

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.

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SUMMARY

The decade from 1821 to 1832 is a fundamental period for the creation of the New Greek state. The period started with the war of independence and ended with the international declaration of the establishment of the state. The French interest for the affaires in the broader area is very intense for more than a century before, reflected massively in map production. In the early 19th c. the representation of the area of Greece was depicted in Barbié du Bocage's work as the map of the Peloponnese (1803-1807) and the map of Greece for general use (1810-1811). In the second decade of 19th c. Pierre Lapie produced, in the frame of the Dépôt de la guerre, two maps, one in 1822 representing the European territories of the Ottoman Empire and a second in 1826 focused in Greece already engaged in the struggle for independence. This map, even if the best until then produced for the area, it belongs to the era of pre-geodetic cartography, which was applied in Peloponnese from 1828 with the arrival of the troops of Nicolas-Joseph Maison of the Expédition du Morée. In the frame of the Expédition the first scientific map on the territory of Greece was constructed known and printed in Paris in 1832 the year of the official creation of the Greek state. In the paper, a discussion concerning the history and the outcome of Lapie's 1826 map and the Expédition 1832 map, two major French products of the early 19th c. cartographic heritage of Greece, is carried out based on the digital copies of the two maps using relevant standard comparison techniques.

INTRODUCTION

The French officer Pierre Lapie (1777-1850), ingénieur-géographe in the Dépôt de la guerre (1805-50), prepared in 1826 a 1.7 m X 1.2 m. map, in four sheets, entitled *Carte Physique, Historique et Routiere de la Grèce*, in scale 1:400.000 (Figure 1, Left). This map is actually the last French map of the area of Greece belonging in the so called *type semi-topographique*, an evolution of the Barbié du Bocage relevant maps in the beginning of 19th c. The 1826 Lapie map is a clear advancement of his previous one (1822) and is still based on records and data made available by distinguished military of the period (e.g. General Guilleminot, 1774-1840, former head of the Dépôt and then Ambassador in Constantinople, and General Boudin de Tromelin, 1771-1842), by travelers (e.g. Gell and Dodwell) and by the known hydrographers Commanders Gauttier and Smith. Of course, the footprints of other data-providers for the production of the 1822 map (as e.g. Pouqueville and the military Foy, Haxo, Andreosy, Trézel, Fabvier) are also evident in this 1826 map, which was used later (1831) by Blouet, the known Expédition du Morée architect, as the basis for his 1:500.000 map where the relief is now shaded by a different technique.

Two years later, in the early 1828, the first Governor of the newly established Greek State, requests from the Dépôt de la guerre a mission of French officers, in order to organize the training of the first Greek military engineers and in order to create a modern map of Peloponnese. The first French mission, composed by four military engineers, of various expertises, arrived in Greece in May 1828. Lieutenant Peytier (1793-1864) is the only ingénieur-géographe and geodesist in the group and he is supposed to organize the state cartography. But soon Peytier joins the armies of the French Expédition under General Nicolas-Joseph Maison and he undertakes the mission to organize and perform the systematic geodetic triangulation and surveying works in the Peloponnese, in order to produce the first scientific map entitled *Carte de la Morée*, which will be published in Paris in 1832, in six sheets (plus two more supplementary sheets), in scale 1:200.000 (Figure 1, Right). This map of the Peloponnese, based on detailed and consistent measurements in the field during the years 1829, 1830 and 1831, is now known as the "Expédition map", or as the "Peytier map", or some times as the "Pelet map" due to the only name written on the map-legend (for a presentation of the French cartography in the area, at the time, see Livieratos, 2009).



Figure 1. Left: *Pierre Lapie, Carte Physique, Historique et Routière de la Grèce*, in scale 1:400.000, 1826. Courtesy: Map collection of the “Sylvia Ioannou Foundation”. Right : *Expédition Scientifique, Carte de la Morée*, in scale 1 :200.000, 1828-1832. Courtesy: Manos Haritatos.

These two maps, created during the crucial period of the process of birth of the Modern Greek state, indicate the French interest for the area of Peloponnese and represent strong points in the Greek Cartographic Heritage, since the Lapie’s map marks the transition from the semi-scientific tradition to the first, for this area, scientific cartographic work of the *Expédition*, based on geodetic triangulation.

THE REPRESENTATIONS OF GREEK TERRITORIES IN EARLY 19TH C.

The French cartographer Jean Denis Barbié du Bocage is widely considered as a dominant personality in the representation of Greek territories in the beginning of 19th c. His cartographic work indicates the transition from the old, traditional cartography to the new, scientific cartography, which is inaugurated by the geodetic and topographic works in Peloponnese during the French Morea Expedition (1828-33). In the meantime, the nautical cartographic tradition (end of 17th and the major part of 18th c.) is characterized by the representations and depictions of coastlines in Ionian and Aegean Seas, based on the point position corrections by recent astronomic observations of geographic latitude and longitude, mostly in places near the coastlines (see e.g. Boutoura et al. 2011). Barbié’s maps by this time, the classified map of Peloponnese (1803-1807) and the Map of Greece for general use (1810-1811) are characteristic products of the so-called “transition cartography” from the old way representations to the new ones.

As a result of French aspirations on the Balkan Peninsula and the Ottoman Empire, based on the domination of the Dalmatian coasts and the Ionian Islands, the French cartography shows a great interest to map these areas during the first years of 19th c. Among the relevant cartographic products of the period is a map less known by Gaetan Palma, printed in Trieste in 1811, during the French domination of the area (1809-1813). This bilingual map, in Greek and French, is based on old material, corrected by recent astronomic observations and according to data provided by various travelers (see Pazarli, 2010).

The two maps of Greece, edited in the second decade of 19th c. by Lapie (1822, 1926), could be seen as the evolution of Barbié’s cartography, with the addition of new data elaborated in the *Dépôt*, in combination with records and data provided by Pouqueville’s traveling in Greek lands. The first Lapie map, entitled *Carte Générale de la Turquie d’Europe*, is edited in Paris, in fifteen sheets, with total dimensions 2.20x1.70 m., in scale 1:800.000. Two significant military and political personalities of the era, with remarkable cartographic and travelling experience, provided Lapie the material for the edition: Guilleminot, and de Tromelin, with the assistance of other officers, some known for their involvement in the military affairs in Greece during the first years of the Independence (Themeli-Katifori, 1985), as well as with the assistance of travelers and hydrographers.

THE 1826 LAPIE MAP

The second Lapie map, in 1826, in four sheets, entitled, is a depiction of Greek areas from the Ionian island Corfu to the island of Naxos in the Aegean Sea (in longitude) and from the mountain Ossa to the island of Kythira (in latitude). This map, with total dimensions 1.70x1.20 m., in 1:400.000 scale and it is based on data and material (see Hase, 1827) provided by de Tromelin and Guilleminot, as well as on travelers' texts, and in measurements of coastlines made in the Greek Seas by Gauttier and Smith (in Cyclades islands and in west coast of Peloponnese respectively). Inside the map, there are insets with depictions of cities of strategic importance in larger scales (for more, see Livieratos 2009).

As reported by Livieratos (2009) there is a reference by Quérard that the classified, for many years, Barbié's map of Peloponnese (1807), was used in the military operations during the Greek War of Independence *...aujourd'hui elle sert à faire la guerre dans cette contrée...*, (Quérard, 1827) without other explanation. Another relevant note, about the use of Lapie's map in the military activities in the Aegean Sea is given by Lapie's student Dufour (1826): *...vaut-on connoître dans quelles eaux et su quelles plages les enfans de la Grèce régénérée joignent, attaquent et brûlent les vaisseaux des Ottomans, if faut consulter l'Archipel dressé par M. le chevalier Lapie...*

THE 1828-1832 EXPEDITION MAP

When the French troops of General Maison arrived in Peloponnese in August 1828, the Dépôt approved, as a matter of first priority, the edition of a high quality map, efficient for the troops' needs. The incorporation of the first scientific mapping of Greece in the frame of Expédition de Moreé, resulted the first scientific map of Greece, a high quality cartographic work, derived by systematic geodetic and topographical measurements, in the largest until then scale, the latter compared only with the relevant Venetian military maps of the beginning of 18th c.

The results of the geodetic, topographical and cartographic field work were exported to Paris. There, the map of Peloponnese was edited and published just as a supplement *...among the issues of botanic and zoology, under a common cover...*, as the key creator of the map Jean Pierre Eugène Félicien Peytier bitterly mentioned (Saitas 1996). For this gifted and experienced engineer-geographer Peytier, his partners and the results of the mapping works, see Livieratos 2009 and the references there, especially Sivignon 1996 and Tsakopoulos 1996.

The geodetic works begin in April 1829 and completed in April 1831 (Peytier, Puillon-Boblay, Servier 1833). Between September 1831, when Peytier returns to France, and the first months of 1832, the works of processing, computations and reductions of the field measurements and the map drawing are completed in Dépôt. The same year the map, entitled *Carte de la Morée*, is edited, in six sheets (plus two more supplementary sheets), in scale 1:200.000, in Flamsteed equivalent projection.

The geometric precision of the Peloponnese map is varying, because though the initial field works were detailed and rigorous, including height measurements, soon later from the end of 1829, the works are accelerated for the urgent needs of the French military Staff. The result of this acceleration of the field work was the simplification of the procedures in the field.

Two more map-sheets are added in the original six sheets map in larger scales representing sites of strategic interest (for more, see Livieratos 2009).

Beginning in 1833, the French officers surveyed areas in east Central Greece and Euboea (Peytier 1835). The second mapping proceeds until 1849, twenty years after the start of Expédition's cartographic works. In this year, Soitoux completes the field works in Thermopyles and Athens, while in the meantime (1837-1840) the geodetic works in Western Greece and the triangulation link with the Ionian Islands are completed (Conteaux (1841).

COMPARING THE MAPS

The comparison focusing on the Peloponnese allows the extraction of important elements related to the spatial documentation in the area which was the centre of the New Greek state. This comparison is assisted today, in a variety of ways, by the digital technologies in which the maps under comparison are embedded.

The maps, even very close in time, belong to different cartographic typology, as e.g., a) are given in two different scales, the Lapie map in half the scale of the Expédition map, b) are products of different processing methods, the Lapie map is a "semi-topographic" map (according to Barbié du Bocage terminology, indicating the pre-geodetic era of mapping) whereas the Expédition map is a geodetically derived map based on triangulation and on original field measurements and c) are aiming at different targets: the Lapie map at the description of the physical and historical milieu of the country as well as its land crossing (roads) and the Expédition map at the exact spatial placement and differentiation of sites and toponyms as spoken at the period.

Nevertheless, even with these differences it is interesting to attempt a comparison, which it is easy today with the digital support, in order to derive some results which are not visible if following the traditional, so to say, analogical (pre-numerical) way in the comparative analysis of maps. The digital analysis, among other assisting results, enriches the taxonomy impact in the cartographic heritage discussion which is growing in our times.

The experiments carried out here are targeted both at the geometric and at the thematic content of the two maps. Considering the scale difference as treatable in our experiment a) by reducing in half the scale of the Expédition map for the geometric comparison with the Lapie map and b) by increasing two times the Lapie map for the thematic comparison with the Expédition map we derive the results illustrated in the following figures.

Concerning the geometric aspect, we can see, in Figure 2, the second order polynomial projection difference of the two maps when the Lapie map is fitted to the Expédition map given in the Flamsteed equivalent projection. In Figure 3, the severe deviations of the Lapie representation of the east Peloponnese coastline from a modern counterpart are shown (Right) which is not the case in the relevant Expédition representation (Left). Concerning the thematic aspect some very interesting results are coming out from the comparison, some not always conformal with the expected principles known today in the cartographic theory. The first result is that the Lapie's map is reproducing more antique toponyms than the Expédition map. In Lapie map the road network of the time is displayed as a principal theme, which surprisingly is not the case in the Expédition map. Lapie's toponyms are reflecting a somehow older naming recalling in some cases the Venetian legacy in that geographic area. On the contrary the Expédition map reports place names which are closer to those used by the population keeping also the place name lettering which is closer to the Greek writing. In the Expédition map, the differentiation of symbolism is much more systematic and broad than that of the Lapie map. As far as the density of the toponyms is concerned the relevant generalization rules, associated to the scale of representation, are not generally respected as it is evident in the case of the Figure 4. In some cases the toponymy density is similar, as it is shown in the example of Figure 5 and in other cases the generalization rule, according to the scale, is applied as one can see in Figure 6.



Figure 2. Left: The Expédition map (1828-1832) in the equivalent Flamsteed map projection. Right: The projection alteration of the Lapie 1826 map when best fitted in the Expédition map according to a second order polynomial transformation.

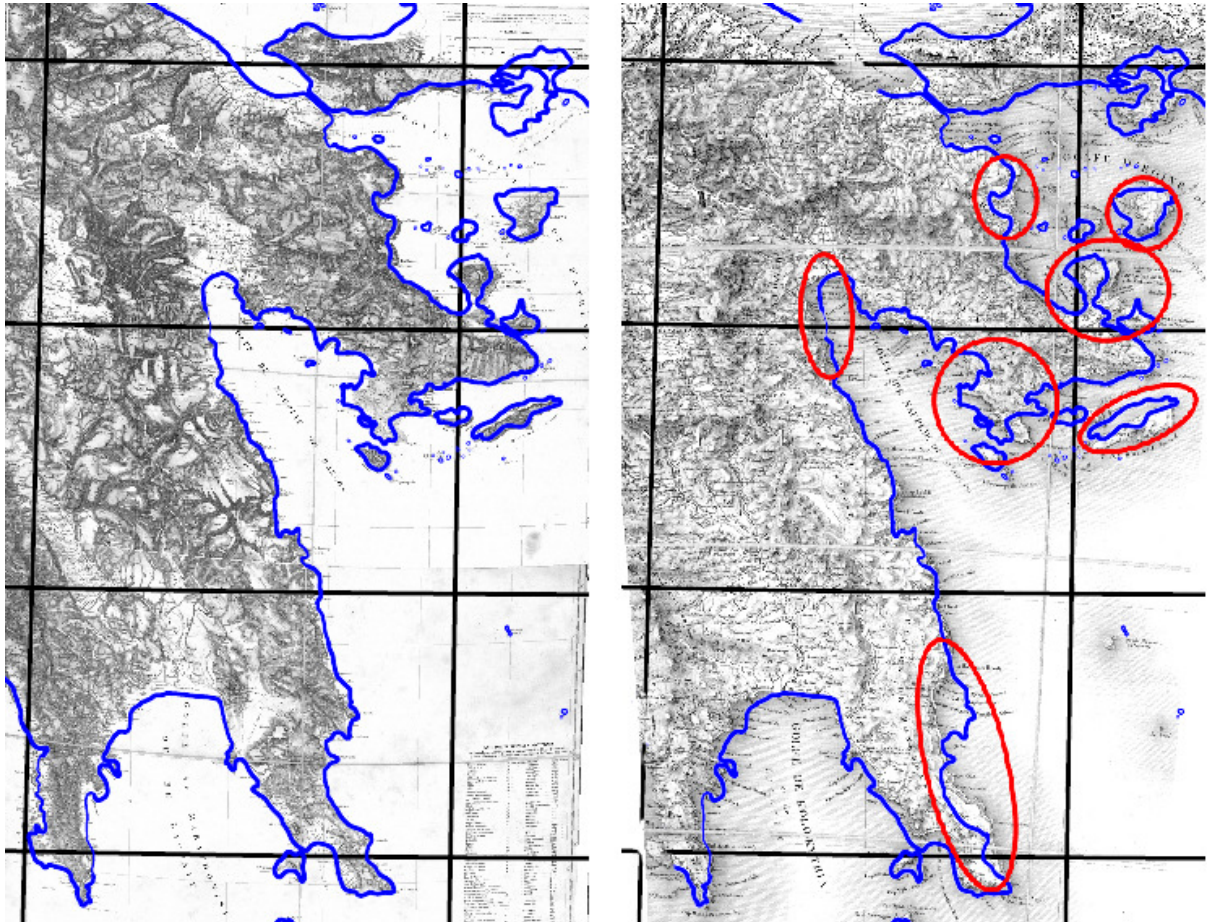


Figure 3. Left: The modern coastline representation in bleu, best fitted onto the Expédition map. Right: The modern coastline representation in bleu, best fitted onto the Lapie map. Large coastline discrepancies are marked within red.



Figure 4. The territory of Patras – Chateau de Morée (Rhium) in Expédition map (left) and in the Lapie map (right). The dense toponymy in Lapie's map is impressive, despite the smaller scale of its representation (half of that of the Expédition map).



Figure 5. The territory of Argos – Nauplie in Expédition map (left) and in the Lapie map (right). The toponymy density in the maps is more balanced with respect to the original scale of the maps.

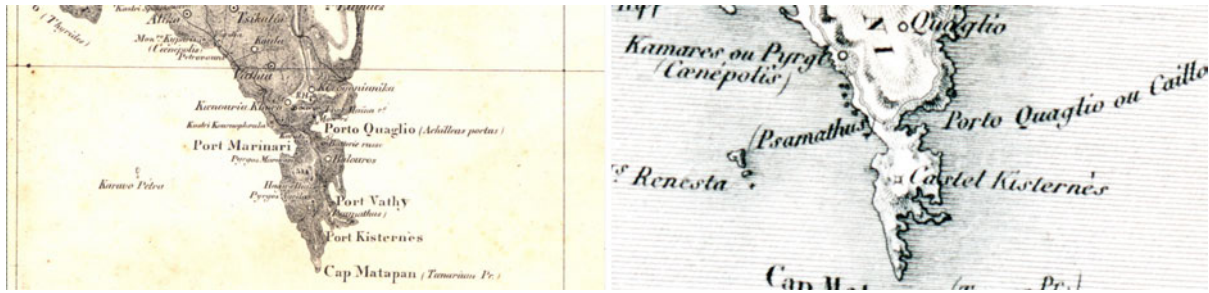


Figure 6. The territory of Cape Matapan (Taenaron prom.) in *Expédition* map (left) and in the *Lapie* map (right). The toponymy is now less dense in *Lapie*'s map than in that of the *Expédition* map.

CONCLUSIONS AND PROPOSALS FOR FURTHER RESEARCH

The two maps studied here, mark a turning point in the cartographic heritage, of French origin, of the most important period of the decade in which Modern Greece was born. The *Lapie* 1826 map is the last example of a cartography based on the accumulation of scholar processes, travellers' reports and point positioning of latitude and longitude whilst the *Expédition* 1828-1832 map is based on geodetic triangulation and modern surveying. The advancement of the quality in the geometric content of the second map is indisputable, compared to the first map content. But can not escape our attention the fact that even if the coastline discrepancies of the *Lapie* map with respect to the *Expédition* map is generally constant, there are some local cases where the relevant consistency is exceptional. This leads to the opening of a further investigation in order to determine which parts of the *Lapie*'s coastline are better surveyed and compatible to the *Expédition* coastline. Concerning the accuracy heterogeneity of the *Expédition* map, mentioned above, an interesting research could be spatial distribution of this heterogeneity in order to detect eventual priorities in keeping high accuracy in the field measurements. On the other hand, the question is open for the thematic content of the maps under comparison. Here, despite the great difference in scale, the thematic information given in the maps are certainly complementary. The generalization rule concerning the proportional relationship of toponyms density with respect to the map scale (high density in large scale vs low density in small scale) is not always the case in our comparison. This means that in the pre-scientific cartography this rule was not always the case.

It turns out that the comparison using digital technologies can help us to detect interesting points for further research: concerning e.g. the variety in density and the origin of *Lapie*'s toponyms, it may be useful to compare *Lapie* with previous maps. The road networks and the method used for the terrain representation in the transition from the "semi-topographic" to the scientific cartography are also subjects open to further investigation. The different way that the toponyms are given in each map, is reflecting the transition to the new, scientific, more "realistic" and more accurate 19th c. maps, which reflect the geo-strategic policies in the area, requiring representations of actual data instead of historical information, as it was the common practice in 18th c. scholar and partially in "semi-topographic" cartography.

Moreover, given the fact that the *Expédition* map even today recalls the interest on of historical topography and archaeological research in Peloponnese (Witmore 2005), it is obvious that a comparative study with other material of the area's cartographic and archaeological heritage from that time, such as e.g. the works by Leake (1830) could be of great importance (for a discussion on the issue see Livieratos 2009, with reference to Leake and Curtius).

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