



ORIENT - OCCIDENT



AGENCE NATIONALE DE LA RECHERCHE  
**ANR**

*Ouvrage publié avec le concours*

*de la Société des Amis de la Bibliothèque Salomon Reinach*

*et du projet ANR MeDIan (Les sociétés méditerranéennes et l'Océan indien)*

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**Diffusion** : De Boccard Édition-Diffusion, 11 rue de Médicis, 75006 PARIS

*Topoi. Orient-Occident* Supplément 11, Lyon (2012)

ISSN : 1161-9473

Illustration de couverture : Al-Hariri, *Maqamat*, BNF, Manuscrits, arabe 5847,  
f.119 V° (navire marchand).

Illustration du dos : Atlas portugais, dit « Atlas Miller » (1519), image BNF, cote  
GE DD 683 RES (détail).

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Textes édités par M.-Fr. BOUSSAC, J.-Fr. SALLES et J.-B. YON

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## THE LIMITS OF KNOWLEDGE : EXPLORATIONS OF AND INFORMATION FROM THE HORN OF AFRICA TO THE EAST AFRICAN COAST IN THE GRAECO-ROMAN TRADITION

The description of the region of the Horn of Africa is related in the historical and literary tradition to the problem of the shape of Libya, which was represented in Ionic geography surrounded by Okeanos and separated from Asia by the river Nile. The *perirrhutos* character of Libya was discussed as early as Herodotus, who, in famous passages in his IVth book, tells us about both the Phoenician expedition sent by Nechao<sup>1</sup> and the circumnavigation of Libya attempted but not completed by Sataspes<sup>2</sup> : it was already mentioned<sup>3</sup> that, between the 6th and 5th centuries BC and beyond the reliability of names and episodes, one can see a significant exploratory fervor along the Atlantic and southeastern coast of Libya. It is necessary to be cautious in evaluating the stories related by the sources : Janni (1978, p. 114) has pointed out that such stories have transferred into single and detailed adventures what the Greek geography must have developed only gradually, a notion to keep in mind when looking at the testimonies provided by our sources. Even Strabo (2,3,4 C98-99)<sup>4</sup> refers, in the context of the *Ozeanfrage*, to the story of Heraclides Ponticus who reported the adventure of a magician who at the time of Gelo is supposed to have sailed around Africa from the Arabian Gulf to the Mediterranean Sea.

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1. Hdt. 4, 42. See CORCELLA 1993, p. 265-266.

2. Hdt. 4,43. See CORCELLA 1993, p. 266-267.

3. BIANCHETTI 1989, p. 871.

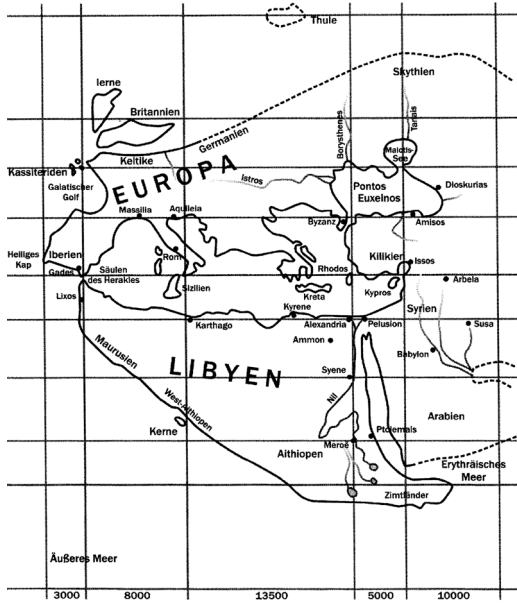
4. AUJAC 1969 *ad locum* ; RADT 2002 ; RADT 2006 *ad locum*.

Among the information derived from the *periploi*, that of Hanno<sup>5</sup> is particularly important despite the problems about its authenticity or its date which I will not discuss here. In paragraph 17 of the text where Hanno's navigation along the Atlantic coast of Africa is described, *Notou Keras*<sup>6</sup> is mentioned as the name of the bay which was the furthest point reached by the Carthaginian ; the story ends in paragraph 18 when Hanno says that he could not continue his navigation due to a lack of food. What we should understand from the text – and I acknowledge here the important pages by Desanges<sup>7</sup> who has stimulated a debate on the historicity of the toponym *Notou Keras* – is that this name marks the end of Hanno's periplus, not the end of the African continent.

Desanges<sup>8</sup> should also be credited for having drawn our attention to the meaning of *Notou Keras* in a passage of Strabo (16,4,14 C773-774<sup>9</sup>, from Artemidorus), where the geographer describes the region of the Aromata in great detail from Deire to *Notou Keras* (see *Table 1*). Strabo says in conclusion : « Then to Elephas the mountain, which juts out into the sea, and to a trench, and, next thereafter, to the large Harbour of Psygmus, and to a watering-place called the Watering-place of the Cynocephali, and to the last promontory of this coast, *Notou Keras*. After rounding this promontory approximately towards the South, we no longer, he says, have any record of harbours or places, because the promontory is not known from here on, and the same is true of the coast next after it »<sup>10</sup>.

This passage should be compared with another in Strabo's *Geography* (16,4,4 C769<sup>11</sup>), providing a short description of the same coast from Deire to the region of the *Kinnamomoforos*, which concludes : « After the islands, the next voyage, following the sinuosities of the bays, along the myrrh-bearing country in

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5. DESANGES 1978, p. 74 ss. ; GONZÁLEZ PONCE 2008, with updated bibliography.
  6. WINDBERG 1936, coll. 1120-1122 ; OLSHAUSEN 2000, col. 1015.
  7. DESANGES 2000, p. 141-146 ; DESANGES 2006, p. 21-34 .
  8. DESANGES 1978, p. 74 ss.
  9. Strab. 16, 4, 14 C774 εἶθ' ὁ Ἑλέφας τὸ ὄρος ἐκκείμενον εἰς θάλατταν καὶ διῶρυξ καὶ ἐφεξῆς Ψυγμοῦ λιμὴν μέγας καὶ ὕδρευμα τὸ κυνοκεφάλων καλούμενον καὶ <τὸ> τελευταῖον ἀκρωτήριον τῆς παραλίας ταύτης, τὸ Νότου κέρας. κάμψαντι δὲ τοῦτο ὡς ἐπὶ μεσημβρίαν οὐκέτι, φησὶν, ἔχομεν λιμένων ἀναγραφὰς οὐδὲ τόπων διὰ τὸ μηκέτ' εἶναι γνώριμον † ἐν δὲ τῇ ἐξῆς παραλίᾳ †. (Text from RADT 2005).
  10. Translation from JONES 1930, p. 333.
  11. Strab. 16, 4, 4 C769 μετὰ δὲ τὰς νήσους ὁ ἐξῆς πλοῦς ἐστὶν ἐγκολπιζουσι παρὰ τὴν σμυρνοφόρον ἐπὶ τὴν μεσημβρίαν ἅμα καὶ τὴν ἕω μέχρι πρὸς τὴν τὸ κιννάμωνον φέρουσαν ὅσον πεντακισχιλίων σταδίων. πέρα δὲ ταύτης οὐδένα ἀφίχθαι φησι μέχρι νῦν· πόλεις δ' ἐν μὲν τῇ παραλίᾳ μὴ πολλὰς εἶναι, κατὰ δὲ τὴν μεσόγαιαν πολλὰς οἰκουμένας καλῶς. τὰ μὲν δὴ τοῦ Ἐρατοσθένους περὶ τῆς Ἀραβίας τοιαῦτα. προσθετόν δὲ καὶ τὰ παρὰ τῶν ἄλλων. (Text from RADT 2005).



Map 1 – Libya according to Eratosthenes' map (from GEHRKE 2007, p. 17-30).

the direction of South and East as far as the cinnamon-bearing country, is about five thousand stadia ; and to the present time, it is said, no one has arrived beyond that country ; and though there are not many cities on the coast, there are many in the interior that are beautifully settled. Such, then, is Eratosthenes' account of Arabia ; but I must also add the accounts of the other writers »<sup>12</sup>.

Of these two descriptions by Strabo, the second which comes from Eratosthenes does not mention the *Notou Keras*, while the first one which probably goes back to Artemidorus considers the *Notou Keras* as the limit of knowledge of the coast which actually turns to the South at Cape Guardafui.

The account of Artemidorus who, in accordance with Posidonius, envisioned Africa in a trapezoid shape, basically derived from the exploration of Eudoxus of Cyzicus<sup>13</sup>, a point which was disputed by Eratosthenes<sup>14</sup>. We do not know to which

12. Translation from JONES 1930, p. 315.

13. From Strabo (2, 3, 4 C 98) we know that Eudoxus of Cyzicus was the first to take advantage of the monsoon to sail to India : the geographer of Amasea gives him – and not Hippalus – this credit, because Eudoxus – with the aid of a single Indian, survivor of a shipwreck and brought to Alexandria – , led two expeditions from the Red Sea to India under the auspices of Ptolemy VIII : the date of the enterprises ranges between 116 BC and 110 BC ; all the Strabonian report in open contradiction with Posidonius' conception of the Ocean is full of problems. See THIEL 1966, p. 13-16 ; DESANGES 1978, p. 152-173.

14. BIANCHETTI 1989, p. 875 n. 22 ; BIANCHETTI 2008, p. 39-40.

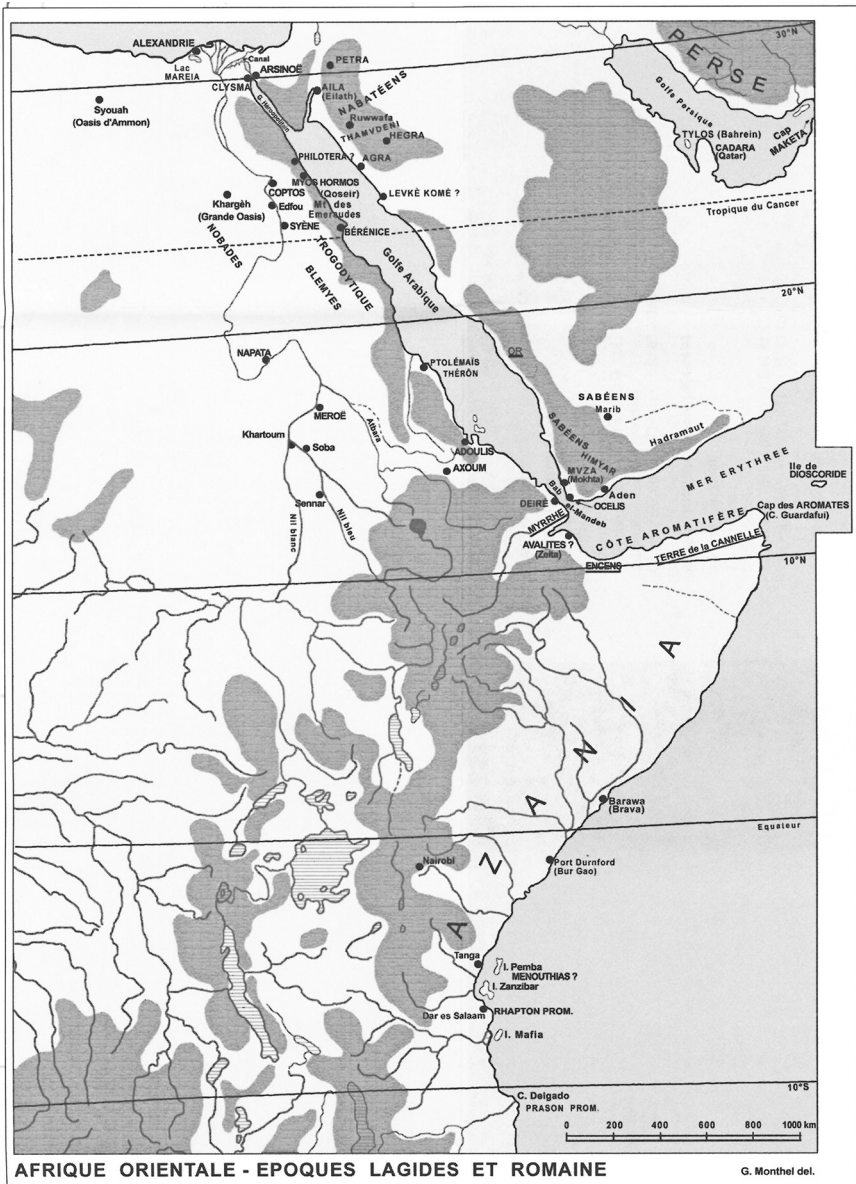
extent the mention of *Notou Keras* could be an argument in the controversy with Eratosthenes, but we know that the major disagreement was about the shape of Libya : Eratosthenes thought that it was roughly triangular, while for Artemidorus and Posidonius it was trapezoidal (see *Map 1*).

As a matter of fact and considering Strab. 16,4,4 C769, *Notou Keras* cannot be the southern summit of a rectangular triangle, the hypotenuse of which being the coast that goes from this cape to Gibraltar, but rather the summit of a trapezoid as the coast from *Notou Keras* folds southwards and then at an unspecified point turns northwards. It is in any case important that this cape (not a gulf<sup>15</sup>, as in the text attributed to Hanno) does not assume in Artemidorus the meaning of summit of a figure to which the shape of Africa is compared.

Pliny relying on Juba (6,175<sup>16</sup>) as attested by the text (whether Pliny was agreeing with Eratosthenes'idea of Africa will not be discussed here), notes that it is possible to navigate from Cape Mossylites near Guardafui sailing with the wind *corus*. He also relates a description of the Horn of Africa enriched by toponyms that can be compared with those of the *Periplus Maris Erythraei* (*PME*) and with those of the *Geography* of Ptolemy. In Pliny's description (6,174<sup>17</sup>) we find the *sinus Aualitu* which probably corresponds to the modern Zeila, approximately 79 miles from the Strait of Bab el-Mandeb (see *Map 2*). The form *Aualitu* is understood by Desanges<sup>18</sup> as a transcription of the Greek genitive Αὐαλίτης also present in *PME* 7 ; 25<sup>19</sup>. Even Ptolemy (4,7,10), as we will discuss below, refers to a Αὐαλίτης κόλπος which opens south of Deire and extends up to the Cape of Spices. Only

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15. DESANGES 1984-1985, p. 33-34 assumes that the author of the Hanno's *Periplus* uses *keras* to designate two big gulfs – *Hesperou Keras* and *Notou Keras* – : the Greek *keras* and the Latin *cornu* usually are used meaning « Cape ». See too PONCE 2008, p. 145 n. 37.
16. Plin. 6, 175 *A Mossylico promunturio Atlanticum mare incipere vult Iuba praeter Mauretaniae suas Gadis usque navigandum coru, cuius tot sententia hoc in loco subtrahenda non est. a promunturio Indorum quod vocetur Lepte Acra, ab aliis Drepanum, proponit recto cursu praeter Exustam ad Malichu insulam [XVI] p. esse, inde ad locum quem vocant Sceneos CCXXV p., inde ad insulas Adanu CL : sic fieri ad apertum mare [XVIII]·LXXV p.*
17. Plin. 6, 174 *ultra Isidis portus, decem dierum remigio ab oppido Adularum distans ; in eum Trogodytis myrra confertur. insulae ante portum duae Pseudopylae vocantur, interiores totidem Pylae ; in altera stelae lapideae litteris ignotis. ultra sinus Aualitu, dein insula Diodori et aliae desertae, per continentem quoque deserta, oppidum Gaza, promunturium et portus Mossylites, quo cinnamum devehitur. hucusque Sesostris exercitum duxit. aliqui unum Aethiopiae oppidum ultra ponunt in litore Baragaza.*
18. DESANGES 2008, p. 88.
19. CASSON 1989, p. 115-117.





Map 2 – From DESANGES 2006, Map, *in fine*.

Pliny<sup>20</sup> mentions the *oppidum Gaza*, which Desanges explains as a scribe's error, maybe from *Barigaza / Baragaza*, or derived from γίζι, indicating a variety of cassia attested by Galen<sup>21</sup>. And for the *promunturium et portus Mossylites*, the only port mentioned by Pliny on the African coast in the Gulf of Aden<sup>22</sup>, it may be the transcription of an adjective derived from Μόσυλλ(λ)ον (see *PME* 10 and Ptol. 4,7,3<sup>23</sup>). From this passage quoted from Juba and maybe reflecting Eratosthenes' geographical vision, it becomes highly unlikely that the king of Mauretania would refer to the *Notou Keras* or to the coast of Azania<sup>24</sup>.

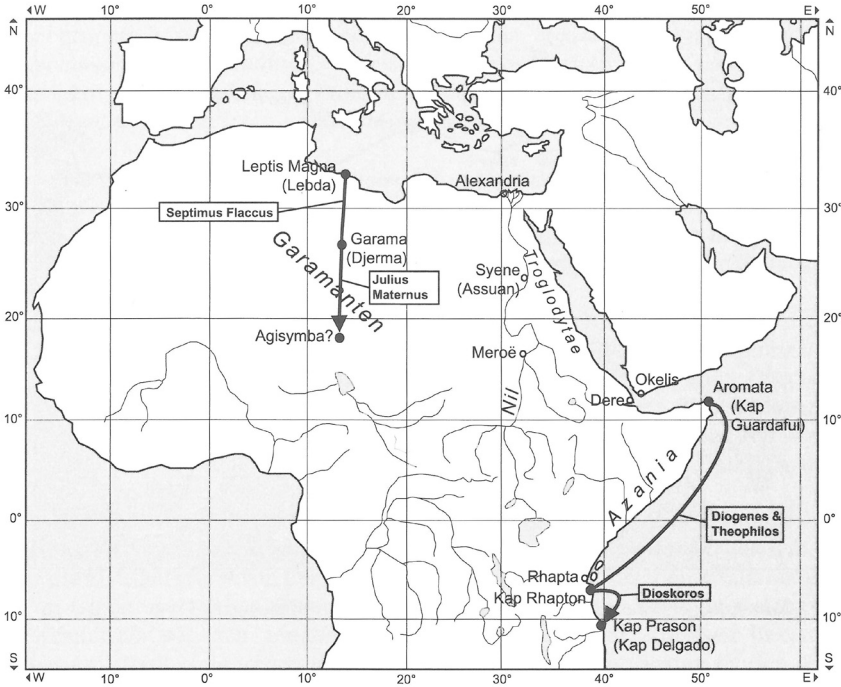
Pliny's sentence *unum Aethiopiae oppidum ultra in litore Baragaza*<sup>25</sup> should be explained, as the site is to be identified with the region of Broach in north-western India, on the north bank of the river Narmada<sup>26</sup>; the naturalist has distanced himself from those who put Barigaza on the African coast beyond Mossylites (*aliqui... ponunt*) and opposes Juba with these authors, mentioning him in such a way (*vult Juba*<sup>27</sup>) that we may guess the distance between Pliny from his source.

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20. Pliny 6,174 relates also to the *insula Diodori* on the western border of *sinus Aualitu*; see DESANGES 2008, p. 89.
21. Gal. *De ant.* 17, 43.
22. See Plin. 6,175 *Mossylico promuntorio*.
23. From Ptolemy (4,7,27) we know that the tribe that live in the vicinities has the name Μόσυλλοι.
24. Pliny mentions *Azanium mare* (6, 172) instead of *Azanium oceanus* (6, 108) which cannot be the actual Red Sea but presumably the Gulf of Aden; and the partition line between the *Azanium mare* and the *sinus Arabicus* should be the Strait of Bab el Mandeb. See DESANGES 2008, p. 75-77. Plin. 6,171-172 *haec est regio secundo volumine a nobis significata, in qua XLV diebus ante solstitium totidemque postea hora sexta consumuntur umbrae et in meridiem reliquis horis cadunt, ceteris diebus in septentrionem, cum in Berenice quam primam posuimus ipso die solstitii sexta hora umbrae in totum absumentur nihilque adnotetur aliud novi, DCII p. intervallo a Ptolemaide: res ingentis exempli locusque subtilitatis immensae, mundo ibi deprehenso, cum inauditata ratione umbrarum Eratosthenes mensuram terrae prodero inde conceperit. 172 hinc Azanium mare, promunturium quod aliqui Hippalum scripsere, lacus Mandalum, insula Colocasitis et in alto multae, in quibus testudo plurima. oppidum Sace, insula Daphnidis, oppidum Aduliton; Aegyptiorum hoc servi profugi a dominis condidere.*
25. See above n. 17.
26. DESANGES 2008, p. 92.
27. DESANGES 2008, p. 93.

Nor in Pomponius Mela<sup>28</sup> do we find any reference to the *Notou Keras*, which in fact disappears until Ptolemy : in his *Geography* (3,89 *vasta omnia vastis praecisa montibus ripae potius sunt quam litora*), the author emphasizes the steep banks of the *Notou Keras* region which form rocky reefs overlooking the sea<sup>29</sup>. Mela<sup>30</sup> describes a second time (see 3,80-81) the Coast of Spices, and confirms, based on the authority of Cornelius Nepos, that Eudoxus was able to circumnavigate Africa from the Arabian Gulf to Gades. There is no mention of *Notou Keras* in the *PME*, a work which clearly belongs to the periplographical tradition and describes quite precisely the coast from Myos Hormos or Berenike to the Bab el Mandeb and then up to Rhapta.

The *PME*<sup>31</sup>, a text particularly important to reconstruct the trade routes which linked Egypt under the Lagids, thus the Mediterranean to India, was written by a merchant or Greek pilot of Egypt probably in the first century CE<sup>32</sup> ; it provides us with a detailed understanding of the Roman trade with Africa, Arabia and India, of the goods shipped from East to West and *vice versa*, the routes followed and the lands and people reached<sup>33</sup>. The voyage is described without literary ambitions with the specific intention of being a useful navigation manual, especially for merchants. The description delineates the flow of goods which were circulating the Horn of Africa and Arabia, between the West and the East, and these flows and associated routes allow us to recompose the exchanges and history of the various goods that travelled from the East to the West. The fact

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28. Mela 3, 89-90 : *Ceterum oras ad eorum sequentibus nihil memorabile occurrit. Vasta omnia vastis praecisa montibus ripae potius sunt quam litora. Inde ingens et sine cultoribus tractus. Dubium aliquandiu fuit, essetne ultra pelagus caperetne terra circuitum an exhausto fluctu sine fine se Africa extenderet : 90 verum et[si] Hanno Carthaginensis exploratum missus a suis, cum per oceani ostium exisset magnam partem eius circumvectus, non se mari sed commeatu defecisse memoratu rettulerat, et Eudoxus quidam avorum nostrorum temporibus cum Lathyrum regem Alexandriae profugeret, Arabico sinu egressus per hoc pelagus, ut Nepos adfirmat, Gades usque pervectus est : ideo eius orae notae sunt aliqua.* For the possibility of a single source for Pliny and Mela, *i.e.* C. Nepos, see PARRONI 1984, p. 435 ; SILBERMAN 1988, p. xxx-xxxvi.
29. This description recalls that of the Ichthyophagi' coast of Agatharchides (Diod. 3, 20, 1).
30. See also DESANGES 1994-1995, p. 79-89.
31. SCHOFF 1912 ; HUNTINGFORD 1980 ; CASSON 1989 ; BELFIORE 2004 with updated bibliography.
32. RAUNIG 1970, p. 231-242.
33. DE ROMANIS 1992 ; BOUSSAC-SALLES 1995 ; SALLES 1995 ; DE ROMANIS 1996 ; SIDEBOTHAM 1996 ; DE ROMANIS/TCHERNIA 1997 ; BIANCHETTI 2002.



Map 3 – From STÜCKELBERGER – GRASSHOFF 2006, vol. 1, p. 17, Abb. 1.

that the *PME* in paragraph 12 mentions the Cape of Spices<sup>34</sup> as ἐμπόριον καὶ ἀκρωτήριον, and does not record the *Notou Keras*, could incline us to believe that this constitutes an important piece of information in the discussion of the shape of Libya given by Artemidorus ; however, this omission might be the only part of the periplographical tradition which tends to indicate essential stages of navigation to be recognized by the sailors. The disappearance of *Notou Keras* and the prevalence of the Cape of Spices could possibly be explained by the pragmatic, empirical conception of the *PME* only concerned with the various aspects of a safe navigation. The essentially practical character of the *PME* is more evident when we try to compare the geographical reality described by the text with that, for example, of Ptolemy's *Geography* which in any case shows itself in the end to be a geographical *diorthosis*.

Ptolemy wanted to correct the measurements of the *oikoumene* offered by Marinus of Tyre ; he reduces the excessive breadth given by Marinus (1,9) to

34. *PME* 12 Καὶ μετὰ ταύτην, τῆς γῆς ὑποχωρούσης εἰς τὸν νότον ἤδη, τὸ τῶν Ἀρωμάτων ἐμπόριον καὶ ἀκρωτήριον τελευταῖον τῆς Βαρβαρικῆς ἠπείρου πρὸς ἀνατολὴν ἀπόκοπον.

the regions below the equator (27.800 stadia) and uses the same evidence as his predecessor to place the southern limit at 16°S<sup>35</sup>. The *oikoumene* of Ptolemy measures 79° degrees (from Thule at 63°N to Prason at 16°S), versus Eratosthenes' 54° who limited the extension of the *oikoumene* to the Country of cinnamon (12°S). It is precisely Ptolemy's relationship with scientific geographers that could help to understand the perspective of the *Geography* : in 1,9,6 he emphasizes that we should make use of mathematics, but that mathematically derived data are lacking for the East African coast, specifically from Guardafui towards the South. This passage is important because it indicates Ptolemy's need not only to draw on travel stories that could integrate previously unknown information, but also to exceed the data of the scientists who had preceded him, but could not have known those elements that had changed the very idea of the world.

Quoting Marinus of Tyre – Ptolemy (1,9,1-4) reports on the voyages of Diogenes, Dioscorus<sup>36</sup>, and Theophilus<sup>37</sup> for which we have no other source. During his second trip back from India, the first one, known as the *Indien-Fahrer*, was saved by the north wind that allowed him to sail along the Troglodyte coast during 25 days and arrive at the source of the Nile, a little North of Rhapta. Leaving aside the problem of locating the source of the Nile<sup>38</sup>, it is interesting to note that Ptolemy then ascribes to Theophilus, the *Azaniien-Fahrer*, a 20-days' sailing in the opposite direction from Rhapta to the Cape of Spices fulfilled with a south wind. Ptolemy adds information based on the experience of one Dioscoros who sailed from Rhapta to Prason, covering in many days a distance of 5.000 stadia. The fact that Ptolemy then discusses (1,14,4) the meaning of « many days » in Marinus, emphasizing the importance of the winds in this African route, shows the importance given by the geographer to reports from travellers in a region that had just recently been discovered.

Ptolemy also provides the geographic coordinates for this region in his fourth book (4,7,9-12), and as noted by Mžik<sup>39</sup>, there are significant differences between the distances measured on the basis of travel reports and those measured by latitudes and longitudes. He rejects the idea that Ptolemy had more exact information for the fourth book than those he used in the first, one and states : « es ist nicht unwahrscheinlich, daß Ptolemaios auf diesem Wege einen seinen eigenen Forderungen durchaus widersprechenden Bericht mit diesen unter einen Hut zu

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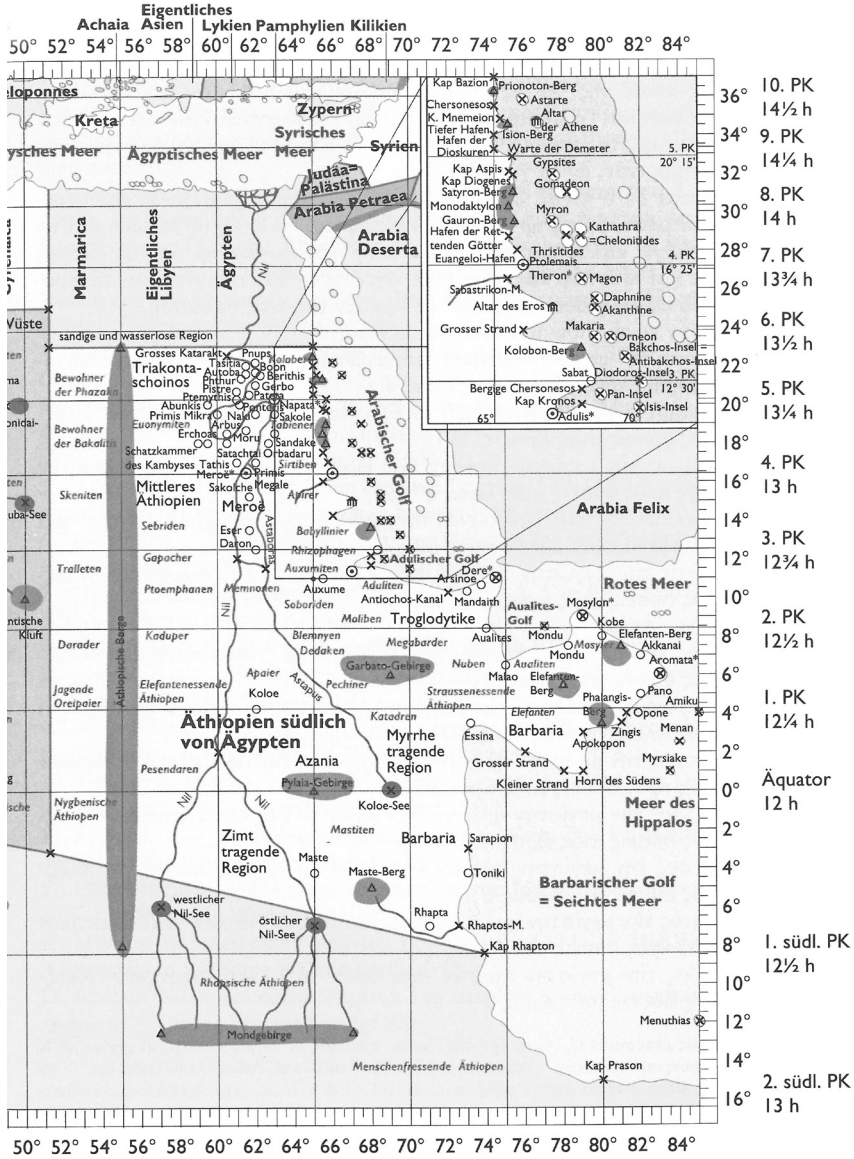
35. AUJAC 1993, p. 166 ss. ; BERGGREN/JONES 2000, p. 23-30, Appendix B, Appendix F.

36. BERGER 1903, col. 1086.

37. Cfr. Ptol. 1,14,4. LAQUEUR 1934, coll. 2137-2138. See *Map 3*.

38. BONNEAU, 1964 ; BONNEAU, 1971 ; GIANOTTI, 1988 ; DE NARDIS 1991 ; BIANCHETTI 2008. For the *Nilsquelle* in Ptolemy : STÜCKELBERGER -GRASSHOFF 2006, p. 77, n. 55.

39. MŽIK 1938, p. 57, n. 2.



Map 4 – From STÜCKELBERGER – GRASSHOFF 2006, vol. 2, p. 839, Afrika 4. Karte.

bringen suchte, ohne daß er sich dabei Rechenschaft gab, wie sehr er durch ein derartiges ‚Angleichungsverfahren‘ die Wirklichkeit vergewaltigte ».

The importance of the periplographical material within Ptolemy's *Geography* therefore allows a comparison with the text of the *PME*, which, since it is dated to the first century CE, would not be so far from that of Ptolemy. Thus, a comparison between chapters 7-16 of the *PME*, i.e. the description of the coast from the Gulf of Aden to Cape Guardafui, and the passage of *Geography* (4,7,10-12), with the latitudes and longitudes of the same stretch of coast of the Horn of Africa, allows some considerations based on the references in the tables here included :

1) The coincidences in the toponymy suggest that Ptolemy may have borrowed his information from the periplographical tradition of the *PME*, possibly not from the text itself, particularly regarding the region of the Gulf of Aden (but not only this one), where the toponyms are almost identical.

2) In his *Periplus Maris Exteri*, Marcianus of Eraclea seems to reflect the Ptolemaic description (1,12 Αὐαλίτης ; 1,13 Μόσυλον ἄκρον ; ὄρος ὁ Ἐλέφας ; Ἀπόκοπα ; μικρὸς Αἰγιαλὸς καὶ μέγας ; Ῥαπτοῦ ἄκρωτηρίου), following the same list of places and the same course of the coast ; it provides us with a nice glimpse of the fortune of the *Geography*<sup>40</sup>. The presence of Ἐλέφας ὄρος in Marcianus, in Ptolemy (4,7,10) and the *PME* (11) is a clear Artemidorean reference<sup>41</sup> ; the absence of *Notou Keras* in the *PME* and in Marcianus and the presence of the same *Notou Keras* in Ptolemy may suggest an hypothesis regarding Ptolemy's method. The geographer probably collected data from Artemidorus himself together with other data issued from the tradition raised by the controversy with Eratostenes, with the aim of reconstructing not only a map but also a history of the knowledge related to a precise region. The presence of Artemidorean data in Ptolemy therefore seems to have arisen from the necessity to contribute to the history of knowledge in addition to the current state of that knowledge.

3) Ptolemy (4,7,11) locates the *Notou Keras* at 79°00 E, 1°00 N<sup>42</sup> ; it is located far to the south of the promontory which Artemidorus had marked as

40. See GGM I, 521 with Müller's commentary : *constat eum (Marcianum n.d.r.) presso pede sequi Ptolemaeum*.

41. Strab. 16,4,14C774. There are also some hypotheses about a link between Strab. 16,4,14 C774 Δαφνοῦς λιμὴν καὶ ποταμὶά Ἀπόλλωνος καλουμένη and *PME* 11 δαφνώνα μέγαν λεγόμενον Ἀκάνναι and Ptol. 4, 7 10 Ἀκάνναι ἐμπόριον. See BIFFI 2002, p. 289 ; RADT 2005 ; RADT 2009 *ad locum*.

42. STÜCKELBERGER – GRASSHOFF 2006, p. 461, n. 218 stress that for the coast from *Notou Keras* to Cape Sarapion the manuscript X (*Codex Vaticanus graecus* 191) evidences data which draw a different line of coast. *Codex Vat. Graec.* 191, single copy of *Recensio* X, is very different for the indications of latitudes and longitudes from the manuscripts of the *Recensio* Ω. Cfr. MITTENHUBER 2009, p. 9-13 ; STÜCKELBERGER – MITTENHUBER 2009, p. 23 and p. 288 : « Beim Horn von Afrika fallen zunächst die übergrossen Buchten des Adulischen und Barbarischen Golfes auf, die nicht die Realität entsprechen ; allerdings weichen die Koordinatenangaben der Küstenpunkte

the end of knowledge in his time. Desanges<sup>43</sup> emphasizes that Ptolemy's *Notou Keras* has an essentially symbolic function, and that neither this landmark nor the *Hesperou Keras* represent the « end of Africa »<sup>44</sup> from a strictly geographical point of view. Even though we might hypothesize a likely relationship between the above assertion and Hanno's *Notou Keras* (gulf), Ptolemy has deeply modified and innovated the total conception of the African continent, and Desanges notes how important is the *Notou Keras* as the African promontory closest to the equator. If we look at the Ptolemaic map in Stückelberger-Graßhoff edition (see *Map 4*), we can see that the *Notou Keras* of Ptolemy has lost its meaning of « end » of the knowledge and of the eastern coast of Africa : this « horn » is simply the southern point of the peninsula that juts out to the east, South of Guardafui. Ptolemy's *Notou Keras* (4,7,11) marks the southern point of a gulf<sup>45</sup> rather than the top of a geometric figure (Artemidorus' trapezoidal Libya) and stands as a toponym which conveys an idea quite different from that of Artemidorus about this strip of the African coast<sup>46</sup>. A decisive result of the explorations has been to drastically bring to an end the Artemidorean polemic against Eratosthenes' « map » and the ongoing controversy ; a necessity then arose, quickly realized by Ptolemy, to redraw the shape not only of Libya but also of the entire *oikoumene*. Such reports might have given life to the idea that the same coast did not have to go back towards the North to an indefinite point, but had, instead, to continue unexplored and unknown until Cattigara (Ptolemy's Chryse = Malacca peninsula) and to the vision that the Indian Ocean might be « a closed » sea.

4) *PME* describes the coast up to Rhapta, while Ptolemy describes it up to the Cape Prason. Rhapta is defined in Ptolemy (4,7,12) as μητρόπολις τῆς Βαρβαρίας on and near a river, while in the *PME* (16) it is only an ἐμπόριον. It is likely that the economic development of this area, an important centre for commercial traffic to Arabia and to India, deserves Ptolemy's definition who suggests a historical-geographical evaluation of the new knowledge of the coast up to the Cape Prason.

5) *PME* 18 presents a description of the extension of the Ocean different from that in Ptolemy 7,3,6 ; while the *PME* envisions Africa surrounded by an unexplored sea, Ptolemy assumes a continuity of land from Cattigara in the East to Rhapta in the West. It should be noticed that the *Periplus'* indication of the unexplored nature of the southern Ocean might be the result of a lack of knowledge of the exploration by Eudoxus of Cyzicus. It should also be noticed that for

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in den beiden grossen Textrezensionen so stark voneinander ab, dass ein Vergleich nicht sinnvoll ist ».

43. DESANGES 2000, p. 41, n. 26.

44. DESANGES 2006, p. 28.

45. DESANGES 1984-1985.

46. See for this problem the really significant opinion of BIANCHETTI 1989, p. 878.



Ptolemy the Indian Ocean was an enclosed sea, though I do not want to enter here upon this complicated question, which has already been addressed by Polaschek<sup>47</sup> in his discussion on the origin of the idea that the Indian Ocean is an enclosed sea, an idea that some scholars have incorrectly attributed to Hipparchus<sup>48</sup>. The fact is that the empirical character of the text of the *PME* appears here in contrast with a conception which involves a global evaluation of the relationship between land and sea.

In conclusion, if what has been argued here is correct, the comparison proposed between the text of the *PME* and Ptolemy's *Geography* allows us to understand the misfortune of the vocable *Notou Keras* quoted by Artemidorus, which disappeared in the literary-historical and in the later periplographical tradition (see *PME*), to be « recovered » by Ptolemy. The comparison between the toponyms of the *PME* and of the *Geography* (and one of them is *Notou Keras*) shows how the geographer, the last heir of scientific geography and of the history of geographical thought, used all the travel accounts that described hitherto unknown lands.

The primary purpose of these essays was to propose a new drawing of the coast... and also to consider a new vision of the world which had been improving through the new discoveries. Ptolemy's effort to describe at the same time the new oecumene and the long maturation of its knowledge probably enabled him to present data including the early development of the conceptions on Libya: the reference to *Notou Keras* in the *Geography* is, in this sense, a trace – which the geographer chooses not to neglect in his history.

Ptolemy, who usually adheres to scientists geographers, in this case distances himself from them and uses all the more updated information from the periplographical tradition and from exploration, not only to « describe and draw » more accurately the Horn of Africa and the East African coast, but also, perhaps, for the purpose of imagining both the Indian Ocean as a « closed » sea and the « idea » of a new conception of the world.

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47. POLASCHEK 1965, coll. 681-833.

48. See BIANCHETTI 2008, p. 75-76: « Sappiamo (Strab. 1,1,9 = F 4) che Ipparco si opponeva alla concezione della continuità dei mari, che costituiva uno dei cardini dell'impianto erostenico, mentre è certamente frutto di un'erronea lettura del testo di Mela (3,70 = F 5 Dicks: *Taprobane aut grandis admodum insula aut prima pars orbis alterius† ipparchius† dicitur* dove l'editore di Ipparco, Dicks, accoglie la correzione *Hipparcho* rispetto alla lezione dei codici e acclude impropriamente questo testo fra i Frammenti) l'ipotesi che il niceno immaginasse un'altra ecumene, separata dalla nostra e che aveva inizio a Taprobane-Ceylon ».

49. I would like to thank Prof. Hans Joachim Gehrke for his notable suggestions and Prof. Serena Bianchetti for her really important support not only in this research.

Table 1 : *PME 7-15 (Text from CASSON 1989)*

<i>PME 7</i>	Αυαλίτης μικρὸν ἐμπόριον Αὐαλίτης
<i>PME 8</i>	ἐμπόριον Μαλαῶ
<i>PME 9</i>	ἐμπόριον Μούνδου
<i>PME 10</i>	Μόσυλλον
<i>PME 11</i>	Νειλοπτολεμαίου Ταπατηγη ἄκρωτήριον Ἐλέφας δαφνῶνα μέγαν λεγόμενον Ἀκάνναι
<i>PME 12</i>	τῶν Ἀρωμάτων ἐμπόριον καὶ ἄκρωτήριον ἄκρωτήριον Τάβαι
<i>PME 13</i>	ἐμπόριον Ὀπώνη
<i>PME 13</i>	τὰ μικρὰ Ἀπόκοπα καὶ μεγάλα τῆς Ἀζανίας Αἰγιαλὸς καὶ μικρὸς καὶ μέγας (οἱ τῆς Ἀζανίας δρόμοι, πρῶτον μὲν ὁ λεγόμενος) Σαραπίωνος (ὁ λεγόμενος) Νίκωνος Πυραλάοι νῆσοι Μενουθ[ε]σιὰς νῆσος
<i>PME 16</i>	τὸ τελευταίωτον τῆς Ἀζανίας ἐμπόριον κεῖται, τὰ Ῥάπτα [τὰ] λεγόμενα

Table 2 : *Ptol. 4, 7, 10-12 (Text from STÜCKELBERGER – GRASSHOFF 2006)*

Ptol. 4, 7, 10	Αὐαλίτης ἐμπόριον	74°	8°25'
	Μαλαῶ (Μάλεως) ἐμπόριον	75°	6°30'
	Μόνδου ἐμπόριον	78°15' (78°)	7°30' (7°)
	Μόσυλλον ἄκρον καὶ ἐμπόριον	79°	9°
	(Κώβη) Κοβὴ ἐμπόριον	80°	8°
	Ἐλέφας ὄρος	81°	7°30'
	Ἀκάνναι ἐμπόριον	82°	7°
	Ἀρώματα ἄκρον καὶ ἐμπόριον	83°	6°
Ptol. 4, 7, 11	Πανὼ κώμη	82°	5°
	Ὀπώνη ἐμπόριον	81°15' (81°)	4° (15')
	Ζίγγις ἄκρα	81°	3°30'

	Φαλαγγίς ὄρος	80°	3°30'
	Ἄποκοπον (Ἄποκόπα)	79°	3°
	Νότου κέρας ἄκρον (ἄκρα)	79°	1°(2°)
	Μικρὸς αἰγιαλός	78°	1°
	Μέγας αἰγιαλός	76°	2° (0°30'N)
	Ἑσρινά (Ἑσρινάδου) ἐμπόριον	73°10' (30')	3°30' (0°)
	Σαραπίωνος ὄρμος καὶ ἄκρα (ἄκρον)	73°(74°)	3° S
	Τονίκι (Τοινικία) ἐμπόριον	73°	4°15' S
Ptol. 4, 7, 12	Ῥαπτοῦ ποταμοῦ ἐκβολαί	72°30'	7° S
	Ῥαπτὰ μητρόπολις τῆς Βαρβαρίας		
	μικρὸν ἄποθεν θαλάσσης	71°	7° S
	Ῥαπτὸν ἄκρον	73°50'	8°25' S

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