Journal of Geography and Cartography 2024, 7(1), 4493.
https://doi.org/10.24294/jgc.v7i1.4493

Article

Science in the service of politics. The cartographic representation of a local territorial context of the Kingdom of Naples in the early nineteenth century

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CITATION

Sisto M. Science in the service of politics. The cartographic representation of a local territorial context of the Kingdom of Naples in the early nineteenth century. Journal of Geography and Cartography. 2024; 7(1): 4493. https://doi.org/10.24294/jgc.v7i1.4493

ARTICLE INFO

Received: 31 January 2024
Accepted: 8 April 2024
Available online: 11 May 2024

Abstract: The erudite priest Marciano Di Leo (1751–1819), a prominent personality in the historical and geographical panorama of his time, not only in his home territory, authored a vast literary and poetic production but also tried his hand at producing some maps, referring to a province of the Kingdom of Naples. At a time when the principles of geodetic cartography had become increasingly known, even locally, hand in hand with improvements in technology and accuracy of measurements, the author reflected on the historical narratives of the progress of the European (and Neapolitan) Enlightenment and translated them into an unpublished manuscript of statistical, historical, and geographical nature, accompanied by numerous maps of various scales. The rediscovery of a largely unknown—and therefore not very thorough—minor cartographic production underscores the spread, even in more marginal contexts, of the most innovative ideas and increasingly precise scientific foundations in the cartographic-mathematical representation of the territory. It also illustrates the role of a number of intellectuals in the service of the political choices of their time, in an attempt—often unrealized—to bring about a decisive change of course in public administration, in accordance with Enlightenment ideals and in the spirit of reform that spread throughout Europe thanks to the French Revolution.

Keywords: Marciano Di Leo; historical cartography; Kingdom of Naples; Principato Ultra

1. Introduction

The research conducted here aimed to illustrate the cartographic production of the priest Marciano Di Leo (1751–1819), the author of a manuscript drawn up in 1816—the very difficult "year without summer" [1]—complete with numerous maps, drawn up to illustrate the historical-geographical-economic characteristics of the Principato Ultra. The administrative division of the Kingdom of the Two Sicilies was based on a 4-tier structure. There were 22 first-level divisions, called provinces (provincie in ancient Italian). The 22 provinces were divided into 76 districts (Distretti). The districts were divided into Circondari (present in a total number of 684). The districts were divided into municipalities (Comuni), one of the 22 provinces of the Kingdom of Naples, which encompassed the southern part of the Italian peninsula and has been the largest state entity since the Norman conquest in the 11th century (several times separated and then reunited with the Kingdom of Sicily), which was conquered in 1734 by the Spanish Bourbons, who reestablished the Kingdom of the Two Sicilies. After the Napoleonic interlude (1806–1815) and the return of the Bourbons to the throne, Naples and Sicily were included in the new Kingdom of Italy in 1860.

At the time, the basic principle of modern geography, that is, the application of social studies to the reading of the environment, in addition to only physical

description until then prevailing, was becoming established among Italian and European intellectuals [2]. However, the Kingdom did not yet possess advanced maps, despite having had for centuries some fundamental references (Tabula Peutingeriana, Tabula Rogeriana, etc.) and the survey of Mario Cartaro (1540–1620?) and Nicola Antonio Stigliola (1546–1623), a true cartographic monument [3]. The Map of the Kingdom of Naples by these two authors had no circulation in print [4], with a similar fate to the magnificent Aragonese maps of the early Modern Age, perhaps derived from a Roman cartographic base, which were so innovative and precise as to constitute a historical and cartographic enigma [4]: these maps circulated "only for a very short time or among a very small group of people, maps that were forgotten or lost without a trace, and maps that were never completed or never printed" [5]. And, in addition to the multiplication of small- and large-scale maps from the 18th century onward, cartography gradually became not only a descriptive representation but a symbol of appropriation: a representation of a political space, also becoming enriched with this important meaning as a political instrument for boundary drawing and tax collection [6]. Insist also on a deeper knowledge of the territory, including through appropriate cartography, to improve agriculture and trade and thus the living conditions of peoples, their common welfare, and thus their happiness, one of the cardinal principles of Enlightenment thought. As one of the masters of Italian and Neapolitan economic thought of the time, Antonio Genovesi (1713–1769) had already wisely exhorted, "It is a turpish and shameful thing for a philosopher [...] not to know the land in which he lives" [7].

Marciano Di Leo responds to these changes throughout his vast cultural output, through poetry, theater, science, and even cartographic achievements, demonstrating how expertise in such complex topics was widespread even in more peripheral territorial areas [8]. The community of erudites also welcomed these scholars with encyclopedic interests into the Respublica litteraria, an utopian space in which intellectuals like our priest contributed to the circulation of ideas and innovations with a true constructive spirit. This one is part of his attempt to map the territory with finally modern criteria, in the wake of a geodetic-geometric consciousness derived from the French influence [9], also spread in the Neapolitan cultural milieu.

Di Leo, therefore, is an example of a local production rarely found elsewhere in southern Italy, and he indicates the ability of the periphery to stay abreast of the great directives of contemporary thought.

2. Materials and methods

The unpublished manuscript in question is preserved at the State Archives in Naples (Ministry of Internal Affairs, Inventory I, b. 2060, dated 1816). It is in a good state of preservation and consists of 465 pages, transcribed on the recto and verso on sheets of paper of excellent quality but of varied sizes. So, it was assembled at separate times, perhaps after the author's death.

The text has been transcribed in full, philologically, respecting the handwriting of the time without making the spelling corrections that today's Italian grammar would require (the diagram in **Figure 1** shows the entire transcription and commentary process). The manuscript fully reflects the role that intellectuals of the XIX century

were assigning to themselves, urging politicians to equip for more up-to-date systems for administering finances, a deeper understanding of resources and their management, and improved agricultural and industrial practices in the wake of Enlightenment ideals and the rapid advances in applied sciences that were maturing in that era (Geology, Chemistry, Crystallography, Optics, and especially the ubiquitous electricity, the latter a real craze [7]). And, after the official "cartographic silence" that characterized southern Italy, noted, for example, economist and philosopher Domenico Grimaldi (1734–1805):

> "…abbiamo notizie assai più distinte delle produzioni e dell'Agricoltura della Cina, che del più bel Regno dell'Europa, qual'è il nostro". In fact, "quali notizie si hanno mai dell'Istoria naturale dell'Agricoltura, delle Arti, del Commercio, e delle Finanze delle nostre provincie? Niuna notizia certamente che fosse fedele, circostanziata ed esatta…" and so much would be helpful "…form a Topographical Map" ("…we have far more distinct news of the productions and Agriculture of China, than of the most beautiful Kingdom of Europe, which is our own", and "what news do we ever have of the Natural History of Agriculture, Arts, Commerce, and Finance of our provinces? No news certainly that was faithful, circumstantial and exact") [10].

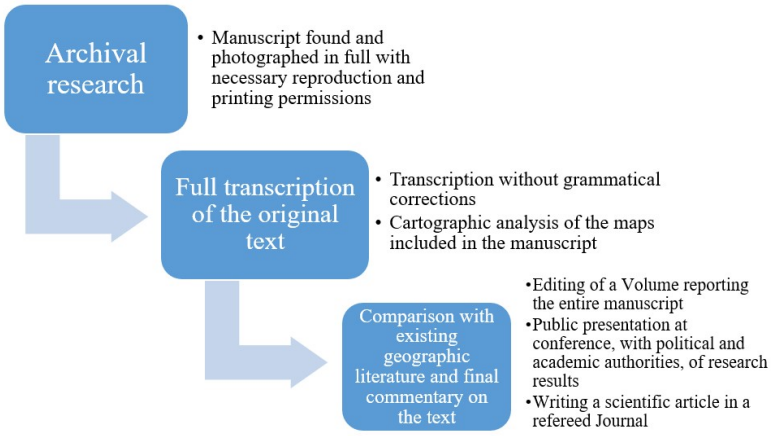


Figure 1. Path of manuscript analysis and subsequent publication.

So, Marciano Di Leo specifies in his introduction to the manuscript the need to equip his territory with a modern, rigorous cartography that would surpass previous productions, more like "paintings" than precise representations of reality. Therefore, he includes in the final part of the manuscript 63 maps, described later, justified by the need for a more precise description of the province and its administrative subdivisions and by the Kingdom's requirement to build a new, faster, and more convenient road, uniting the two seas, Tyrrhenian and Adriatic, through the Apennine chain, passing right through the Principato Ultra.

The maps drawn by the priest-geographer are also accompanied by a statistical report illustrating history, physical geography, human settlements, roads, natural and agricultural resources, and even the hydrogeological instability of the described territory. The manuscript begins with these auspices:

> "Al benevolo Lettore
>
> Tralle tante carte topografiche, nelle quali viene dinotata e descritta La Provincia

> del Principato Ulteriore del nostro Regno di Napoli, non mi è riuscito finora di osservarne una, che esattamente comprenda le terre, e fissi tutt'i Luoghi nella propria posizione, dirigga con accuratezza il corpo de' Fiumi, che la bagnano, ne determini con specificazione i Confini, e metta ne dovuti punti di prospettiva la vera configurazione, l'elevatezza, e la distanza delle Montagne, che la circondano, ed i tanti continuati colli, che per ogni parte la covrono. Per la deformazione di queste carte particolari è necessaria assolutamente l'oculare ispezione, per così notare, e specificare il Sito de Luoghi in quella parte, e posizione, che si conviene" (In the English translation of the early 19th century Italian, simplifications have been made that are useful for understanding the text: "To the benevolent Reader. Among the many topographical maps in which the Province of the Principality of Naples is described, I have not yet succeeded in observing one that exactly encompasses the lands, and fixes all the Places in their position, accurately directs the body of the Rivers that flow through it, determines its Boundaries with specification, and places in due perspective the true configuration, elevation and distance of the Mountains that surround it, and the many continuous hills that cover it on all sides. For the deformation of these particular maps it is absolutely necessary to make an ocular inspection, in order to note and specify the Site of Places in that part and position that is appropriate…") [2].

In fact, important historical factors (pandemics, demographic crises, and economic crises) had slowed down the Kingdom in the seventeenth century, and scientific production was also somewhat reduced [11] compared to the previous exceptional Aragonese period, while in Europe and the rest of Italy, the Scientific Revolution was inspiring a formidable evolution in every field. The encounter between cartography and astronomy, which will be used to fix the positions of the earth using the positions of the stars, will not take place in the Kingdom of Naples until the end of the 18th century (when it will take on the name Kingdom of the Two Sicilies, **Figure 2**), in a completely overturned cultural climate, so much so that the Capital of the Kingdom will become one of the driving centers of Italian and European culture, as it had already been in the aforementioned fifteenth century [5]. This thirst for knowledge, even under the impetus of the new sciences, was responsible for so many initiatives in the Kingdom, such as—among other things—the establishment of the Royal Mineralogical Museum, the Botanical Garden, or the Royal Agricultural Societies (later to become Economic Societies) in the provinces of the Kingdom to make Naples one of the European capitals for cartographic engravings [12].

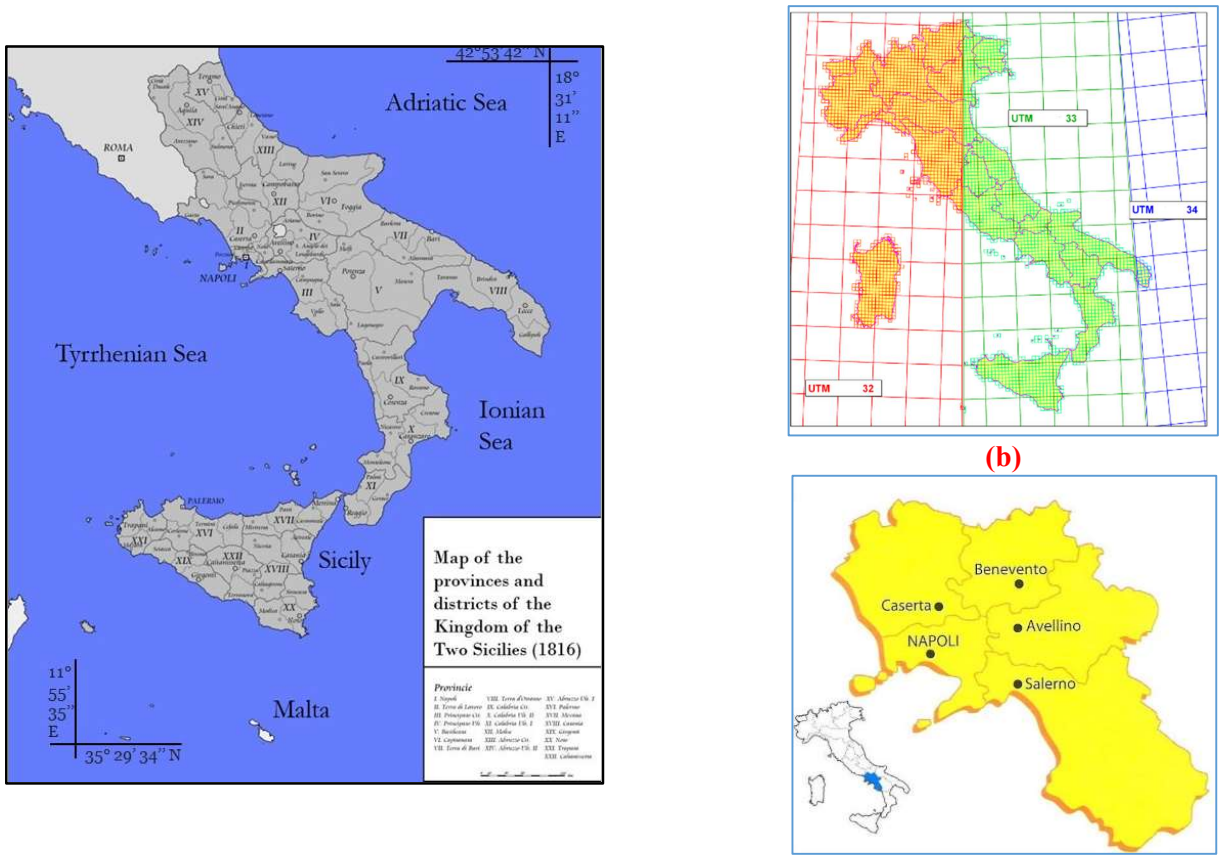


Figure 2. (a) The Kingdom of Two Sicilies in 1816 and its provinces, divided into districts. The Kingdom occupied the entire southern part of the Italian peninsula, including Sicily. The Principato Ultra is indicated by the number IV, not far from the capital city of Naples (from Wikipedia, free use); **(b)** the territory of the ancient kingdom is included almost entirely in UTM Zone 33; **(c)** the location of Principato Ultra is in the present Campania Region, Southern Italy (it roughly corresponds to the present united provinces of Avellino and Benevento).

3. Results and discussion

The maps attached to the manuscript, some in draft, some final, have a small size, and we ignore whether they were engraved or printed in larger formats (maximum width 50 cm, height about 25 cm).

The North is correctly placed always at the top, in all maps produced, at any scale (Septentrio in the maps of ancient Hirpinia); the South is shown at the bottom, with the inscription Mezzogiorno (Meridies in historical maps). Occasionally, the words West appear on the left of the cards and East on the right.

Contour lines are absent, as in Rizzi Zannoni's more famous Atlante geografico del Regno di Napoli (Geographical Atlas of the Kingdom of Naples), published by Giovanni Antonio Rizzi Zannoni (1736–1814), the great scientist from Padua who called to Naples to design a map of the entire Kingdom. First published in 1808, the atlas was not completed until 1812 to replace the old 1769 map of the Kingdom by the same author and the partial ones edited during the Napoleonic Wars in Italy (after all, they would appear in cartography in Italy decades later), and relief is still rendered by

stylization, although the tops of the best-known mountains are correctly located with geographic coordinates.

The territory represented occupies thirty-six miles of latitude and forty-seven miles of longitude, which, in current measurements, can be calculated by the product 66.4 km × 86.7 km, for a value of about 5758 km^2.

Such maps reproduce:

1) the Antiquus Hirpinorum Ager, the ancient territory of the Hirpini, i.e., the Italic people who inhabited the territory called in the future Principato Ultra (**Figure 3**);
2) the map of the province of Principato Ultra (**Figure 4**);
3) an example of a district map is shown in **Figure 5**;
4) finally, an example of a map of a Circondario (**Figure 6**).

In order, Antiquus Hirpinorum Ager:

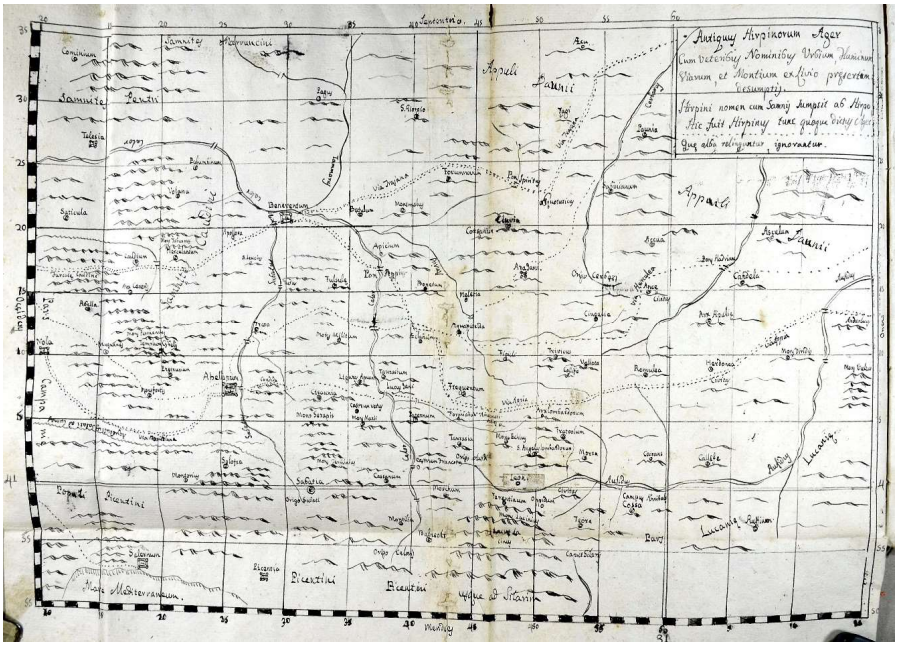


Figure 3. One of the maps drawn, relating to the same territory in pre-Roman times: Antiquus Hirpinorum Ager ("the ancient territory of the Hirpini", i.e., the Italic people who inhabited the territory called in the future Principato Ultra). The author claims to have reported the ancient names of cities, rivers, roads, and mountains as given by Titus Livy in his monumental work on the history of Rome (ASNa, State Archive of Naples, Ministry of Internal Affairs, Inventory I, bustage 2060).

The map of the province of Principato Ultra shows meridian 33, in which cities, major roads and bridges, rivers, mountain ranges, etc. are shown.

An example of a district map is shown in the next figure; the territory represented is that of the Ariano District, divided into 7 Circondari. The rivers are represented by thick black lines, while in brown are marked the boundaries between the Circondari (**Figure 5**).

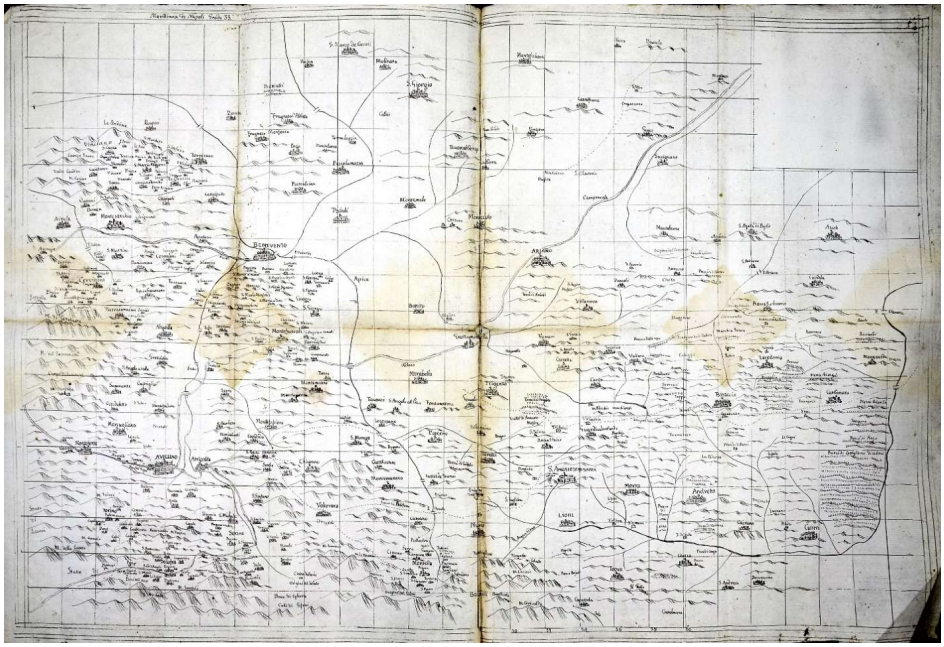


Figure 4. Map of the Province of Principato Ultra (ASNa, State Archive of Naples, Ministry of Internal Affairs, Inventory I, bustage 2060).

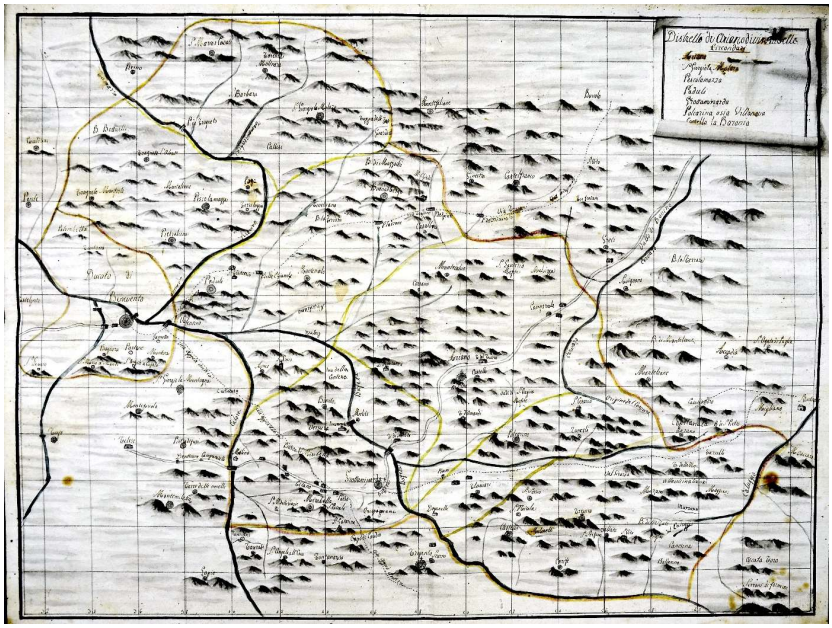


Figure 5. The district of Ariano (ASNa, State Archive of Naples, Ministry of Internal Affairs, Inventory I, bustage 2060).

An example of a map of Circondario (Circondario di Frigento), including six municipalities, with indications of non-routable roads, main and secondary waterways, forests, and with the reliefs just stylized:

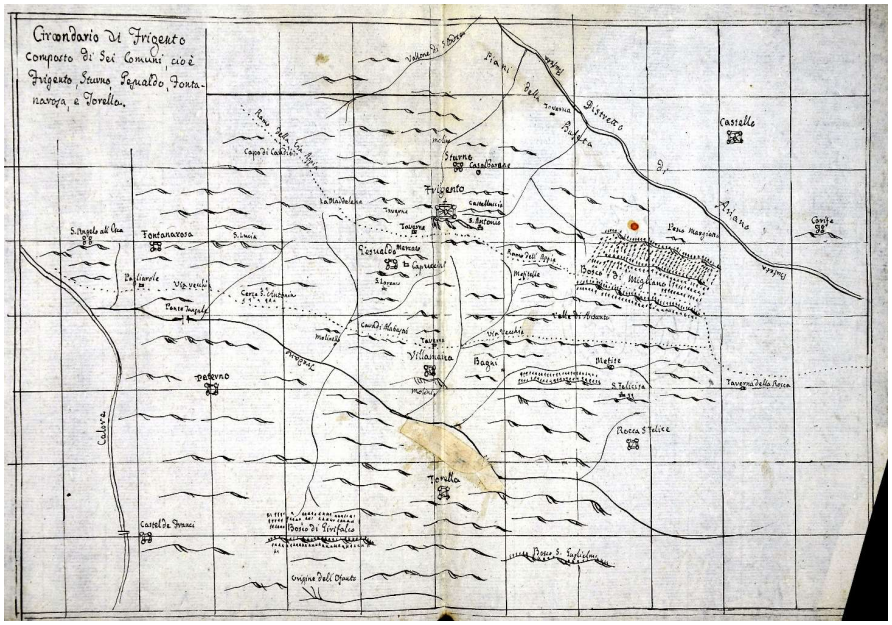
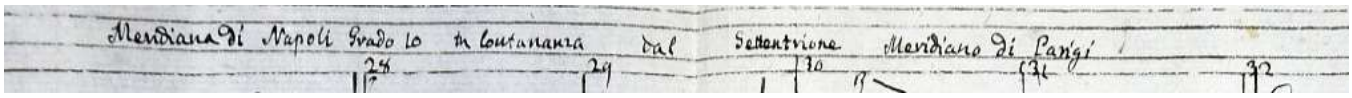


Figure 6. The Circondario of Frigento (ASNa, State Archive of Naples, Ministry of Internal Affairs, Inventory I, bustage 2060).

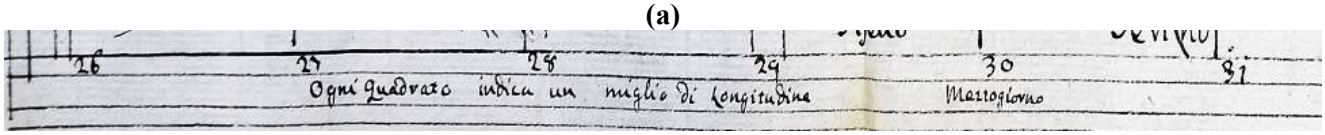
3.1. The problem of geographical coordinates

The maps elaborated by our scholar all present the geographical grid. The latitude obviously refers to the Equator; almost all of the mapped territory lies above the 41° N parallel, except for the southernmost part of the province.

Longitude, on the other hand, generally refers to the meridian of Paris (or meridian of France), which was commonly adopted at the time and remained as a universal reference until the 1884 Washington Conference, when it was decided—not without bitter controversy—to adopt the Greenwich meridian. A fortiori, the Paris meridian, is used by the scholar who drafts his papers in the decade when the Napoleonic dynasty ruled Naples (1806–1815). Naples is exactly 10 degrees from the meridian of Paris (**Figure 7**), as the author points out several times in the manuscript; this angular distance was later confirmed by the Capodimonte Astronomical Observatory in Naples, the first one established in Italy to fix exact time, astronomical surveys, and meteorological measurements.



(a)



(b)

Figure 7. Some details from the maps: **(a)** literally: the Meridian of Naples is 10 degrees of distance from the Meridian of Paris; **(b)** each square indicates one mile of longitude (amplitude). The terms Settentrione (North) and Mezzogiorno (South) appear in the two details.

In the manuscript text and in a few maps, longitudes of 32° E or 33° E sometimes appear, referring to the El Hierro Isle (the Meridian Island), in the Canary Islands, which, as we know, has been the reference since the 2nd century A.D., when Ptolemy considered the meridian passing there to be the zero meridian, the westernmost point of the Old Word.

The author clarifies that in the province and district topographic maps, each square indicates two miles of longitude and latitude, while in the district maps, each square has only one mile of side. This will enable the reader "at a glance" to find the distance between villages and to measure the longitude and latitude of mountains and their height. In fact, in the topography and descriptive geometry texts of Marciano Di Leo's historical period, there is a special emphasis on providing the reader with an "at a glance" perspective. Just as an artist does with the "picturesque," the topographer must show an immediate glimpse of nature, as if the reader were actually immersed in a field observation [9]. The mile that our author uses for his square grids measured seven thousand palmi, equal to one-sixtieth of a degree on the meridian; this mile was used in Naples as the "sixty-degree mile" for more than three centuries, and its final measurement would not be fixed until 1782 by the famous cartographer Giovanni Antonio Rizzi Zannoni [5] through direct surveys. During these surveys, Rizzi Zannoni met Marciano Di Leo, with whom he made numerous field "measurements with available scientific instrumentation".

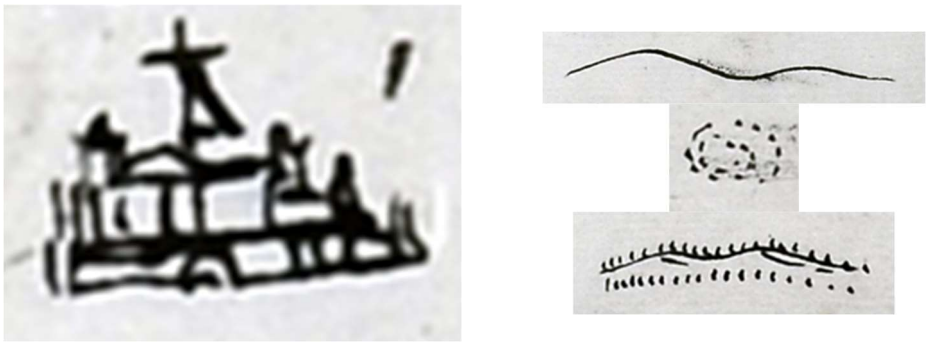
For surface measurements, our author used the measurements of square miles, corresponding to 200 Neapolitan palmi and 1 moggio. The moggio (from Lat. modius = measure) was an ancient unit of volume measurement, used particularly for grain, and counted among the more than 200 agrarian measures widespread in southern Italy. But as with other local units, it was also a unit of measurement of area, which in the Kingdom of the Two Sicilies—although highly variable—corresponded to about 3365 m^2. The moggio generally corresponds to 220 palmi, while the author uses the equation 1 moggio = 200 palmi. The entire Province of Principato Ultra, according to his calculations, from South to North measured 42 miles, while from West to East it was 54 miles wide, for a total of 2268 square miles; in this vast territory were more than 200 municipalities and villages, with a population of 324,000.

3.2. The map legend

The map legend is never given in the cartographies but is listed within the manuscript in a section named Avvertimento ("Warning," "Monition").

It specifies, through the size of the font used, the importance of the cities: the largest ones ("Capoluoghi" = Chief Towns) are presented in isometric capital letters; the medium-populated ones in capital letters with larger initials; those over 4000 inhabitants only in capital letters and italics; and, finally, the villages in capital letters and no italics.

The few other symbols on the maps concern man-made elements (bishop's seats, provincial governor's or sub-governor's seats, inns, carriageable and non-routable roads, bridges) and natural elements, like rivers, lakes, and forests (**Figure 8**).



(a) **(b)**

Figure 8. Examples from the map legend: **(a)** chief towns, including bishoprics, are indicated by this symbol; **(b)** other symbols are used in the maps: top, rivers; middle, lakes; bottom, forests.

4. Summary and conclusion

There is now an endless literature on European cartographic production, both for general and local studies; in many articles, the activity of the many professionals who worked between the second half of the eighteenth century and the beginning of the nineteenth century (geographers, engineers, mathematicians, astronomers, topographers, engravers, etc.) has been emphasized [13]. In the Age of Enlightenment, the refinement of topographical tools, the transition from lists of landed properties without cartography (Apprezzi in the technical language of the time) to geometric representations of these properties, the creation of geometric land registers, and the development of urban cartography with plans of large cities indeed led to unprecedented innovation. These detailed, high-quality cartographic productions, linked to the spread of cadastres, have the parcel geometric cadastre (in Italian, catasto geometrico particellare) in Tuscany, compiled between 1817 and 1834, and that of the papal dominions (1816–1835). It has also been argued that in these valuable cartographic representations, the real and the symbolic-ideological, the technical and the imaginary, were mixed [14].

The cadastre had no geometric character in the Kingdom of Naples, having been drawn up on an expert basis; more or less illustrious land surveyors (agrimensori) worked there [12]. The provisional or Murattian Cadastre of the Kingdom of Naples, started at the end of 1806, was almost completely rectified between 1813 and 1816 [15], using a bird's-eye view/perspective for the measurement and description of these tiny parts of the earth's surface, with figurative-type symbolism and details that were immediately comprehensible, thanks also to the reduction scale that inexorably conditions any cartographic representation. However, examples abound, especially in ecclesiastical archives, of representations of the properties of religious orders that demonstrate the intense professional activity of land surveyors, experts in measurement and estimation (an example of an Indian ink drawing, without scale or wind rose indication, is given in the following **Figure 9**).

Alongside this vast, mainly local, cartographic production, state-oriented cartography also advanced in the pre-unitary Italian States, and the influence of Napoleonic innovations was felt in every territorial sphere, as it was in so many other

fields of state organization, economy, and culture. It is true that Southern Italy and, in general, the entire Peninsula were not without cartographic representations, known since antiquity, but the construction of such maps was not yet based on mathematical principles (there were no underlying geometric projections, no geographical grid of meridians and parallels, etc.). And the actual quantity and quality of the studies on historical cartography and the history of cartography published (at least in Italy [16]) testify to the great interest in the issues that these disciplines address, also in light of the possibilities offered by GIS [17], sensing the need to arrive at a "geographically integrated historiography" [18].

Figure 9. An example of very large-scale mapping of a church property (APME, Mirabella Eclano Parish Archives, Platea (the term Platea indicates a document, including a cartographic one, that inventories the complex of real estate and patrimonial rights, territorial pertinences with their annuities, of an ecclesiastical institution, of a municipality, of private individuals) of ecclesiastical property of the distinguished collegiate church of Santa Maria Maggiore, vol. I, 1731). In current measurements, the rustic property measures 59.2 m in width and 122 m in length.

An intellectual like Marciano Di Leo, with a non-scientific background, was able to learn some of the cartographic techniques that would enable him to produce maps that were innovative compared to the production that had preceded it. His maps were certainly used by royal engineers in designing new roads for the province, although their construction was never completed until much later. In any case, they also remain valuable as an intellectual product in the happy meeting of geography, history, and natural sciences. A precious attempt to restore an idea of territory in Roman antiquity and then in its time, an important step for a history of cartography and the statistical-geographical thought that permeated its reforming time, in the reconstruction of the landscape and the understanding of its functions.

Hence, not surprisingly, several times in the manuscript the author insists on the importance of knowledge of science subjects, but he especially urges on the need to—istruire i Fanciulli nella Geografia, e nella Storia, affinché avendo aperto avanti gli occhi questo gran Teatro ("…instruct the Children in Geography, and History, so that having opened before their eyes this great Theater". The great Italian geographer and

writer Eugenio Turri (1927–2005) used the metaphor of theater to define landscape in one of his successful and significant volume)—can more consciously make the choices best suited to their happiness. As Marciano Di Leo states, l'abitazione degl'uomini è la Terra ("The habitation of men is the Earth").

Acknowledgments: I would like to express my gratitude to Francesco Barra, emeritus of the University of Salerno, Italy, a gentleman of other times and a very fine historian, who has been following me for years and has given me the opportunity to transcribe and comment on the unpublished manuscript that forms the basis of this publication. The maps were published with the concession of the Italian Ministry of Heritage and Cultural Activities.

Conflict of interest: The author declares no conflict of interest.

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