

Navigating through historic Danube maps: a look at the fluvial islets between Giurgiu and Oltenita towns

Andreea-Florentina Marin

Faculty of Geography, University of Bucharest
andreea.marin09@yahoo.com

Abstract. This paper presents a cartographical retrospective of the most relevant maps for the Danube River, focusing on the fluvial islets. The study area corresponds to the Giurgiu-Oltenita sector, one of the Danube's sectors displaying a relative stability regarding the number of such geomorphological landforms. If by the end of the 17th and the beginning of the 18th centuries the Danube River was drawn as a straight, wavy or curly lines, after this period the maps were made more detailed and precise, also depicting its fluvial islets and marshes. At the same time, information about the navigation, vegetation, topography and bathymetry is starting to be collected and mentioned. All these maps and aerial/satellite images provide an excellent record of historical locations and configuration of the Danube course and its islets.

Keywords: *historical cartography, old maps, fluvial islets, Danube River*

1. INTRODUCTION

Historical maps are an important source of data and information for identifying, locating and studying the evolution of the geographical elements. So, in this paper we propose a cartographical retrospective of the most relevant maps for the Danube River, focusing on the fluvial islets. Because this research is a part of my PhD Thesis, we'll explore and identify the Danube's islets between Giurgiu and Oltenita towns (this being the area of my analysis).

My cartographic research on the Danube's fluvial islets involved searching, identifying and selecting all the relevant historical maps found in different libraries. In that regard, the most maps were consulted from the collection of The Maps Department from the Romanian Academy Library. Also, some of them were taken or bought from different virtual libraries. It's important to mention the portal of the National Library of France, which provides free access to a collection of public domain maps and the Europeana Collections – a European Digital Library for all, which offers a huge collection of books, journals, films, photos, old maps, etc.

A remarkable project which lead to the digitalization, georeferencing and the online publishing of Szathmari's map should be noted. The initiative was conducted by a team of specialists from Babes-Bolyai University from Cluj, coordinated by Professor Bartos-Elekes Zsombor.

Also, the website of the geo-spatial.org community is an online resource for enthusiasts of old maps.

At the same time, my cartographic research was complete with a visit to the National Museum of Maps and Old Books from Bucharest (Romania).

2. DANUBE COURSE FROM ANTIQUITY UNTIL THE EARLY 17th CENTURY

The first mathematical descriptions of the Danube was made in *Ptolemy's Geography*. He used latitude and longitude for positioning (Constantinescu, 2014). But the oldest and successful map of Ancient Dacia, including the Danube course, is *Tabula Peutingeriana* (Figure 1). It's the first map that depicts the Danube's islets.

Also, it should be noted the works of the authors: Isidorus of Seville, Abraham Ortelius, Gerard Mercator and Nicolas Sanson D'Abbeville.

What is significant for this period is that the Danube course was drawn elusively through straight, wavy or curly lines.

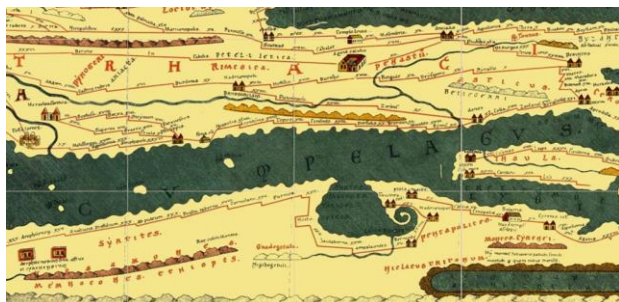


Figure 1 Fragment of *Tabula Peutingeriana*
Source: <http://www.tabula-peutingeriana.de/>

3. MAPS OF THE DANUBE COURSE IN THE 18th -19th CENTURIES

At the beginning of the 18th century, Constantin Cantacuzino draws up the first map of the Wallachia. This is one of the most detailed, complete and accurate maps made up to that time. It was engraved in 1700, in Padova (Italy) and highlights the territory “between Carpathians and Danube River and from Siret to near Cerna Valley, including portions from Dobrogea, Moldova, Transylvania and Banat” (Popescu-Spinteni, 1978). Along the Danube River are mentioned 18 islets of which 3 are located in the study area (Figure 2). Based on the map drawn up by Constantin Cantacuzino, several copies were made, including: a map executed by Shierendorff (in 1707) and the map drawn up by Anton Maria Del Chiaro (in 1718). Unlike the original map, the version of A.M. Del Chiaro lacks some geographic features such as the river islets situated to the East of the Olt River's Mouth.

Contemporary with the map created by Anton Mara Del Chiaro is the map drawn up by Marsigli. He has conducted a series of research on the Danube River, executing a map of the river between Kahlenburg and Ruse cities; as such, it doesn't include the Danubian sector under study.



Figure 2 Fragment from a map of Wallachia drawn up by Shierendorff, containing the Danube's islets between Giurgiu and Oltenita

Source: https://ro.wikipedia.org/wiki/Harta_%C8%9A%C4%83rii_Rom%C3%A2ne%C8%99ti_-_Constantin_Cantacuzino#/media/File:Cantacuzino_1707.jpg

Throughout the 18th and the 19th centuries, Eastern Europe has been affected by various conflicts between the Austro-Hungarian Empire, the Ottoman Empire and the Russian Empire (Constantinescu, 2014). Those wars led the need to hold new, detailed and accurate information about the topography of the areas where they operate. An exceptional cartographic document from this period is the map made by Captain Lauterer (Figure 3). This is the first serious attempt to represent cartographically the whole course of the Danube River. For this action, Lauterer had done several expeditions on the Danube course. After the first trip, a map was drawn between Zemlin – Rusciuc cities (11 boards at a scale of 1:100.000). In the second expedition, carried out in the summer of 1782, Lauterer completed his set of maps with boards for the Rusciuc-Sulina sector (Docan, 1912; Popescu-Spinteni, 1978; Constantinescu, 2014). Shortly, Captain Siegfried Iohannes Heribert baron de Tauferer performs a review of Lauterer's Map (Constantinescu, 2014). On Captain Lauterer's Map are depicted 22 islets between Giurgiu and Oltenita town.

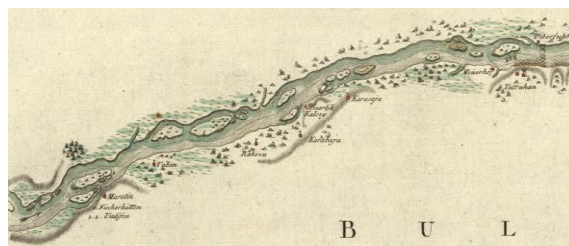


Figure 3 Fragment from Captain Lauterer's Map containing the Danube's islets between Giurgiu and Oltenita

Source: <http://www.wildernis.eu/chart-room/?keyword=danube>

This series of cartographic materials created with a relative accuracy continue with the map of Wallachia made by the Specht at a scale of 1:57,600.

Also, river islets along the Danube course appear on *Mappa specialis Valachiae* created by Josephi Dirwaldt (1810) and on *Generalcharte der Walachey nach allen vorhandenen Hilfsmitteln bearbeitet und gezeichnet* drawn up by Franz Fried (1811). General Frédéric Guillaume is the author of *Carte générale de la Turquie d'Europe à la droite du danube ou des beglerbegliks de Roum Jli, Bosna et Morée : dressée d'après les meilleurs observations astronomiques, itinéraires, cartes particulières, & reconnaissances existantes jusqu'à ce jour / par F. Guillaume de Vaudoncourt, ... ; K. Wimberger graviert ; die Gebürge gravirt v. I. Päringer ; In Stein gravirt von A. Falger u:L. Zertahelly in München ; beschrieben und die Gebirge gravirt v. L. Zertahelly*, which dates from 1818; 17 fluvial islets appear between Giurgiu and Oltenita. Later, in 1837 Artaria&Comagnie publish *Carte du cours du Danube depuis Ulm jusqu'à son embouchure dans la mer Noire, ou Guide de voyage à Constantinople, sur le Danube avec indication de tout ce qui a rapport à la navigation des Pyroscaphes sur cette route*. On this map we have identified a total of 10 islets (Figure 4).



Figure 4 Fragment from the map published by Artaria&Comagnie

Source: Bibliothèque nationale de France, département Cartes et plans

We should also take notice of the Russian maps from 1835 and 1853. Even though on the map the essential element is the human settlement, we can see that the Russians gave a particular attention to Danube River. The maps show big and small islets, the ponds on both banks lakes and second channels. In our study area 14 fluvial islets appear.

From 1844 dates *The Plan of Danube Course*, executed by V. Begenaru. Created in Russian language, the maps show the islets along the Danube, as well as the marshes and towns located near the river; 22 islets are represented between Giurgiu and Oltenita towns.

In 1864 another detailed map of Wallachia was made being entitled *Charta Romaniei Meridionale* (Figure 5), but often is called after his draughtsman: Szathmári's map. This map is based on the Austrian topographic survey between 1855-1859 (Bartos-Elekes *et al.*, 2014). The map shows the Danube course, with its islets and sandy bars; 19 fluvial islets appear in the studied area.



Figure 5 Fragment from Szathmári's map
Source: <http://www.charta1864.ro/>

Subsequently, based on the Second Military Survey, a general map entitled *General-karte des Fürstenthums Walachei ausgeführt und herausgegeben durch das k.k. militärisch geografische Institut im Jahre 1867* (General map of Principality of Wallachia compiled and issued by the Imperial and Royal Military Geographical Institute in the year of 1867) was produced at the scale of 1:288,000 (Bartos-Elekes *et al.*, 2014). There was also a Romanian edition at the same scale, with the title: *Harta Țerii Românească după reducția originală din harta ce' mare ridicată de Corpul de Geniu Geografic Austriac cu numirile corectate prin Ministerul din Intru* (Map of Wallachia after the original reduction from the large map surveyed by the Austrian Corps of Geographic Engineers with the corrected names by the Ministry of the Interior). On both maps 17 fluvial islets appear.

The officers of the Danube Division made in 1897 a map as an atlas for Danube from Vârciorova to Brăila towns. In the Danubian sector between Giurgiu and Oltenita towns are mentioned 17 river islets.

4. DANUBE MAPS FROM THE 20th CENTURY UNTIL PRESENT

Further, the 20th century brought a cartography more precise and focusing on the Danube course.

A Danube Map from Silistra to Gura Văei executed by Sub-Lieutenant Matei Vasilescu is based on the survey from 1900. Known as the *Fluvial Islet's Map*, this was created at a scale of 1:56,500 and includes 24 sheets with 28 x 40 cm each. Our study area is represented on four sheets: N III sheet, N IV sheet, N V sheet and N VI sheet.

A few years later, Lieutenant – Colonel Mihail Drăghicescu draw up a navigation map known as *The Danube River from The Iron Gates to the Black Sea*. On this map we found 20 river islets.

After The First World War a reference cartographic document is represented by the map called “*Plan Director de Tragere*”. The information on these plans is the results of several measurements from previous sources: Romanian, Austrian and Russian, and since 1924 some of them have been updated based on aerial photographs (Crăciunescu *et al.*, 2011). The Giurgiu-Oltenita sector is represented with 27 islets (Figure 6).



Figure 6 Fragment from a map called “*Plan Director de Tragere*”

Source: <http://www.geo-spatial.org/>

Another important navigation map which needs to be noted is the map created by N. Marinescu and D. Anton. *The Navigation Map of the Danube River from km 500 to Mn 73* was printed in 1962 and was based on the maps edited by the European Commission of the Danube (CED). In the Danubian sector analyzed 27 fluvial islets are mentioned.

From all maps of the 20th century, the most valuable are the Soviet Maps and, of course, the Romanian Topographical Maps made by the Military Topographic Department.

The 20th-21st centuries have brought a revolution in the cartographic science by developing new techniques such as aerial survey, remote sensing or global positioning systems. Therefore, the fluvial islets can be monitored based on different satellite images (Figure 7) or can be mapped with GPS instruments.



Figure 7 Danube river and its islets on a Sentinel-2A image (30.07.2016)

Source: <http://sentinel-pds.s3-website.eu-central-1.amazonaws.com/>

5. STATISTICAL APPROACHES

Through our research, we identify a total of 83 historical maps and satellite images, of which 36 are maps (from Antiquity Period to 20th century) and 47 are satellite images taken between 1986 – 2017 (Figure 8).

Based on maps and satellite images found for the Danube River, we can identify the number of the fluvial islets located between Giurgiu and Oltenita towns (Figure 9). It's true that the appearance on the maps of those landforms is conditioned by the scale and the precision on which they were made.

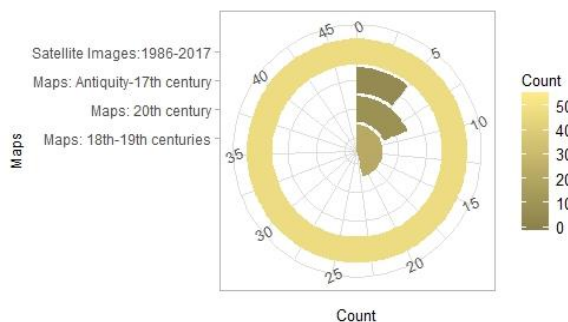


Figure 8 The graphical representation of the count of maps and satellite images founded in our research

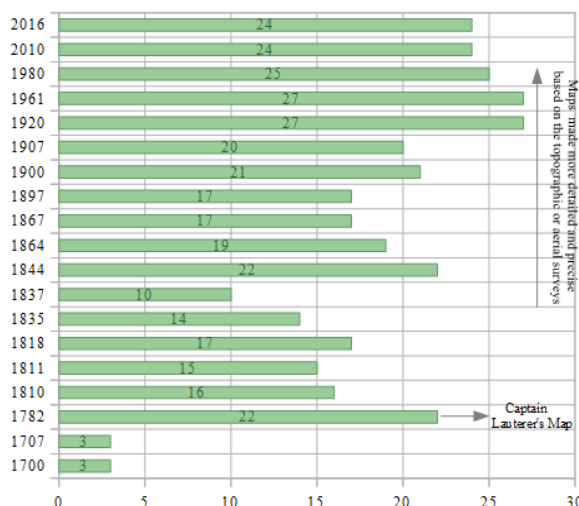


Figure 9 The graphical representation of the total number of islets along Danube River between Giurgiu and Oltenita, founded on various maps and satellite images.

6. CONCLUSIONS

This article presents a cartographical retrospective of the most important maps for the Danube River. We paid special attention to fluvial islets, taking as a case study the Giurgiu-Oltenita sector.

As a finding, we observed that if by the early 18th century the Danube course was drawn elusively through straight, wavy or curly lines, after this period more accurate and detailed maps appear, depicting the islets of the Danube river and its marshes and lakes. Subsequently, information about navigation is collected and mentioned, bathymetric and topographic surveys are conducted and nowadays the Danube course is monitored through satellite images and RADAR technologies.

Because we want our approach to be perfectible, we are open to all signs about other maps.

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