

III Congresso Histórico Internacional

25 a 27 de outubro de 2023

***AS CIDADES NA HISTÓRIA: ECONOMIA***

CIDADE CONTEMPORÂNEA

2023

# FICHA TÉCNICA

TÍTULO

**III Congresso Histórico Internacional**  
*As Cidades na História: Economia*

VOLUME IV

**Cidade Contemporânea**

COORDENAÇÃO

**Antero Ferreira**  
**Alexandra Marques**

REVISÃO

**Casa de Sarmento - Centro de Estudos do Património**

DESIGN GRÁFICO

**Maria Alexandre Neves**

DATA DE PUBLICAÇÃO

**Dezembro de 2025**

ISBN (OBRA COMPLETA)

**978-972-8050-85-6**

# ÍNDICE

|   |     |
|---|-----|
| <b>Cidade Contemporânea – Nótulas de apresentação</b>   | 7   |
| Jorge Fernandes Alves   |     |
| <b>La actividad económica en la ciudad contemporánea: espacios, formas y procesos en las áreas urbanas españolas</b>                                | 17  |
| Gonzalo Andrés López  |     |
| <b>Simbologias Urbanas de Poder, Saber e Religião</b>   | 53  |
| Miguel Castro   |     |
| <b>A Grande Transformação – A infra-estruturação do Porto e o contexto político, económico e social do entre séculos XIX/XX</b>                     | 71  |
| Mário Mesquita  | 3   |
| <b>O crescimento das actuais cidades de Ourém e de Fátima: a dicotomia originada pelo desenvolvimento do turismo religioso nos anos 1920 e 1930</b> | 101 |
| Fábio Emanuel Oliveira  |     |
| <b>O custo da gestão de uma pequena cidade de interior no Portugal da 2ª metade do século XIX: o caso de Lamego (1851/1852-1900)</b>                | 121 |
| Paulo Jorge Oliveira Leitão   |     |
| <b>Urbanização extensiva nos anos 1970: o Estado e a interiorização da economia no Brasil e em Portugal</b>   | 161 |
| Ricardo Trevisan  |     |
| <b>Praça sete, pampulha e savassi: Centralidades urbanas e modernidade periférica na cidade de Belo Horizonte</b>                                   | 173 |
| Marcelo Cedro   |     |
| <b>España 1818-1820: edificios, estructuras urbanas y fuentes geohistóricas</b>   | 203 |
| Miguel Ángel Bringas Gutiérrez  |     |
| Ana Luna San Eugenio  |     |
| Rafael Sánchez Domingo  |     |
| <b>Cartographic, descriptive and quantitative sources for analysing the urban space: Rome in the 18th and 19th centuries</b>                        | 223 |
| Keti Lelo   |     |

|   |            |
|---|------------|
| <b>Las geografías médicas españolas como fuente para la investigación económico- social de las ciudades del siglo XIX</b>   | <b>243</b> |
| Alejandro Vallina Rodríguez<br>Ángel Ignacio Aguilar Cuesta<br>Concepción Camarero Bulón  |            |
| <b>Comércio e inovação: Um paralelo entre as transformações dos espaços d e comércio e as Revoluções Industriais</b>  | <b>267</b> |
| Gabriela Incagnoli de Gouveia<br>Nayara Pires<br>Valter Caldana   |            |
| <b>Memorial Berlim   A Subversão do Sujeito</b>   | <b>287</b> |
| Francisco Palmeira de Lucena  |            |
| <b>Mudanças e permanências na vocação industrial de uma comunidade: “ casa”, “oficina” e “fábrica” na indústria de curtumes em Guimarães</b>                              | <b>311</b> |
| Elisabete Pinto   |            |
| <b>Memórias do Rio de Janeiro: um estudo sobre capitalismo brasileiro e distinções sociais</b>  | <b>333</b> |
| Isabel Feix   |            |
| <b>O Município de Lisboa durante a I Guerra Mundial: Desafios e Práticas Económico-Sociais</b>  | <b>357</b> |
| Eunice Relvas   |            |
| <b>A farmácia como espaço de sociabilidade e o farmacêutico como elemento de mudança em Lamego, entre 1899 e 1933 – a Farmácia Monteiro e Joaquim Monteiro da Fonseca</b> | <b>385</b> |
| Isilda Monteiro   |            |
| <b>Fiat urbem!: O fenómeno religioso enquanto agente criador de cidade no mundo contemporâneo. O caso de Fátima</b>   | <b>415</b> |
| André Melícias  |            |
| <b>As cidades e as sarjetas: a poluição aquática e o elemento urbano na bacia hidrográfica do rio Ave (1892-1974)</b>   | <b>445</b> |
| José Rafael Soares  |            |
| <b>Os Circuitos de abastecimento de Produtos Hortofrutícolas a Lisboa: Instituições, Relações Sociais e Quotidianos (1880-1970)</b>                                       | <b>467</b> |
| Leonardo Aboim Pires  |            |
| <b>A construção do edifício dodecagonal dos “Banhos Velhos” de Caldas das Taipas (1868-1875)</b>  | <b>501</b> |
| António José de Oliveira  |            |
| <b>As políticas florestais na foz dos rios Lima e Cávado durante a Regeneração: entre a continuidade e o Progresso</b>  | <b>533</b> |
| Ana Isabel Lopes  |            |
| <b>Água para a cidade: visitar o Projeto de Abastecimento de Água à Cidade de Guimarães (1949-1950)</b>   | <b>563</b> |
| Célia Oliveira  |            |





# **Cartographic, descriptive and quantitative sources for analysing the urban space: Rome in the 18th and 19th centuries**

Keti Lelo



## CARTOGRAPHIC, DESCRIPTIVE AND QUANTITATIVE SOURCES FOR ANALYSING THE URBAN SPACE: ROME IN THE 18TH AND 19TH CENTURIES

**Keti Lelo**

Roma Tre University – Dept. of Business Studies

keti.lelo@uniroma3.it



## **Introduction**

The transformation processes that describe the evolution of cities between the 18<sup>th</sup> and 19<sup>th</sup> centuries solicit the need for a study of the city with regard not only to changes in buildings, spaces and urban furnishings, but also to the demographic, economic and, more generally, social aspects that mark the modernisation processes that distinguish the transition to contemporary city.

The goal of this paper is to propose a critical analysis of the possible documentary sources available in Rome, with particular reference to the cartographic, census and fiscal (especially cadastral), administrative and police ones. The aim is to discuss not only the variability of the degree of reliability and the possibilities of diachronic comparability, but also the reliability of useful integration processes and, where the sources relate to certain spatial elements, also of cartographic rendering and integration in a geographical information system. In particular, with reference to this last aspect, it will be necessary to discuss the feasibility of some processes of simplification and standardisation of the information, in order to facilitate its utilisation and occasionally render the syntheses and cartographic representations possible.

The nineteenth century urban cadastre of Rome represents a fertile ground for experimentation in the domains of the quantitative analysis of the physical and socio-economic characteristics of the urban space. The explicit relationships between the descriptive data of the cadastral registers and cadastral maps facilitate the computerization of this historical source and the construction of the GIS database. The 1:1.000 scale cadastral map of Rome dating 1818-1824 was georeferenced and further digitized. Thematic information was collected from the second series of brogliardi (cadastral registers). We were able to produce thematic maps such as: building consistency, land uses, property types, social status, estimate values, and to closely investigate the spatial relationships amongst different information layers. Furthermore, we integrated the cadastral database with a coeval data source from the Police Department, describing the detailed spatial and descriptive information about the commercial activities.

We will illustrate some first attempts at integration between historical sources for the purpose of analysing the spatial distribution of economic activities in Rome in the 19<sup>th</sup> century. The case study discussed here is on leather tanners. We consider this experience valuable starting point for further detailed studies on the urban economic structure of contemporary Rome.

### **Literature review**

Spatial humanities is an expanding research field [1]. Research in this discipline exploits the Geographical Information Systems (GIS) as one of the key methods for data handling, analysis and representation. Today's spatial humanities draw on the experience of archaeology, where these methods were applied quite early, and historical geography, which has a long tradition of interdisciplinary studies. Indeed, the so-called 'spatial turn' in historical studies [2, 3] during the last few decades has stimulated integration between traditional and new research trends, obtaining often complex, but generally promising, results. In this context, the spatial component has acquired a stronger meaning, also due to the increasing awareness towards historical maps as digital cartographic supports. The possibility of integrating into a single digital platform historical source of a different nature and origin, as well as to manage, compare and share huge amounts of information, imply the need to adopt innovative solutions. Thus, new insights, concepts and models have found application in numerous historical GIS (HGIS) projects [7]. There is no doubt that these developments bear important consequences in the field of historical research, in general, and urban history, in particular [4-6]. The application of logical-mathematical theory to the data structure deeply influences both the methodology of the approach to the sources and the logic of their treatment, which becomes necessarily formal [8].

In historical applications, GIS is often considered a computer program to be used as a support for visualization purposes. However, GIS is a technology. As such, it is a synthesis of hardware, software, data, personnel and protocols combined into a single paradigm, which has its power and main distinguishing features in geo-spatial analysis. GIS provides the mechanisms to allow historical data from different sources to interact and create new information. How would it be possible to integrate this complex technology within a discipline that has its own, long-standing and consolidated epistemology?

The application of GIS in urban history is subject to severe limitations, such as high levels of uncertainty related to the localization of events in space and time [9, 10] and imprecise source data [11-13]. The latter is greatly accentuated when using GIS techniques that 'constrain' data to levels of precision that generally exceed those 'naturally' derivable from historical sources. Uncertainty in a GIS environment is treated differently when

compared to historical research: GIS experts use quantitative measures based on statistical models, while historians evaluate source characteristics, their potentiality and limitations, mostly qualitatively, according to experience and knowledge of similar sources and of the historical context [14-16]. Nevertheless, finding solutions that suit different necessities is, most often, possible [1, 17]. In this regard, the use of GIS in historical studies requires the specific and careful evaluation of every single case, strictly depending on the characteristics of archive sources to be integrated into the system [18].

Gregory et al. (2001) motivate the use of GIS in historical studies: data of different natures can be easily integrated through their location on the Earth's surface; visualization of research outputs is more effective and enduring, thanks to advanced techniques, such as animation and virtual landscapes; GIS enables forms of spatial analysis where the coordinate locations of the features under study are an explicit part of the analysis [19].

The wealth of research on HGIS includes, amongst others, papers that introduce national historical GIS systems, such as those of Great Britain, Belgium, the United States, Russia, China, South Korea and Germany [20-28], and a multitude of papers covering, at different spatial and temporal scales, topics, such as demography, landscapes and land uses, economic activities, industrial development and transport networks [29].

However, scientific literature on urban HGIS is not very common. This is not surprising. The urban space, as a container of knowledge, traditions, memories and images, embodies complexity levels that are difficult to fill by historical sources. The need for maps that depict the urban structure with an elevated level of detail, as well as for spatially homogeneous descriptive sources, makes the implementation of spatial databases more difficult. Nevertheless, there are documented examples of the extensive use of HGIS at the urban level: the Social atlas of London in the 17th century [30], the project on health in 19th century London, based on Charles Booth's inquiry [31], the Urban history of Tokyo [32], the Timemap of Sidney [33], the Virtual Kyoto project [34], the Atlas des Parisiennes [35] and trading places in London, Canada [36]. These examples show, in their diversity of intents, the versatility of GIS methods in supporting urban history research.

229

### **The 1820s urban cadastre of Rome**

The birth of the geometric cadastre of the rural and urban land ownership in the Papal State is linked to the decision taken by Pius VII in the aftermath of the Second Pontifical Restoration to reform both the tax system and the public administration of the State<sup>1</sup>.

---

<sup>1</sup> *Motu proprio* of 6 July 1816, *Reformatio publicæ administrationis et tribunalium ditionis pontificiæ*.

The management task was assigned to the Congregation of Cadastres, founded on 3 January 1817, composed of prelates chosen from the members of the Apostolic Chamber and presided by Msgr. Cesare Guerrieri Gonzaga, who was also in charge of the Treasury of the Papal State. The technical and administrative structure was headed by the General Directorate of Cadastres, under the Presidency of the Census. For each province the General Directorate of Cadastres supervised the Census Chancelleries established in 1817 with the operational tasks to survey, control and preserve documents. Rome had a special autonomous structure, the Chancellery of the Census of Rome, also in charge of the Roman countryside [37-39]. The first step undertaken by the Congregation of Cadastres was the publication of regulations, on 22 February 1817. The next step was to entrust the cadastral operations – with the exception of the territories of Rome and the Roman countryside – to experts from Milan, based on a contract signed on 4 March 1817. A few months later, on September 5, 1817, in an effort to dispel the anxiety of ‘local’ professionals side-lined by the initial contract awarded to ‘foreigners’, another contract was assigned to four Roman engineers for the survey of the Roman campaign. Finally, more than one year later, on 24 November 1818 a contract was assigned to two Roman architects, Gaspere Salvi and Giacomo Palazzi, members of San Luca Academy, to survey the city of Rome within the Aurelian Walls.

230

The urban cadastre is composed of 14 maps, one for each *rione* (district), each divided into sheets (approximately 64 x 89 cm), the number of which varied according to the size of the territory to be represented. There are in total 94 map sheets in scale 1:1.000.

Cadastral operations took longer than the expected six months because the contract with Salvi and Palazzi did not include the valuation of properties but was limited to surveying and descriptive tasks. During the cadastral operations the Congregation stipulated precise “Instructions” for the communication of ownership changes to the cadastral services, according to dispositions dating back to the French domination period (1809-1814), which were still in force. Two documentary series “Catastini” and “Trasporti” were created to record properties variations [40].

Information on properties were recorded in hand-written registers called *brogliardi*. There are two series of *brogliardi*. The first series, said “the originals”, one for each district, was completed for most districts between 1818 and 1820, and for each parcel in the map reports: the full address, the surface, the nature and the use of real estate units (*fondi*), the number of rooms and the number of floors, the identity of the owner (or owners) and their social status.

The second series, completed between 1822 and 1824, considers the updates and corrections occurring in the meanwhile, and is complemented by the indication of the rent and the related estimate values of real estate units. Estimated property values

(*estimi*) were used in the calculation of taxation dues. The *estimo* was usually assigned to the owner, and may include more real estate units (*fondi*), which do not necessarily lie within the same parcel.

The detailed information gathered for the second series of *brogliardi*, is to be found in the *isole estimative* (estimative blocks). These are small-format registers, traditionally indicated by archivists with the term *bastardelli*, containing separately bound sheets, one for each *isola* (building block), with a cover showing the name of the reference district (*riione*). As the cadastral source, the archival series of *isole estimative* belongs to the fund *Presidenza del Censo* (Presidency of the Census) preserved in ASRoma (the State Archive of Rome); it consists of 20 registers, one or two for each of the fourteen districts of Rome<sup>2</sup>. Their compilation became necessary the day after the drafting of the first series of *brogliardi*, which were lacking relevant information such as detailed descriptions of the interiors and the calculation of the *estimi*, information that subsequently entered in the second-series *brogliardi* (1822-1824).

In the *isole estimative*, in fact, the illustration of the interiors of the buildings is completer and more precise, enriched by interesting details such as the presence of furnishings or external links, loggias, arcades, balconies, as well as the number of floors and rooms belonging to each individual fund, the value of the current (*corrente*) or available (*reperibile*) rent, referred to rooms in each floor. The “current rent” referred to the value paid by the tenant, while the “available rent” was reported for buildings inhabited by the owner; its value was obtained or from the amount of the last rent paid, if the property had previously been rented, or from the general level of the rents related to that type of property [41]. In the registers it is also possible to find information on correspondence exchanged between surveyors and buildings owners about building documentation and property acquisitions. The precise and detailed information of the *isole estimative* was used to produce the second-series of cadastral registers *brogliardi* (1822-1824), although in many cases information were subject to unifications amongst funds and variations, that led to the loss of detail of the source.

The Urban Cadastre was approved by the Secretary of State on 4 October, 1823 and became operational from January 1824. After the unification of Rome with the Kingdom of Italy in 1870 the new Italian Administration proceeded to update the urban cadastres on the basis

2 In detail: Monti rione I, isole estimative 1-54 n. 2696, 55-100 n. 2697; Trevi rione II, isole estimative 1-63 n. 2698; Colonna rione III, isole estimative 1-29 n. 2699, 30-51 n. 2700; Campo Marzio rione IV, isole estimative 1-50 n. 2701, 51-95 n. 2702; Ponte rione V, isole estimative 1-38 n. 2703, 39-74 n. 2704; Parione rione VI, isole estimative 1-42 n. 2705; Regola rione VII, isole estimative 1-29 n. 2706, 30-60 n. 2707; Sant’Eustachio rione VIII, isole estimative 1-43 n. 2708; Pigna rione IX, isole estimative 1-31 n. 2709; Campitelli rione X, isole estimative 1-36 n. 2710; Sant’Angelo rione XI, isole estimative 1-28 n. 2711; Ripa rione XII, isole estimative 1-44 n. 2712; Trastevere rione XIII, isole estimative 1-49 n. 2713, 50-111 n. 2714; Borgo rione XIV, isole estimative 1-64 n. 2715.

of the law of 11 August, 1870 and the regulations to implement this of 5 June, 1871 extended to Rome by Royal Decree No. 260, 16 June, 1871<sup>3</sup>. The Urban Cadastre of Rome consisting of the city maps, the second series of *brogliardi*, and the updates drawn up after Rome's annexation to the Kingdom of Italy, represent an extraordinarily rich and complete set of information concerning the city and its population during the nineteenth century.

### The HGIS of Rome in the nineteenth century

Most of the map sheets composing the urban cadastre feature errors of measurement greater than generally acceptable today. The GIS techniques of calibration, geo-referencing and transformation of projection overcome most of the problems of accuracy by reducing the distortion of the paper format, the imprecision of the measuring techniques, and the lack of a projection system. The 94 sheets of the urban cadastre of Rome were geo-referenced using a network of ground control points (GCPs) based on a custom-made GPS survey, and then digitized.

Thematic information was collected from the second series of *brogliardi*. The complex inter-dependencies, especially those observable amongst owners and property types, were handled in relational databases so as to avoid redundancy. The *brogliardi* is configured as a list of real estate units (*fondi*) with their characteristics, estimate values (*estimi*) and respective owners (*proprietari*). It was possible to interpret this source so as to retrieve consistent information about:

- » the property types: private property of an individual person or shared (multiple-properties), property of public or religious authority;
- » the social status of the owners: aristocratic, bourgeois, ecclesiastical, public administrator;
- » the property use: housing, economic activities, public offices, education, cultural;
- » the physical characteristics of the units: number of floors, number of rooms.

Notwithstanding the difficulties arising from the complexity of relationships and the frequent inhomogeneities in reporting estimated values, it was decided to include them in the dataset, after having introduced a series of quality controls. Operationally, the information obtained from the second *brogliardi* was classified according to the above-

3 Istruzioni per la rettifica catastale della parte topografica e descrittiva delle proprietà costrutte della provincia di Roma (Florence, 1871) Archivio di Stato di Roma, Presidenza del Censo, envelope 2105.

listed categories and associated with polygons representing single cadastral parcels through *ad hoc* data querying routines. The level of detail of *brogliardi* is higher than that of the cadastral maps: one parcel is composed of many real estate units (*fondi*) which have one or more owners. Thus, in order to map the information deduced from the *brogliardi* it was necessary to aggregate data at the parcel level. Aggregated data is, by necessity, standardized according to specific rules; it may run the risk of losing the most peculiar characteristics and/or representative values. Even more complex is the situation when it come to include in the analysis, and to map, the estimated property values (*estimi*) of property units [42]. Having defined clear and standardised data acquisition procedures, allowed us to produce new quantitative information which facilitated statistical analysis and thematic mapping of different socio-economic characteristics of the 1820s Rome within the Aurelian walls. Information was aggregated from the parcel level to the city block and district levels so as to compare various performance indexes easily. The following thematic maps were produced: building consistency, land uses, property types, social status of owners, estimated property values.

The distribution of parcels, owners and properties amongst the districts (*rioni*) of Rome is summarized in Table 1. Pronounced dissimilarities characterize different districts, reflecting the variability of the urban structure and its stratification. Simple thematic maps clearly illustrate spatial distributions of physical characteristics derived from the cadastral source. Building density (percentage of built-up area/total district area) is very high in the bends of the river Tiber, an area that was densely built during the Middle Ages but inhabited since Antiquity (Ponte, Parione, Regola, S. Eustachio and Pigna districts). The north-eastern districts (Trevi, Colonna, Campo Marzio) and *rione* Borgo have slightly lower building densities, while the large peripheral districts (Trastevere, Ripa, Campitelli, Monti), characterized by the presence of villas, gardens and vineyards, have fairly low building density indexes.

The difference between the medieval and the baroque city is evident by inspecting the property values (estimates). The highest property values are to be found close to the main political and administrative poles, in the areas of Montecitorio (Curia Innocenziana, Ospizio Apostolico) and Quirinale (Palazzo Pontificio nel Quirinale, Dataria Apostolica, Consulta) respectively to the left (west) and to the right (east) of Via del Corso. Around these two power zones imposing residences as well as new commercial, welfare and productive places were built between the seventeenth and the eighteenth centuries. These dynamics are reflected by the property values, which are higher in the central districts of Parione, Pigna, Colonna and Trevi.

**Table 1. Distribution of owners and properties**

| Rione |              | Area (km <sup>2</sup> ) | Parcels | Owners | Property units | Rooms   |
|-------|--------------|-------------------------|---------|--------|----------------|---------|
| I     | Monti        | 4.43                    | 1,741   | 2,625  | 2,311          | 14,949  |
| II    | Trevi        | 0.78                    | 631     | 933    | 952            | 11,672  |
| III   | Colonna      | 0.63                    | 556     | 917    | 918            | 13,564  |
| IV    | Campo Marzio | 0.82                    | 1,354   | 2,051  | 1,914          | 18,869  |
| V     | Ponte        | 0.26                    | 808     | 1,286  | 1,383          | 18,856  |
| VI    | Parione      | 0.19                    | 510     | 872    | 921            | 10,139  |
| VII   | Regola       | 0.24                    | 587     | 891    | 866            | 10,240  |
| VIII  | S. Eustachio | 0.18                    | 323     | 463    | 550            | 8,033   |
| IX    | Pigna        | 0.21                    | 265     | 396    | 452            | 6,919   |
| X     | Campitelli   | 1.37                    | 517     | 665    | 695            | 5,245   |
| XI    | S. Angelo    | 0.10                    | 381     | 1,105  | 988            | 4,959   |
| XII   | Ripa         | 2.44                    | 569     | 825    | 672            | 2,202   |
| XIII  | Trastevere   | 1.73                    | 1,441   | 1,942  | 1,841          | 10,848  |
| XIV   | Borgo        | 1.02                    | 562     | 845    | 835            | 5,569   |
|       | ROMA         | 14.39                   | 10,245  | 15,816 | 15,298         | 142,064 |

Source: Urban Cadastre of Rome, 1818-1824.

234

With reference to the property type, the *brogliardi* registers indicate that, on average, 54% of owners fell into the category of 'single private'. This feature is more pronounced in the districts of Trevi, Colonna, Campitelli and S. Eustachio. Multiple-properties were, on average, 17% of the total, with higher shares in the districts of Regola, Colonna and Campo Marzio and lower shares in Pigna, S. Angelo and Campitelli. Property held by public authorities or religious bodies averaged 28% of the total, with a stronger presence in Borgo, the heart of the ecclesiastical Rome, as well as in Monti and Trastevere, where the number of convents and monasteries situated in the green suburbs was higher than in other parts of the city.

The distribution of owners according to social status shows the prevalence of a bourgeois element, averaging 48% of all owners across the city, with higher shares in the districts of Colonna, Parione e Regola. Aristocratic owners (average 18%) had a stronger presence in the districts of Trevi, Campitelli, S. Eustachio, Pigna and Ponte, while the ecclesiastical category accounted for 17% of the total number of owners, and was more numerous in Monti, Pigna and Parione. The class of owners termed 'Other' represents mostly public administration and foundations, except for the S. Angelo district where due to the presence of the walled Ghetto, Jewish people were forced to live in conditions of extreme overcrowding.

### Case study: leather tanners in Rome in the 19<sup>th</sup> century

The case study focuses on the integration between historical sources for the purpose of analysing the spatial distribution of leather tanners in Rome in the 19<sup>th</sup> century. Since 1565, by law, leather tanners had to locate along the river in *rione* Regola<sup>4</sup>, just north to the Jewish Ghetto, established in 1555. This obligation ended in 1801, year of dissolution of the Leather Tanners Corporation. The detailed map obtained from the Police Census of the *botteghe* (workshops) of 1827 shows that, even after the liberalization, leather tanners continue to locate in Regola, with a few exceptions of activities located in *rione* Trastevere and in *Isola Tiberina*. In order to give a reliable picture of the functional specialization and of the spatial relationships related to this economic activity, we proceed as follows:

- » Identify the most exhaustive archive source allowing to locate and describe qualitatively and quantitatively the activities;
- » Find other pertinent additional sources that would allow the comparison amongst spatial distributions and descriptive contents;
- » Integrate sources into a geographic information system;
- » Utilize non geographic information to «assist» the interpretation.

235

The most exhaustive archive source allowing to locate and describe qualitatively and quantitatively the activities is the *Isole estimative*. They report 59 leather tanners, of various size and value, with the names of the licensed owners/tenants, their address and parcel number. This information was geocoded in the cadastral map.

When we compare the picture obtained from the *Isole estimative*, with that emerging from the second *brogliardo*, we realize that only 14 tanners have “survived”, located in the immediate vicinity of the river. Reported activities are not the biggest, and our initial assumption that the co-presence of a house and a tanner by the same owner brings about the incorporation of the latest with the house, is not always true. The spatial distribution of tanners reported in the second *Brogliardo* suggests that, in most of the cases, the choice not to incorporate the activity with the house is related to the position of the activity and to the “weight” of the tans compared to the houses in each building block. Completely different picture of the activities is given by the 1793’s *Assegne dei Beni*, a register of properties, compiled on the basis of voluntary declarations by the owners. Only 8 big leather tanners are listed, representing only two representative tanners families: Codini and De Cupis.

---

4 Bolla Pontificia, 1565.

Thirteen years later, in 1809, Vincenzo Colizzi, general inspector for the manufacturing arts, compiles the “Catalogue of the manufacturing activities of Rome” recording minutiously the state of Roman industry at the beginning of the Napoleonic period. The leather tanners are 18; they include the 8 “known” activities from the *Assegne dei beni*, in addition, other families appear, such as Candi, Giorgi and Gauttieri, the latest one intermarried with the De Cupis since the end of the 18<sup>th</sup> century. Matrimonial policies, having as an objective the economic expansion of the families, were common practice amongst roman craftsman, and this characteristic clearly emerges in the *Assegne* and in the Catalogue by Colizzi.

The census of the shops by the Police Department in 1827, reports 29 leather tanners, many of which located in the same address as tanners registered in the *Isole estimative*, but reporting different tanner names. The discordance does not affect the big families, it represents small activities, often managed by tenants.

It is interesting to notice that most of the leather tanners indicated in the second brogliardo, was not indicated by the other sources. Surprisingly, the Cadastral source revealed the most unappropriated for analyzing leather tanning activities in the 19<sup>th</sup> century in Rome. The integration with other sources highlighted the fact that spatial distribution of leather tanning activities is strongly influenced by the presence of big families and relationships amongst them.

236

## Conclusions

Technologies that incorporate the spatial component allow the development of a deeper and more sophisticated understanding of the data. This type of analysis, traditionally scarcely used by historians, is now experiencing a growing number of applications, as GIS technologies are no longer niche products and are becoming more accessible in terms of costs and the supply of interfaces that are suitable for less experienced users [56]. This latter aspect raises an important question: what would be the theoretical and methodological impact of the recurrent use of information technology on the work of the historian of the city and the territory? The use of spatial databases and map application environments does not release historians from the duty of understanding the circumstances and purposes of the creation of the studied documents or the application of historical critiques. Interdisciplinary cooperation, especially including digital technologies, places new requirements on researchers. Each of the relevant research sectors has already developed a specialized vocabulary and methods. Topics, such as a town or a certain territory and its appearance and development in the past, attract scholars to go beyond the boundaries of their branch and seek a common language.

However, this requires knowledge of quickly developing technologies, openness to new impulses and the desire to understand the thought and work processes of colleagues from other branches of science.

We bring evidence on the usefulness of GIS in evidencing/illustrating historical data, exploring spatial relationships and producing new information. Although GIS is neither sufficient nor necessary condition for applying microhistory, it represents a valid tool for city historians. In the project Historical Atlas of Modern Rome, we are developing methodologies of data integration based on GIS technology. We have completed the acquisition of the 1818-1825 urban cadastre, and we are evaluating possible integrations.

The urban cadastre of Rome was updated in 1875, soon after Rome was proclaimed Capital of Italy, and the maps with the relative descriptive information are fully comparable with the previous 1820's version. These two-integrated digital cartographic databases represent the most complete and detailed large-scale information about the city and its physical and socio-economic transformations during the 19<sup>th</sup> century.

Another important data source for the city of Rome is represented by the registers of "Stati delle anime" ("Survey of Souls") that contain detailed information on residents organised by parish. These registers were systematically compiled every year, at least since 1630. Although it is not always possible to precisely locate residents inside a building block (so as to have the information comparable with the cadastral source), data are referred to the spatial units of parishes, offering the opportunity to keep track of the demographic structure and its transformations and to perform demographic statistics.

237

## References

- Bodenhamer, D. J., Corrigan, J., Harris, T. M., Eds.; *The Spatial Humanities: GIS and the Future of Humanities Scholarship*; Indiana University Press: Bloomington, USA, 2010.
- Knowles, A. K. Historical GIS: The spatial turn in social history-introduction. *Soc. Sci. Hist.* 2000, 24, 451-470.
- Doorn P. A Spatial Turn in History. Available online: [http://www.gim-international.com/issues/articles/id453-A\\_Spatial\\_Turn\\_in\\_History.html](http://www.gim-international.com/issues/articles/id453-A_Spatial_Turn_in_History.html) (accessed on 29 November 2014).
- Rodaway, P. *Sensuous Geographies: Body, Sense and Place*; Routledge: London, UK, 1994.
- Witcher, R. E. GIS and landscapes of perception. In *Geographical Information Systems and Landscape Archaeology*; Oxbow Books: Oxford, UK, 1999; pp. 13-22.
- Vitali, S. *Passato Digitale. Le Fonti Dello Storico Nell'era del Computer*; Bruno Mondadori: Milano, Italy, 2004.

- The Historical GIS Research Network. Available online: [http://www.hgis.org.uk/resources.htm#online\\_hgis](http://www.hgis.org.uk/resources.htm#online_hgis) (last accessed October 8, 2014).
- Borillo, M. *Informatiques Pour les Sciences de L'homme*; Mardaga: Bruxelles, Belgium, 1984.
- Castleford, J. Archaeology, GIS, and the time dimension: An overview. In *Computer Applications and Quantitative Methods in Archaeology*; Lock, G., Moffett, J., Eds.; British Archaeological Report: Oxford, UK, 1992; pp. 95-106.
- Langran, G., *Time in Geographic Information Systems*; Taylor and Francis: London, UK, 1992.
- Openshaw, S.; Alvanides, S. Applying geocomputation to the analysis of spatial distributions. In *Geographic Information Systems: Principles and Technical Issues 1*, 2nd ed.; Longley, P. A., Goodchild, M. F., Maguire, D. J., Rhind, D. W., Eds.; John Wiley and Sons: New York, NY, USA, 1999; pp. 267-282.
- Zhang, J.; Goodchild, M. F. *Uncertainty in Geographical Information*; Taylor and Francis: London, UK, 2002.
- Knowles, A. K. *Placing History: How GIS is Changing Historical Scholarship*; Hillier, A., Ed.; Digital supplement; ESRI Press: Redlands, CA, USA, 2008.
- Miller, P. How to look good and influence people: Thoughts on the design and interpretation of an archaeological GIS. In *Archaeology and Geographical Information Systems: A European Perspective*; Lock, G., Stančić, Z., Eds.; Taylor and Francis: London, UK, 1995; pp. 319-334.
- Unwin, D. J. Geographical information systems and the problem of error and uncertainty. *Prog. Hum. Geogr.* 1995, 19, 549-558.
- Gregory, I. N. *A Place in History: A Guide to Using GIS in Historical Research*; Oxbow: Oxford, UK, 2003.
- Gregory, I. N.; Ell, P. S. *Historical GIS: Techniques, Methodologies and Scholarship*; Cambridge University Press: Cambridge, UK, 2007.
- Lelo, K.; Travaglini, C. M. Il GIS dell'atlante storico di Roma: Metodologie per l'informatizzazione, l'integrazione e l'analisi congiunta delle fonti catastali ottocentesche. In *Fonti, Metafonti e GIS per L'indagine della Struttura Storica del Territorio*; Panzeri, M., Farruggia, A., Eds.; Politecnico di Torino, Celid: Torino, Italy, 2009; pp. 51-60.
- Gregory, I. N.; Kemp, K.; Mostern, R. Geographical Information and historical research: Current progress and future directions. *Hist. Comput.* 2001, 13, 7-21.
- Gregory, I.; Southall, H. Putting the past in its place: The Great Britain historical GIS. In *Innovations in GIS 5*; Carver, S., Ed.; Taylor and Francis: London, UK, 1998; pp. 210-221.
- Gregory I. N. The Great Britain historical GIS. *Hist. Geogr.* 2005, 33, 132-134.

- De Moor, M.; Wiedemann, T. Reconstructing Belgian territorial units and hierarchies: An example from Belgium. *Hist. Comput.* 2001, 13, 71-97.
- Fitch, C. A.; Ruggles, S. Building the National Historical Geographic Information System. *Hist. Methods* 2003, 36, 41-51.
- McMaster, R. B.; Noble, P. The USA National Historical Geographical Information System. *Hist. Geogr.* 2005, 33, 134-136.
- Merzlyakova, I. A. Historical GIS initiative in Russia. *Hist. Geogr.* 2005, 33, 147-149.
- Bol, P.; Ge, J. China historical GIS. *Hist. Geogr.* 2005, 33, 150-152.
- Kim, J.-H. HGIS project of South Korea. *Hist. Geogr.* 2005, 33, 152-154.
- Kunz, A. Fusing time and space: The Historical Information System HGIS Germany. *Int. J. Humanit. Arts Comput.* 2007, 1, 111-122.
- Gregory, I. N.; Healey, R. G. Historical GIS: Structuring, mapping and analysing geographies of the past. *Prog. Hum. Geogr.* 2007, 31, 638-653.
- Spence, C. *London in the 1690s: A Social Atlas*; Centre for Metropolitan History, Institute of Historical Research: London, UK, 2000.
- Orforda, S.; Dorling, D.; Mitchell, R.; Shaw, M.; Smith, G. D. Life and death of the people of London: A historical GIS of Charles Booth's inquiry. *Health Place* 2002, 8, 25-35.
- Siebert, L. Using GIS to Document, Visualize, and Interpret Tokyo's Spatial History. *Soc. Sci. Hist.* 2000, 24, 537-574.
- Wilson, A. Sydney timemap: Integrating historical resources using GIS. *Hist. Comput.* 2001, 13, 45-68.
- Yano, K., Nakaya, T., Isoda, Y., Eds.; *Virtual Kyoto: Exploring the Past, Present and Future of Kyoto*; Nakanishiya Shuppan: Kyoto, Japan, 2007.
- Pinol, J.-L.; Garden, M. *Atlas des Parisiens: De la Révolution à nos Jours*; Parigramme: Paris, France, 2009.
- Novak, M. J.; Gilliland, J. A. Trading places: A historical geography of retailing in London, Canada. *Soc. Sci. Hist.* 2011, 35, 543-570.
- V. Spagnuolo, *I Catasti generali dello Stato Pontificio. La Cancelleria del Censo di Roma poi Agenzia delle Imposte (1824-1830)*, Rome, 1996.
- A. Ruggeri, L. Londei, 'Il catasto urbano di Roma (1818-1824)', in A. Cantile (ed.) *Eventi e documenti diacronici delle principali attività geotopografiche in Roma*, Florence, 2000, 102-37.
- V. Spagnuolo, 'Nuovi modelli organizzativi fra ancien régime, periodo napoleonico e Restaurazione: l'introduzione dei titolari d'archivio e la realizzazione del catasto gregoriano, Roma fra la restaurazione e l'elezione di Pio IX. Amministrazione, economia, società e cultura', in L. Bonella, A. Pompeo, M. I. Venzo (eds.) *Roma fra la restaurazione e l'elezione di Pio IX*, Rome, Fribourg, Vienna, 1997, 1-18.

- C. M. Travaglini, 'Le cadastre de Rome. De l'estime au cadastre en Europe. Les systèmes cadastraux aux XIXe et XXe siècles', in F. Bourillon, P. Clergeot, N. Vivier (eds.), *Colloque de 20 et 21 Janvier 2005 Comité pour l'histoire économique et financière de la France* (Paris, 2008), 323-50.
- K. Lelo, 'GIS e storia urbana', in R. Morelli, E. Sonnino, and C. M. Travaglini (eds.), *I territori di Roma, Storie, Popolazioni, Geografie* (Rome, 2002), 191-211.
- K. Lelo, 'L'ambito urbano di piazza Navona: una interpretazione attraverso le fonti cartografiche e documentarie sette-ottocentesche', in J.-F. Bernard (ed.) *Piazza Navona, ou Place Navone, la Plus Belle & la Plus Grande* (Rome, 2014) 557-70.



