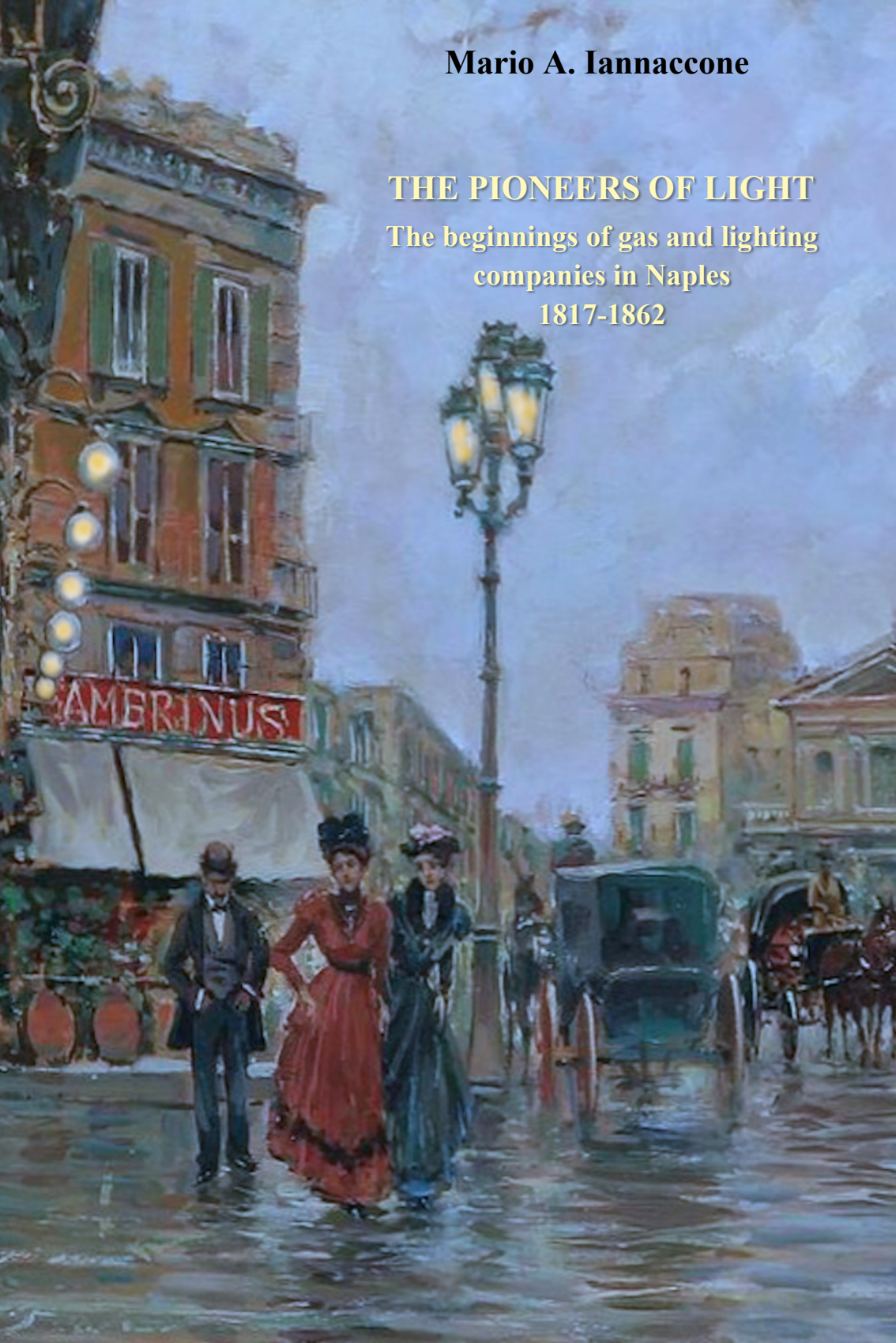
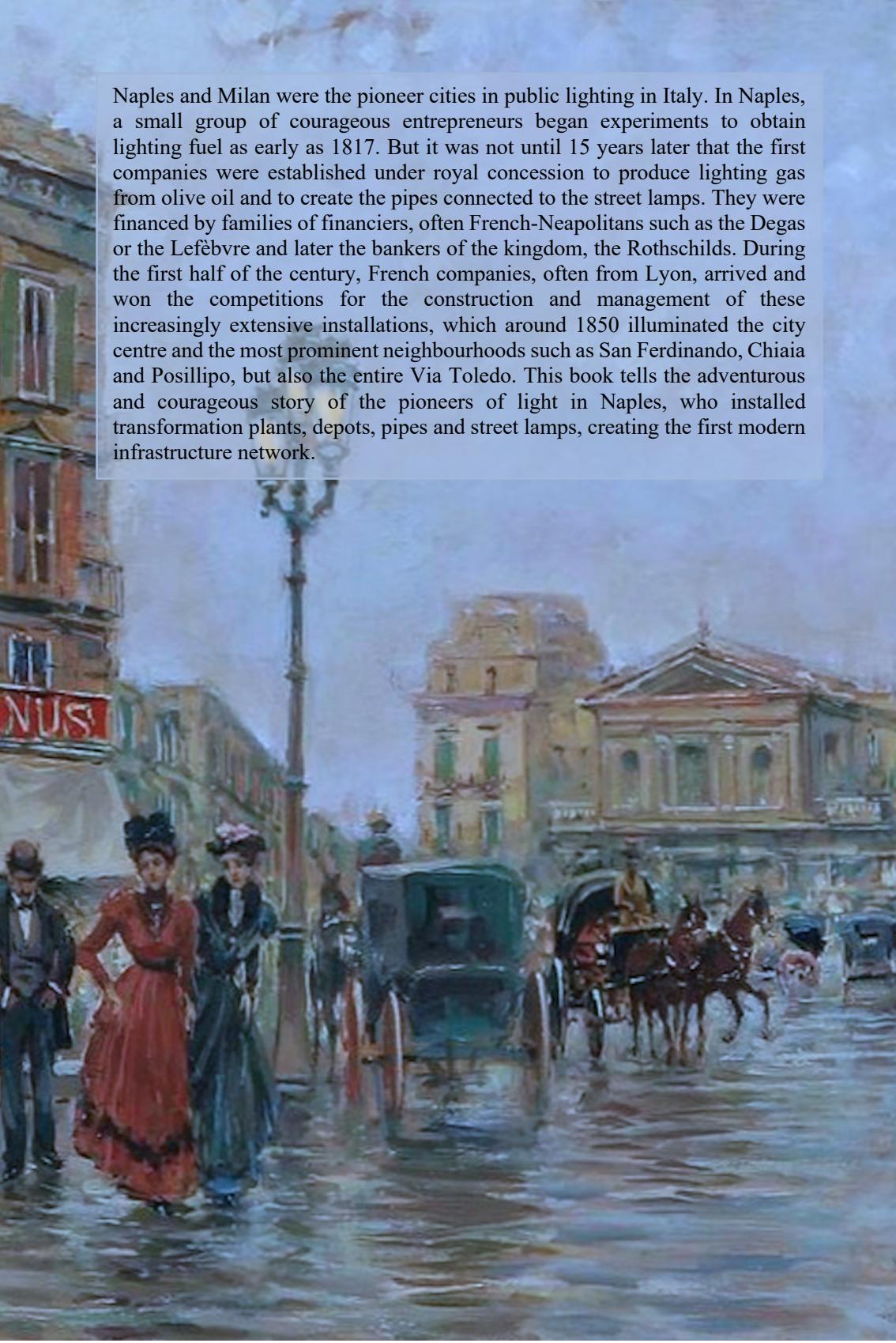
Mario A. Iannaccone

THE PIONEERS OF LIGHT

The beginnings of gas and lighting companies in Naples 1817-1862





Naples and Milan were the pioneer cities in public lighting in Italy. In Naples, a small group of courageous entrepreneurs began experiments to obtain lighting fuel as early as 1817. But it was not until 15 years later that the first companies were established under royal concession to produce lighting gas from olive oil and to create the pipes connected to the street lamps. They were financed by families of financiers, often French-Neapolitans such as the Degas or the Lefèbvre and later the bankers of the kingdom, the Rothschilds. During the first half of the century, French companies, often from Lyon, arrived and won the competitions for the construction and management of these increasingly extensive installations, which around 1850 illuminated the city centre and the most prominent neighbourhoods such as San Ferdinando, Chiaia and Posillipo, but also the entire Via Toledo. This book tells the adventurous and courageous story of the pioneers of light in Naples, who installed transformation plants, depots, pipes and street lamps, creating the first modern infrastructure network.

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Chapter 1

Capital and service networks

An unfortunate pioneer: Pierre Andriel

It is well known that Naples was one of the first cities in Europe, and perhaps the first in Italy, to have a public lighting system installed but, despite numerous mentions, this history, known in its general outline, has been little studied and few documents about it have been searched for in the archives. This text is intended as a contribution to the clarification of this history.

It began when Pierre Andriel, a naval captain and entrepreneur from Montpellier, brought the continent's first steamer to Paris in the spring of 1816: it was the British-built Margery, renamed the *Elise.* Andriel formed a company, the Andriel & Pajol with General Pierre Claude Pajol (1772-1844). Sailing along the Seine, he reached the French capital, where he asked the government for help. He requested a concession to set up a fleet of steamboats to provide a public, 'network' service, which was to include passenger transport but also mail transport. His mentality was not that of an inventor, but that of an entrepreneur, and his idea was very clear: to bring his knowledge of an innovative technique, to find state support, to find funding in the marketplace and to offer a network service.

It went badly for him in France, so he moved to Naples, where he knew he could, by playing his cards right, obtain concessions and benefits. How his Neapolitan adventure went we will recount in another volume. Here it suffices to recall that Andriel formed a company in 1817, obtained a licence from Luigi de Medici by *royal decree* (2 December 1823) and thus built a ship that, in his intentions, was to be the first of a fleet. The *Elise,* with the name *Real Ferdinando I*, started sailing in 1824. It is curious that when he obtained a privative for the construction of steamships, he also asked for and obtained a privative to experiment with gas lighting, with a duration of thirty years (1817-1847: *Collezione delle leggi e de' decreti reali del Regno delle Due Sicilie [Collection of Laws and Royal Decrees of the Kingdom of the Two Sicilies]*, 1817, sem. I, Naples 1817, pp. 125; 129-131).

For the first venture he found a number of investors, for the second venture he did not find them or perhaps did not even seek them out. What is interesting is that these two technologies, steam navigation and gas lighting, were perceived as services that the city needed; services that very soon, and one can say inevitably, would be realised because they were being realised elsewhere. In both cases they were introduced early on in the capital of the Kingdom by French entrepreneurs. It did not go well for Andriel, however: the failure he suffered was due to the immaturity of steam navigation technology at that time even though he was right: that field was about to undergo a veritable explosion in both technological improvements and investment. As happens to certain lone pioneers, Andriel arrived too early in both the field of navigation and gas lighting. He represented the vanguard of

a projection of capital and technical expertise that would become established within a few years.

It is interesting to note, then, that in five of the main innovative companies established in the fifteen years between 1817 and 1833 (*Amministrazione della Navigazione a Vapore*, *Società Lionese del Gas*, *Società Industriale Partenopea, Società Sebezia, Società Enologica*) the same people who can be qualified as financiers, capitalists and industrialists were always present: Charles Lefèbvre, who believed in these enterprises and understood the spirit of network services; Lorenzo Zino who, although not French, had an intellectual profile similar to Lefèbvre's (and like him owned a factory in Carnello near Sora, the centre of an important wool and paper district); various French financiers and leading figures in the Neapolitan economy such as Luigi de' Medici, Carlo Filangieri, Luigi Giura.

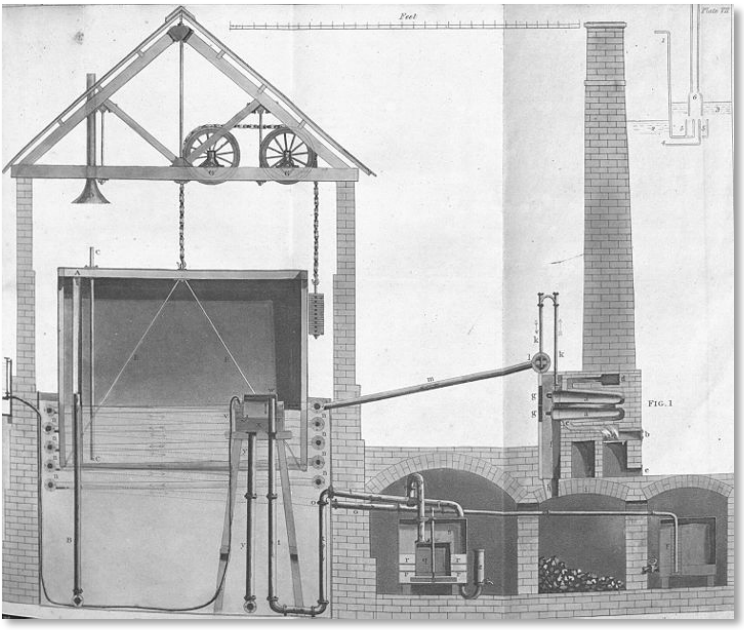
In any case, the fact that Andriel applied for patents to develop an innovative transport network and lighting network makes it clear that these activities were part of a new conception of the economy, into which another network service par excellence would later enter: the construction of railways. In the industrial and financial Europe of the 20th century, shipping, rail transport and gas networks would be a driving force for the economy, but also a means of concentrating large amounts of capital. Lyon, Paris and London will play a key role in this.

It is no coincidence that recent historiography has devoted itself to the study of the flows and uses of international capital during the 19th century, defining their trajectories, the amount of money invested and their origins. These studies have also

clarified, in part, the role played by Naples during the Bourbon Kingdom for a vocation to innovate that was also present in northern Italy but which, while the latter was always recognised, in the case of Naples was long denied.

Here, mainly French entrepreneurs and financiers became involved in some of the sectors affected by the greatest technological innovations. In two studies that, although not exhaustive, are useful to give an outline of the matter, one dedicated to the events of the *Amministrazione della Navigazione a n* and the other to the *Società Industriale Partenopea*, I have dealt with innovations in the textile industry, in the paper industry and in the steamship industry, the result of foreign and native capital that arrived and was employed in the Kingdom.

Already for some time, since John Davies' studies in the 1970s, it has been noted that in Naples the actors of innovation were, throughout the first half of the 19th century and even after Unification, with a change of name, a small group; people united not only by their financial availability but above all by their desire to enter sectors considered modern, new and probably profitable. In the Bourbon period, this group of mayors partially coincided with the one active in the phases preceding the French Decade. After the Unification, investments in Naples were made by financiers and industrialists linked to very important international financial groups.



A coal-fired gasometer built in London in 1814 similar to those in use in much of Europe in the following decades.

The historical study of the uses of gas has delved into the flows, dynamics, and conditions under which foreign investments rewarded this or that territory for this or that technology. Through the categories elaborated by economic theory, the historical research analyses the flow of capital that, starting from the large financial centres, flowed into the different countries during the 20th century. Already at the beginning of the 20th century, capital moving from England and, secondarily, from France, defined a real 'first globalisation'.[1] The mobility of capital and people – especially entrepreneurs and technicians – was considerable. After 1870,

[1] See Rugman A.M. (ed.), *The Oxford Handbook of International Business, second edition*, Oxford University Press, New York 2009.

from London and Paris, but also Marseille, Lyon, Berlin and within individual nations – Turin and Milan to the South of Italy – the dynamics of capital concentration that had supported the construction of gas networks and then the building of tens of thousands of kilometres of railways, first in England and then in the rest of Europe, revolutionising transport, began to be exported along the channels of commercial intermediation, that of loans to governments and direct investment in industrial activities.

The construction of infrastructures is important, from which numerous investment companies (*business groups*), networks of enterprises (*joint ventures*) and *holding* companies originated, but also enterprises networked by cross-relationships and cross-shareholdings, fostered perhaps by proximity of place or family relationships.[2] From around 1870 onwards, therefore, increasingly integrated and interrelated economic-financial spaces were constructed. The gas networks, like, and even more so, the railway connections, far from being a simple 'physical' infrastructure, were configured as relational vectors, favouring the investment of capital; and the same applies to maritime connections and networked services by increasingly sophisticated subjects capable of international projection.[3] A proof of this is the close correlation between many Marseille and Neapolitan entrepreneurs who were able to enjoy, after the introduction of steam navigation, a proximity previously unknown: they collaborate, set up partnerships, study cross-investments.

[2] Jones G. - Zeitlin J. (edr.), *The Oxford handbook of business history*, Oxford University Press, New York 2008.
[3] Tarr J., Dupuy G. (curr.), *Technology and the Rise of the Networked City in Europe and America*, Temple University, Philadelphia.

Sometimes these societies were short-lived, but one understands how the coastal cities of the Mediterranean, between Italy and France, are a common space that almost disregards the countries they belong to. After all, the proximity and ease of communication that Lyon had with Marseilles (but also Montpellier) explains why the people of Lyon were so active in the lighting gas industry in Naples.

This gas industry, which is the subject of this paper, established itself early on in Lyon. In the early 19th century, the French city was one of the main centres of transalpine industry, thanks to the availability of coal and the initiative of local capitalists. Between 1840 and 1880, as many as 82 gas companies were created by the Lyonnais and were based in Lyon. They operated in 97 different locations including, in addition to France, Spain, Algeria (in one case) and Italy (in 8 major cities). Of those 82 companies, 49 were created between 1836 and 1845. In Venice, the Lyonnais invested 4,500,000 francs using an aerial gas pipeline, while in Naples they invested 1,540,000 francs. Given the amount of money invested in Lyon, a local stock exchange second only to that of Paris was established in 1845.

During the Restoration period, the new financial entrepreneurs defined suitable instruments to secure capital and to exploit it for the construction of service networks such as the distribution of gas for lighting and, secondarily, of electricity, drinking water, sewage, urban transport services and even street cleaning. What is called a *networked city in* Anglo-Saxon terms is precisely an investment space open to international capital, which has begun to manage many services in cities by projecting its capital into places where there was a need for such interventions.

This process was present in Italy before Unification although, of course, the new liberal system (understood in the technical sense, not in terms of value judgement) accelerated it after the mid-century wars by producing the formation of a larger Italian common market. It was one of the building blocks of the capitalist system of the period that can be very cautiously called early globalisation. Because of their importance, so-called network services have been studied in the fields of *business* history, financial history, social history and studies of societal change.[4]

Historical studies on 'network services', therefore, paint a complex picture and show how the creation of network services (railways, urban transport, gas, water, electricity, telegraphy) were organised and financed in close connection with the influx of international capital. Describing the complexity of these networks means uncovering the links and relationships that were formed to constitute these investments,

[4] Wilkins M., Schröter H. (eds.), *The Free-Standing Company in the World Economy. 1830-1996*, Oxford University Press, New York 1998; Jones G., Schröter H. (edr.), *The rise of multinationals in continental Europe*, Aldershot: Elgar 1993; Jones G., *Multinationals and global capitalism: from the Nineteenth to the Twentieth-first Century,* Oxford University Press, New York 2005; Cameron R.E., *France and the economic development of Europe*, 1800-1914, Princeton University Press, Princeton 1961; Jones G., *Merchants to multinationals: British trading companies in the nineteenth century*, Oxford University Press, New York 2000; Bonin H., *Histoire de la Société générale*, Droz, Genève 2006; Cassis Y., *The Capitals of Finance*, cit.; Roth R., Dinhobl G. (curr.), *Across the borders: financing the world's railways in the nineteenth and twentieth centuries,* Ashgate Publishing 2008; Conti G., Feiertag O., Scatamacchia R., *Credito e nazione in Francia e in Italia (XIX-XX secolo)*, Pisa University Press, Pisa 2009; Stoskopf N., *150 ans du CIC, 1859- 2009,* 2 vols., Editions La Branche, Paris 2009; Tarr J., Dupuy G., *Technology and the Rise of the Networked City in Europe and America*, Temple University Press, Philadelphia 1988.

the people who were at the centre of financial and industrial nodes, the relationships between the peripheries and the large financial centres, such as Paris. These studies have also contributed to an understanding of the difference between Anglo-Saxon capitalism (*market oriented*, open to competition) and the more widespread capitalism in the rest of the world often referred to as oligo-monopolistic (relationship oriented in Anglo-Saxon terminology).[5] The widespread presence of *business groups* composed of actors linked by various types of personal relationships (family, friendship, business, religious community and others) has thus been demonstrated.[6] This second characteristic is particularly evident in Naples.

They function as examples of organised cooperation in business (like cartels, consortia, *joint ventures,* etc.), intermediate forms located between free markets and power; such groups internalise functions for which there are no supporting institutions or external markets. [7] Moreover, the literature on *elite* structures has long studied so-called *inter-organisational networks*, in which companies, institutions and financial centres are integrated as power nodes capable of

[5] Morck R.K., Steier L., *The Global History of Corporate Governance. An Introduction*, in Randall K. Morck (ed.), *A history of corporate governance around the world. Family business groups to professional managers*, University of Chicago Press, Chicago and London, 2007, p. 2.
[6] Colpan Asli M., Hikino T., Lincoln James R. (eds.), *The Oxford Handbook of Business Groups*, Oxford University Press, New York 2010.
[7] White H. C., *Markets from Networks: Socioeconomic Models of Production*, Princeton University Press, Princeton 2002; Nohria N., Eccles R. (eds.) *Networks and Organizations: Structure, Form, and Action*, Harvard Business School, Boston 1992; Granovetter M., *The Impact of Social Structure on Economic Outcomes*, in Journal of Economic Perspectives, 19, 2005, pp. 33-50.

influencing decision-making processes and even far-reaching economic strategies. If this type of network worked in Paris or London, the same is true for Naples.[8]

Relationships between boards of directors sharing one or more members (*interlocking directorates*), which we can also call shareholder intersections, also prove to be instruments for the formation of a *corporate elite* with power and influence across the economic system.[9] Through such interlockings, shareholders come to embrace many interests. Similar examples have been studied in Bourbon or pre-unification Italy. In the Kingdom of the Two Sicilies, one may recall the complex affair of the *Società Industriale Partenopea* studied by the undersigned, with the many enterprises in *partnership*, initially small and large, the collaborations with the great *Compagnia Sebezia* up to the concentration of financial energies in the Filanda di Sarno. One notices how, from decade to decade, it is always the same names or the same families that engage in business. Not those who lived off the large landed estates, but dynamic families from all social groups and often of foreign origin.

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[8] Moore G., *The structure of a national elite network*, 'American Sociological Review', 44 (5), 1979, pp. 673-692; Scott J., *Networks of corporate powers: a comparative assessment*, 'Annual Review of Sociology', 17, 1991, pp. 181-203.

[9] Bunting D., Barbour J., *Interlocking directorates in large American corporations 1896-1964*, 'Business Histroy Review', 45 (3), 1971, pp. 317-335; Stanworth P., Giddens A., *The modern corporate economy: interlocking directorships in Britain (1966-1970)*, 'Sociological Review', 23, 1975, pp. 5-28; Scott J., *Corporate Business and Capitalist Classes*, Oxford University Press, New York 1997; Domhoff G. W., *Who Rules America?: Power, Politics, and Social Change*, McGraw-Hill, Boston 2006.

The definition of the concept of economic activity in terms of interest groups (business groups), rather than enterprises, is still a new area of study. These groups are widespread in England and France and in much of continental Europe.[10] The importance of this form of enterprise in the period before the First World War is now well established. These were companies that were set up to do specific business abroad but generally did not operate in their country of origin where they kept a small operational or financial base. In this sense, these types of companies were different from the model of the modern multinational corporation, as it has taken shape especially since the First World War. Thus, one can cite, among others, Chapman's studies on English merchants who became diversified *investment groups* with an essentially financial function.[11] Or the studies on companies agglomerated around different actors who are, in general, promoters, financial intermediaries, lawmen, accountants, engineers, banks, merchants and trading companies *(free standing companies*). Geoffrey Jones studied the concepts of English *investment groups*, *clusters* and *trading companies* and combined the two and defined the structure of English *trading companies* as *business groups*. The way these groups operated is interesting. Since communication was then more difficult, they sent agents abroad to identify opportunities, new technologies and promote

[10] Randall K. Morck (ed.), *A history of corporate governance around the world. Family business groups to professional managers*, Chicago Press, Chicago-London, 2007, p. 57.

[11] Jones G., *Merchants to multinationals,* cit., pp. 10-12. Chapman S., *British-based investment groups before 1914*, in Economic History Review, vol. 38, 1985, pp. 230-251; Chapman S., Merchant *Enterprise in Britain from the industrial revolution to World War*, Cambridge University Press 1992.

them in their own country. We have seen, in the volume dedicated to the Filanda di Sarno, how some of the innovations that were perfected in England were probably discovered by curious travellers and technicians and brought to Italy.

These agents communicated the news of innovations and opportunities and based on this, the formation of enterprises was decided upon to exploit that opportunity. They were enterprises, often, that remained independent of each other, but partnership was the specifics of each group.[12] This model was typically assumed by networked service companies dealing with gas, or electricity. The operational dynamic describes a process of identifying the business and launching it on the capital markets. Personal networks of social relations facilitated the raising of finance. Investors placed their trust in a company formed in a familiar environment, controlled by reliable and well-known individuals, so they entrusted their investments to them. The operating company (or *free standing company*) thus stood at the centre of a group (referred to in the literature as a *cluster*) of individuals and companies. Often, these individuals contributed different competences and joined the project. In the case of networked services, central actors were often (but not always) financial intermediaries or engineers or innovators able to mobilise capital. Often, markets saw the merging of companies that tended to become structured groups, *holding companies,* where groups of actors continued to be involved.[13]

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[12] Jones G., *Merchants to multinationals: British trading companies in the nineteenth century*, Oxford University Press, 2000.

[13] Haussmann W., Hertner P., Wilkins M., *Global electrification. Multinational enterprise and international finance in the history of light and power*, 1878-2007, Cambridge University Press, pp. 35-74.

Chapter 2

Networked services in Restoration Europe

An extensive historical literature has developed around the *large technical systems* or network services mentioned by Thomas Parke Hughes in *Networks of power* (1983). Networked services are defined as public services characterised by a networked service distribution structure starting from a production and distribution, procurement or organisation centre. In this case, the provider distributes the service through a physical network, which may be its own – as in the case of tracks, cables and pipes – or shared by other users, as in the case of services distributed through the road network.[14] Postal services, the public school system, hygiene, medical or even cultural services should also be considered 'networked' services. However, it is above all complex 'socio-technical systems' that become a specific object of study. The process of realising such services is complex because it involves a multiplicity of actors operating at the scientific-technological, economic, financial, socio-political and different territorial levels (local, national and global). The historical investigation has also expanded from the railways to other 'network services' which, like these, were often the subject of concessions by the public authorities and thus a

[14] Ferrari E. (ed.), *I servizi a rete in Europa. Concorrenza tra gli operatori e garanzia dei cittadini*, R. Cortina, Milan 2000; Predieri A., Morisi M. (curr.), *L'Europa delle reti*, Giappichelli, Turin 2001.

privileged field of action for private capital in search of guaranteed investment. Particular interest has also been reserved by scholars for networked urban services (gas and drinking water distribution, sewerage and urban transport), which are considered to be characteristic of the modern networked *city*.[15]

A specific set of networked services are those characterised by technical infrastructures installed in the territory such as rail transport, energy distribution, drinking water and sewage, which require an expensive infrastructure network that is difficult to implement without government commitment or large capital. Studies on the gas industry, on which we will focus in this paper for the case of Naples, are also significant because gas lighting was among the first services to be installed in European cities.[16] Around 1825, it had been adopted by the main English cities and from there it began to spread across the continent, for example Lyon.

Exporting technical knowledge and entrepreneurial know-how were entrepreneurs who were often already active in the transport industry, i.e. in the construction of canals, railways, shipping and metallurgy, as well as in the mining sector, in addition to equipment manufacturers and engineers often with their own patents. The most dynamic entrepreneurs, such as Charles Lefèbvre and Lorenzo Zino for Naples, were the ones who welcomed this export and financed it at home. In addition to engineers and entrepreneurs, owners, financiers and bankers

[15] Starting with Hughes, an extensive literature has developed on the topic of urban networks. See Giuntini A., Hertner P., Nunez G. (curr.), *Urban growth on two continents in the 19th and 20th centuries*, Granada 2004.

[16] Paquier S., Williot J.-P. (curr.), *L'industrie du gaz en Europe aux XIXe et XXe siècles*, Peter Lang, Brussels 2005.

also participated in the financing of these companies. Some of them were already active in the wool, paper and steamship industries. In short, urban elites in their varied composition. Quite significant is the establishment of *holding companies* for the diffusion of the gas industry on a large scale for both lighting and supply purposes.

Two examples of important exporters of technology can be found in England and France. In the former country, the *Imperial Continental Gas Association* (ICGA) was founded in 1824 to export gas lighting to the continent's major cities.[17] Contributing to its foundation were the bankers Mathias Attwood (1808-1865), Isaac Lyon Goldsmid (1778-1859) and Moses Haim Montefiore (1784-1885), a naturalised Englishman of the Jewish religion. They were three leading exponents of London's private banks.[18]

In 1847, the first French holding company, the Parisian *Compagnie Centrale d'Éclairage pour le Gaz* (Lebon et C.ie), was founded by entrepreneurs from the sector. It would play a very active role in the following period. Within a decade thereafter, the entry of Parisian high finance into the urban services sector began, with the export of French technology and capital to the same markets (such as Italy) that had channelled railway and banking investments. Parisian high finance found interesting opportunities for diversification in this sector with a very high rate of development. The process included:

[17] The first stages: Ghent 1825, Berlin and Hanover 1826.
[18] Paquier S., Williot J.-P. (curr.), *L'industrie du gaz en Europe*, cit. p. 33-34.

a) the extraction of coal (or even oils of various kinds, at first);
b) distillation, metallurgy, mechanics workshops;
c) the transport of the raw material (by normal ships or steamers);
d) urban planning interventions in the main nodes of the network, i.e. real estate companies, renovation of ports and construction of general warehouses;
e) construction of plants for processing raw material into gas and gasometers for storage.

It is well understood how the construction of a gas distribution network, even if only for lighting, required considerable capital. While in France the international high finance intervened, in the German and Scandinavian areas the initiative of territorial holding companies and above all the action of municipal authorities developed, which organised themselves to set up workshops financed by local banks and bankers. In these countries there was less international projection, more interest in services useful to their own population and less adherence to a liberalist economy.

Studies have highlighted two different conceptions of networked services: the *service public industriel et commercial*, of the French matrix, and the *public utilities* of the Anglo-Saxon matrix.[19] In the French area, the private entrepreneur acts as a 'delegate' of the public body to carry out services judged to be the latter's responsibility. The public body therefore organises, regulates and supervises the

[19] Cossalter P., *Les délégations d'activités publiques dans l'union européenne*, L.G.D.J. 2007.

service.[20] Here, the main instrument of delegation for the construction or management of networked services in the French area is the *concession à la française*, an alternative legal instrument to the contract, whereby the public authority entrusts a third party with the performance of its service task and the related 'obligations', while retaining responsibility and the consequent powers of regulation, supervision and control. The specific characteristics of the concessionary instrument can be summarised in the following three: the indirect remuneration of the private enterprise by the Public Administration through the collection of fees paid by the users of the service; the possibility for the Public Administration to guarantee the exclusivity of the service granted; the recourse to selection criteria not based solely on technical and economic motivations, but on trust in the "quality" of the concessionaire.

Studies have also highlighted similarities in the concept of public service in France, Belgium, Spain and Italy, both North and South. The French-style concession, for example, was used extensively in Italy and Spain for the construction of infrastructures promoted by the unified State, with the aim of strengthening the nation and integrating pre-unitary markets.[21] But it was also used in the pre-unification, Bourbon period, for example the one that interests us in this paper, with the specificity of the privative.

It has been noted that there is an interrelationship between the concessionary instrument and the political-administrative

[20] Guglielmi Gilles J., *Le modèle français de la concession: conquête ou concurrence*?, http://www.guglielmi.fr/IMG/pdf/TableRondeConcess.pdf.
[21] Fernandez A., *Villes, services publics, entreprises en France et en Espagne XIXe-XXe siècle*, MSHA, Pessac 2006.

structure of the French State.[22] The characteristics of the concessionary institution were perfected in the process of developing the instruments that allowed for the construction of railways and stations. This led, around 1855, to the achievement of a balance between public and private interests, placing in the hands of the governments of the Second Empire an effective instrument to force local balances and resistance to the policy of modernisation and opening up of markets. This also brought support from finance, which until then had been lukewarm towards the immobilisation of capital in 'industrial' enterprises.

The instrument of the concession, already known in Roman law, received its proper form in the law of the Ancien Régime, reaching its peak in the 19th century.[23] In the case of the execution of public works and public utilities, the relationship between the public and private sectors underwent major changes in the transition from the Old Regime to the monarchy born after the revolutionary season. A continuity can be seen in the centralised approach and in the powers of the state property that controlled the territory, which from royalty became 'public', the property of the nation.[24] This peculiarity of the political-administrative system of the French state gave rise to the method used to finance public utility works, the ownership of which – even in the case of private construction and management concessions – remained with the public

[22] Mannori L., Sordi B., *Storia del diritto amministrativo*, Laterza, Rome-Bari 2001; D'Alberti M., *Le concessioni amministrative*, Jovene, Naples 1981.
[23] Lichère F., *L'évolution du droit des concessions,* cit., p. 117.
[24] Bezançon X., *Histoire du droit concessionnaire en France*, in 'Entreprises et histoire', No 38 2005/1, pp. 24-54.

administration.[25] Since the expenses incurred by the concessionaire had to be recovered in full within the term of the concession, the relationship of the concessionaire company with the granting authority often took the form of a credit relationship and the concessionaire was similar to the "société d'emprunt" set up in the ancient regime for the construction of canals.[26] The recovery of the capital advanced by the concessionaire took place through the collection of tariffs paid by the users of the service, a sort of "fractional reimbursement".[27] This is the system we have seen used for the privatisations/concessions relating to steamboats, which provided a passenger, freight and mail transport service in the Kingdom of Naples: the capital advanced by the shareholders of the various (not many) steamship companies could be recovered through the demand for the payment of a ticket that remained wholly or partly in the hands of the company under privatisation or concession.

The concession, which in the Old Regime was a unilateral act that could be revoked by the political power, by the mid 19th century had become everywhere – even in Naples – a bilateral contract, in which both parties assumed reciprocal commitments and the obligation to respect the contractual clauses before the judicial authority and the commercial courts. The concessionaire had obligations, but also the right to collect a tariff set by the authorities; he also generally obtained subsidies and privatisations that resulted in

[25] Christophle A., *Traité théorique et pratique des travaux publics,* Paris 1862, t. I, p. 25.
[26] Hautcœur P.C., Romey C., *Les émetteurs sur le marché financier français 1800-1840*, PSE Working Paper No. 2006-41.
[27] Christophle A., *Traité théorique et pratique,* cit., p. 594.

monopolistic operation, to be conceived as a protection of the capital invested.[28] In France, the logic of monopoly and guarantee of interest imposed itself with the Second Empire.[29] In this phase, many concessionaires took the form of joint-stock companies, which were able to issue bonds. At the same time, they retained the French-style system of financing *travaux publics with the* return of share capital over the duration of the concession. For this reason, the companies introduced into their statutes a capital amortisation plan that provided for the progressive redemption (by lot) of all shares at their nominal value, to be carried out by means of staggered withdrawals from operating profits and also by means of an accumulation plan. In addition, at the end of each financial year, each share was guaranteed legal interest on its nominal value to be taken from profits before the distribution of the dividend, which was the profit to be added to the interest already calculated.

The L'*Amministrazione della Navigazione a Vapore di Napoli*, which conceived of its activity as a service, as well as, even more *conspicuously*, the *holding companies Società Industriale Partenopea*, *Compagnia Sebezia* and *Banca Fruttuaria,* were born in the third decade of the 19th century in Naples. All these companies also offered network services. They offered, for instance, the management and storage of large quantities of grain, and facilitated transport, storage and distribution services. They provided financing services and 'networking' of capital, tools and expertise in both traditional services and innovative, mechanised and modern sectors.

[28] M. Delalleau, *Rev. De législ.*, 1835, t.1, p.182.
[29] Caron F., *Histoire des chemins de fer en France*, t. 1: 1740 - 1883, Fayard, Paris 1997.

From all this, it is clear how concession contracts were financial in nature and explains why finance intervened so heavily in the service industry with such guarantees, guaranteeing more money than the sovereign debts now in the hands, almost as a monopoly, of the biggest bankers like the Rothschilds. More feasible, for many, were the interventions in infrastructure or transport services, which were also demanded by governments. In order to ensure the replenishment of equity and bond capital, the duration of concessions was proportionate to the size of the companies' capital and the tariff set by the authority. In the 1850s, the duration of concessions in France was extended to 99 years. This solution was devised by Parisian financial experts in order to make the construction of the national railway network possible after the crisis of 1848 by moving on to the financing of urban service companies. The gas sector also became a model that could be exported.

Chapter 3

The gas industry in Europe (1802-1862)

Having made these necessary introductions, we can now turn to the history of the gas industry in Europe, the subject of considerable recent historiographical interest.[30] The production of gas for use in lighting systems developed around 1810-1820 after a season of experiments at the end of the 18th century to which Italian scientists such as Alessandro Volta were no strangers. This type of lighting, which was experimented with around 1810 in Great Britain and France, led to the construction of the first gas production plants in the main European cities by around 1850 and then also covered smaller towns and suburbs by around 1880. Only after this date did competition from

[30] Franco R., *Industrializzazione e servizi. Le origini dell'industria del gas in Italia,* in "Italia Contemporanea", 1988, n.171, pp. 15-38; Castronovo V., Paletta G., Giannetti R., Bottiglieri B., *Dalla luce all'energia. Storia dell'Italgas*, Laterza, Rome-Bari 1987; Berselli A., Della Peruta, F. e Varni A. (curr.), *La municipalizzazione in area padana. Storia ed esperienze a confronto*, Franco Angeli, Milan 1988; A. Giuntini, *Dalla Lyonnaise alla Fiorentinagas 1839-1989*, Laterza, Rome-Bari 1990; Bigatti G., Giuntini A., Mantegazza A., Rotondi C., *L'acqua e il gas in Italia. La storia dei servizi a rete, delle aziende pubbliche e della Federgasacqua*, Franco Angeli, Milan 1997; Bartoletto S., *Gli esordi dell'industria del gas a Napoli: 1837-1862*, in *La città che cambia. Infrastrutture urbane e servizi tecnici a rete in Italia fra '800 e '900,* "Ricerche storiche", 2000, 3, pp. 569-582; Conti F., *Crescita urbana e infrastrutture in Italia e in Europa. Studi sull'industria del gas fra Otto e Novecento*, in "Italia contemporanea", 1992, 186, pp. 103-111.

electric lighting begin, which became synonymous with modernity, replacing the now obsolete gas lighting. This, however, gave the gas lighting operators a competitive advantage of about 70 years, enough to create big business and company concentrations. At that point, gas lighting was exploited for its calorific value and continued to expand by transforming its uses.

The first experiments in the application of illuminating gas date back to the work conducted in the 18th and 19th centuries by the Scotsman William Murdoch (1754-1839) and the Frenchman Philippe Lebon (1767-1804), a technician who had studied at the École des Ponts et Chaussées in Paris. There were various ways to produce gas with high illuminating power. Murdoch experimented with the gas released from fossil coal while Lebon concentrated on the products of wood combustion.[31] On the experiments conducted mainly in England as early as 1832, a thick and comprehensive book was written, *A Historical Sketches of the Origin and Progresses of Gas lighting* (Simpkin & Marshall, 1832) which is still interesting for the amount of information it contains. It shows well how the study of the uses of gases produced from various substances and especially from coal had been long and laborious. When the technology was ready, society and the economy were ready for it.

[31] Berzelius J. J., *Treatise on Chemistry,* v. VII, transl. it. Naples 1841, pp. 327-328; 665-669; Products of Wood Distillation, pp. 739-742; 783-784.

William Murdoch (1754-1839).

It was in England, a land rich in good quality coal, that efficient processes for the industrial production of a gas suitable for lighting were developed: the first results were seen as early as 1798 in the experiments of the aforementioned Murdoch. Four years later, in 1802, Murdoch himself organised the first public demonstration of the operation of his lighting system in the Boulton & Watt foundry and construction company in London. It was from this time that industrial gas production began in England with subsequent improvements that made commercial distribution safer and more profitable. Murdoch worked in the field of hard coal technology, in foundries, and the company he worked for, Boulton & Watt, installed the first steam engines with coal-fired boilers.

As for the Frenchman Lebon, he had filed his patents as early as 1799 and 1801, but the first practical applications

could only be presented in 1811. From then on, he began a series of experiments and refinements to which he added the work and insights of other technicians and engineers working in smaller companies. From the diffusion of systems for the lighting of individual buildings, large centralised systems for the networked distribution of illuminating gas were realised within the space of fifteen years.

The first autonomous systems were installed in factories and quickly spread to the textile districts of Northern Europe where large factories spent large sums to light large rooms with wax and oil candles.[32] The cheaper tallow candles gave an unpleasant smell and made smoke. It was not until around 1800 that candles made of stearin and rapeseed oil became popular, but by then gas lighting was beginning to spread.

Following the Birmingham experiment, Murdoch and Boulton & Watt lit the Philips & Lee spinning mill in Manchester. For this purpose, they built a large installation comprising some 3,500 metres of piping between 1805 and 1807. The installation reduced the cost of lighting by over 300% from 2,000 to 600 pounds per year. From then on, given the results, there was a rush to use the new technique. Over the next four years, Boulton & Watt installed dozens more systems and soon other innovators improved the technology even further. This enabled the emergence of companies that produced small systems for lighting smaller environments such as shops, public buildings, companies and even private homes.[33]

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[32] Falkus M.E., *The Early Development of the British Gas Industry, 1790-1815*, in The Economic History Review, v. 35, no. 2 (1982), pp. 218-220.
[33] Falkus M.E., *The Early Development,* cit., pp. 220-225.

It was Frederick Albert Winsor (1763-1830), a German businessman from Brunswick who, after making proposals to several German cities, all of which were rejected, identified London as a suitable place to launch his project to centralise the production and distribution of gas for lighting purposes.[34] London was ideal: it had factories, a large population, low cost of coal, high cost of candles. In 1806, he laid the foundations of a national company, the *National Company*, obtaining a privilege to operate in all territories of the Empire, kingdom and colonies, in order to supply gas through underground pipes as was done with water. When it put its shares up for sale in 1807, it was a great success: subscriptions rained in, but it still lacked the privilege without which it could not start. The company therefore came to life in 1812. The delays were mainly caused by the fact that the Privy Council in London referred the decision back to Parliament, which did not decide to legislate favourably. It was requested that the company be incorporated by an act of parliament, according to the rules that applied to the formation of joint-stock companies. From 1809, when the first piece of legislation in its favour was presented, to 1812, when the company was granted the Royal Charter (essentially what in the Bourbon Kingdom was called a privatisation by royal decree), the project underwent many changes because it met with opposition in Parliament. James Watt, for instance, who was involved in the industry, wanted to prevent the creation of a monopoly by others. Only by renouncing the privilege, the production of equipment and restricting itself to acting in London did the *London and Westminster Chartered Gas Light and Coke Company* obtain

[34] Williot J.-P., *Naissance d'un service public: le gaz à Paris*, Rive Droit, Paris 1999, p. 24.

incorporation and permission to produce and distribute gas in London, Westminster and Southwark.[35]

So: the London financial environment responded, but the project ran aground on the problem of monopoly and the need to ensure competition. Eventually, however, the company succeeded and was an immediate success. In 1814 it started production of installations to light public buildings in the urban area of London and in 1817 the first dividends confirmed the high profitability of the investment. It was at this point that emissaries from the Bourbon Kingdom began to take an interest in the technology, reporting on it to the King, who, during several trips to Northern Europe personally appreciated the benefits of brilliant lighting in public streets. The biggest problem, for that English technology to be adopted in the Kingdom, was the use of coal, which was very expensive.

By 1821, all English towns with a population of over 50,000 were illuminated with the new system, and by 1826 this had extended to almost all towns with a population of over 10,000, industrial districts, and smaller towns with factories. By 1825, three more companies were operating in London with all the *know-how* needed to lay pipes and operate lighting systems.[36]

The gas production process consisted of four steps; distillation, condensation, purification and storage.

In the first phase, the coal was heated inside closed vessels placed in masonry furnaces; the heated coal produced gas, mixed with other substances and coke, a residue of the distilled coal. The vapours produced were extracted from the retorts and conveyed to the condensation stage to separate the gas

[35] Falkus M.E., *The Early Development,* cit., pp. 225-229.
[36] *Ibid*, p. 234.

from other substances not useful for lighting purposes (but usable for other industrial purposes), then to purification. The purified gas was then conveyed to storage facilities (gasometers) and then distributed through a network of pipes buried under the streets, which, on arriving at the places of use, flowed out of valves that fed the appliances that burned the lighting flame. In the beginning, it was necessary to purify the gas of harmful and irritating substances or substances that produced a bad smell or diminished the illuminating power. Gradually each problem was eliminated, with remarkable speed. Large plants allowed economies of scale, and by moving gas production away from places of consumption, the polluting effects of gas were eliminated.

As for the financing and incorporation of the companies, they took different institutional forms depending on the size of the plants: the largest companies, in England, required *limited liability,* while the smaller ones operated without incorporation. Parliament had to provide permission to break ground and pave roads for the companies that applied for it on incorporation. In the process of the formation of the gas companies, in the financing of which local capital played an important role, historian Falkus identifies two lines of tendency: the first is the so-called 'contractor system' in which a specialised technician was called in from outside to carry out locally born initiatives; the second is the autonomous action of promoters, technicians or speculators, active in every part of the country.

The *gas contractor* acted as a promoter of new ventures; he often started construction with bank loans or credit from the companies that supplied him with material and then formed a

company proper.[37] This *contractor system* was prevalent in the initial phase of the English companies in the periods following the initial one, i.e. in the fifteen years from 1831-46. This was the era in which gas lighting expanded beyond the big cities.[38] The *contractor system made it possible* to finance smaller plants that could discourage risk-taking. Falling plant and coal costs also influenced the spread of the technology by driving down the price of gas. Falling prices were followed by an increase in consumption and company profits. Sometimes, however, stimulating consumption meant spending on new pipelines. To maintain the increase in profits, gas companies tended to increase the consumption of existing subscribers, favouring large consumers, such as factories or theatres, by applying differentiated tariffs.[39]

Factories, public buildings, hospitals and businesses were therefore among the first customers of the gas companies, along with the homes of the wealthier classes.

The spread to middle-class homes followed the fall in prices and took place mainly in large cities where the size of the market allowed for the installation of more companies, such as in London, where thirteen companies were active by 1850.[40] By the middle of the century, the gas industry was widespread

[37] Falkus M.E., *The British Gas Industry before 1850,* cit., p. 505.
[38] *Ibid.* p. 505-508. In the 1831-37 cycle, gas reached medium-sized towns with a population of between 4,000 and 10,000, and in the 1842-46 cycle almost all towns with more than 2,500 inhabitants.
[39] Millward R., *Emergence of gas and water monopolies in nineteenth-century Britain: contested markets and public control*, in Foreman-Peck J. (ed.), *New perspectives on the late Victorian economy. Essays in quantitative economic history 1860-1914*, Cambridge University Press, Cambridge 1991, pp. 102-104.
[40] Goodal F., *Gas in London: a divided city*, in Paquier S., Williot J.-P. (eds.), *L'industrie du gaz en Europe*, cit., p. 123.

in England and it was generally agreed that there was not much more to be done.[41]

The English example was soon followed on the continent. Interest in the new discovery and the technology developed to make it widespread and profitable developed, as it had in England, through public demonstrations carried out with small distillation plants located near the prestigious sites chosen for the experiments. Thus, technicians and entrepreneurs stimulated demand and encouraged the construction of the first production and distribution plants for illuminating gas. Starting with Paris and Brussels, already reached by the plants in 1818, Ghent, Bordeaux and Lille (1825) followed.[42] Then Hanover (1826), Berlin (1826), Dresden (1828), Lyon, Roubaix, Rouen (1834); Leuven, Liège, Charleroi, Tournai (1835). Nancy and Tourcoing (1835); Boulogne-sur-Mer in 1836; Marseille, Dunkirk, Le Havre, Saint-Etienne in 1837; Strasbourg in 1838.[43]

A Neapolitan travelling in France in the 1820s and 1830s might consider his own city to be more backward than those in France, which explains why a Frenchman transplanted to Naples like Charles Lefèbvre joined the first gas company installed in Naples after the second half of the third decade with such enthusiasm.

The location of the workshops was conditioned by the availability or access to the raw material being distilled, and

[41] Falkus M.E., *The British Gas Industry before 1850,* cit., p. 409.
[42] Paquier S., Williot J.-P., *Origins et diffusion d'une technologie nouvelle au XIX siecle*, Paquier S., Williot J.-P., (curr.), *L'industrie du gaz en Europe*, cit., pp. 21-51.
[43] Williot J.-P., *De la naissance des compagnies à la constitution des groupes gaziers en France (années 1820-1930),* in Paquier S., Williot J.-P. (curr.), *L'industrie du gaz en Europe*, cit., pp. 149-156.

thus also by communication routes; port cities and cities along road and river routes were favoured, as were those reached by the progress of the European railway network. All these were enlightened before the isolated cities. If English technology developed, as we have seen, around the distillation of hard coal, in France until the 1850s coal, resin and various oils were distilled; in many German territories wood was used instead. It is also significant that in Germany the gas industry developed in parallel with the construction of the railway network.[44] Among the first cities reached by the gas industry were those located on sea routes such as Barcelona (1842), Hamburg (1844), Trieste (1846) and Lisbon (1848). In Geneva, coal was transported via the Rhone valley. Bern and Lausanne used local coal.[45] The main Italian cities were reached via Lyon: Turin (1837), Naples (1838-41), Florence (1839), Milan (1839), Venice (1839). By 1850, 107 French municipalities were served and 32 in Germany. This was followed by Berne (1843), Geneva (1844), Lausanne (1848), Vienna (1842), Trieste (1846), Prague (1847), Gothenburg (1846), Oslo (1848), Barcelona (1841), Madrid (1846), Lisbon (1848), Parma (1846), Bologna (1846).

From 1839 to 1844, olive oil was distilled and used to produce gas in Naples as a result of the Bourbon government's aspiration towards autarky. The Kingdom was a major producer of oil and the interests of powerful landowning and merchant

[44] Schott D., *The significance of urban enterprises in late 19th century German cities*, in Paquier S., Williot J.-P. (curr.), *L'industrie du gaz en Europe*, cit., p. 497.
[45] Paquier S., Williot J.-P., Origins et diffusion, cit., p. 27.

elites revolved around it.[46] From this point of view, the Neapolitan case remained isolated: on the continent, other fuels such as coal were more available and less expensive. Moreover, experience at the time shows that various products were tried: gas from bituminous shale, gas from resin, gas from various vegetables, gas from oil, gas from whale oil. In the end, the cheapest would have been gas from coal. It is no coincidence that the first technology to spread across the Channel was the British one based on hard coal. So it was in France, in the port cities of the North, in Belgium, in northern Germany and in Scandinavia.[47] Between the late 1830s and the 1840s, however, French technology also grew, developed in Paris, Mulhouse and Lyon.[48] This was mainly applied in Italy, Spain, western Switzerland and the German territories bordering France, such as Alsace. In Italy and Spain, the same companies were active as in Italy and the same subjects. From the *Société de l'Union*, a limited partnership (1837) that arose from the sale to a group of capitalists from Lyon of patents obtained between 1834 and 1835 by the Parisian engineer Alexander-François Selligue (1784-1845) – also active in Milan – in the field of purification,

[46] For the case of Naples see: Berzelius J. J., *Trattato di chimica,* cit. pp. 396- 398; *Il Politecnico*, 1°, s. I, Milan 1839, pp. 9-17 and 225-237; Bartoletto S., *Gli esordi*, cit., pp. 571- 572.

[47] Paquier S., Williot J.-P., *Origins et diffusion*, cit., pp. 32-45. For Paris, see Williot J.-P*., Naissance d'un service public,* cit., in which the history of the first diffusion of gas lighting in Paris is detailed, where it is the founder of the London Gas Light and Coke Company who took out the first patent in 1815 and established the first lighting company in 1817.

[48] Williot J.-P., *De la naissance des compagnies*, cit. pp. 152-156 and for more information on the Lyon case Cayez P., *L'industrialisation lyonnaise au XIX siècle. Du grand commerce a la grande industrie* (These-Université de Lyon II), Service de reproduction des thèses de l'Université de Lille III, 1979, Tome I pp. 415-434 et II pp. 875-897.

derived the Neapolitan business.[49] Across the Rhine, the penetration force of French production techniques was curbed by the development of German technology based on wood distillation. Workshop builders and equipment manufacturers, engineers and chemists took the knowledge of the new technology to other countries.[50] Construction and operation of the plants was carried out through the *contractor system*, as in England. Participating in the establishment of the companies were the urban elites of the cities concerned and thus financiers, bankers, merchants but also industrialists active in other sectors.

First established in 1824 was the *Imperial Continental Gas Association* (ICGA), set up to export gas lighting to the continent. The ICGA, with its £2 million, had as its main collaborator the engineer Aaron Manby (1776-1850) who, with his son Charles (1804-1884), was a key player in the export of British technology and also a key player in steamship construction. Aaron Manby was already active in Paris in 1821. He had built several workshops in the French capital and ran one for gas lighting. The Manbys also worked in the steamship industry and in the metal industry.

The company began its activities in Ghent in 1825, later expanding to Berlin and Hanover (1826), Bordeaux (1832), Brussels (1839) and Antwerp (1840).[51] In addition to the ICGA, there are two other English investment companies, the *United*

[49] Cayez P., *L'industrialisation lyonnaise,* cit., p.423-429. The Gosse engineers, father and son, were also in Naples in 1854.
[50] Paquier S., Williot J.-P., *Origins et diffusion*, cit., p. 32.
[51] Hutchinson K., *The Royal Society and the foundation of the British Gas Industry*, in Notes and records of the Royal Society of London, vol. 39, no.2 1985, pp. 256-258. Aaron Manby, *A biographical dictionary of civil engineers in Great Britain and Ireland: 1500-1830*, v. 1, London, 2002, pp. 431-432.

General Gas Company (1825) and the *European Gas Company* (ECG), founded in 1835 by coal producers, which supported the export of English ore and built several workshops in Northern France: Rouen, Caen, Le Havre, Boulogne-sur-Mer, Amiens and Nantes.[52] During this period, skilled promoters and concessionaires from Lyon, who were particularly interested in the Italian market, also began to enter the international market.[53] In 1847, the first French investment company was founded, the *Compagnie Centrale d'Éclairage pour le Gaz*, *Lebon Père, Fils et C.ie*, which was to unite Charles Lebon's various construction workshops under one administration.[54] *Lebon Père, Fils et C.ie* was a limited partnership for shares, established on 23 March 1847 by Gustave and Charles Lebon with other unknown partners. The company was set up to manage the gas lighting of the towns of Dieppe, Chartres, Honfleur and Pont Audemera. Charles Lebon already held concessions previously obtained in Spain (Barcelona 1842, Valencia 1843, Cadiz 1845). In the 1850s, the company expanded into northern France, Spain and Algeria (Bernay, Fécamp, Santander, Nice, Algiers); in the 1860s and 1870s, again into northern France, Spain, Algeria and Egypt (Quimper, Saint-Brieuc, Saint-Malo, Saint-Servan, Granada, Almeria, Murcia, Blida, Oran, Cairo, Alexandria, Porto Said).

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[52] Williot J.-P., *De la naissance des compagnies,* cit. p. 148-154. In France, following the administrative reform, elective councils were established from 1831, which gave impetus to urban improvement projects.

[53] Cayez P., *L'industrialization lyonnaise,* cit., pp. 421-423.

[54] Cazez P., *L'industrialisation lyonnais*, pp. 40 and 166; Arroyo M., *Ildefonso Cerdà y el desarollo del gas en Barcelona*, in 'Scripta Nova', vol. 1, no. 2, April 1997; Arroyo M., *Actitudes empresariales y estructura industrial. El gas de Málaga*, 1854-1929, in 'Scripta Nova', vol. 10, no. 215, June 2006.

Chapter 4

Mid-century development

After the crisis of 1848, the continental economy recovered mainly thanks to railway construction and the growth of financial markets. The gas industry also experienced considerable expansion on the continent and spread the model of the *networked city*, the city covered by a network of services given in management, in concession, in privatisation to groups of technicians, entrepreneurs and financiers. These were decisive years for the gas industry: the technical improvements, and the development of forms of financing allowed for a further spread of its technology, which was appreciated, with little romantic opposition, especially by writers and poets, nostalgic people who deplored the breaking of the healthy darkness due to the illuminating power of gas. This changed the appearance of cities, swept away their nocturnal mystery and made the stars invisible in the urban circle.

Beyond these small pockets of resistance, the demand from notables and governments was also irresistible because it was linked to the impressive phenomenon of urbanisation, the often tumultuous swelling of certain urban areas, such as Paris, London, Berlin and, with delay, Milan and Turin. Together with Rome, Naples was the most populous city. The reasons that were used to explain lighting were the most diverse, but the main one was the need for safety and also the savings that

were expected after amortising the construction of the installations.

The expiry of the first short-lived authorisations, the renovation of the old, technically outdated installations, and the extension of the service to areas that had not yet been reached favoured the construction of new workshops and ensured a more widespread distribution of the lighting service in Italian cities.

Barriers to entry into the industry were lowered by falling plant and supply costs due to improved transportation and a stronger presence of subsidised credit. In the course of the 1840s, continuous technical progress enabled operators to achieve better plant efficiency and thus lower production costs. The development of railway construction, on the other hand, brought down raw material supply costs and reduced consumer prices.

The 1850s were characterised by concentration phenomena that rationalised the problems of access to sources of finance in order to address the financial needs of the growing number of gas companies. The fragmentation into individual enterprises that were economically and financially autonomous, but united by network ties between shareholders, gave rise to the concentration of different enterprises under a parent company that coordinated financial needs while maintaining control over income and expenditure. Concentrating several companies with different levels of development allowed already productive companies to finance start-ups. This was the case with *Lebon Père, Fils et C.ie* mentioned above.

Concentration acted as an important diffusion factor allowing the reduction of investment risks and the exploitation

of competitive advantages in technology, organisation and finance. By mid-century, the technology reached the German and Scandinavian areas in particular: in the German states, the number of active workshops rose from 32 in 1850 to 193 in 1858.[55] Here, territorially active holding companies also brought gas works to smaller urban centres.[56] Municipal administrations also moved into these areas. After the municipalisations in Dresden and Leipzig (1833), a municipal workshop was also built in Berlin (1847).[57]

In areas where governments took the initiative, foreign capital and technicians had less play and the plant construction market was controlled by entrepreneurs and technicians from that country.[58] In Denmark, local entrepreneurs moved in reaction to the threat of a monopoly by the English *Danish gas company*. Local banks began to finance the plants and local technicians in Denmark, Sweden and Norway. In these countries, the technology that continued to be used was English. In France, on the other hand, municipalities did not intervene and the gas industry remained in the hands of private companies until well into the first quarter of the 20th century.

In England, the *Lighting and Watching Act* of 1832 had given strong powers to local authorities to ensure street lighting, then it was the turn of water with *franchise contracts*, then, for gas, the adoption of a general law, rather than

[55] Schott D., *The significance of urban enterprises,* cit., p. 497. The spread in the Scandinavian area was managed by English entrepreneurs and technicians: Hyldtoft O., *The question of ownership,* cit., in Paquier S., Williot J.-P. (curr.), *L'industrie du gaz en Europe*, cit., pp. 573-577.
[56] Paquier S., Williot J.-P., *Origins et diffusion*, cit., p. 34.
[57] *Ibid*., pp. 46-47.
[58] *Ibid*, cit., pp. 38-45.

repeated regulation in the form of contracting, was chosen with the *Gas works and water works clauses act* (1847).[59]

In France, an effective legal framework was found to regulate relations between gas companies and public authorities. A balance was found between the return on invested capital and the public interest. In the evolution of legal forms of relations between municipalities and companies, the case of Paris is particularly exemplary. The 1846 contract for public and private lighting was an evolution of the first contract of 1821, when the first concessionary companies were authorised to lay pipes underground with a 'permission de voirie', revocable every year. Confusion ensued, with several requests for channelling the same roads overlapping. The situation was resolved by authorising the monopoly of individual companies in certain perimeters: in 1822, the Prefect of the Seine specified, in a series of decrees, the roads assigned to each of the three existing companies, and in 1839, when three more companies were created, he decided to divide the city's territory into six sectors.[60] Rational regulation came in 1846, when the new industry was adapted to the legal instrument of the administrative concession like the railway companies.[61]

By contractually 'granting' the municipal authority the 'exclusive right' to lay and maintain pipes in a certain area of the city's subsoil, the municipal authority recognised the monopoly of the individual companies for a period of 18 years,

[59] Millward R., *Emergence of gas and water monopolies,* in Foreman Peck J, (ed.) *New Perspectives in Late Victorian Industry*, 1991, pp. 96-108.
[60] Williot J.-P., *Naissance d'un service public,* cit., pp. 157-166.
[61] *Ibid*.

at the end of which it ensured the redemption of the pipeline. The companies freed themselves from the risk of sudden withdrawal but accepted technical obligations and the extension of the service to less profitable areas of the city. In France, the gas industry was characterised by the emergence of powerful companies. Alongside the so-called 'unipolar monopolies', which arose from the merger of several companies operating in a single city, such as Paris, Marseille and Lyon, 'polycentric groups' were also formed, which acted on a large geographical scale.[62] In all cases, the intervention of financial capital after 1848 was decisive and helped the process of infrastructure creation. The Parisian *Grands Travaux* gave birth to the idea of the city-system, characterised by functional planning. The renovation of the road network, with its integration of railway stations, rationalised the urban fabric and foresaw its future expansion. During this work, services such as the distribution of drinking water, the restructuring of the sewage system, the creation of an efficient public transport service and gas lighting were 'networked'.[63]

In 1855, the six city gas companies merged in Paris at the behest of the Emperor and Prefect Georges Eugène Haussmann (1809-1891).[64] The aim was to extend the lighting service to the whole city and to move the workshops outside the city limits. The result was the grand *Parisienne du gaz*. The concession contract of 1855 was the result of a long elaboration in which the intervention of the brothers Jacob

[62] *Ibid.,* pp. 161-167.
[63] Gay J., *L'amélioration de l'existence à Paris sous le règne de Napoléon III: l'administration de services à l'usage du public*, Droz, Genève 1986.
[64] Calabi D., *Storia dell'Urbanistica Europea*, Paravia, Turin 2000, p. 152.

Pereire (1800-1875) and Isaac Pereire (1806-1880), founders of *Credit Mobilière,* proved decisive.[65] In Marseilles, it was the financier Jules Mirès (1809-1871), who was involved in Parisian finance and enriched himself with the securities of the railway companies, who brought together the three companies active in the city.[66]

Finance, the gas industry and the railway and transport industry are always linked. The intervention of finance is also visible in the formation of the *Union des gaz*, or the Vautier group (engineer from Lyon), founded in 1857. The specialised press reserved a specific section of the stock exchange listings for the gas industries, with the public annuity, shares in railway companies, metallurgical industries and mining companies. In the following decade, financial companies were formed on an international scale which, following the example of the ICGA in London, exported capital and mature, profitable technologies.[67] In the newly established companies, the financing partners played a greater role than the technicians.

In 1861, the leading Geneva banking houses set up the *Compagnie genevoise de l'industrie du gaz* (IDG) in Geneva with a capital of 10 million francs. This company, which intervened in the renewal of contracts and the expansion of installations of pre-existing companies, invested both in the purchase and direct management (Bologna, 1862) and in shares in various companies (Marseilles, Cannes, Naples – in the early 1860s).[68] Instead, in 1862, the *Compagnie générale*

[65] Williot J.-P., *Naissance d'un service public,* cit., pp. 232-261.
[66] Williot J.-P., *De la naissance des compagnies*, cit., pp. 155-156.
[67] Paquier S., Williot J.-P., *Origins et diffusion*, cit., pp. 33-36.
[68] Paquier S., Perroux O.*, De la compagnie privée à l'entreprise municipale. L'exemple genevois* (1844-1930), in Paquier S., Williot J.-P. (curr.), *L'industrie du gaz en Europe*, cit. pp. 302-306.

pour l'éclairage et le chauffage par le gaz was founded in Brussels on the initiative of the *Oppenheim* group*,* which opened subscriptions in Brussels, Paris, Geneva, Frankfurt and Hamburg. The Belgian company started by buying up several concessions at home (Louvain, Tournai, Charleroi) and abroad (Prague, Chemnitz), and between 1863 and 1864 acquired the concessions of Siena, Rimini and Catania in Italy.[69] Both companies were active in Italy where, following unification and the extension of the Piedmontese administrative law to the entire national territory, the municipalities acquired a wide margin of action in the field of public contracts and set up projects to install or extend the gas lighting system, where it already existed, as in the case of Naples and Bologna. In all Italian cities, however, starting with Naples, the initiative did not originate from local mayors but from the outside intervention of foreign technicians, financiers or industries, who acted in concert. Even if, however, reference figures were sought in the area who could provide a valid trait-d'union with the State and local elites. This pattern must be kept in mind because it was repeated, although, in this case, we will describe it for the case of Naples only.

[69] Joseph Oppenheim R. Brion J.-L. and Moreau invested in *La Compagnie générale pour l'éclairage et le chauffage par le gaz* (1862-1929), cf. Paquier S., Williot J.-P., (curr.), *L'industrie du gaz en Europe*, cit. pp. 225-240. The company appears to be connected to the *Compagnie Centrale pour la construction et l'Entretien de Matériel de Chemins de Fer* (1858). Pierre Schaken indeed cultivated interests in both. Dumoulin M., *Les relations économique italo-belges (1861-1914)*, Académie Royale de Belgique, Brussels 1990, pp. 160-174.

Chapter 5

The beginnings of gas in Italy and Naples (1837)

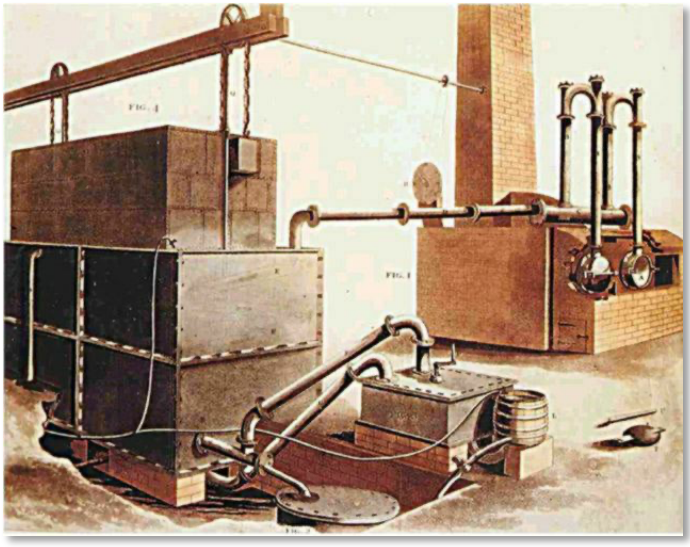
It was the Milanese Count Luigi Porro Lambertenghi (1780-1860) who had an initial, small plant set up in his palace in Via dei Tre Monasteri (today Via Monte di Pietà in Milan). It was a prestigious location because this was where the writers of the romantic magazine *Il Conciliatore* used to meet, a magazine that published contributions ranging from literature to history to illustrations of scientific and technical progress. Among the leaders were Silvio Pellico, Federico Confalonieri, Pietro Borsieri and Ludovico di Breme.

It was Silvio Pellico, tutor to the count's children, who translated into Italian the *Trattato pratico del gas illuminante (Practical Treatise on Illuminating Gas)* by the English inventor and technician Frederick William Accum (1769-1838), published in Milan in 1817. The Count purchased a plant in England from Frederic Winsor, the German who had started the gas industry in England. In all likelihood, the plant purchased was the one illustrated by Accum in his treatise.

Porro purchased the plant, a number of lanterns, many tons of coal and commissioned an English mechanic to assemble and operate the plant. The experiment was successful and the Count wanted to continue by starting a proper public lighting business. Unfortunately, political repression soon followed: in

1819 *Il Conciliatore* was closed, Confalonieri arrested and Lambertenghi fled abroad.

Already in 1818, however, Giovanni Aldini (1762-1834), Galvani's nephew and professor of Experimental Physics at the University of Bologna, had built a lighting system similar to Porro Lambertenghi's but based on oil and not coal. In 1820, after having illuminated the small theatre of his home in Via Olmetto in Milan, he proposed to illuminate the entire Teatro della Scala. However, the Austrians did not grant it because they considered the system still too risky. In 1822, Turin took a little revenge of its own by lighting the Caffè Gianotti (today Caffè San Carlo) with a small coal-fired system.



A system identical to the one installed in Milan by Count Luigi Porro Lambertenghi.

In 1831 it was the turn of Gaetano Brey, who obtained permission to experiment with a lighting system based on oil (in that case whale oil) that was judged to be safe: it did not risk bursting, produced a gas with excellent illuminating power and had no unpleasant odour. In 1832 he designed a privileged Intrapresa for lighting and reached an agreement with Luigi de Cristoforis, designer of the de Cristoforis Gallery, to experiment with lighting in the gallery. The lighting included De Cristoforis's home and the shops on the ground floor of the gallery on his side for a total of 50 beaks of light. The system was also judged excellent by the visiting Archduke Viceroy on 22 August 1832. This was the first illumination of a public place, outdoors even if it was covered. Eventually 36 lamps were installed, 28 movable and 8 fixed. The impact was remarkable.

The literary descriptions document the great impact of novelty of that lighting system and of the light emanating from the new lamps – "silvery, vivid, and one might say sympathetic", said the Sacchi brothers – skilfully amplified in the gallery by marble, mirrors and display cases and which the Sacchi brothers themselves hoped would be extended to all the workshops. Equally surprising, if not frightening, is the mechanical arrangement of the lights along the roof, probably announced by a whistle or a crackling sound, which allowed the lamps to parade one after the other "like a row of geese" or "almost as many little nuns who come out of the cloister in a row and go to their stalls in chorus", as the Sacchi brothers illustrated. The very rare iconographic reproductions of the artificially lit gallery make it rather difficult to define the model and technical characteristics of the lamps used; very schematically, these are portrayed in the well-known image celebrating the great event of the public ball that was given in the gallery on 10 February 1834. Gas lighting was also used in the Pictorial-Mechanical Cabinet, where

"four truncated columns adorned with vague carvings (which) support four lamps enclosed in globes of tarnished crystal, and scatter lively light"; the lamps were turned off and on by themselves at the same time "by an ingenious mechanical apparatus" and the gas was supplied by Brey from the same room in the gallery towards the contrada del Monte (Irene Giustina, *La Galleria de Cristoforis a Milano: : tecnologia e committenza* in (curr.) Giuliana Ricci - Giovanna D'Amia, *La cultura architettonica nell'età della restaurazione*, Ed. Politecnico, Milan 2002, pp. 480-496. Ibid pp. 489-491).

The De Cristoforis Gallery when it was lit with gas.

The theatre hall adjoining the gallery was also illuminated, bringing the installation in Milan to around 50 to 60 lanterns. The demonstration of the De Cristoforis gallery concretely opened up the debate on public lighting in Italy. Brey was unfortunately opposed by the Austrian authorities and it was not possible for him to realise his idea of forming a public lighting company. The traces of his initiative were lost. De

Cristoforis, however, maintained the lighting system in the gallery and later extended it further.

Was it the Milanese initiative that opened up the possibility of Naples? Perhaps. Certainly, it was proof that public lighting was possible, and the King himself, who was travelling, began to advocate the venture. Due to Austrian preclusion, the primacy of gas lighting passed from Milan to Naples, where the first real outdoor public lighting system was to be set up, albeit still to a limited extent. However, the start in the two cities was very close and Turin should also be included in the competition. In Naples, a city then much larger than Milan (which had a population of less than 300,000), Joseph Bonaparte had already tried to improve the lighting by having 1800 oil lamps lit in the city centre. But this was oil lighting, quite different from gas lighting, both in terms of functionality and lighting power.

The actual introduction of a modern lighting system occurred when a group of gas industrialists from Lyon intercepted the needs of the Kingdom.[70] In Naples, the first contacts for the installation of gas lighting date back to late 1836. In Turin already the year before, although the installation was built almost a decade later. Between the end of 1836 and the beginning of 1837, the French entrepreneur and technician Pierre Andriel, who had already worked in the field of steamboats, obtained a concession in Naples for the installation of a gas lighting system. Andriel had come to Naples to obtain a fifteen-year licence for 'accelerated navigation by means of fire trumpets known as steam navigation' – which we discuss in another volume – but also

[70] It is a *'véritable "mania" gazière qui s'empara alors des capitalistes lyonnais',* Cayez P., *L'Industrialisation lyonnaise*, cit., p. 418.

'to set up fossil coal excavations in our royal domains on this side of the Lighthouse'.[71] Moreover, his figure is linked to the beginnings of steam navigation. Evidently, the use of coal as fuel for his steamship made him think that an extension was possible, in prospect, in the nascent gas lighting industry as well. He thus obtained both concessions, but the licence for gas lighting was not followed through for reasons that are unclear, probably due to lack of capital or because the coal he used for his steamship was not allowed to be used for gas lighting as well.

Later, Jean De Frigière, from Bordeaux, acting with partners Montgolfier Bodin, from Paris, and Alexandre Cottin (and a certain A. Joumel whose name is unknown), participated in the establishment of gas companies in various Italian cities: Florence and Venice (1839), Bologna (1846) and Rome (1847).[72] In Naples, De Frigière took action in anticipation of the expiry of the contract for oil lighting, which was set for 31 December 1838. While the renewal of this contract was being discussed, he proposed lighting the city with gas by organising a lighting experiment for King Ferdinand II, which was held on 10 September 1837 in the portico of the church of San Francesco di Paola, opposite the Royal Palace. This experiment therefore took place long before the installations in Venice and Turin came into operation, although companies had already been set up here as in other cities.

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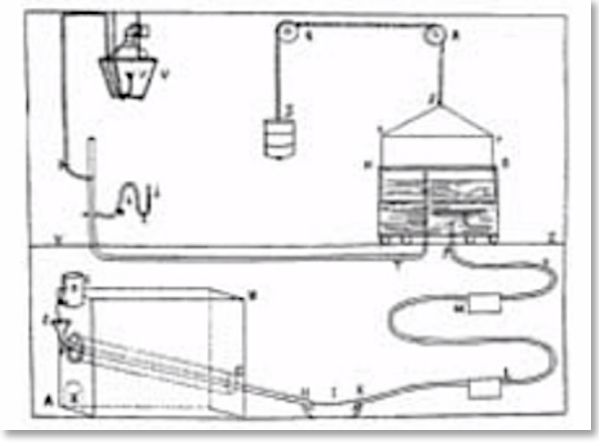
[71] *Collezione delle leggi e de' decreti reali del Regno delle Due Sicilie,* a. 1817, sem. I, Naples 1817, pp. 125, 129-131.
[72] Giuntini A., *Dalla Lyonnaise alla Fiorentinagas,* cit., pp. 8-10 and 16.

The demonstration was held before the eyes of the King, notables, and certainly De Frigière's future partners in Italy (Lorenzo Zino and Charles Lefèbvre) as well as an enthusiastic populace. The first experiment illuminated the portico of the new basilica of Santa Maria di Paola. The technicians installed 29 lanterns, waited for the sun to go down and then lit the lanterns one after the other. It was observed that they gave off a very white light. Although it was small, it was the first fully functioning gas lighting plant in Italy because it included conversion, transport and final use. It consisted of a small 'portable' factory that had been mounted behind the Basilica's porticoes. It was an olive oil cracking plant whose hourly output, which was needed to feed the 29 lanterns (each of which was equipped with 2 nozzles with a total capacity of 200 litres per hour), was estimated at 6 cubic metres. The system, which was of French design, has been described and we therefore know what it looked like. We also have a drawing that shows a cooker that had, on one side, a tin vessel in which oil was distilled drop by drop into an iron tube two inches in diameter. The tube was then heated and made incandescent by the heat of coal.[73] As a result of this heating, gas was formed, which, passing through a lead pipe, was conveyed through a number of oil pans that purified it by eliminating the bad smell. The pipe ended in a wooden vat lined internally with lead. This vat, which had a capacity of 15 barrels, was covered by a second inverted vat, so that there was little space between them. The space between the two vats was filled with water in order to form a sort of hydraulic guard that prevented gas from escaping. Through a pulley system, moreover, a weight was

[73] Andrea Lizza, *Storia dell'illuminazione a gas nella città di Napoli*, pp.1183-1888.

connected which lowered to allow the weight and thus the quantity of gas produced to be calculated. From the bottom of the vat, then, a lead pipe started, which drew the gas above the water level and conveyed it to the lantern, which was lit with a match. It was turned off by means of an interception key, called a *barrage*, which also served to regulate the flow of gas to the lanterns.

De Frigière's system was also equipped with a differential water pressure gauge, which allowed the gas pressure to be controlled by opening an additional shut-off key. This rudimentary but functioning gasometer bell had a capacity of 7 cubic metres, the cracking temperature was between 700 and 759 degrees centigrade and the gas yield was 0.55 cubic metres per litre of oil treated. The calorific value was 10,000 kilocalories per cubic metre.



Sketch depicting the layout of the Neapolitan experiment of 10 September 1837 in front of the King, the people, the notables of the Kingdom.

The strong, steady light coming from the glass spheres must have made an impression on the King and those present, including De Frigière's future 'Neapolitan' partners: the Duchess of Berry and her husband Leopold, Lorenzo Zino, Carlo Filangieri and Charles Lefèbvre. The latter three were partners in joint ventures and the latter two met several times at the latter's house to discuss this business, both at Isola di Sora and in Naples.

Before asking the French entrepreneur to resume the project on a larger scale, the King consulted chemists and experts to ensure that the gas, which had a strong and unpleasant odour, was not toxic. The experts' opinion was unanimous: the gas was not harmful to health. The process of examination, of finding funds on the local market, of analysing the gas, the pros and cons, took about a year, but by the end of 1838 everything was ready and it was decided to build a system that would extend gas lighting to the Royal Palace, along Via Toledo and other routes. Unlike in France or England, here the decision-making process and legislation could be approved much more easily. The Bourbon Kingdom was an absolute monarchy and a royal decree with a concession and privative were all that the entrepreneur needed to get started. There was money to be found, of course. And from this point of view, Naples was a more difficult place than London or Paris. However, De Frigière knew his way around, he was part of an entrepreneurial-financial network already in place. Part of the money he took from Lyon partners and the rest was paid to him by the Neapolitan partners.

The contract with the Kingdom was signed on 13 December 1838. De Frigière acted in his own name and as representative of the 'lighting company united in partnership with Messrs.

Alessandro Cottin and Montgolfier Bodin'. The contract had a duration of 15 years, with an expected completion date of 1854. The company was called the *Compagnia di illuminazione a gas per la città di Napoli*. At the time, it was allowed to excavate a few streets in the city's most elegant neighbourhoods, starting from today's Piazza del Plebiscito (Largo Palazzo) and then Villa Reale, Teatro San Carlo, Rivera di Chiaia (where the centre of the network would be located), Chiatamonte, Monteoliveto, Via dei Tribunali, Via Foria, Porta Nolana as well as the vicinity of the Royal Palace. From the Palazzo degli Studi (now the National Museum) a branch was then to illuminate the Albergo dei Poveri, Castel Nuovo and a few other points: 34 in all. In the rest of the streets, oil lighting was to be maintained, which guaranteed the consumption of a material of which there was an abundance and ensured considerable earnings for the city's powerful merchants.

In the decades that followed, as in many European cities, Naples was faced with the construction of aqueducts, sewers and lighting networks in order to solve urgent public health and safety problems. Above all, aqueducts and sewers were to be the subject of the so-called 'Risanamento', which was much talked about in the last quarter of the 19th century.

The capital needed to set up the first gas company, which would dominate unchallenged until 1962, came from Lyon, mainly from the Lyon-born but Turin-born banker Theodore Brouzet (1796-1859), the notary Prospero Gallay (1795-post 1842), the shopkeepers Victor (Vittore) Chartron (1782-1842), his son-in-law Adolphe Girodon (1798-1885), married to one

of Chartron's daughters, and Alfred Girodon (c. 1810-1849).[74] This was a very close family and friendship group linked by kinship and common affairs, residing in Lyon but almost all originating from small communes in the Ardèche.

Adolphe Girodon was, among other things, a silk industrialist who also invested his money in Lyon's 'new industry'. His entrepreneurial history is impressive: administrator of *Le Magasin des soies de Lyon* (1859), shareholder of *Crédit Lyonnais* (1863), even before that of the Compagnie *des fonderies et forges de la Loire et de l'Ardèche* (1836), administrator of the *Compagnie des Mines de la Loire*, auditor and administrative director of two oil production factories in *Rive-de-Gier* and *Saint Étienne* (1854-55). He also sat on the board of the steel company de l'Horme. Victor (Vittore) Chartron came from a family of silk merchants in Saint-Vallier and was also involved in many of the same companies. Girodon therefore had experience in mining, oil refining, banking, heavy industry and had considerable contacts in the world that mattered at the time.

Some of them, and in particular the last two, were members of the *Société de l'Union pour l'éclairage par le gaz*, a limited partnership established in January 1837 in Lyon, which had publicly announced in 1838 that it was extending its activities through companies set up specifically for the installation and maintenance of lighting systems in various cities. Among these, in addition to those active in Rennes, Dijon and Strasbourg, was the Neapolitan company.

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[74] Bartoletto S., *Gli esordi,* cit., p. 570 and Cayez P., *L'Industrialisation lyonnaise*, cit. pp. 422-424; Bouvier J., *Le Crédit Lyonnais de 1863 a 1882: les années de formation d'une banque de dépôts*, t. 1, Impr. Nationale, 1961, pp. 131-132.

The *Compagnia di illuminazione a gas per la città di Napoli* was founded in Lyon on the basis of a notarised deed dated 20 January 1839 by which Chartron and Girodon, together with Brouzet and Gallay, commissioned Alphonse de Boissieu (1807-1886) to continue negotiations with the city, choose the site for the workshop and begin work. Born in Lyon on 11 December 1807 into a noble family, De Boissieu studied law and was known as a legitimist politician and a man of great culture, with interests as an epigrapher and archaeologist. The partners were carefully selected from among those active in the Naples marketplace, financially sound and of recognised open-mindedness. The contract meticulously set out various information and prescriptions regarding the way in which the lighting service was to be provided. Since the effect of the light produced with gas lanterns had to be no less than double that produced with oil lamps, the contract contains a summary and pragmatic method for controlling the brightness of gas lanterns: being able to read – it is not clear – at twice the distance of oil lighting.

Faced with this increased financial strength, De Frigière decided on 11 March 1839 that it was more convenient for him to cede the plant at San Francesco di Paola – which had evidently not been dismantled – together with the contract to De Boissieu and partners to create a joint stock company in which he secured a share. The costs of the plant to be built were to be borne entirely by the contractors and De Boissieu. Although the contract did not stipulate a specific site for its construction, but only stipulated its location outside the city, the factory was to be built on an eastern municipal area where other industrial factories were already established. Instead, it was built at the opposite end of the city, in the Chiaia area,

destined to become a residential area and already densely inhabited. The land in Vico Cupa di Chiaia was located between two pieces of land belonging to Lefèbvre and a certain Verhulet. This later created quite a few problems.

De Boissieu completed the construction of the workshop and the canalisation, and directed the company until it was established. The use of gas from the processing of olive oil was envisaged, and the use of gas produced from coal or wood was expressly forbidden. Very stringent were the penalties applicable to contractors in the event of delayed switching on or early switching off of lanterns, failure to clean lamps, or lack of gas.

The workshop was inaugurated on 28 May 1840. On 29 June, in a private deed, the people of Lyons, who had hitherto controlled all operations, undertook to leave a quarter of the shares to a number of Neapolitan citizens once all the work had been completed; these citizens, who had certainly followed the work closely, were selected for their financial solidity, but – we must believe – not only for that: it is also probable that the two entrepreneurs chosen had been identified by the King himself. The other Neapolitan figures, who belonged to the royal entourage, had symbolic shares that allowed them to attend the company's meetings and maintain a certain amount of control.

The three gasometers installed were of French technology and construction while the pipes, fittings, instruments and tools came from the Neapolitan foundry *Zino, Henry & Co* founded by Lorenzo Zino in 1833. The King wanted the spread of lighting to have a beneficial effect on local industry. The factory in Vico Cupa originally extended over an area of 550 square metres in a 12.5 metre high building, which housed 14

retorts for the production of gas while the products of combustion were released through a 128.52 palm chimney, a good 34 metres high. Adjacent to the plant were two large pavilions containing offices and warehouses, each measuring 500 square metres. The gasometric capacity of the first plant was approximately 200 cubic metres per hour. The production process was based on *cracking* oil using a patented British process. It was a technique that was considered not very advanced and inefficient compared to others in use by the French, such as the production of gas from earthen coal (lithantrace).

As early as the spring-summer of 1840, problems began. An inadequate yield of the plant, insufficient for the production of quality gas, was observed. In part, this was attributed to the late delivery of shale gas, which was considered indispensable to increase the illuminating power of the gas, but also to gas leaks on the pipelines. On 15 June 1840, there was a spectacular but not very destructive explosion that caused great consternation and fear in the city. De Boissieu had to report to the Minister of the Interior on 15 June 1840, assuring him that it was a problem that would not be repeated. In any case, it was above all the technical problems related to the canalisation – smells, leaks, excavations with danger of collapse – that fuelled mistrust.

At that point, the engineer Mandudit (a name that appears in the sources but does not correspond to any identifiable person) was called in to manage the plant. By the end of the summer, the installation of the three-armed cast-iron poles and wall brackets on which the gas lanterns or lanterns, supplied by the street pipes, were installed, had also been completed. Each pole was equipped with a gas shut-off system and two

spouts that were lit with a lighter by an igniter or lamplighter. Later, a problem noted by many observers about the lack of uniformity in the light emission was improved by introducing a regulator that made the flame more stable compared to open flames. Lighting and extinguishing operations were carried out by specially trained personnel who, for a few decades, constituted a small aristocracy among the Neapolitan workers; the teams consisted of a few dozen Neapolitan lighters, who operated with a long pole on top of which was placed a lantern; they used long, narrow ladders that were used for maintenance work, and especially for replacing the wick and cleaning the glass bowls of the lanterns, which tended to blacken easily. Above these lighters, inspectors supervised that each operation was carried out in a workmanlike manner. As can be seen, the organisation of this first enterprise was not simple. We have a description of the factory made by a journalist in December 1840:

The Neapolitan and French Company formed for the gas lighting of the city of Naples has founded a vast establishment in vico Cupa near S. Maria in Portico, which includes in the same enclosure the large ship where the furnaces for the distillation of the gas are located, the hydraulic basins destined to be the gas tanks, the purifying apparatuses that must purify it, the warehouses for the conservation of the materials, and finally the factories necessary for the service and employees. The good arrangement and intent put into the distribution of all the parts of this establishment leave nothing to be desired. Without losing the beautiful ensemble full of harmony and grandeur, each of them is perfectly established and calculated for its intended use. The distillation room above all satisfactorily impresses the viewer by offering an imposing mass with a façade of correct and severe design, with the elegance and boldness of the

vaults, and the great pyramidal chimney that rises in the middle of the factory.

As for the work outside the factory so that the gas will flow and be communicated to the main quarters of the city and later to the entire city, it is in full swing; with equal zeal the housing of the molten iron pipes is continuing, and especially the main canal that will cross the Riviera di Chiaia and extend through the streets of Chiaia and Toledo. If the great difficulties that arise in these neighbourhoods where the housing itself had to begin, if the numerous watercourses, the great gutters that often intersect in unequal planes, did not sometimes hinder the continuation of these works, which by their very nature demand great care and scrupulousness, if finally the bad season did not interrupt them, they would be completed more quickly, but praise is due to the efforts of the *Compagnia del gas* that triumphs over so many obstacles.

The purpose of this company was, at the same time, to meet the public's needs and the interests of Neapolitan factories, and to this end the foundry of Messrs *Zino Henry and C. is* provided with all the tubes and apparatuses of molten iron that it needs. of all the tubes and apparatuses of molten iron it needs; one of the Neapolitan trading houses will likewise supply the lead tubes for public lanterns and for the illumination of details; but at the same time it will bring from France the machines not yet known in Naples, and whose manufacture can only be carried out by special workers; these machines would have already arrived if for two months contrary winds had not opposed the landing of the ships on which they are embarked, and such is the reason that keeps the workers who were brought in on purpose to place the gazometers in the hydraulic tanks whose beauty we admire, idle.

All in all, the inspection of the works and constructions of the *Compagnia del gas* inspires us with the greatest confidence, noting moreover that from 8 May 1839, the day the foundation stone was laid, until today nothing has been overlooked in order to develop them with the greatest activity and foresight. The public expected a

useful establishment from the Company, and it has still made a monument of it.

December 1839 (*Bollettino di statistiche ed economiche d'invenzioni e scoperte*, Società degli Editori degli annali universali, 1840, Milan pp, 220.221).

The article seems to contain many justifications that the technicians evidently presented to the writer, knowing full well what criticism was circulating in the city. In any case, when the work was finished, the capital was calculated on the basis of the expenses incurred at 350,000 ducats and divided into 3,500 shares of 100 ducats registered to the bearer, and the contract – the actual constitution of the company – was signed on 7 January 1841, when the activity described had already begun. Unlike other companies that were set up before the construction of factories, factories, materials or means of transport, here the first investors had created the infrastructure and then set up the company registered on the Naples market.

[...] at the end of 1840, the calm seemed to return to the Neapolitan nights. De Boissieu sent home some French workers who were unable to maintain good relations with the population [...]. On the other hand, municipal officials and above all the citizenry began to tame themselves and live with the gas, including [...] the stench. At the beginning of 1841, a year and a half after the first entry of the Neapolitan partners, and with the whole plant at full capacity, a new organisation was set up with a 30-year renewable duration and a new name: *Compagnia di Illuminazione a Gas della Città di Napoli*. The orgy of capital letters gave importance to the event:

1. the right of the founding members to gaslight the city of Naples;

2. the production factory and two plots of land to house the

facilities (the second was purchased by Pio Monte della Misericordia);

3. 18,000 linear metres of pipes, as many as were sufficient for the complete illumination of Naples;

4. all streetlights that the municipal administration was obliged to reimburse in 15 years;

5. two gasometers each containing 35,000 cubic feet of gas and as many cookers as needed to fuel them.[75]

As agreed, once the installation work had been completed with the first canalizations that allowed the production of gas, or gaz, as it was called at the time – 9 January 1841 – to begin, the *Compagnia di illuminazione a gas della città di Napoli* was definitively established before the notary Carlo Maria Ferrar.[76] It was to be participated in by De Frigière and the individual Lyon partners, who would hold the majority. At this point, the *Union pour l'éclairage par le gaz* would not enter the company as a legal entity.

A picture that seems to refer to the factory built in 1838 in Turin shows a building with the same characteristics described for the factory in Vico Cupa di Chiaia, including the characteristic pyramid-shaped chimney that 'in the middle of the factory rises'. The builder was in fact the same: Hippolyte Gautier. If this is not the Neapolitan factory, it is built according to the same model inside and out.

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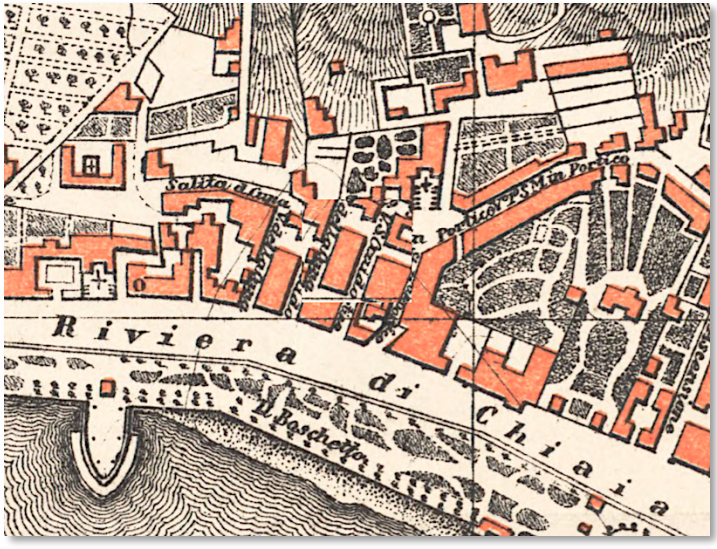
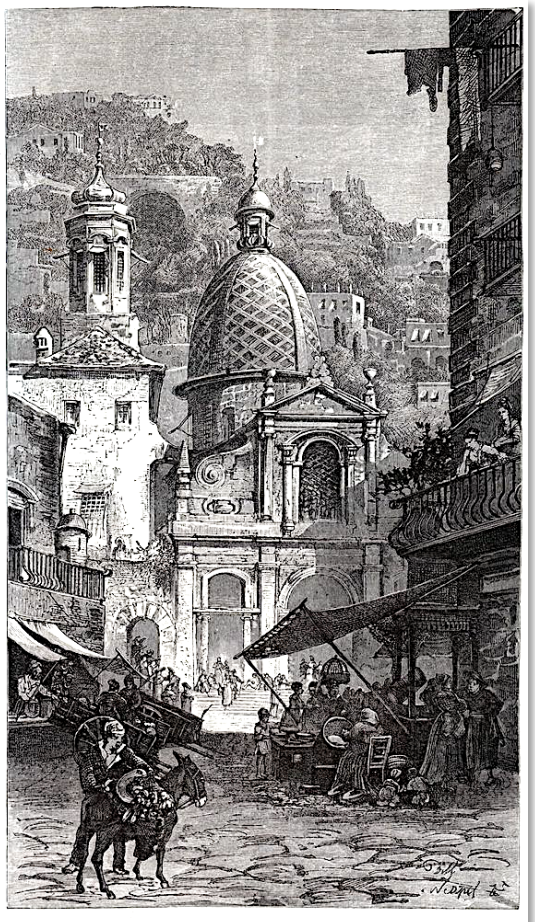
[75] Pier Antonio Toma, *Napoletanagas: 1862-2012. Da 150 anni il futuro della Campania*, Compagnia dei Trovatori, Naples 2012, p. 26.
[76] *Le Compagnie del gas in Napoli,* cit., p. 98.

A map of Naples, drawn and published in Milan in 1860 by Ferdinando Sacchi e Figli, shows Vico (later Via) Cupa di Chiaia (today corresponding in part with Via Palasciano), the fourth street on the left starting from the garden of Villa Pignatelli. In today's Via Palasciano, no buildings can be distinguished that might recall the structure of the ancient factory. The first building on the street front must have been the gas factory, which was installed there between 1840 and 1860 and then demolished. The plant, which stood on land belonging to the municipality, bordered, as mentioned, on land owned by Charles Lefèbvre, land that in later years (1850-1860) underwent extensive redevelopment. On the left side of the church of Santa Maria in Portico, moved a block away, in an alley leading to Chiaia, the first gasometer for lighting was built by the *Lyonnais Society in* a new building.

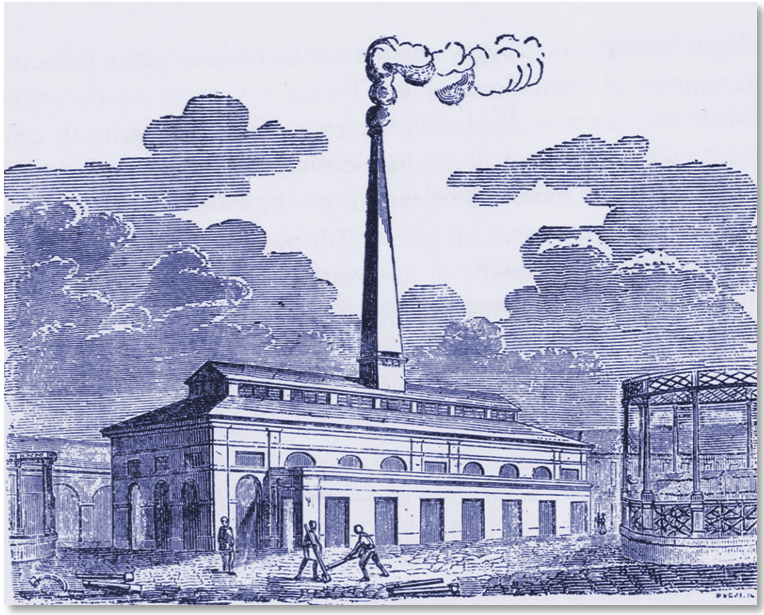


Map of Naples from 1859: in the centre, slightly to the left, you can see the Salita and Vico di Cupa di Chiaia.



S. MARIA IN PORTICO IN NEAPEL.

The first gas production plant stood just a few metres from this church.



The Turin factory was built by Hyppolite Gautier, the same architect as the Neapolitan one. The two factories were, in all likelihood, very similar, if not identical.

As far as the company composition was concerned, the share capital was calculated on the basis of the expenses already incurred and was 350,000 ducats, represented by 3,500 shares, which were distributed among those who had participated in the enterprise as follows:

De Frigiére and Associates (Bodin, Cottin and Jumel), no. 412.
Adolfo Girodon, No. 386.
Alfred Girodon, No. 386.
Vittorio (Victor) Chartron, owner in S. Vallier Drome, no. 386.
Teodoro Brouzet, banker in Lyon, No. 386.
Prospero Gallay, former notary in Lyon, No. 386.
Alphonse de Boissieu, owner of Lyon, No. 193.
Hippolyte Gautier, civil engineer in Lyon, No. 193.
Balsamo Vienot and C., Bankers, No. 275.
Carlo Lefebure, shopkeeper in Naples, No. 200.
Alfonso Pouchain, owner in Naples, no. 120.
Zino, Henry & C., no. 100.
Lorenzo Zino, shopkeeper in Naples, No. 27.
RR. Princ. of Syracuse Count Lucchesi Palli and Duchess of Berry, 15 cad. no. 30.
H.E. Lieutenant General Prince Filangieri, No. 20.
Total number of shares 3500.

An examination of the shares shows that the absolute majority, 66% of the capital, was guaranteed to the Lyonnais partners by the division of 386 shares into 6 shares, one of which was in turn divided between Alphonse de Boissieu, two members of the Girodon family and Hippolyte Gautier. Despite the preponderance of the Lyonnais in the division of shares, the management body was rather equal as the company was run by a board of directors made up of 5 members, 2 of

whom were Neapolitans, 2 Lyonnais and one representing the government. The elected members were Zino and Lefèbvre. Given that, among the founding members of the *Société d'éclairage par le gaz de la ville de Lyon*, along with Gautier were the De Bossieu father and son.[77]

A few more words must be said about the Neapolitan personalities. Among the Neapolitan partners, as mentioned, we also find exponents of the Kingdom's high aristocracy, namely two members of the royal family, the King's brother, Leopold Bourbon, Prince of Syracuse (1813-1860), and his sister, Caroline of Bourbon, Duchess of Berry (1798-1870), who took the shares for Count Ettore Lucchesi Palli (1806-1864) with whom she had united in 1831 after the death of her first husband, the Duke of Berry. These personalities, of whom no particular interests are known, neither in technology nor in business or finance, and who invested symbolic shares (30 ducats each), seem to simply represent a tribute to the King who could not, for reasons of convenience and etiquette, participate directly in the deal. Even the powerful general Carlo Filangieri, prince of Satriano, who we find in many important companies of the time and who from 1832 directed the state-owned metalworking plants that were to become the Officine si Pietrarsa, had invested the symbolic sum of 20 ducats.

Apart from Zino (who personally had only invested 20 ducats) and Lefèbvre, the other Neapolitans held 'symbolic' shares. The only independent 'Neapolitan', admitted to the deal

[77] Cayez P., *L'Industrialisation lyonnaise,* cit. pp. 417; 424; 1022. Cadrat F., *Les journaux légitimistes de Lyon et leur personnel sous la Monarchie de Juillet*, in 'Revue d'histoire de Lyon', 1913, pp. 311-313.

in an important personal, not corporate capacity – like Zino – was Carlo Lefèbvre (written in the notarial deed in Latin, Lefebure). Both Lefèbvre and Zino were already partners in several important enterprises. In the future, Lefèbvre would be the largest shareholder after Zino in the formation of the capital for the re-founding and relaunching of the prestigious mechanical factory *Zino, Henry & C.* in the 1855 deed of incorporation.

Lefèbvre was French, Zino was not. They were at that time the richest merchants, financiers and industrialists in the city (apart from the Rothschilds), 'shopkeepers' active in financing state-protected industrial activities.[78] Born as an entrepreneur in the paper mills sector, Lefèbvre figured not only in *Zino, Henry & C.*, but also as a shareholder in the *Società Industriale Partenopea*, in the *Compagnia di Navigazione a Vapore delle Due Sicilie* and as owner of the vast *Cartiera del Fibreno* complex and printing works.[79] While Zino controlled, through his own personal share and that of his company, 127 shares, Lefèbvre held 200 shares.

A very limited number of native subjects were admitted to the deal, others probably would not have been refused if they had wanted to participate, as was the case with the Rothschilds, who had been present in the Neapolitan market since 1823. Apparently, they did not participate unless someone from

[78] Davis J.A., *Società e imprenditori*, cit., pp.17-48.
[79] *Le Compagnie del gas in Napoli*, cit., p. 96. De Rosa L., *Iniziativa e capitale straniero nell'industria metalmeccanica del Mezzogiorno 1840-1904*, Naples 1968, p. 3, 7 and 64. On Lorenzo Zino, see de Majo S., *L'Industria protetta: lanifici e cotonifici in Campania nell'Ottocento*, Athena, Naples 1989; Davis J. A., *Società e imprenditori*, cit., pp. 119-122.

Lyons acted as a front man, which was the case with other French gas companies and as was likely to happen after Unity.

The bankers Balsamo, Vienot and C. guaranteed the deposit paid by the contractors. Alfonso Pouchain, whom the company's memorandum of association describes as an 'owner in Naples' was, as we have seen, from Lyon and was later chosen by the directors to replace De Boissieu.

The latter complained of technical difficulties, as well as hostility from the city's environment due to the inconvenience the excavations caused to the inhabitants, the unpleasant smells from gas leaks in installations that were still imperfect or during testing. Some clauses of the contract, imposed by the Administration to protect the economy of the Kingdom, had turned out to be very burdensome: for example, the use of minerals from the state mines of Mongiana (an iron and steel complex founded in 1770-1771 by Ferdinand), which the people of Lyons considered unsuitable, had been imposed, and the use of coal as fuel for distillation was expressly forbidden. As an alternative fuel, olive oil was imposed, which was produced in large quantities in the Kingdom and to whose trade the interests of important trading houses were linked.

Oil lighting, on the other hand, continued and was included in the contract signed by De Frigière. This, however, provided for the option of subcontracting its execution to the holders of the previous contract, until any further requests from the administration to extend the gas lighting. The holders of the oil lighting contract were "Messrs. Rocca and Scala", who had participated in the signing of the contract by securing the subcontract for the oil lighting, even though they had not joined the company in which, in fact, they are not listed.

It is unknown whether this foreclosure was due to a prior agreement or was the result of mediation with the Neapolitan business milieu. What is certain is that Andrea Rocca, a 'shopkeeper' of Genoese origin, who made agreements for the firm Rocca e Scala, was one of the Rocca brothers, i.e. one of the most conspicuous trading houses in the Kingdom, and one of the five 'signatures of the square' whose undisputed solvency guaranteed the circulation of the term bills with which transactions in the grain market were settled. The other, Nicola Maria Scala, was Judge of the Commercial Court.[80]

It is therefore possible that the *Società lionese* had not met with favour among the city's economic elite. In general, other Neapolitan 'proprietors' were hostile, as De Boissieu complained to the Minister of the Interior: 'a distinguished malevolence in the class, which by virtue of its position should indeed encourage and favour true progress, threatens to completely ruin our company and make its development impossible'. These were 'several conspicuous owners' followed later, by emulation, by many others. Many important names of the elite of the time had not entered the gas business: perhaps they considered the French presence excessive. "Our industry, Excellency," De Boissieu's letter continued, "does not live on public illumination; the particulars alone can make it bear the heavy burden of a service at a low price. Perhaps some Neapolitans were jealous of the innovation brought by the Lyonnais? The conflict was nevertheless considerable. A report by the Intendente of Naples on 23 January 1841 noted the poor 'association of private individuals', the depletion of funds, high daily expenses and low income.

[80] *Le Compagnie del gas in Napoli, Naples 1862*, pp. 63-68; Davis J.A., *Società e imprenditori,* cit., pp. 66-92.

A report from the Board of Intendance to the Minister confirmed De Boissieu's views; it noted the opposition to the spread of the service to private individuals that came from oil producers and merchants as well as building owners, who in some cases forbade tenants from having gas lamps installed. Not only that, they took legal action against those who did so. At the same time, the same problems arose in Turin. At the start of the new gasworks that supplied lanterns similar to those in Naples, the population was divided into two currents that Silvio Pellico called 'gasists' and 'anti-gasists'. While the some extolled the beauty and vividness of the light that gas brought, the others lamented the dangers of the bursts, the fumes and the cost of gas, which, compared to the oil that had been used for centuries, was extremely high. When, years later, the Italian Futurists railed against 'moonlight', they were also referring to this: lovers of modernity, of artificial light, of speed, they mocked those who were nostalgic for the times when night light was still scarce and kept the mystery alive.

Chapter 6

A difficult undertaking

Problems that were encountered during the construction phases included, after the entire system had been installed, the leakage of gas from the joints (a real problem, of course), with the result that the excavations sometimes had to be reopened and everything had to be redone. For the various reasons, two years after the company was established, the 408 lanterns planned to illuminate the 34 locations in the city had still not been installed, and therefore more was required from the capital already employed, which the members paid in. Against this critical background, however, all the shareholders of the Company by absolute majority demanded the replacement of Managing Director De Boissieu at a meeting that probably took place in Vico Cupa on 6 April 1841. Alfonso Pouchain was chosen, who would govern the company's fortunes for so long that it would be associated with his person. By the middle of the decade, in fact, the *Società Lionese* was commonly referred to as the *Compagnia Pouchain*.

The moment was also difficult for other reasons: there had been a high increase in the price of oil, the only fuel. There was also the difficulty of finding oil shale on the market, an indispensable component to improve the illuminating power of gas. Therefore, one of Pouchain's first acts was to request the use of coal instead of oil and to apply for permission to extract gas from coal. When the construction of the plant, according to

the original specifications, was completed, permission was also requested to extend it to other parts of the city.

That the relationship between the Lyonnais and Lefèbvre was close is also shown by the fact that Alfonso Pouchain was to become director of the Stamperia del Fibreno, remaining to live in Naples all his life.

Returning to the affairs of the *Società Lionese* or *Compagnia Pouchain*, after a probably heated debate, the Decurionate granted the extension in 1844, with the possibility of digging new tracts, and also allowed the extraction of gas from hard coal, certainly displeasing some powerful merchants. Pouchain insisted on this point: the survival of society depended on it. Thus began the importation of coal from France, mainly via *steamships* of the *Amministrazione della Navigazione a Vapore*. All this, however, kept revenue low and led to fears of the *Compagnia Pouchain*'s ruin. For all these reasons, it is well known that until 1844, the shareholders did not receive any dividends. Admittedly, they were high earners, people who had plenty of money and could wait; they wished to participate in innovative ventures and therefore did not withdraw their money even after the period of compulsory restriction.

It was precisely in 1844 that a silver medal with a diameter of 33 mm and the following description was struck in the mint of Lyon (it was decided to have it struck in the mint of Lyon as the shareholders were predominantly from this city): Opus: Marius Penin (1807-1880) 1844.

The inscription NEAPOLIS appears on the medal. Parthenope is seated on a throne in the form of a rostral prow and facing to the right, she holds in her left hand an olive branch to represent the importance of olives in the distillation

of gas; a small shell can be seen near the rostrums and in the background Vesuvius in eruption, in the exergue is written

COMP.ie DU GAZ
under: M. PENIN F.
Rampant lion with torch on globe with inscription:
LUCEM DIFFUNDO PER ORBEM: I spread light throughout the world – referring to the Company of Lyon (lion).
Underneath: MDCCCXLIV (in incuse)
on the sides: PENIN F. - LUGDUNI (in Lyon)
In the cut: ARGENT in incuse

It is significant that the figure of Parthenope, the ancient goddess who naturally represented Naples, is depicted as a seated matron, with the Bay of Naples and smoking Vesuvius in the background and holding an olive branch in her hand. The olive tree represented the primary source of fuel but also the peaceful, civilised nature of this enterprise. However, the suitability of olive oil as fuel was disputed by the French technicians.

The causes of the company's poor performance were attributed to various problems: to the fact that the work had not been carried out in a workmanlike manner; that the

canalisation gave rise to gas leaks in many places, due to the numerous joints required because of the tortuous route of certain streets or the frequent interruptions during the installation; or even because other underground services had been encountered in the course of the work: modern and ancient water pipes, ancient walls, sewers, underground water tanks, cellars extending under the streets. The city authorities, for their part, attributed the responsibility for the canalisation defects to the inexperience of the foreign workers, ignorant of the Neapolitan 'trembling soil' and stubbornly out of 'natural French pride'.

One of the 1840 lanterns.

A mid-century French cartoon depicting the same protests that took place in Naples against lighting gas pipes and gasometers: polluting, explosive, smelly.

The quality of the lighting was also deemed unsatisfactory and De Boissieu attributed the cause to problems of a technological nature arising from the fact that equipment had to be used that had been created for coal combustion and then modified, but not expressly designed for olive oil gas; this was

compounded by inexperience in the autonomous adjustment of the lamps by the users, which led to accidents.[81]

To solve these problems, Alfonso Pouchain, the representative of the Society's Council, had asked, as we know, for authorisation to use coal as a raw material for distillation in derogation of the 1838 contract. This authorisation was only granted to him in 1844.

In the meantime, in 1845, De Frigière, who had started the Neapolitan venture, moved to Bologna and presented a project with tender specifications for the city's gas lighting that had been sent to several companies. The city administration, however, preferred *Grafton and Goldsmith* to him, considering the latter's technical expertise more important than the financial backing offered by De Frigière. *Grafton and Goldsmith* was a 'renowned manufacturer of appliances for gas lighting'. It was weighed down by the unfavourable opinion of some Parisian bankers that Grafton's creditworthiness and financial solidity was doubtful. In fact, the dealers had difficulty depositing the security. However, although it was outside the network of relations of French high finance, *Grafton and Goldsmith* from a technical point of view was very competent and its installations had not experienced the problems encountered in Naples. In De Frigière's defence, it can be mentioned that the soil in Naples was much more difficult to work with. Grafton had built workshops in Brigthton, The Hague, Barcelona, Cadiz, Passy, Batignolles, Neuilly, St. Denis, Versailles. Grafton and Goldsmith had also worked with the pioneer of the gas industry, Charles Lebon, in Spain.

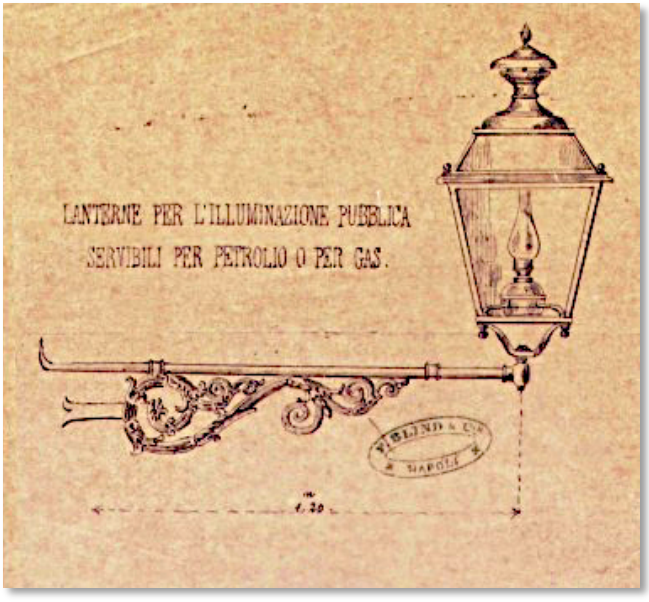
[81] Ibid, pp. 100-104.

So, while De Frigière's financial reputation was good, there were doubts about his technical skills and the unfortunate developments in the Neapolitan venture had damaged him not a little, as the reputation of those problems had spread. To have entrusted the undertaking to others was considered a defeat for him. The only installation he had built entirely up to that point was the contract for the public lighting of Venice. He did enjoy the strong support of the councillors who illustrated his offer, Count Carlo Marsili and Count Ludovico Isolani, but the Council finally rejected his offer when De Frigière asked for a change in the article concerning the prices envisaged for the purchase of materials in the event of redemption at the end of the contract. For the presentation of the contract to the Bologna City Council De Frigière had used the intermediation of two local businessmen, Adriano Trouvè and Enrico St. Cyr, born in Bologna and 'shopkeepers in Rome'.[82] Therefore, what had succeeded for him in Naples did not succeed for him in Bologna.

Also in Rome two years later, in 1847, De Frigière was the author of a gasometer project. The first proper gas lighting contract in the capital was awarded to the brothers Adriano and Marcellino Trouvé and later the concession was taken over in 1852 by the Englishman Sir James Shepherd on behalf of the *Imperial City of Rome and Italian Gas Light and Coke Company*. It was later devolved to the *Anglo-Roman Society for Gas Lighting of the City of Rome,* which was established on 10 March of the same year. This in turn – demonstrating

[82] Alaimo A., *Prima delle municipalizzazioni: gas e acqua a Bologna nella seconda metà dell'Ottocento* (1846-1875), in Berselli A., Della Peruta F., Varni A. (eds.), *La municipalizzazione nell'area padana*, cit., p. 270 and p. 289.

how this technology was still the preserve of the few – was given to Carlo Pouchain (son of Alfonso Pouchain) in 1869.[83] Also in 1852, the Bologna business, interrupted in 1849, was taken over by the *Nuova impresa di Charles Laffitte, Blount e Compagni*, bankers in Paris, represented by the lawyer Zanolini and the engineer Augusto Vitali, director of the workshop.[84]



The type of lamp used in Naples, convertible from vegetable gas to fossil gas.

[83] Cecchini L., *Contratti per l'illuminazione con la Società anglo-romana*, Rome 1906, p. 121.
[84] Alaimo A., *Prima delle municipalizzazioni,* cit., p. 290.

As for Naples, when a contract was nearing expiry, other companies or unions of European companies were evaluated in search of better contractual conditions and new entrepreneurs. The best conditions were offered by Luis de Gosse from Paris, who demanded exclusive rights to the service for a certain number of years.[85] However, as the *Compagnia Pouchain* retained the licence for private lighting until 1871 and had full ownership of the installations and ducting, it was decided to recontract the offer with Pouchain. The new contract, signed on 16 October 1854, granted public lighting for a duration of 17 years until January 1871, in order to equalise the expiry date of the contracts for public and private lighting.[86] An exploration into the possibility of improving the technical equipment of the installations had begun in 1851 when the Intendant of Naples, as the expiry of Pouchain's contract approached (31 December 1853), had asked the Neapolitan ambassadors in London and Paris to enquire about the production and management systems adopted in those cities, where it was known that the public lighting system worked very well. He had Mr. De Gosse of Paris submit an offer to counter that of the *Compagnia Pouchain*, but in 1854 the contract with the *Compagnia Pouchain* was renewed.

Despite the new contract, the economic conditions of the *Compagnia Pouchain* did not improve, although it continued to provide its service until Unity with the same partners. At the fall of the Kingdom, the first Municipal Council of unified Naples posed the problem of lighting with the idea of extending the service to the entire city territory by granting it

[85] *Le Compagnie del gas in Napoli,* cit., p. 141.
[86] *Ibid* p. 143.

to a large Company. However, since the 1853 contract was due to expire in 1871, a tender was called for the part of the city that went beyond the perimeter reserved for the *Compagnia Pouchain*. It was then assured that in 1871 the contract would be extended to the entire territory. The three competing bids were those of the *Compagnia Pouchain* itself, the Turinese N.O. Accini, on behalf of a company to be formed (a report was written on this proposal: *Progetto sull'illuminazione della città di Napoli a gaz fluente e portatile. Proposta dalla Compagnia N. B. Accini. Riflessioni dell'avv. Alessandro Alfieri,* Naples, Tip. Di G. Rusconi), and that of *Parent, Schaken et C.ie* of Paris, *contractors* in large enterprises in France and elsewhere, including the construction of railways.

As for the search for the best contractor to offer the gas service, the offers differed essentially in the type of capital return guarantee required. To circumvent the problem of the *Pouchain Company*'s exclusivity, *Parent, Schaken et C.ie* offered to light up the perimeter not granted to Pouchain until 1871, by installing its own ducting where possible, or otherwise using 'portable gas', i.e. wagons containing tanks. In return, they asked for a 50-year concession for the entire city (1871-1921). The idea of the promoters was to induce 'agreement between the old concessionaire and the new, not so much by the will of men as by the necessity of things'.[87] They applied in Naples what had been done in Paris, where the concession granted to the Pereire brothers had made it necessary for the existing companies to join the merger, on pain of being ousted from the business. *Parent, Schaken et C.ie* reached an agreement with the *Compagnia Pouchain* – which

[87] Savarese R., *Dell'illuminazione della città di Napoli. Memoria al Consiglio Comunale di Napoli, Naples* 1861, p. 10.

had appealed against the Municipality's decisions (8 February 1862) – to cede the plants and rights deriving from the 1854 contract. Thus, having reduced the bids to two, the City Council decided in favour of *Parent, Schaken et C.ie* on 24 March, and on 12 May 1862, the contract was notarised granting this company the exclusive right to public and private lighting throughout the city, for the duration of 60 years, from 1 June 1862 to 1 June 1922.

The city council that had replaced the decurionate, unable to get rid of the 1854 contract, called for a tender for the part of the city excluded from the previous agreement. In addition to Pouchain, a certain Accini and Emilio Emery also participated in the tender. This Emery (sometimes referred to as Hemery) was the progenitor of a family that some 40 years later, with Giulio Emery, would run the Lefèbvre paper mills, which were sold by the owner family to the Turin-based *Società delle Cartiere Meridionali*. Emilio Emery was a co-founder of the *Cartiere del Liri* in Isola and his son Giulio (who died in 1904) was the director of the *Cartiere Meridionali*, which would bring together several of the Isola del Liri paper mills under one ownership. Once again it is shown – as can be verified by other texts written during this research – how families of technicians, entrepreneurs and financiers established in Naples tended to maintain positions and reappear over the generations with different roles in different companies.

Thanks to the support of Mr. Roberto Savarese (1805-1875), the Municipal Council resolved to award the contract to *Schaken & Co.* and Alfonso Pouchain, sensing the change of direction, ceded the rights from the 1854 contract to Parent for the sum of 1,750,000 francs. During this phase, the first

partners, the Duchess of Berry (1898-1870, still living), Charles Lefèbvre's heir, Ernest, and Lorenzo Zino did not withdraw from the shareholding.

The municipality was chosen because of the solid reputation of the *Compagnia Parent & Schaken*, which was considered to be financially very solid and ensured that the quality of service problems that had been experienced with the *Compagnia Pouchain* were excluded. After all, lighting gas technology that was in some ways still experimental 30/35 years earlier was at that point a mature technology that guaranteed excellent performance. In addition to the IDG and the *Compagnie générale pour l'éclairage et le chauffage par le gaz,* based in Brussels, the *Union des gaz* also expanded in Italy from 1860, acquiring ownership of the gas works in Alessandria, Genoa, Milan, Modena, Parma and Sestri. From 1865, a German company, the *Gesellschaft für Gasindustrie in Auzburg* brought together the plants in Ancona, Brescia, Foggia, Rivarolo Ligure, then Rapallo and Salò.[88] It should also be noted that Basilio Parent appeared with other partners in concessions for the construction of railways, granted to the company altogether called *Contratti de Lahante e Comp.*, and that *Parent & Schaken* had the concession for the network of railways from Naples to the shores of the Adriatic Sea around 1860.

[88] Gille B., *Les investissement français en Italie (1815-1914),* ILTE, Turin 1968, p. 263; Hertner P., *Municipalizzazione e capitale straniero nell'età giolittiana*, in Berselli A., Della Peruta F., Varni A. (cur.), *La municipalizzazione nell'area padana*, cit., p. 59.

Chapter 7

A new idea of urban spaces

Sometimes one risks overlooking the powerful symbolic value of enterprises such as the one described here, beyond the obvious and due considerations to be made about the progress, practical advantages, and financial aspects that gas lighting brought to society.

Example of an oil lamp: the lighting power is poor.

The *Società Lionese* and then *Compagnia Pouchain* introduced to Naples a new concept of urban space that had become established in recent years in Paris. The French capital, not by chance, was becoming known in those years as

the Ville Lumière, the illuminated city, for the tens of thousands of lighting points that lit up its nights. London had also been illuminated in those years, despite the protest of the misoneists and, often, poets, who mourned the death of the night. Many other cities had also followed, such as Turin, Genoa, Rome and Milan, which already had streets and squares lit by gas, such as the Galleria de Cristoforis.

The introduction of gas lighting was no small change and greatly influenced people's perception of their city, of urban spaces, of living. One has to consider that cities up to that time had never had illuminated streets at night. Oil lamps were placed at street crossroads or in particularly important places, such as bridge embankments, taverns, city gates. These were, however, low-intensity lamps, with a yellowish and reddish light, which had to be constantly replenished. People moved around holding lanterns with very weak lighting power or smoky torches. Then there were the lamps lit by candles placed inside dwellings or the light of hearths: but it was an entirely different light. Different was the colour, different the intensity, different the mobility of the light source. The change had to be felt as profound.

The gigantic complex of the Albergo dei Poveri, the entrance square of which was illuminated by the twenty or so lanterns glimpsed in the picture from 1841 onwards.

Lighting with oil, burnt in wicks placed inside lanterns, was also used outdoors but had a very low lighting power. It had variable characteristics due to the fact that there was a lamp powered by different wicks and different oils, and therefore different colours. Overall, the appearance of pre-modern cities, indeed before the gas lighting revolution, remained very dark and therefore dangerous. All the more so in winter or fog. It was no coincidence that it was considered risky to go out after the setting of the sun, when bandits could act almost undisturbed at a dark turn or outside the circle of light of a shaky oil lamp.

Gas lighting, even the one that began to be installed in Naples, had some important advantages: first of all, the light was more stable because the nozzles, if well maintained, had a

steady flame; in addition, the fuel was supplied through pipelines and therefore the hours needed for maintenance and replacement of tanks, as was the case with the old lamps, were much shorter, as was the cost, not so much of the installation – high and which had to be amortised – as of management.

Lamps from the time of the first
Neapolitan installation.

But above all, what changed drastically, and forever, was the appearance of urban spaces. Streets lit with gas lamps began to become passable even at night. The night had been the time of danger for centuries: one went out at night only protected, by carriage for those who could afford it, in crowded places or lit with torches or lamps.

The diffuse lighting that took over entire streets, as in Naples, in Via Toledo or in Chiaia or Chiatamonte, in the streets or in the large squares, made it possible to inhabit urban spaces even when the sun was gone and there was no moon. The light that was diffused by these lampposts, usually made of cast iron, with two or three arms, was quite intense, produced very little smoke, and was golden-amber in colour, very warm. Poets and writers complained about the visual pollution of the light hiding the stars and forever changing the perception of space in the city, but the benefits outweighed any old-fashioned nostalgia. In general, people welcomed these innovations. Music and opera historian Philip Eisenbeiss writes about the new life of the squares that gas lighting gave the city, bringing it closer to the metropolises of Europe:

> In 1840, for the first time, the large public squares in Naples were lit with gas, bathing the city in a light that had never before been seen that way at night and, in many senses, opening up the squares to the kind of nightlife we still see today. After Paris, Naples was one of the first European cities to have gas public lighting, and the San Carlo Theatre was immediately adapted to public lighting (Philip Eisenbeiss, *Bel Canto Bully, The Life an the Times of the Legendary Opera Impresario Domenico Barbaja*, 2013, Cadongan Press, London, p. 33).

The squares of Naples changed forever from 1841, and this change, which revitalised Naples' *night life*, was a leitmotif of the memoiristic texts of the period. Given the gentler climate, that life was more alive in Naples than in Paris and London. Hence the importance and impact that the *Società Lionese* had on the social life of the metropolis of the Kingdom.

The switch from gas to electric lighting was another cultural shock: we had moved from the mobile light of wicks and oil lamps to the more stable light of gas from oil and coal. These two types of lighting were different, but at heart they still had some characteristics in common: it was combustion light. The source of illumination was a flame. Very different was the electric light produced by a resistor with an electric current flowing through it causing incandescence. Depending on the gases in the bulbs or the materials used, the colour of this light could be different, but it was certainly much more powerful and much brighter, often white.

Thus, electric companies were seen, in the manner of the new steamboats or the new steam engines installed in spinning mills, mills or other types of factories, as an impressive manifestation of modernity. It is no coincidence, then, that we find that the men involved in financing these modern activities, all equally definable as modern, were always the same: they had a mentality that led them to push modernity, to take risks for progress.

The location of the factory in Vico di Cupa di Chiaia within the urban fabric still demonstrates a pre-industrial conception of production settlements; the population's complaints about gas problems forced the next factory to be moved outside the more densely urbanised urban network.

River Seine lit by gas lamps. Painting by Claude Monet.

Chapter 8

Parent and Schaken.
From railways to gas (1835-1862)

On 12 May 1862, Augustin Cochin – son-in-law of Denys Benoist d'Azy, a great protagonist of the French metallurgical industry – wrote of a return trip from Naples on which he had met Basil Parent, whom he described as a great entrepreneur who had arrived in the Neapolitan city to sign a contract *pour l'éclairage au gaz de Naples*.[89]

Piazza del Plebiscito at mid-century. Note the three-armed street lamps installed in the early 1840s.

[89] Lambert-Dansette J., *Histoire de l'entreprise et des chefs d'entreprise en France*, I, Harmattan, Paris 2000, p. 388.

It was on 12 May that Monsieur Basile Parent signed the contract with the City of Naples to extend the gas lighting service to the entire city. But the old partners did not back down. Ernesto Lefèbvre, Charles's son, did not want to leave the company despite the fact that individuals unknown to him were now acting as investors in it and despite the fact that he had invested in those years in other companies of his own, such as a new wallpaper factory in Isola di Sora, the construction of a chemical factory and a shareholding in *Zino & Macry* together with Lorenzo Zino.

Parent undertook to build a new plant within 18 months of the municipality handing over the land and to construct a pipeline for the daily supply of 4,500 cubic metres of gas. In this case too, the contract is full of indications, clauses and precise obligations as to how the service was to be provided; just as minutely set out are the procedures according to which the service was to be supervised by 12 inspectors, one for each district of Naples, who were to be accompanied on their patrols by a fireman.

Memorial in honour of Basil Parent in the church named after the saint to whom it was consecrated: Saint-Basile, Charleroi (Belgium).

But who was Basil Parent (1807-1866) and what interests had brought him to Naples? A Belgian, a former soldier, awarded many honours by the King, Monsieur Parent had signed the contract as managing partner of the *Parent, Schaken et C.ie* company of Paris, one of 'the most conspicuous in France'. Thus Roberto Savarese had expressed himself in a memorandum for the Naples City Council on 29 November 1861 in support of this company's bid for the new lighting contract. The company 'has great capital', wrote Savarese, 'and has done immense work in France, Belgium, Holland and

Spain. It has a large share in the railways of Naples. In short, no words need to be spent to show that she is right for us, and that the lighting of Naples entrusted to her would be equal to that of Paris and London'.

The first ten years of the new company's life were taken up with the construction of the new production plant and the laying of gas pipes in a significantly increased network. Once the initial, very costly investments were completed, the company ran its day-to-day business. Its big problem was that it could not win over a large private clientele and therefore devoted itself mainly to public lighting. In February 1862, it was granted the concessions of the *Lionese*, which were to last until 7 January 1871, and was also granted extension rights, with the stipulated privileges, until the end of the concession, as well as ownership of the workshop with all its installations. The old partners all remained shareholders in the new company. After ratification of the agreement by the shareholders of the *Lionese* and after successful negotiations with the City of Naples, *Parent, Schaken et C.ie* obtained the concession for lighting and heating with gas for 60 years from 1 June (1862-1922).

A 'cahier des charges' attached to the deed of concession stipulated that *Parent, Schaken et C.ie was* to act on behalf of a *Compagnie* to be established with a capital of 2.5 million lire, so Basil Parent and Pierre Schaken founded, together with Auguste Dassier (1790-1862) from Geneva and Vincent Dubochet (1796-1877), other well-known businessmen and financiers, the *Compagnie Napolitaine d'éclairage et de chauffage par le gaz*, whose statutes were approved by royal

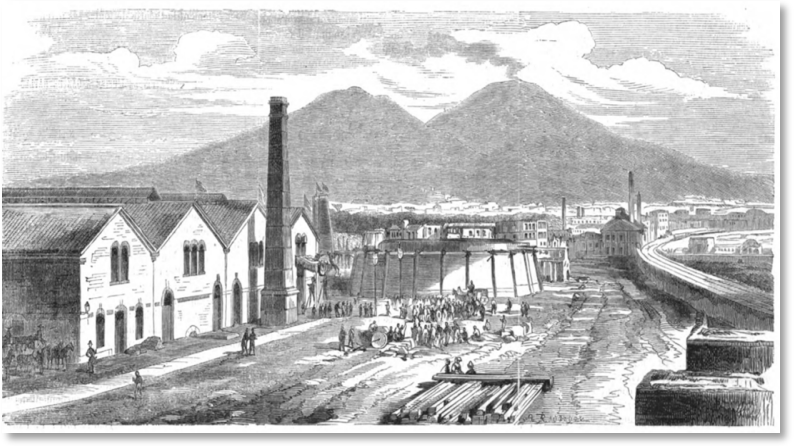
decree on 14 December 1862.[90] Parent and partners signed the contract for the company to be established with a capital of no less than 2,500,000 lire. On 18 October 1862, the *Compagnie Napolitaine d'Eclairage* e *de Chaugffage par le Gaz was* established and Mr Emilio Hemery (Emery?), as we know, appointed director of the company.

The new factory was designed by the engineer Jean Daniel Colladon (1802-1893) from Geneva and the work was entrusted to the French company M. Lacarriere. The area on the banks of the Sebeto, called Arenaccia, was chosen for the construction. It covered an area of 55,000 square metres, 1,600 of which were intended for coal storage. The inauguration took place on 21 November 1863 in the presence of Crown Prince Umberto di Savoia, who would later become Umberto I. The production plant consisted of:

a distillation room consisting of 4 groups of retorts, each of 9 retorts with 8 ovens for a total of 36 retorts with direct heating and hand loading;
two organ pipe magazines;
an extractor;
two purification groups;
two manufacturing gauges;
three single-lift gasometers of 400 m3 each;
an emission controller for a 500 mm pipeline;
a warehouse for refractories;
a canopy for extinguishing coke;
a water system with sufficient wells for the needs of the factory.

[90] R. Savarese, *Dell'illuminazione della città di Napoli. Memoria al Consiglio Comunale di Napoli*, *Naples* 1861, p. 11.

The production capacity of the illuminating gas was 25,000 cubic metres per day with a calorific value of 500 kilocalories per cubic metre.



Picture of the new gasometer inaugurated in an area called the Arenaccia, on the old course of the Sebeto. The inauguration took place in November 1863. The image of this installation, judged to be very modern, was published in the French magazine *L'Illustration Universelle*, no. 42 (pp. 421) of December 1863.

The plant area grew to 100,000 square metres. The canalisation work proceeded slowly due to delays by the company F. Edward of Glasgow in supplying the pipes. The first section of the network of no less than 135 kilometres of pipes was ready within a few years. The old plant of the *Società Lionese* was valued at 1,615,524.47 francs, of which 227,500 were paid in exchange for the 455 shares of the new company and 1,343,840.06 for 2,590 shares redeemed in September and October 1862 and March 1863, including capital and interest. Other (small) sums concerned the balance

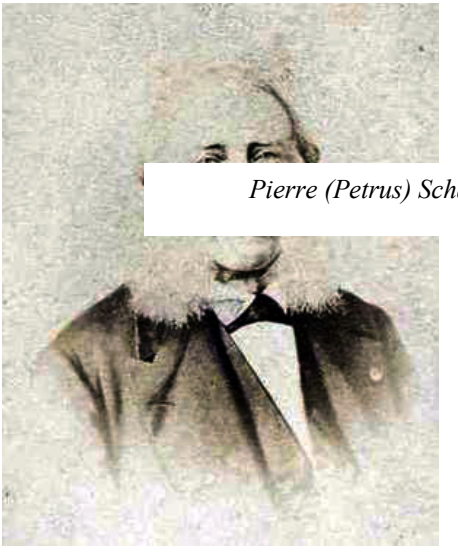
of the dividend on 910 shares not redeemed, the indemnity to the managers of the old company who were granted 455 shares out of 5,000 in the new one, and the 3,108 francs paid to Lyons on liquidation account. The old shareholders were thus granted just under 10 per cent of the company compared to 34 per cent in the old company in the 1840s. The old shareholders exited the company gradually by selling their shares, but not immediately. However, some names on the Board of Directors are known: the Neapolitan-Swiss banker Meuricoffre (Parent, Dassier, Dubochet and a certain Commendatore De Martino from Naples were also on the Board. Messrs Mattino and Balsamo were also appointed). The official Italian name of the company was *Compagnia Napolitana di Illuminazione e Scaldamento col Gas*.

The cost of the new facilities was 600,000 francs for the workshop, sewerage, measuring equipment and buildings. Part of the sum was used to make transitional use of the old factory in Vico Cupa. The old gasometer was repaired and the purification equipment replaced. The old plant was now inadequate both because of its size (although it was not small) and because of serious inefficiencies: leaks from the pipeline system and from the gasometer itself reached up to a third of production in those years. Between August and September 1863, the first tank of the new gasometer was ready. Every effort was made to get the new plant up and running by October-November, as the demand for subscriptions increased considerably. A further 2.5 million was spent in the second year and 780,000 francs in the third. By 30 June 1864, the value of the first plant had doubled and in 1865 it increased again. Following the completion of the second factory, the

first, belonging to the *Società Lionese*, located in Cupa di Chiaia, was closed down, although, as we have seen, not immediately. It was dismantled, and demolition took place after 1871.

At the beginning of the 1860s, when it was awarded the Naples gas lighting contract, *Parent, Schaken et C.ie* was in fact at the height of the expansion phase of its business, which had developed over the previous 20 years in the railway sector. Evidence of the partnership between Basil Parent and Pierre Schaken dates back to the mid-1840s, when the two entrepreneurs, who had come from Belgium, had entered the French railway construction market, which in those years was taking shape around the construction of the great lines of the national railway network. From the construction of individual sections, their activity had soon expanded to the construction of entire lines and even to other industrial sectors. But that was not all: the activity of these 'habiles et riches entrepreneurs belges' had over time acquired an increasingly pronounced financial character. In fact, *Parent, Schaken et C.ie* showed at the beginning of the 1860s a complex structure, close to that of a holding company, with shareholdings in companies differentiated by sector of activity (metallurgy, mechanics, mining, urban public works) and by geographical location: it had followed, in essence, the investment model that historiography defines as characteristic of financial groups linked to railway companies which, from the outset, "tended to become giant industrial buildings" around which "the groups of large industrial and banking capitalism" took shape, investing in other network sectors as well.[91]

[91] Bouvier J., *The Rothschilds*, transl. It. by Editori Riuniti, Rome 1984, p. 130.



Pierre (Petrus) Schaken

Chapter 9

The new neapolitan plant

How had a company of this importance come to be interested in the southern railways and other investment prospects that were opening up in Italy around the time of unification? There are currently no specific studies on *Parent, Schaken et C.ie*, despite its importance. Let us therefore give a few more details on the main partners.

Basile Parent (1807-1866) was born in Couillet (Belgium) to an old local family, while Pierre (Petrus) Schaken (1793-1870) was born in Ostend (Belgium). We can define how they fitted into the financial network that revolved around the Parisian marketplace, the one in which the *Napolitaine* business matured: Basile Parent and Pierre Schaken have in fact been likened to the Pereire brothers and Paulin Talabot (1799-1855), the latter linked to the Rothschilds.[92] The founders of the *Compagnie Napolitaine* also included Emmanuel-Vincent Dubochet (1796-1877), known to be their partner in railway and gas companies including the *Società Italiana per il Gaz* (Turin 1863), both financed by *Crédit Mobilier*.

[92] Beaujouan G., Lebée E., *La fondation du Crédit Industriel et Commercial,* in "Histoire des Entreprises", no. 6, 1960, p. 23 and Bonin H., *Histoire de la Société générale*, cit., p. 53; Jacquemyin G., *Langrand-Dumonceau, promoteur d'une puissance financière catholique,* t. II, Éditions Université libre de Bruxelles, Brussels 1960, p. 115 and Dumoulin M., *Les relations économique italo-belges*, cit., p. 163.

The rise of Parent and Schaken took place in France between 1840 and 1860, in the most significant two decades for the development of the modernisation process of that country's economic structures and the instruments to support it. Their entrepreneurial journey shows the interlacing dynamics between the needs of productive enterprises and the development of a modern banking system; it shows how they were able to finance the expansion of their business in a financial system that was still not very specialised or formalised in specific institutions and in which the medium and long-term credit function was carried out by different actors, inside and outside the productive system. For this reason, networks of interpersonal relations were still the main channel through which access to credit travelled. The path they took in the financial networks that took shape around railway construction and gas is linked to the opportunities offered by the context, without it being possible to attribute their membership to one or another of the interest groups. The mobility of actors is produced on the basis of personal ties, the kind of business being planned and according to their location.

Portrait of Basile Parent (1807-1866), versatile Belgian industrialist and financier.

Reconstructing the entrepreneurial path of Parent and Schaken requires tracing the development of railway networks on the European continent, an industry to which almost every conspicuous industrial and financial group in Europe formed during the 19th century is linked. Indeed, it is significant to note that the *Statutes* of the *Compagnie Napolitaine d'éclairage et de chauffage par le Gas* were printed in Paris by a printing house called: *Imprimerie centrale des chemin de fer,* i.e. Central Printing House of the Railways, which was based in Rue Bergère, not far from Montmartre. The joint-stock company was incorporated in Turin at the notary Turvano but was domiciled in Naples. So it was born with a multinational profile, since most of the financing came from France, Switzerland and Belgium but the anchorage with investors

residing in Naples was much less than in the past. Its relationship with the world of industrial-financial railway groups is also remarkable. The act of agreement signed in Naples in May 1862 at the notary Martinez was therefore approved in Turin on 14 December 1862 with a French and Italian text, and signed by Victor Emmanuel II, Minister Manna and the Director of the Ministry of Trade and Industry, Gaetano Serra. The deed was signed in the presence of Francesco Zanetti, Giuseppe Bertolotti notary public, all residing in Turin, a senior bureaucrat of the French genius, Jaen-Edouard Lannoy who acted as *Parent & Schaken*'s attorney, Auguste Dassier and Vincent Dubochet. Previous agreements made in Montreaux, by the notary Mayor, were incorporated in this deed. The actual company was therefore born in Turin and the 'desistance' (dissolution) of the old *Società lionese* was declared there.

The main partners made their first experiences during the 1830s in their home country, where the English example was followed sooner than elsewhere; they then expanded their activities to the French market in the 1840s and 1850s, and finally participated in the expansion of railways to the European suburbs in the 1860s. The years between the two revolutions of 1830 and 1848 were the years in which railway construction spread from England to the heart of continental Europe. The constitutional government of Belgium, which emerged from the revolution of 1830, focused on improving communication routes and promoting its mining and metallurgical industries in order to achieve self-sufficiency.[93] The construction of a railway network, to speed up land

[93] Gille B., *Histoire de la Maison Rothschild,* t. I, Droz, Genève 1965, pp. 269-279.

transport, was intended to strengthen ties with neighbouring German and French regions. Through the creation of a north-south axis, a new sea outlet for German territories as an alternative to that of Amsterdam, and an east-west axis, a fast link between the French and German borders, the national railways enabled Belgium to become the crossroads of northern European trade and the gateway to the heart of the continent for English trade from the English Channel. With two early laws (1834 and 1837), the Belgian parliament planned the construction of the network; the railways of the main network were built by 1843 directly by the State, which then also retained the operation, while for the tributary branches the instrument of concession to private companies was used.

Discussions on how to finance railway construction delayed work in France compared to Belgium. A choice had to be made between public and private. The iron road, and steam, symbols of speed and unity, seemed destined to overcome material and moral barriers: they could be powerful tools for stimulating the movement and production of goods, and thus instruments for spreading prosperity to the new social category of industrial workers, on whose deplorable conditions the debate became intense around the 1840s. But recourse to the 'industrie privée' could nullify the potential of this instrument of modernity, of opening up markets and spreading wealth, and it was feared that it could give rise to the constitution of a 'féodalité nouvelle', or a 'féodalité financière' that, operating on behalf of the state, could exploit its position of privilege by subordinating the interests of all to those of a few.[94]

[94] Lobet J., *Des chemins de fer,* cit., pp. 327; 376.

This was, in fact, what happened in France, according to the democratic press, as a result of the law of 1842: with this law, the liberal parliament of the July Monarchy drew up a regulatory framework that left more room for private capital, establishing a mixed system based on public-private co-partnership for construction and the concession to private individuals for management. Parliament reserved the right to use private capital entirely for construction as well, when deemed appropriate.

The founding act of that 'féodalité nouvelle', a new form of privilege in the age of the bourgeoisie, was identified in the formation of the *Compagnie du Nord*, 'the great operation of the house of Rothschild', for the award of the first concession for the lines from Paris to the Belgian border (1845).[95] After the passing of the 1842 law, the *haute banque* entered the railway business in an accomplished manner. Prior to the 1842 law, while the general principles and the elaboration of an organic network plan were being discussed, short sections of railway had already been granted to private applicants. The first railways to be built were the service lines in the mining area of Saint-Étienne, in the Lyon area, granted in the years 1823-28; in the 1830s, concessions were then approved for the first nuclei of important lines, around which both territorial interests and the first interventions of the capital's financial milieu had begun to move. The great protagonists of the railway construction season, from France to Germany to Belgium, were Paulin Talabot, the Pereire brothers, Oppenheim, the Englishman Edward Blount and Charles Laffitte. The interests of local industrialists and banking

[95] Bouvier J., *The Rothschilds*, cit., p. 125.

houses, such as François Bartholony but also James de Rothschild, were concentrated in Alsace.[96] The progress of railway construction continued according to an organic plan laid down in the 1842 law: a 'système de chemins de fer' would radiate from Paris throughout the country, connecting the capital to the frontiers. The Pereires were at this stage the channel through which high finance approached the railway construction sector. There were also discussions in the mid-1840s about the creation of a 'European' railway network, which would cross the borders of individual States and open up fast routes to the access points for intercontinental trade: from ports on the Atlantic, the North Seas and the Mediterranean, to the passages to the East, through the Russian territories and the Ottoman Empire.[97]

The control of strategic access points to international traffic routes was a decisive criterion for those who invested in the railways. From the passing of the 1842 law onwards, the history of the French railways was intertwined with that of *Parent, Schaken et C.ie*. Between 1843 and 1846, companies developed that fought to win the big lines. After a crisis in 1847, there was a standstill and only a recovery during the Second Empire.

It was then that the State intervened to give a strong impetus to the construction of the national railway network, through the concentration of the companies and the use of State-guaranteed bonds, which gave them an important source of external financing, and the guarantee of interest on

[96] Picard A., *Les chemins de fer français,* cit., pp. 23-24.
[97] Cameron R.E., *France and the economic development,* cit., p. 212; Ostuni N., *Iniziativa privata e ferrovie nel Regno delle Due Sicilie*, Giannini, Naples 1980, pp. 129-134.

immobilised capital. Thus came into being that 'nouveau crédit' of the State that Bartholony had been calling for since the 1830s: 'la création des effets publics de la paix'. Instruments that, as far as the haute banque was concerned, did little to change the substance of its relationship with the State and without which, as Isaac Pereire would recall many years later, it would not have committed itself as it did in a field of action so fraught with risk due to the long immobilisation of capital, on the liquidity of which it had built its fortune.

What remains today of the three gasometers of the plant built around Unity, inaugurated in the autumn of 1863. They stand in the area where one of Naples' ancient rivers, the Sebeto, once flowed.

Epilogue

The *Compagnia del Gas* of Naples was consolidated between 1860 and 1870. In 1881 it took its new headquarters in the building at 138 Via Chiaia. After the cholera epidemic of 1884, which caused 7,150 deaths in Naples and was a dramatic setback, expansion resumed. Until gas lighting was replaced by electric lighting, a change that began in Naples around 1885. The transition process takes a few years, considering the past, and lasts from 1887 to 1894.

The great Neapolitan families of the past seem to have lost much of their power at this stage, as was the case in many other parts of Italy. Large concentrations of capital had been formed, even in Italy, with the railways, even though the companies that ran or built them were largely linked to French capital.

Some considerations on neapolitan industrial and financial elites

We have discussed in this text the French, Belgian and Swiss industrial elites and the way they interacted to create concentrations of power and project their business outside the states in which they were born. A similar phenomenon had also begun to form in Naples, where we see the same names recurring around some important industrial and financial initiatives that gave hope for the permanent formation of an industrial class in the Kingdom. This did indeed form, but after the Unification both for intrinsic reasons, weakness and low numbers, and for extrinsic reasons, too complex to be discussed here, it did not survive. And yet, in at least three of the initiatives examined so far in the first series of monographs devoted to the industries of the Kingdom, certain names recur frequently. They are not all because others could be added – and the integration will be made later – considering the entire history of these companies.

Luigi de Medici, Charles Lefèbvre, Carlo Forquet, Carlo Filangieri – the latter the owner of the country's largest ironworks in Razzona di Cardinale and of various privatisations – recur more than once in these three companies. Other names appear more than once in later stages of share acquisition: Ilario Degas, Domenico Catalano, Domenico Laviano, Lorenzo Zino, Augusto Meuricoffre and a few others such as Vito Nunziante, president of *Sebezia*. This was an elite of the Kingdom that did not have time to consolidate its positions beyond Unification but maintained an absolutely

pre-eminent position for the first sixty years of the 19th century. The tables compiled by John Davies on the Kingdom's elites in his old but seminal study, *Società e imprenditori nel Regno borbonico (1815-1860)* of 1979 should be revised today.

Founding members of the Amministrazione della Navigazione a Vapore (1817)

Luigi de Medici
Agostino Serra, on behalf of the reason of Emmanuele Appelt
Ludovico Potenzani, Marquis
Carlo Filangieri, General
Augusto Lefèbvre
Charles Lefèbvre
Giovanbattista Bourguignon, Swiss Consul
Augusto Rougon
Maurizio Dupont
Domenico Catalano
Carlo Forquet
Fortunato Wolff

Founding members of the Società Industriale Partenopea (1833)

Carlo Filangieri (later Luigi Filangieri)
Carlo Afan De Rivera
Carlo Forquet
Charles Lefèbvre
Giuseppe de' Medici
Luigi de' Medici
Domenico Laviano

Founding members of the Società Lionese del gas

De Frigiére and Associates (Bodin, Cottin and Jumel)
Adolfo Girodon
Alfredo Girodon
Vittorio Chartron, owner S. Vallier Drome
Teodoro Brouzet, banker in Lyon
Prospero Gallay, former notary in Lyon
Alphonse de Boissieu, owner of Lyon
Hippolyte Gautier, civil engineer in Lyon
Balsamo Vienot and C., bankers
Charles Lefebvre, shopkeeper in Naples
Alfonso Pouchain, owner in Naples
Zino, Henry & C.
Lorenzo Zino, shopkeeper in Naples
RR. Princ. of Syracuse Count Lucchesi Palli and Duchess of Berry
H.E. Lieutenant General Carlo Filangieri

BIBLIOGRAPHY

Amatori F., Colli A., *Impresa e industria in Italia: dall'Unità a oggi*, Marsilio, Venezia 1999.

Atti del Consiglio comunale di Napoli, 1862 e 1863.

Atti del Consiglio comunale di Napoli, 1867, Relazione sul contratto del 12 maggio 1862 per la illuminazione a gas.

Atti del Parlamento italiano, sessione del 1861, Documenti, primo periodo dal 18 febbraio al 23 luglio 1861, Botta, Torino.

Barjot D., *La grande entreprise française de Travaux publics* 1883-1974, Paris 2006.

Barron Baskin J., Miranti P.J. jr, *Storia della finanza d'impresa*, Laterza, Rome-Bari 2000.

Bartoletto S., *Gli esordi dell'industria del gas a Napoli: 1837-1862 in La città che cambia. Infrastrutture urbane e servizi tecnici a rete in Italia fra '800 e '900*, in the journal "Ricerche storiche", no. 3, 2000.

Beaujouan G., Lebée E., *La fondation du Crédit Industriel et Commercial*, in 'Histoire des Entreprises', No. 6, 1960.

Berselli A., Della Peruta F., Varni A. (curr.), *La municipalizzazione nell'area padana: storia ed esperienze a confronto*, Franco Angeli, Bologna, 1985.

Bezançon X., *Histoire du droit concessionnaire en France*, in 'Entreprises et histoire', No 38 2005/1.

Bonin H., *Histoire de la Société générale*, Droz, Geneva 2006.

Bouvier J., *Le Crédit Lyonnais de 1863 a 1882: les années de formation d'une banque de dépôts*, vol. 1, Impr. Nationale, 1961.

Bouvier J., *The Rothschilds*, Editori Riuniti, Rome 1984.

Bruno G., *Risorse per lo sviluppo. L'industria elettrica meridionale dagli esordi alla nazionalizzazione*, Liguori, Naples 2004.

Bunting D., Barbour J., *Interlocking directorates in large American corporations 1896-1964*, 'Business History Review', 45 (3), 1971.

Cameron R.E., *France and the economic development of Europe*, 1800-1914, Princeton UP 1961.

Capriati E., *Ritratto di Famiglia. I Meuricoffre*, Millennium, Angri 2003.

Caron F., *Histoire des chemins de fer en France*, Tome 1: 1740 - 1883, Fayard, Paris 1997.

Cassis Y., *Big Business*, Oxford University Press, New York 1997.

Cassis Y., Cottrell P.L., (eds.), *The world of private banking*, Ashgate, Burlington 2009.

Cassis Y., *Le Capitali della Finanza*, Brioschi, Milan 2008.

Castronovo V., Paletta G., Giannetti R., Bottiglieri B., *Dalla luce all'energia. Storia dell'Italgas*, Rome-Bari 1987.

Chapman S., *British-based investment groups before 1914*, in Economic History Review, vol. 38, 1985.

Chapman S., *Merchant Enterprise in Britain from the industrial revolution to World War*, Cambridge University Press 1992.

Collezione delle leggi e de' decreti reali del Regno delle Due Sicilie, anno 1817, year 1817, semester I, Naples 1817.

Colli A., *Corporate governance e assetti proprietari: genesi, dinamiche e comparazioni internazionali*, Marsilio, Venice 2006.

Compagnia Napoletana d'Illuminazione e Scaldamento col Gas, Statuto, Tip. G. De Angelis e Figlio, Naples 1886.

Confalonieri A., *Banca e industria in Italia,* vol. III, il Mulino, Bologna 1980.

Conti G., Feiertag O., Scatamacchia R., *., Credito e nazione in Francia e in Italia (XIX-XX secolo)*, Pisa University Press, Pisa 2009.

Contratto per illuminare e riscaldare col gas nella città di Napoli. 12 May 1862, Naples 1866.

Convention (Parent, Schaken et C.ie), Dupont 1853, Paris.

Cossalter P., *Les délégations d'activités publiques dans l'union européenne*, L.G.D.J. 2007.

D'Alberti M., *Le concessioni amministrative*, Jovene, Naples 1981.

D'Amat R., Limouzin-Lamothe, *Dictionnaire de biographie française*, t. X, Letouzey et Ané, Paris 1965.

Davis J.A., *Società e imprenditori nel Regno Borbonico. 1815-1860*. 1815-1860, Laterza, Rome-Bari, 1979.

De Majo S. - Vitale A., (curr.), *Napoli e l'industria. Dai Borboni alla dismissione*, Solfanelli, Soveria Mannelli 2008.

De Majo S., *Dal vapore al metano. Centoventicinque anni di storia della CTP. 1881- 2006*, Colonnese, Naples 2006.

De Majo S., *Manifattura e fabbrica*, in Vitali A., de Majo S. (eds.), *Napoli, un destino industriale*, Naples 1992.

De Rosa L., *Iniziativa e capitale straniero nell'industria metalmeccanica del Mezzogiorno 1840-1904*, Naples 1968.

Dumoulin M., *Les relations économique italo-belges (1861-1914)*, Académie Royale de Belgique, Brussels 1990.

Falkus M.E., *The British Gas Industry before 1850*, in The Economic History Review, New Series, Vol. 20, No. 3 (1967).

Falkus M.E., *The Early Development of the British Gas Industry, 1790-1815*, in The Economic History Review, v.35, 2 (1982).

Fernandez A., *Villes, services publics, entreprises en France et en Espagne XIXe-XXe siècle*, MSHA, Pessac 2006.

Ferrari E. (cur.), I servizi a rete in Europa. Concorrenza tra gli operatori e garanzia dei cittadini, Cortina, Milan 2000.

Foreman-Peck J. (ed.), New perspectives on the late Victorian economy. Essays in quantitative economic history 1860-1914, Cambridge University Press 1991.

Galaskiewicz, J., Wasserman, S. (curr.), Advances in social network analysis. Research in the social and behavioural sciences, London-New Delhi, Sage Publications.

Gay J., L'amélioration de l'existence à Paris sous le règne de Napoléon III: l'administration de services à l'usage du public, Droz, Genève.

Gille B., Histoire de la Maison Rothschild, t. I, Droz, Genève 1965.

Gille B., La Banque en France au XIX siècle, Droz, Genève 1970.

Girard L., La politique des Travaux Publics du Second Empire, A. Colin, Paris 1952.

Giuntini A. (cur.), La città che cambia. Infrastrutture urbane e servizi pubblici a rete in Italia tra '800 e '900, "Ricerche Storiche", 3, 2000.

Giuntini A., Dalla Lyonnaise alla Fiorentinagas 1839-1989, Laterza, Rome-Bari 1989.

Giuntini A., Reti, infrastrutture e servizi urbani nelle città italiane in epoca contemporanea, in 'Storia e futuro', no. 4, April 2004.

Goodal F., Gas in London: a divided city, in Paquier S., Williot J.-P. (curr.), L'industrie du gaz en Europe aux XIXe et XXe siècles, Peter Lang, Brussels 2005.

Granovetter M., The Impact of Social Structure on Economic Outcomes, in Journal of Economic Perspectives, 19, 2005.

Hughes T.P., Networks of power: Electrification in Western Society, 1880-1930, Baltimore, Md: Johns Hopkins University Press, 1983.

Jones G., Merchants to multinationals: British trading companies in the nineteenth century, Oxford University Press, 2000.

Jones G., Multinationals and global capitalism: from the Nineteenth to the Twenty-first Century, Oxford University Press, New York 2005.

Jones G., Schröter H. (curr.), The rise of multinationals in continental Europe, Aldershot: Elgar 1993.

Le Compagnie del gas in Napoli, L'Arte Tipografica, Naples 1862.

Lobet J., Des chemins de fer en France, Parent-Desbarres éditeur, Paris 1845.

López Morell M.Á, La Casa Rothschild en España: (1812-1941), Marcial Pons, Madrid.

Merger M., Carreras A., Giuntini A., Les réseaux européens transnationaux, XIXe-XXe siècles, quels enjeux ?, Ouest Éditions, Nantes 1995.

Messina A., L'Italia dell'Ottocento di fronte al cholera, in Della Peruta F. (cur.), Storia d'Italia. Annali 7. Malattia e medicina, Einaudi, Turin 1984.

Moore G., The structure of a national elite network, 'American Sociological Review', 44 (5), 1979.

Mustar P., Généalogie du réseau de gaz: cadre juridique et stratégie commerciale à Paris au XIXème siècle, in 'Réseaux', Vol. 2, No. 4, Année 1984.

Nohria N., Eccles R. (eds.) Networks and Organisations: Structure, Form, and Action, Boston, Harvard Business School, 1992.

Ostuni N., Iniziativa privata e ferrovie nel Regno delle Due Sicilie, Giannini, Naples 1980.

Paquier S., Williot J.-P. (curr.), L'industrie du gaz en Europe aux XIXe et XXe siècles, Peter Lang, Brussels 2005.

Pereire I., La questione delle ferrovie, version by F. Viganò, Stamperia Reale, Milan 1879.

Perrucci R., Pilisuk M., Leaders and ruling elites: the interorganisational bases of community power, 'American Sociological Review', 35 (6), 1979.

Picard A., Les chemins de fer français: étude historique sur la constitution et le régime du réseau, I, Rothschild, Paris 1884.

Plessis A., Régents et gouverneurs de la Banque de France sous le Second Empire, Genève 1985.

Pototsching U., I pubblici servizi, Cedam, Padua 1964.

Predieri A., Morisi M. (eds.), L'Europa delle reti, Giappichelli, Turin 2001.

Randall K. Morck (ed.), A history of corporate governance around the world. Family business groups to professional managers, University of Chicago Press, Chicago, 2007.

Ribeill G., La Révolution Ferroviaire. La formation des compagnies de chemins de fer en France (1823-1870), Belin, Paris 1993.

Rodinò di Miglione M., Storia finanziaria del Comune di Napoli nel XIX secolo, Naples 1908.

Roth R., Dinhobl G. (curr.), Across the borders: financing the world's railways in the nineteenth and twentieth centuries, Ashgate Publishing 2008.

Sachs I., L'Italie: ses finances et son développement économique depuis l'unification du royaume, 1859-1884, d'après des documents officiels, Paris 1885.

Savarese R., Dell'illuminazione della città di Napoli. Memoria al Consiglio Comunale di Napoli. Naples 1861.

Schisani M. C., The Rothschild house of Naples. Business, local market and the Mediterranean, in EABH Bulletin, no. 1/2009, Frankfurt, May 2009.

Schot J., Misa T. J., Oldenziel R. (curr.), Tensions of Europe: The Role of Technology in the Making of Europe in 'History and Technology' Vol. 21, No. 1, March 2005.

Scirocco A., Politica e amministrazione a Napoli, Edizioni Scientifiche Italiane, Naples 1972.

Scott J., Corporate Business and Capitalist Classes, New York, Oxford University Press, 1997.

Segreto L., Imprenditori e finanzieri, in Storia dell'industria elettrica in Italia, I. Le origini. 1882-1914, Laterza, Rome-Bari, 1992.

Sirago M., Nuove tecnologie nautiche: dal vascello alla nave a vapore, in Buccaro A., Fabbricatore G., Papa L.M., Storia dell'Ingegneria, Atti del 1° Convegno Nazionale, Naples, 8-9 March 2006.

Smith M.S., The emergence of modern business enterprise in France, 1800-1930, Cambridge, Harvard University Press 2006.

Stanworth P. and Giddens A., The modern corporate economy: interlocking directorships in Britain (1966-1970), 'Sociological Review', 23, 1975.

Stoskopf N., 150 ans du CIC, 1859-2009, vols. 1 and 2, La Branche, Paris 2009.

Stoskopf N., Banquiers et financiers parisiens, Picard/Cénomane, Paris 2002.

Tarr J., Dupuy G. (curr.), Technology and the Rise of the Networked City in Europe and America, Temple University Press, Philadelphia 1988.

Teichova A., Kurgan G., Ziegler D., Banking, trade and industry. Europe, America and Asia from the thirteenth to the twentieth century, Cambridge, Cambridge University Press 1997.

Toninelli P.A., Storia d'impresa, Il Mulino, Bologna 2006.

Van Der Vleuten E., Kaijser A., Networking Europe, in 'History and Technology', v. 21, no. 1, (2005).

Wilkins M., Schröter H. (eds.), The Free-Standing Company in the World Economy. 1830-1996, Oxford University Press, New York 1998.

Williamson O. E., The Economic Institution of Capitalism. Firms, Markets, Relational Contracting, New York, The Free Press, 1986.

Williot J.-P., Naissance d'un service public: le gaz à Paris, Éditions Rive Droit, Paris 1999.

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