of this great issue, highlighting also a few points and proposing answers to questions which, though not of high priority, are really important: Did Ptolemy himself have first-hand geographic knowledge of that area? Did the ancient people of that part of Africa have adequate knowledge of such a complicated hydrological phenomenon? Was the Ptolemaic text in its original form when Planoudis discovered it, or had it got updated with fresh geographic knowledge through the ages?