CO-479

A DIGITAL REFERENCED STUDY OF PIERRE LAPIE'S MAPS OF GREECE (1822, 1826) WITH RESPECT TO HIS CARTOGRAPHIC RECONSTRUCTION OF PTOLEMY'S GEOGRAPHIA (1834)

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SUMMARY

The contribution of the cartographer Pierre Lapie is very worth mentioning during the important French cartographic and mapping activities in the actual and broader areas of the territories covered by today's Greece. His major maps (1822, 1826) representing Greece, constructed the period between the "semi-topographic" maps of Jean Denis Barbié du Bocage and the scientific maps composed by Expédition Scientifique de Morée, described the country's geography and the pictorial spatial documentation of a territory. A country suffering at that time a hard struggle for independence and "known" until then, mainly through the travellers' memoirs and the literary or artistic descriptions (for an analysis of this issue see Livieratos 2009; also Ploutoglou et al. 2011).

Lapie's cartographic work is not of course limited in these two maps. Among the maps he constructed for many places in the world, there is a less known representation of the Roman World depicted on contemporary cartographic basis (1834), tracing the routes appearing on the Peutinger map and listed in the Antonine Itinerary (1st century AD). Having in mind that the Roman World is described for first time numerically through geographic coordinates in Ptolemy's Geographia the same period (2nd century AD), this Lapie's cartographic work, brought up recently by Talbert (2007), is an extraordinary task because it gives the first modern view on the spatial correspondence of Ptolemy's inhabited world with today's cartography.

In this paper, we analyse and compare, using digital technologies, Lapie's map of Ptolemy's Universe as it was in the Roman times with respect to original Geographia toponymy data and also to his early 19th century maps of Greece.

PIERRE LAPIE AND HIS MAPS OF GREECE

Colonel Pierre Lapie (1777-1850) was a geographic engineer at the French "Dépôt de la Guerre" from 1805 until his death. He constructed several maps for the entire world among which are the two maps of Greece prepared on 1822 and 1826 in the frame of the Dépôt.

The first map consisting of fifteen sheets under the title "Carte Génerale de la Turquie d'Europe", in scale 1:800.000 (Figure 1, Left). Lapie acknowledges the contribution of Guilleminot and Boudin de Tromelin who, all four with Barbie du Bocage, are among the founding members of the famous Société de Géographie, established in Paris in 1821, the year of the starting of the Greek Revolution (War of Independence).

The second map, under the title "Carte Physique, Historique et Routiere de la Grèce" in scale 1:400.000 (Figure1, Right), it consists of four sheets and it represents the area between Corfu and Naxos islands in longitude and from Ossa mountain in Thessaly to Kithyra Island in latitude. Again here Guilleminot and de Tromelin are among the contributors together with travelers such as Gell and Dodwell. Lapie uses also for the preparation of the map, coastline measurements made in Cyclades islands by Lieutenant Gauttier and in Peloponnese by Lieutenant Smith (for an extensive discussion on the issue see Livieratos, 2009).

Figure1. Left: The 1822 Lapie map, 170 cm in longitude X 220 cm in latitude. Right: The 1826 Lapie map, 170 cm in longitude X 120 cm in latitude. Courtesy: The map collection of the "Sylvia Ioannou Foundation".

PIERRE LAPIE'S ORBIS ROMANUS AD ILLUSRANDA ITINERARIA

A less known contribution of Lapie's cartographic work is the modern representation of the Roman World, from the Antonine Wall in Scotland to Hierasycaminos on the border between Egypt and Sudan, under the title "ORBIS ROMANUS AD ILLUSTRANDA ITINERARIA ANTONINI BURDIGALENSE TABULAM PEUTINGERIANAM PERIPLOS ITINERARIA MARITIMA DELINEATUS A P. LAPIE GEOGRAPHO IN COMITATU REGIO MILITARI CHILIARCHA IN ADMINISTRAT RER BELLIC COLL TOPOGRAPH PRAEFECTO LUTETIAE A M DCCC XXXIIII" (Figure 2). This map is in an approximate scale 1:3400000 and depicts in detail the routes appearing on the Peutinger Map and listed in the Antonine Itinerary and the Bordeaux/Jerusalem Itinerary. It consists of nine sheets, each one of them has dimensions 51.5 cm wide X 37.5 cm. This set of maps was produced as part of a two-volume project commissioned by the aristocrat Agricol Fortia d' Urban (1756-1843), but only published posthumously in 1845 at his heir's expense by Colonel Lapie and the Imprimerie Royale of Paris (Talbert 2007).

Apart from the routes appeared in the two itineraries, the toponyms of the places are also ancient existed in Roman times. The Antonini Itinerario was a detailed diagram, probably not depicted on a cartographic basis, in which there are place names (toponyms) and the distances between them. This itinerary is based on Agrippa's map composed the 1st century A.D., derivative of which is the Peutinger map, a road map discovered in 15th century by Conrad Peutinger (Dilke 1985).

Figure 2. Pierre Lapie's Orbis Romanus ad Illustranda Itineraria, c. 150cm in longitude X 110 cm in latitude (source: Talbert 2007).

ON PTOLEMY'S GEOGRAPHIA

The same period with Agrippa's map, which played an important role in the development of cartography, Claudius Ptolemy from Alexandria writes his Geographia describing for the first time textually and numerically, the geography of the known World in the 2nd c. AD. In this book, Ptolemy gives the know-how on map construction and also a list of geographic coordinates of spherical longitude and latitude of almost eight thousand point locations on the earth surface, known at his times.

Geographia had "disappeared" for 10 centuries during the Middle Ages, even if mentioned in texts, but it came back in the late 13th century and influenced profoundly the revival of world's geography and cartography in the Renaissance (Gautier Dalché 2007, 2009). It was one of the most important works, whose reproduction continued for many centuries and it is still considered as an important research issue. The various editions of Geographia appear many differences the one with the other and also errors and discrepancies in the toponyms coordinates which leads to errors in their spatial placement. For this reason, we use in this study a new list of coordinates in which the gross errors and the big discrepancies have been corrected (Tsorlini 2011).

The world of Ptolemy is classified in Regions, since each Geographia chapter is referred to one of them. The area corresponding to the territory of modern Greece is described in seven regions of Geographia consisting of almost 800 toponyms, in Thrace, Macedonia, Epirus, Achaia, Peloponnesus, Crete and Asia Minor (Figure 3). In some of them, all the toponyms belong to territories of modern Greece, in other regions belong just a part of the toponyms.

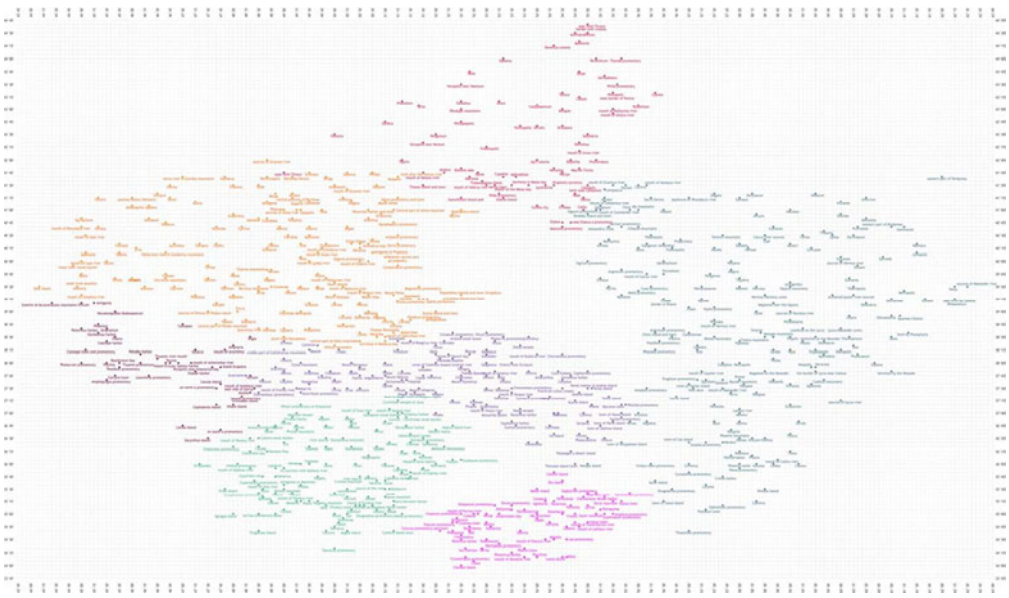

Figure 3. Toponyms given by Ptolemy in his Geographia correspond to the seven regions which cover the area of modern Greece. In this case the toponyms of each region are projected with different colors.

COMPARING LAPIE MAP (1834) WITH GEOGRAPHIA TOPONYMY

In Lapie's map the toponyms of the Roman World are placed according to their distances on the itineraries whilst in Ptolemy's Geographia the toponyms are placed according to their geographic coordinates. The comparison is thus interesting in order to find out the similarities and the differences between them. The result of this comparison is depicted in Figure 4, where it is obvious that most of the toponyms drawn in Lapie's map, especially those in central and southern Greece, are also reported by Ptolemy. The other toponyms of the Lapie's map probably come from other itineraries, or from other sources.

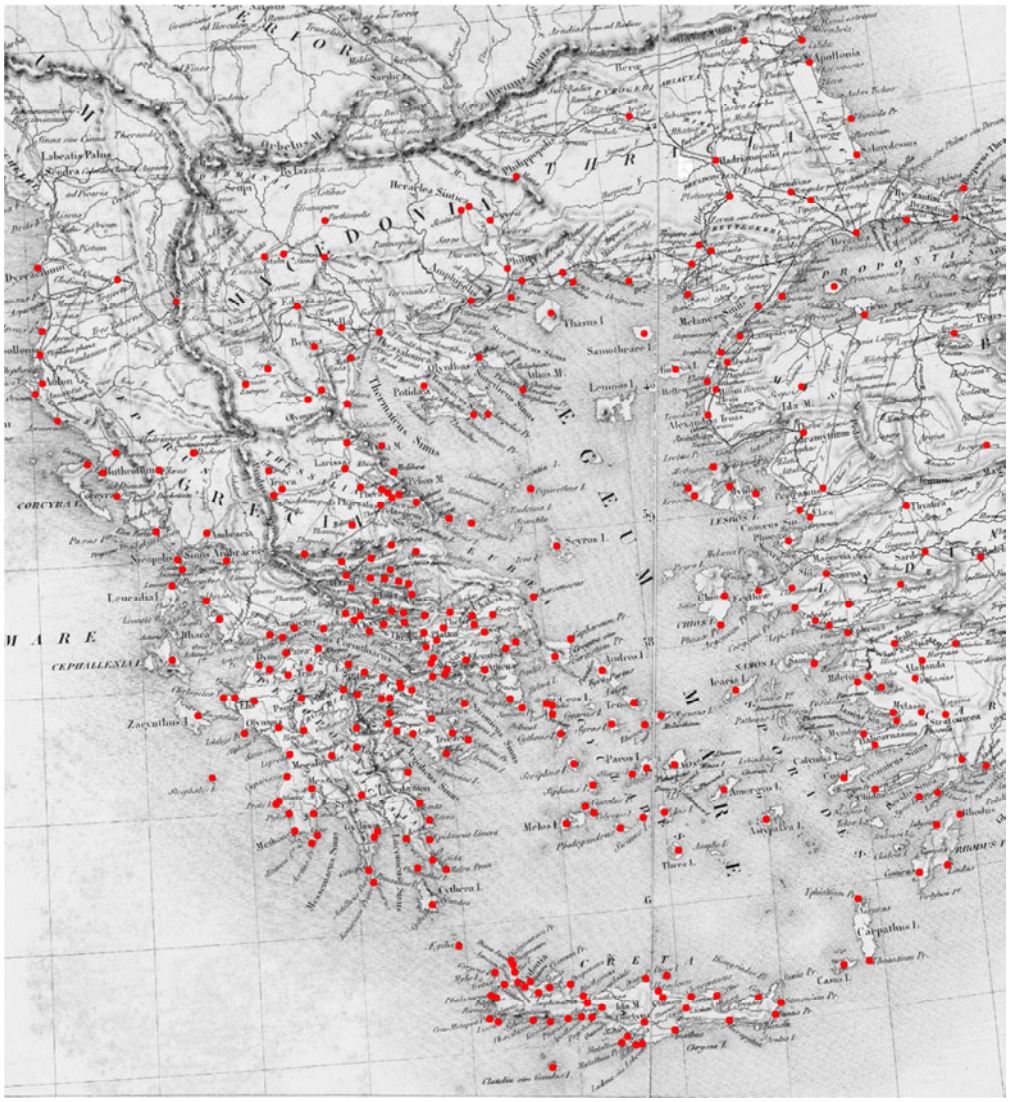

Figure 4 The area of Greece in Lapie's 1834 map where most of the toponyms (marked in red) are also given in Ptolemy's Geographia.

In northern Greece, the number of the similar toponyms is very small in comparison to those in Attica and the surroundings and in Peloponnese. This can be explained, in a way, by the density of toponyms in the area. In northern Greece, especially in the west part of it, there are relatively not many toponyms reported

in Lapie's map and in Geographia (Figure 5), as well.

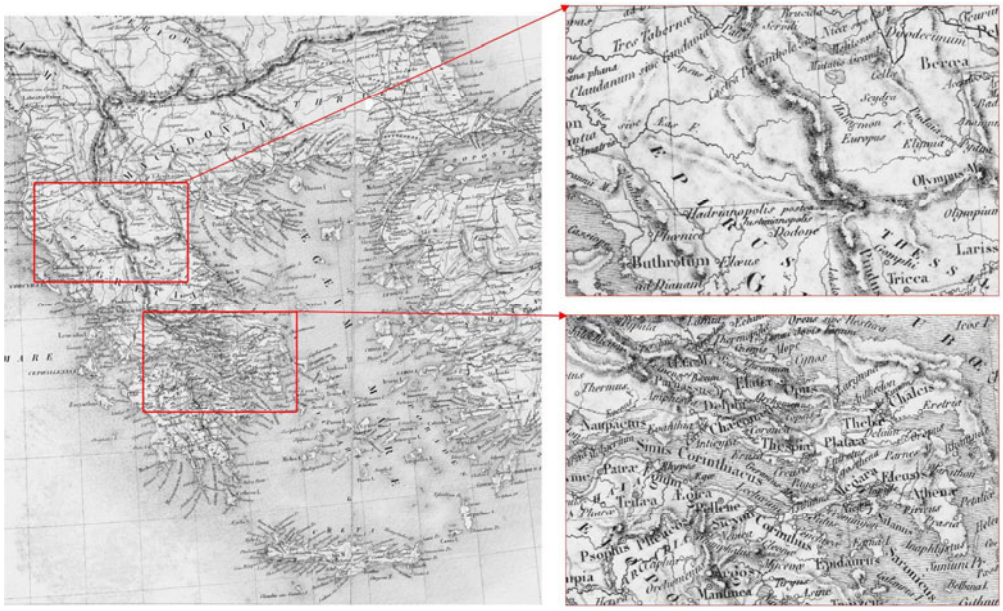

Figure 5. In some areas the density of toponyms is higher than in some other.

Just for a visual comparison of the geometry of the two representations, it is more comprehensible to use a map of the area constructed to be included in one of Geographia's editions, in this case the tenth table (Tabula X) of Europe included in the 1490 De Turre's edition printed in Rome, because through this map, it becomes more obvious the difficulty in comparing the two representations due to the different shape of the coastline (Figure 6).

Figure 6 Left: A part of Lapie's 1834 map depicting the area of Greece. Right: Tabula X of Europe in Ptolemy's Geographia (Rome 1490).

COMPARING LAPIE MAP (1834) WITH LAPIE MAPS (1822,1826)

Lapie's 1822 and 1826 maps were printed within the decade before his map of the Roman World (1834) and this is one of the reasons for the comparative study in this paper. The main difference between all the maps is the area they depict and the scale in which are drawn, which plays an important role in the tracing of the coastline and in the locating of the toponyms. The common area in all maps is that represented in the 1826 map, covering territories of the central and partly of southern Greece.

Studying the toponyms of the maps and looking to their coastline, we notice that there are interesting similarities and differences in its tracing in the maps, considering the scale differences between the map of the Roman World and the maps of 1822 and 1826. These differences, together with relevant information from other sources (Talbert 2007), show that Lapie does not use his maps of 1822 and 1826 as the basis of his Roman World map.

Fitting the 1826 map (blue dots the Ptolemy-referenced toponyms) into the Roman World map (red dots the Ptolemy-referenced toponyms), we obtain the synthetic result of Figure 7. Comparing the toponyms in

the maps, we can see that in the Roman World map, there are more Ptolemaic toponyms than in the 1826 map. These toponyms are usually indicated in 1826 map as ruins of the places, or in brackets, after the toponym of the map's time (Figure 8).

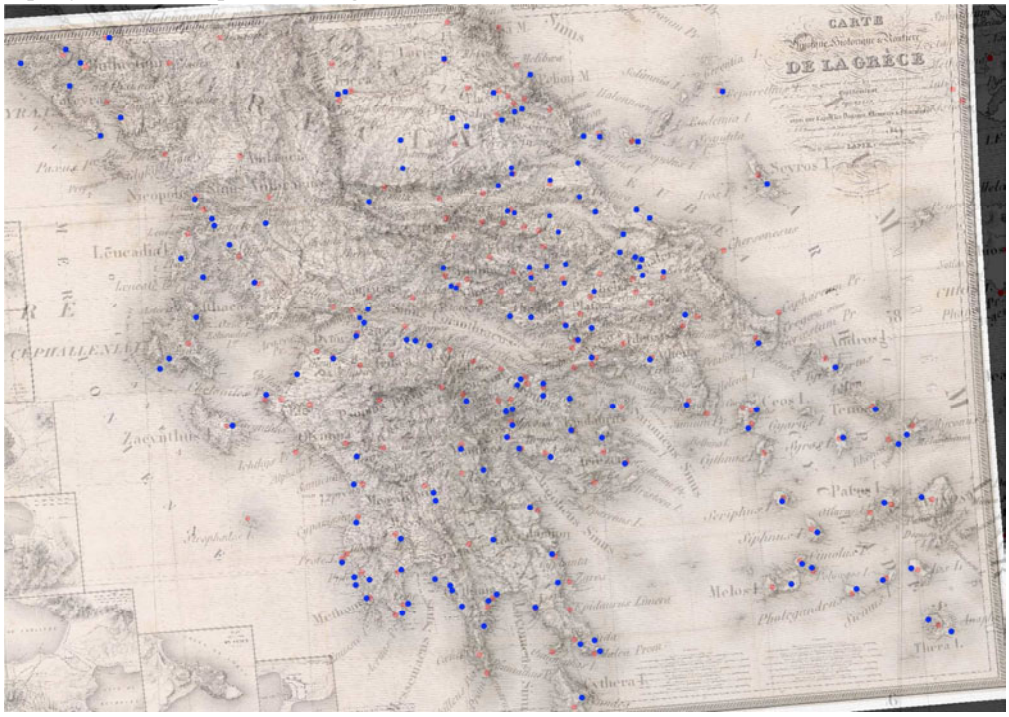

Figure 7. Common toponyms in Roman World map (1834) and Lapie's 1826 map.

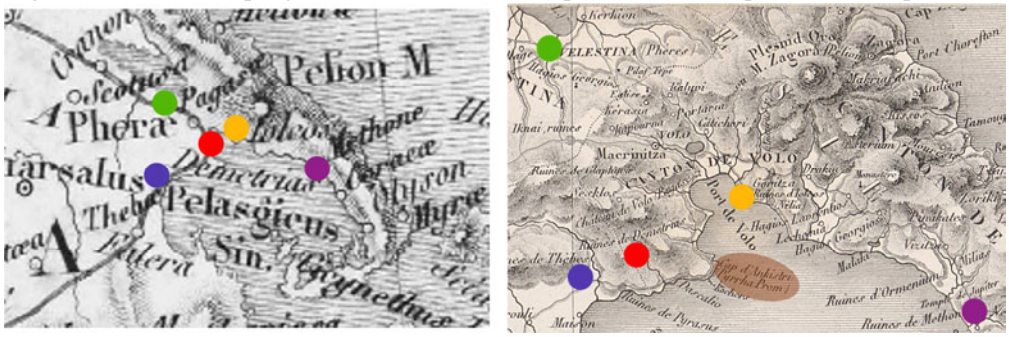

Figure 8. The common toponyms of the maps usually located as ruins in the 1826 map. Each color represents a toponym depicted in both maps, whereas the toponym with the ancient name in brackets is marked in the brown circle.

Focusing on a part of historical evidence (South Peloponnese) on all Lapie's maps dealt here (the 1822, the 1826 and the Roman World) as far as the Ptolemy toponymy is concerned, we obtain the results illustrated in Figures 9, 10 and 11 summarized in the table of Figure 12.

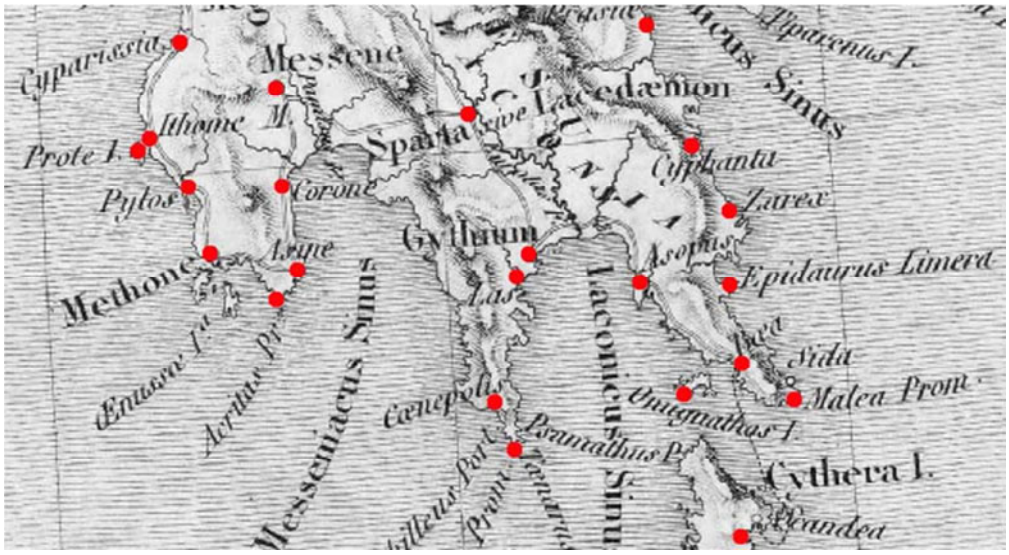

Figure 9. Ptolemy toponymy in Lapie's Roman World map (1834).

The total of thirty toponyms in the example, all depicted with their original Ptolemy names, are placed in the 1826 map, which is represented in the largest scale. In the previous 1822 map we count only seven toponyms (23% of the total in 1826 map) whilst in the Roman World map we have twenty two relevant toponyms (73% of the total in 1826) even if this map is in the smallest scale. In the case of this specific example, we have a deviation from the rule due to which most of the Ptolemy toponyms are depicted on the Roman World map.

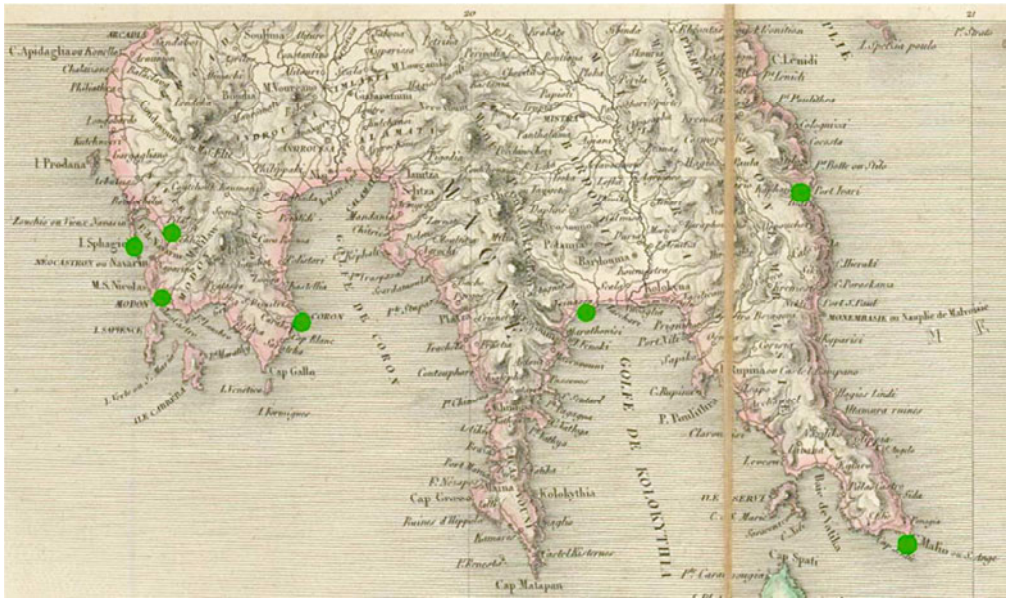

Figure 10. Ptolemy toponymy in Lapie's 1822 map.

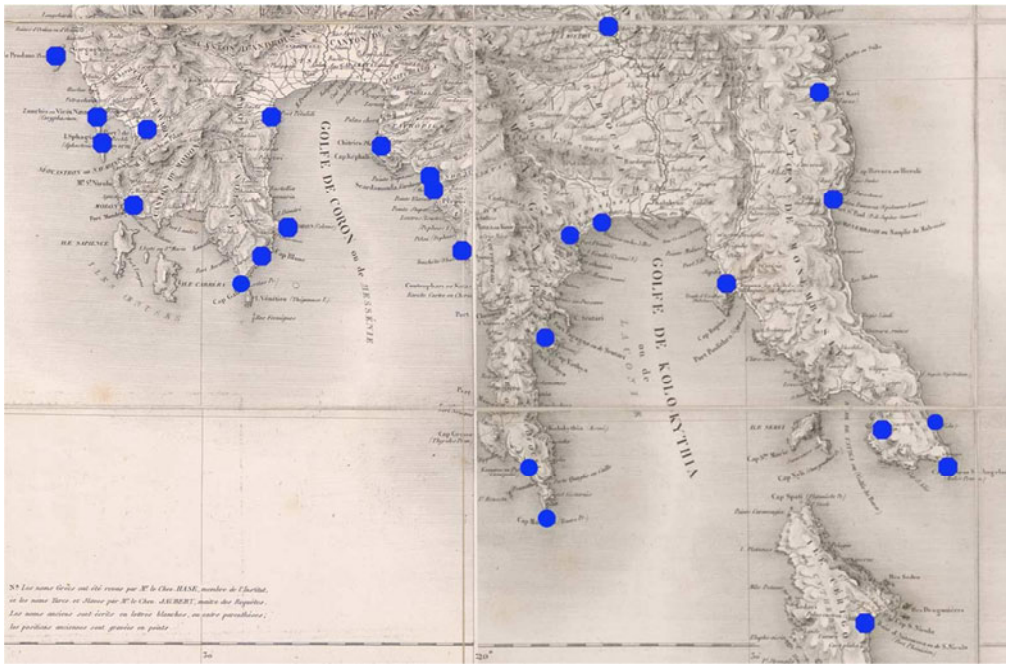

Figure 11. Ptolemy toponymy in Lapie's 1826 map.

Ptolemaic Toponyms	**Roman world, Lapie, 1834**	**Lapie, 1822**	**Lapie, 1826**
Cyparissia	X		X
Ithome	X		X
Prote island	X		X
Sphagia island		X	X
Pylos	X	X	X
Coryphasium promontory			X
Methone	X	X	X
Acritas promontory	X		X
Asine	X		X
Corone	X	X	X
Messene	X		X
Pherae			X
Cardamyle			X
Abia			X
Thalame			X
Caene	X		X
Teanarus promontory	X		X
Teuthrone			X
Las	X		X
Gythium	X		X
Trinassus harbour		X	X
Lacedaemon	X		X
Asopus	X		X
Onognathus promontory	X		X
Boae	X		X
Malea promontory	X	X	X
Epidaurus	X		X
Zarex	X		X
Cyphanta	X	X	X
Prasia	X		X

Figure 12. The Ptolemy toponymy in Lapie's maps.

CONCLUSION AND FURTHER WORK

The Lapie's maps of the second decade of 19th c., are published in Paris in 1822 and in 1826, in a period marked from the start of the Greek War of Independence in 1821 to the official creation of the New Greek State in 1832. They both are important parts of the Cartographic Heritage of Greece, associated to the French cartography of that period and subject of recent cartography studies in Greece. The Lapie's presence in this field was recently enriched (Talbert 2007) by another map, rather forgotten in our times, dated 1834 and published in 1845 in Paris, depicting the Roman World with reference to the relevant geography and cartography of the Roman times and of course to Ptolemy's Geographia. Given that the Cartography Group in the Faculty of Engineering of the Aristotle University of Thessaloniki is doing extensive research on 19th c. cartography as well as on Ptolemy's Geographia, the focusing of interest in these three Lapie's maps was natural.

The study concerns the Ptolemy's toponymy as placed by Lapie on a map of his period which obviously is compatible with his maps from the second decade of 19th c. The similar geometric content of the three maps, even if in different scale, assist considerably the toponymy study and the spatial reduction of the places carrying the Ptolemy names.

Applying digital technologies on this special issue of cartographic heritage, important results are coming out relevant to the spatial reconstruction of ancient geography on modern maps and to the geographic study of ancient toponymy with respect to modern counterparts. The first results of this study, which is in progress, are promising for generalization in association with the analysis of actual numerical values coming from various editions of Ptolemy's Geographia (Tsorlini 2011).

REFRENCES

Boutoura C., E. Livieratos, 2006, "Some fundamentals for the study of the geometry of early maps by comparative methods", *e-Perimetron*, Vol. 1, No. 1, pp. 60-70.

Dilke O.A.W., 1985. *Greek and Roman Maps*, Ithaca, New York: Cornell University Press.

Gautier Dalché P., 2007. "The Reception of Ptolemy's Geography (End of the Fourteenth to Beginning of the Sixteenth Century)" in Cartography in the European Renaissance. Volume 3 of *The History of Cartography*. Chicago and London: University of Chicago Press.Gautier Dalché P., 2009, *La géographie de Ptolemée en Occident (IVe-XVIe siècle)*, Turnhout: Brepols.

Livieratos E., 2006. "On the Study of the Geometric Properties of Historical Cartographic Representations". *Cartographica*, Vol. 41, No. 2, pp. 165-175.

Livieratos E., 2009. *Cartographic adventures of Greece, 1821-1919*, Athens: ELIA - Hellenic Literary and Historial Archive (in Greek: Chartografikes peripeteies tēs Ellados, 1821-1919). Ploutoglou N., M. Pazarli, C. Boutoura, M. Daniil, E. Livieratos, 2011. "Two emblematic French maps of Peloponnese (Morée): Lapie's 1826 vs the 1832 map (Expédition Scientifique). A digital comparison with respect to map geometry and toponymy", 25th International Cartographic Conference, Paris, 3-8 July 2011.

Tabula Peutingeriana, Manuscriptum originale, ca. 1200. In Biblioteca Augustana. Available at http://www.fh-augsburg.de/~harsch/Chronologia/Lspost03/Tabula/tab_manu.html

Talbert R. A. J. (2007). "A Forgotten Masterpiece of Cartography for Roman Historians: Pierre Lapie's Orbis Romanus ad Illustranda Itineraria (1845)", in *A tribute to the man from Northumberland*, H. M. Schellenberg, V. E. Hirschmann, A. Krieckhaus (Eds). Heidelberg- Duesseldorf, pp. 180-190. In digital form: http://www.phil-fak.uni-duesseldorf.de/fileadmin/ Redaktion/Institute/Historisches_Seminar/kovo/birley/18TalbertNEZ.pdf

Tsorlini A., 2011. Doctoral Thesis, in preparation, Aristotle University of Thessaloniki.