

Nopi Ploutoglou^{*}, Maria Pazarli^{**}, Chryssoula Boutoura^{***}

The Petr Ivanovich Sevastianov's 19th century Holy Mt Athos plans, embedded in a modern digital 3-D local cartographic environment

Keywords: P. I. Sevastianov; Mt. Athos cartography; 19th century cartography; digital embedding in 3D representations.

Summary

P.I. Sevastianov, focused his interests, among other things, to the localization, the documentation and the representation of sites and monuments of Holy Mt. Athos. Among his activities there was the surveying of monasteries and its surroundings, the plans of which are now in the Moscow State Library (MSL). In this research work, carried out for the first time on these seven plans, after having them placed in the general context of Sevastianov's two campaigns in the Athonian peninsula, a meticulous digital study is designed and implemented, concerning the geometric precision of the plans and their thematic representation plenitude, with respect to the actual data which are available from modern relevant surveys and representations. The Sevastianov's plans are digitally embedded into three-dimensional modern representations which allow the study not only of the quality of the plans as far the geometry and their content are concerned, but also of the changes caused by the passing of time and the monastic activities during the years.

P. I. Sevastianov in Mount Athos

Petr Ivanovich Sevastianov, the known Russian 19th century art collector, focused his interests, among other things, to the localization, the documentation and the representation of sites and monuments of Holy Mt Athos, during his well organized campaigns in this famous pluri-centenarian monastic community of Orthodox Christianity. Between 1850-60, he made four preparative travels in Athos Peninsula and in 1859 he came back, accompanied by Russians, French, Bulgarians and Greek associates, in order to spot, record, identify, depict and survey places, monuments, images, frescos, manuscripts, documents and other valuable and scientifically interesting objects. The available descriptions about the campaign's activities indicate that the campaign was fully equipped with tools that the contemporary technology could provide.

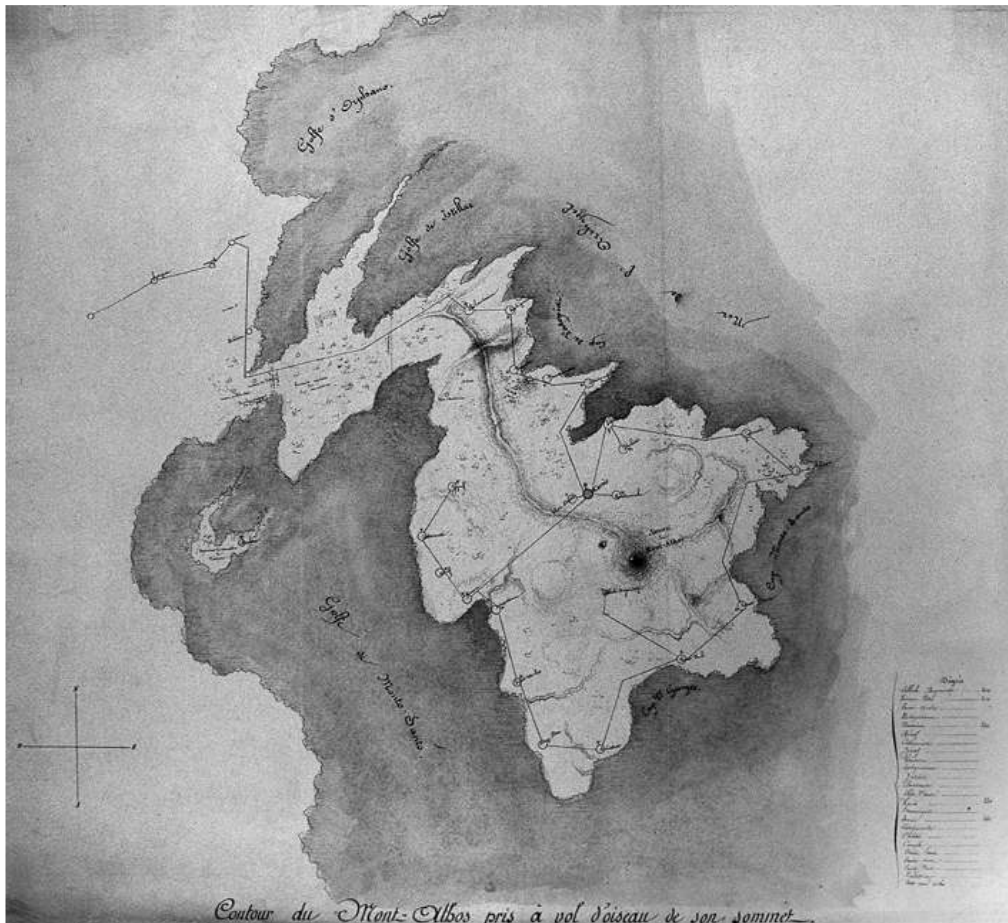
The Sevastianov group, in a time period of only two years (1859-60), managed to put together a vast number of copies and photographs from the objects, such as architectural and other plans of the monasteries. Its work was one of the biggest efforts for collecting, copying and documenting religious art objects –this collection, in the following years was spread in various museums and collections in Russia.

^{*} Surveying Engineer, MSc in Geography and Cartography; Candidate Doctor, Faculty of Surveying Engineering, Aristotle University of Thessaloniki [plouto@topo.auth.gr]

^{**} Archaeologist, MSc in History, Candidate Doctor, Faculty of Surveying Engineering, Aristotle University of Thessaloniki [pazarli@topo.auth.gr]

^{***} Professor of Digital Cartography, Faculty of Surveying Engineering, Aristotle University of Thessaloniki [boutoura@topo.auth.gr]

Among their activities there was the surveying of monasteries and its surroundings and the compiling a detailed topographic map of Mt. Athos peninsula, in nine map sheets. In this map the ten biggest Athos monasteries are depicted: it was the first systematic effort to survey and mapping Athos peninsula in detail. Seven of the original plans and the panoramic plan *à vol d'oiseau* of the Athos peninsula from the top of Mount Athos were located in the Moscow State Library (MSL) and copies were kindly offered to Mount Athos Map Library (Hieromonk Ioustinos Simonopetritis¹).



The Sevastanov's panoramic plan *à vol d'oiseau* of the Athos peninsula from the top of Mount Athos. The original in colour. Source: Moscow State Library (MSL).

The Mount Athos plans

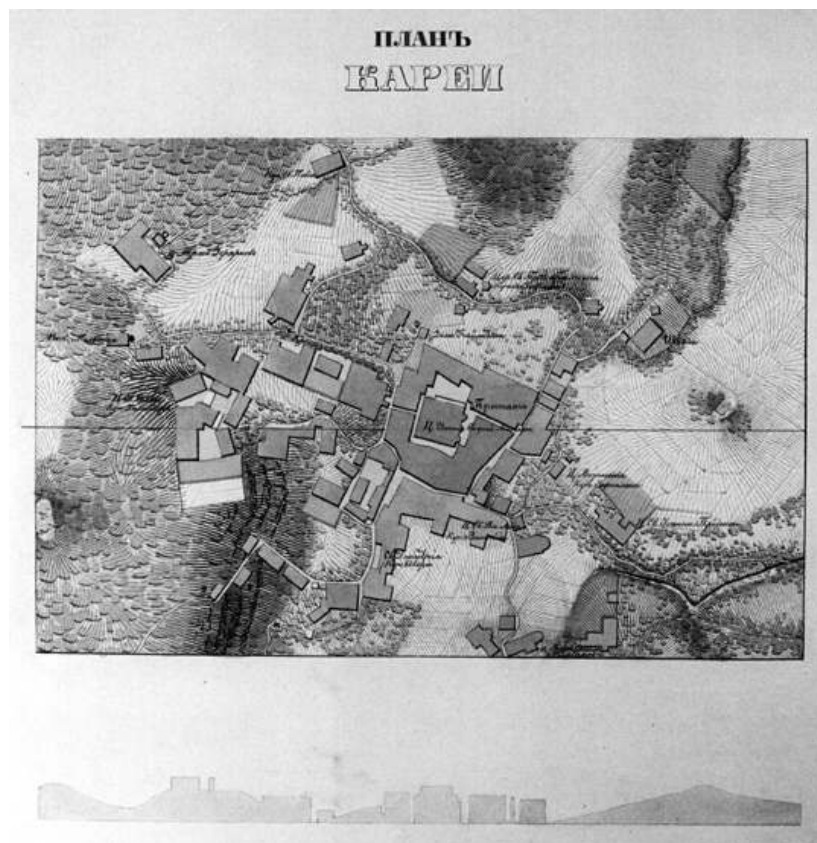
In 2002, on the occasion of the first year anniversary from the establishment of the Mt Athos Map Library and the relevant publication of the book, in Greek, on Mt Athos cartographic representations (*Mt Athos Metamorphoses on Maps*) the Moscow State Library (MSL) gave the permission to the delegated Mt. Athos monks to use the im-

¹ Ref: artathos@otenet.gr

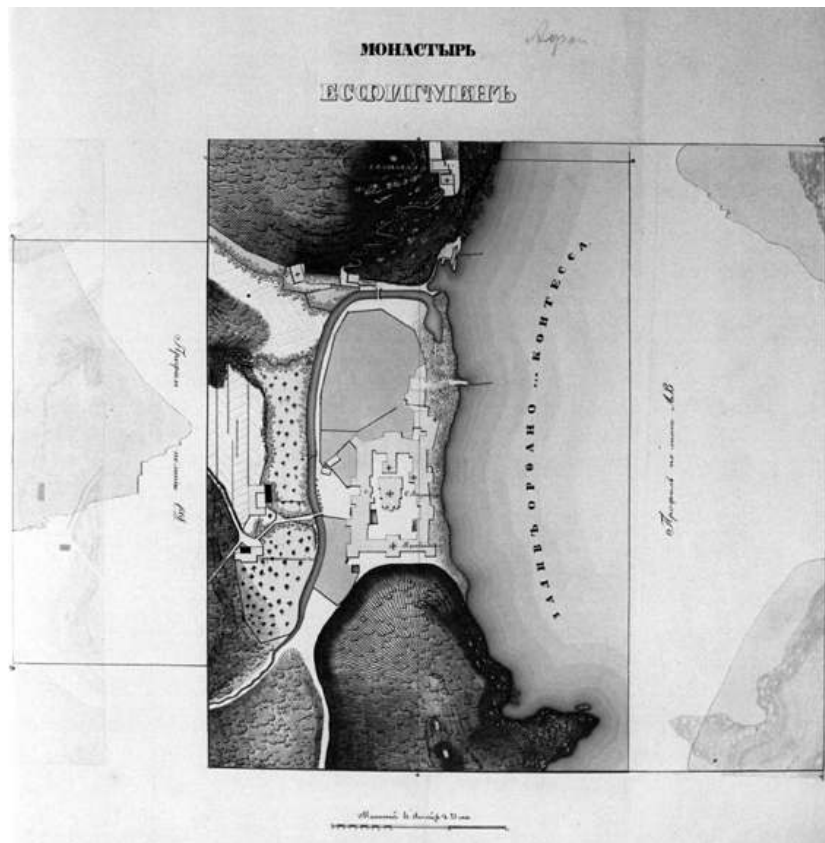
ages of the seven preserved Sevastianov's plans, representing with aesthetic skills some of the monasteries and Mt Athos landscapes.

The Sevastianov topographic plans (of great aesthetic value) are depicting the monasteries and their surroundings. The topographical plans were made according the classical topographic technics, following the contemporary artistic criteria for drawing topographical diagrams (hatching, line-shading for the relief, colouring with watercolors, calligraphic writing of toponyms and names etc.).

The topographic plans are accompanied by orthogonal projections according to selected sections in length and width in order to represent the terrain relief (the heights). The drawing of the sections is placed in the borders of the plans. The whole topographic plan, with external dimensions varying from 38x32 to 42x48 cm, is wonderfully drawn recalling actually an artistic painting rather than topographic plans. Without doubt, these topographical plans of the Russian topographic tradition are rare examples in Greek topographic heritage, despite the expected and well understood geometric differentiations in comparison with modern topographic plans.



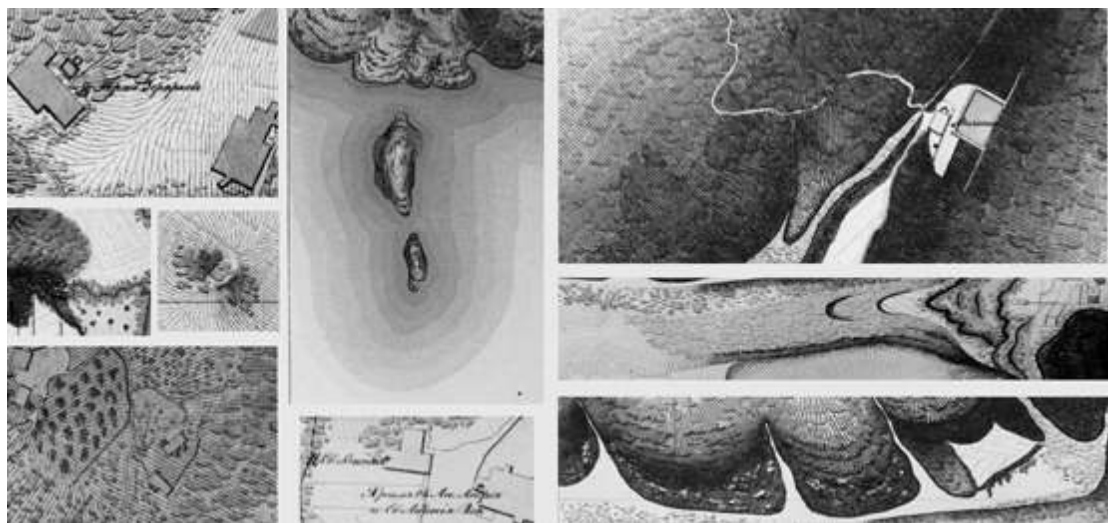
Sevastianov's topographic plan of Karyes, the Mt Athos capital The original (MSL) in colour.



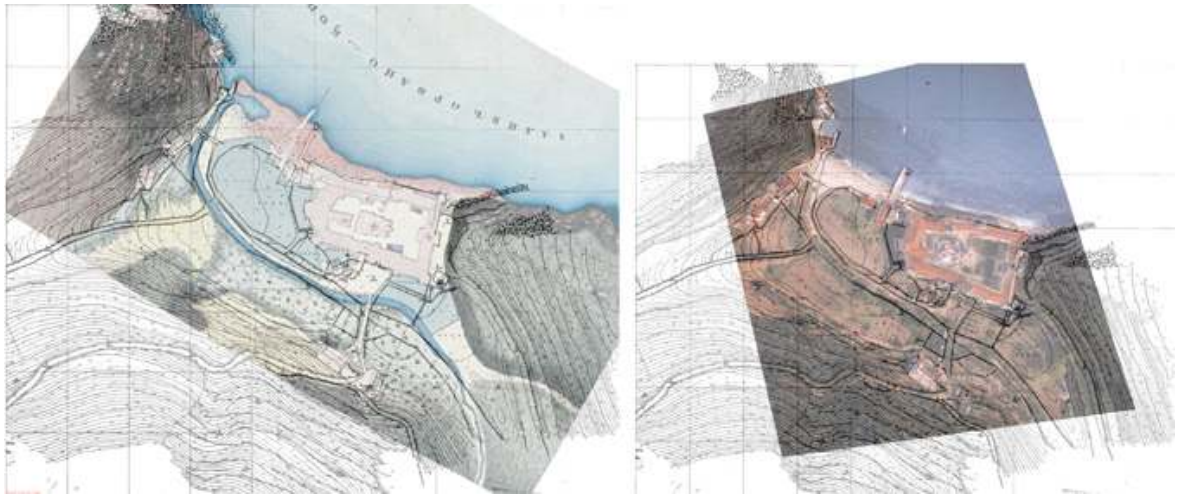
Sevastianov's topographic plan of Esfigmenou monastery. The original (MSL) in colour.

The digital process

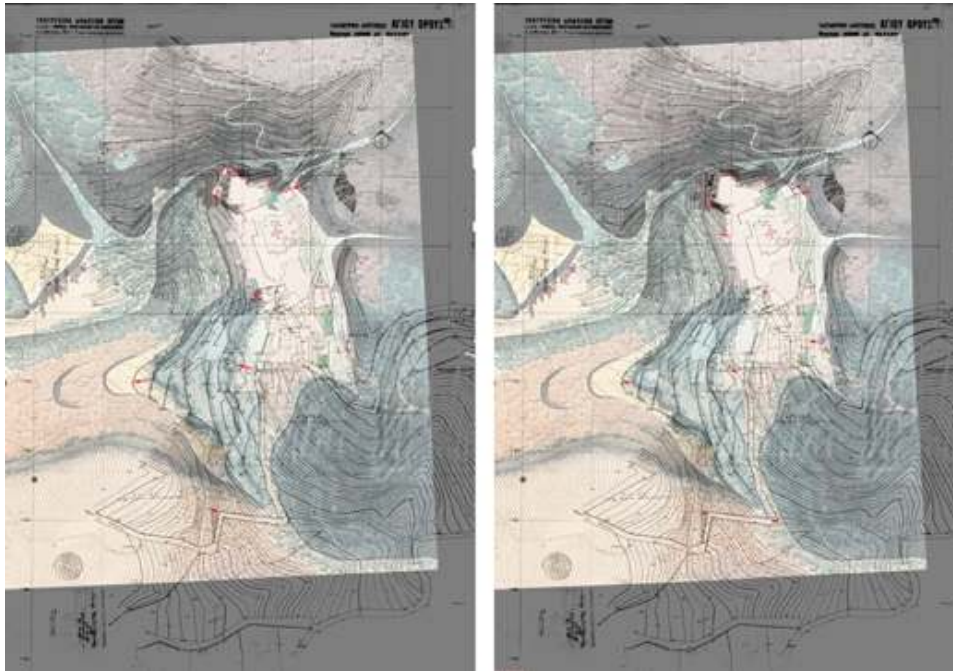
In this research work, carried out for the first time on these seven plans, after having them placed in the general context of Petr Ivanovich's two campaigns in the Athonian peninsula, a meticulous digital study is designed and implemented, concerning the geometric precision of the plans and their thematic representation plenitude, with respect to the actual data which are available from modern relevant surveys and representations.



Details from Sevastianov's topographical plans. The originals (MSL) in colour.



Left: Optimal fitting of Sevastianov's plan to a relevant modern topographic plan according to a warping process using common control points for the fitting process. Right: Optimal affine fitting of a aerial photo to the modern topographic plan.

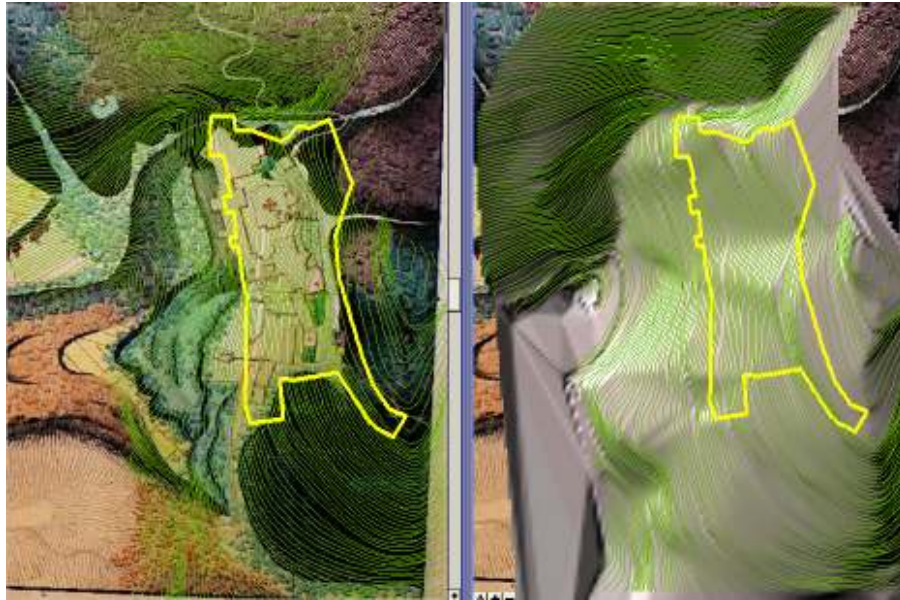


Left: Optimal similarity fitting of the St. Paul monastery plan by Sevastianov to modern topographic plan (1969) in 1:5000 scale by the Surveying and Cadastre Service of the Hellenic Ministry of Public Works. Right: Optimal fitting by warping process applied to the fitting shown left. In red arrows the residuals at the control points due to the fitting.

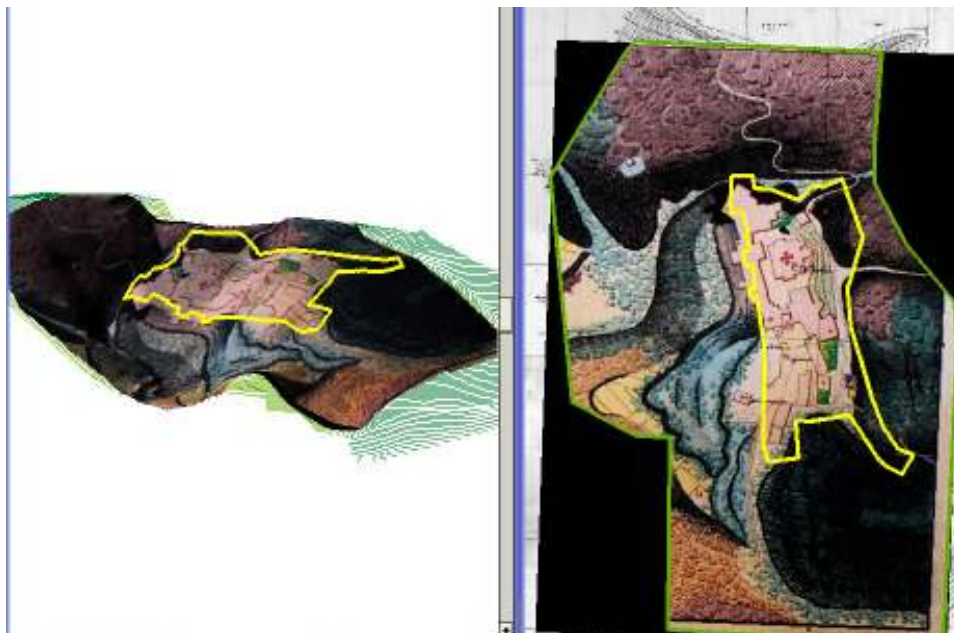
The 3-D embedding

A part of the project which is under development is the digital embedding of the Sevastianov's plans into three-dimensional modern representations which allow the study not only of the quality of the plans as far the geometry and their content are concerned, but also of the changes caused by the passing of time and the monastic activities during the years. In this 3-D context a shading effect study is also included, by simulating the actual solar shading during the day, aiming also at strategies which could be properly used in

promoting not only the scientific value but also the artistic uniqueness of Sevastianov’s precious representations of Mt Athos, recalling thus the attention of the general public on such types of representations in the frame of cartographic heritage as part of the cultural heritage.



Left: The S. Paul monastery plan by Sevastianov optimally fitted to a modern vector topographic plan (green contours) and the broader outline (in bold yellow line) of the monastery depicted on the modern plan. The Sevastianov relief follows pretty well the modern contouring. Right: It is evident that the shading of the Sevastianov representation follows the illumination rules, which corresponds to a North-West position of light source as it is proved by the digital shading relief process. As it is apparent, this proper illumination keeps in light the monastery, whilst any other illumination keeps the monastery in shadow.



Left: The S. Paul monastery plan by Sevastianav, draped on a modern digital relief of the area. Right: This draped image digitally shaded with North-West light source. The resulting image is very close to the original Sevastianov’s representation, proving the skills of Russian cartographers!

Acknowledgements

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Topographic plans of the Mt Athos monasteries(1969) in scale 1:500, Office of Surveying and Cadastre, Hellenic Ministry for the Public Works (source: Centre for Preserving the Mount Athos Heritage – ΚΕΔΑΚ, Hellenic Ministry of Macedonia and Thrace).