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New Parisian atmospheres during the First Empire: crafts and industry

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Abstract. *The Napoleonic Empire turned Paris around from an administrative to an industrial city. A new atmosphere created by sulfuric oxide smells took possession of the Right Bank with sulfuric acid and coal, while mercury fumes and chloride, used respectively for gilding copper and felting hats, poisoned the neighbourhoods downstream and upstream as Paris became the first European producer of luxury items. Before 1789, smells came from fermenting materials and the putrefaction of nightsoil. After 1800, Montfaucon became the world's leading craft district and its stench crossed the Seine and spread as far as the Sorbonne. Along the Bievre River, tanneries and fine leather crafts were so polluted that neither flies nor mosquitoes could ever survive, workers never caught malaria but a lot of lung ailments.*

Keywords: *Paris, Napoleon, smell, fermentation, putrefaction, mercury, lead*

In the 1780's, odours are organic – except in the districts on the edge of the goldsmiths' quarter – and excessive between the Gros-Caillou and the Île des Cygnes on the left side of the Seine first, and also around the mouth of the Bièvre river in the Saint-Marcel quarter. Besides they are rather localized in dead-end streets and alleys. Though in the Latin Quarter and in the Saint-Germain areas they may seem less offensively musty. Denser odours were the result of industrialization, of biochemical development, added to a lucid apprehension of the new reality (Corbin, 1982) by rentiers who along with the State machinery stood as the foundation stone of Parisian wealth, and ultimately the revolutionary deregulation also was an element actively contributing to the disruption of the atmosphere in the surrounding areas: everyone would freely further their own ends; slaughter-houses, quartering yards and bowels workshops thus cropped up everywhere. Smells had grown more offensive and more enduring still. Noise and smell emissions were just as heterogeneous as the trades were various, the more intense ones emitting at summer time when fermentation saturated the atmosphere.

Never before had the Parisian ambiance been so upset by such unprecedented changes, of daily occurrence, concentrated and accumulated, which materialized the advance of the industrial revolution. At summer time mostly, the urban atmosphere was always fraught with green, blue, grey flies and mosquitoes too, with dusty effluvia from the dung heaps of the twenty to thirty thousand horses that moved about the city, and the tons of ashes too. Confined behind its five rings of ramparts Paris got ever richer, bigger, and sicker with excess. Three times larger than London, Paris smelt fusty. And though the smells intensified, they surreptitiously turned from nitrous to sulfurous ones as the façades of the buildings got gradually blacker.

Montfaucon

Since the year 1780, outside the city walls near the buttes Chaumont, the Montfaucon dumping ground was busy collecting the content of 50,000 cess-pools in Paris in order to turn it up into an item of value. The ground was located in former gypsum quarries used as a substitute for the previous place near Saint-Lazare at the top of which was the gibet. In the early 19th century, 2,000 to 3,000 basins were carried over the place every day at night, a momentum that increased under the development of water-closets, i.e. English privies: “cess-pits were formerly emptied every 10, 11 or 12 years, whereas they were now discharged every 2 or 3 years” (Rapport, 146, 1826), as mentioned in 1817. Dumping grounds did not work against salubrity... Yet, they were a sovereign impediment to it. The natural treatment of water sewage produced a powder, the “*poudrette*”, a genuine fertilizer most particularly sought-after by market gardeners whose shops huddled together in the backwater of the Seine, the Marais area – a name derived from their activities – or in the outskirts of the Bièvre and the Croult Rivers and much praised by horticulturists. Processing raw materials was simple enough: the content of the cess-pools was transported to the top of the dumping ground and let there to settle, then water-sewage was led and discharged in four wide retention pools, the Loiseau Lake between the Butte and the backwater of the Seine. Once the compound had been treated, it was done very much like salt in the salt marshes, it was left to solidify during four months, then fermented and it got dry. The last step consisted in scooping out and pulverizing 4 to 5,000 tones per year of an inodorous product very rich in organic compounds. The financial rewards were so significant that other dumping grounds emerged between the years 1824-27, first in Rouen then in Beauvais and in Orleans.

Quartering

Since 1760, the kingdom’s main quartering yard was in the immediate vicinity of the dumping ground. Towards 1790, an average of 9,000 horses per year was slaughtered. In 1810, this number jumped to 15,000 horses in average per year, including Paris and its main outskirts – from Fontainebleau to Senlis – which accounted for an average of 50 to 60, with a peak in November as farmers feared that, unless they did, they might no longer afford to feed their donkey.

The current price of a dead horse averaged 3 to 5 francs relatively to its size and fat; once quartered, it amounted from 100 to 150 francs. Actually the horse quartering yard was the main place in the processing of organic raw materials such as leather, hair, hooves, fat, bowels, shoes, nails, glue, superphosphate... Part of the flesh was sold thirty cents per kilo to the Combat du Taureau and to the Muséum d’Histoire Naturelle as food for ferocious¹ and wild animals and for other gastronomic uses (Thiéry, 1790). “Several inhabitants in Paris, the owners of big dogs, used to train their animals to hunt for flesh and bring it back to Montfaucon. As they were familiar to the members of the quartering trade they would fit a large hunch of muscular flesh with a hole in the middle (12 to 15 kg) to their neck, which they would then bring back to their owners” (Parent-Duchâtelet, 1827).

From May to September, the entrails, the remnants and the fatless bowels were all strewn on the ground in the quartering yard, covered with straw to keep humidity and sunlight away and foster flies-sowing and the production of maggots for fishing or hung meat. Maggots were sold to the benefit of the quartering workers while 9 to 10 francs per year

1. The “*Bull’s Figh*” used to take place in an amphitheatre behind Saint-Louis Hospital, along the old path to Pantin. It was a fight of mastiffs against various ferocious animals, such as boars, wolves, leopards, tigers, lions, etc, and against a bull... There was also the “*peccary*” entertainment (a donkey fighting with dogs) and the “*hourvari*”.

were levied by the master. In the 1820's, "this activity had got commercially so much worth as every part of the animal was merchantable that almost the whole of the horse flesh and bowels were for sale" (Payen, 1827). At winter time, from October to April, these parts were sold to farmers in the surroundings especially those from Pantin and Noisy-le-Sec who used it as manure for their lands (Guillerme, 2008).

Bone black, the raw element that made up superphosphate, resulted from the crushing of fresh big bones stripped of their fat, of their skin, or collected, dry, from the inner and outer suburbs. Once set in cauldrons the lid of which coated with heat resistant lime, they were exposed to the action of fire during four to five hours. Methane emanating from the creaks intensified with the cooking temperature. When transformed into animal coal, it was ground and sold in powder, used to sift syrups, to purify water and to separate out gold and silver from lead. In the year 1822, Prince settled in the Amandiers street of the Belleville quarter with the view of processing "the bones just stripped from their flesh" that were collected in Montfaucon. The wine neighbouring trades used to complain about it: "the infection was so intense that the smell impregnated the basements and threatened to turn the wine sour" (Rapport, 190, 1815). Two other establishments had settled between Montfaucon and La Villette: the black produced was used for the processing of sugar and beetroot in La Villette.

Bowels workshops

In the 1820s, not far from the place, there were about thirty bowels workshops that "used to work in rooms utterly devoid of any draught so that infection had reached staggering levels" (Parent-Duchâtelet, 1834). At the time the bowels of slaughtered animals generated about six hundred thousand francs (Payen, 1833), i.e. twice as much as in 1820. Ten thousand kilometers were thus processed, dried and sent to Spain to make chorizo skins. The remnants were used to make strings for musical and mechanical instruments, glue, surgical thread, etc.

Half a dozen of manufactures producing the Prussian blue — the Marie-Louise or the Raymond blue — had settled around Montfaucon in the 1810s following Raymond's improvement of the chemical process to adapt it to silk when in Lyon, (1811), a process later adapted to wool by his son (1819). Prussian potassium was produced by the calcination of dried blood, tendons, horn scraps, or coal extracted from it, and from three times the weight of commercial potassium carbonate. In order to set the colour, a solution of alun and commercial iron sulfate was added... It produced strong emanations of sulfurous hydrogen that gave off a black brownish precipitate which was then washed. The blue was also used by metal gilders.

In 1789, thirty thousand barrels of smoked herring, three thousand of salmon and one thousand and three hundred of salted mackerel were consumed in the capital... Yet a rather significant amount was found rotten upon arrival in Montfaucon. Five manufactures had specialized in the production of *degras*, a thick liquor or wax used by curriers and extracted from old oils made up of fish mixed with nitric acid and distilled. In the 1810s, they were forced to depart to Montfaucon given the high level of pestilential effluvia they produced (Rapport, 16, 1810; 76, 1812). Fish scraps, skins and backbones constituted the main ingredients in the production of glue: in 1810, Lefebvre who had settled in the Charonne street was forced to leave the place and move to the Montfaucon's dumping ground following the Salubrity Board's first visit: "about thirty barrels filled with putrefied organic compounds" had been found fermenting under a scorching summer sun (Rapport, 44, 1810). In 1827, the Montfaucon center had reached its limits. "Meat from horses slaughtered or quartered... had become a prey to one hundred thousand rats invading the surroundings". The fetid odours emanating from the place encroached upon the Seine and spread to the École Polytechnique area.

Industrial atmosphere

At the beginning of the Restoration period, just as the Montfaucon's dumping ground expanded intensively, so did its odours at hot weather from the Tuileries to Noisy-le-Sec, in spite of strong police surveillance. They eventually ruined the atmosphere in Paris even more. The density of putrefying matters increased and with it dust. The wells that had cropped up everywhere to cater to the needs of industries around got even more polluted, so did the contamination of the ground water. "And what of the household linen, soaked in water to get cleaned though the water was impregnated with rotten matters? Isn't it the most insalubrious habit? Isn't it the most likely way to contract, to transmit, to foster the germs of diseases? As skin diseases are so common in Paris, especially in the poor classes, wouldn't it be the result of such practices and the reason why they catch on and develop so well?" (Rapport, 122, 1821)

Sulphurous acid had encroached upon the city, especially in the right bank suburbs. "Among the secondary causes (of dirtiness and insalubrity) must be included the large amount of manufactories that have now settled in the inner skirts of the city for forty years as most of them use chemical agents emitting sulfurous gases" one member of the *Annales de l'Industrie* noted in 1826.

The earthenware trade was the activity the most severely polluted by sulfuric acid emanating from the sewers and from the chemical manufactures. Gohin, a manufacturer in the Faubourg Saint-Martin Street, one morning in 1821 discovered that the plates and vases in his workshop "were covered with a brownish or black layer" (Rapport, 48, 1810). The investigation carried out by the Salubrity Board revealed that it was the result of sulfurous hydrogen emanations from the sewer adjacent to the shop, "emanations which blackened shoddy goods, or at least the objects which were made of too soft or too leaded enamel, or those whose heating temperature had been too low" (Chevallier, 1830). Scouring was decided and was due to take place. The whole earthenware community felt upset about it. Yet it was undertaken in 1826 in the La Roquette's sewer that spanned the Aval and the Saint-Sabin streets with their wide shops of cheap pottery. To cleanse the place chlorine was sent through chimney stacks. Additional pollution involved mercury for gilding and carroting of pelts in the old areas of the city's right bank as well as lead from tinning, from foundries, and from white lead used in the whole city and its suburbs. New means were found which helped curb nuisance or at least kept them away by either banishing polluters from the housing zone and prompting the development of a no man's land separated from the extra muros area, i.e. the city inner and outer suburbs, or by building higher stacks to drive up and away smokes and dispel odours.

New pollutions

In the years 1823-24, positivist reasoning, open liberalism, and industry i.e. the national power's steam engine, limited the police function to the surveillance to the city crafts – rags and bones trade, green leather or Prussian blue depots. But then, the wealthy and noxious industries started hunting for strips of land in the outskirts as real property prices were there more affordable. At that time, organic matters were more concentrated and ventilated since set in the open air, and their management had improved as hygienic slaughter-houses had now emigrated outside the cities. Therefore the ambiance improved and odours in the dumping grounds and in the bowels depots had diminished in intensity; slaughter-houses were now open to the environment; the Montfaucon's dumping ground had partly been moved to Bondy; sewage pipes were being built so as to absorb putrefaction and get rid of water sewage. The water of the Ourcq had been channeled through conduits that ran along the towns' main streets and made available at fountain

hoses. Waterproof ground surfaces helped further reduce odours, and hence contributed to ruin the crop of saltpetre.

Pollution continued to get denser and to mortify till late throughout the Restoration period. But its amplitude and frequency varied considerably from one district to the next, from one street to the next, between seasons, from a day to the next, as the 2nd Empire was drawing to a close. The Passy and Saint-Germain areas could breathe relatively well while the Sainte-Avoy and the Temple areas suffocated under mists of black dust.

As it seemed to get lower in the capital, it spread and intensified beyond the city gates. The Saint-Martin and Saint-Denis suburbs were stinking with rotten egg odours from the gas factories illuminating the Grands Boulevards whereas the steam engines would start pounding the air at dawn. Alloy metallurgy concentrated there so as to be within reach of the luxury market, to get tuned to its activities and to be near the new places of entertainment such as cafés, restaurants and theaters, all filled with the sweet fragrances of the *lorettes*: the boulevards, the trees and their shadows, the draughts, the lightings and the convenience it offered to circulate. Such was the contrast between the new bourgeois and rich district set so close to the poor and industrious faubourgs.

Industrialisation propelled Paris as the top-rank city in the continent but brought about two new pollutions which two centuries later were still being pervasive: sulfurous acid with its nefarious effect on the city materiality and metals labeled “heavy” were laying much concentrated in the underground.

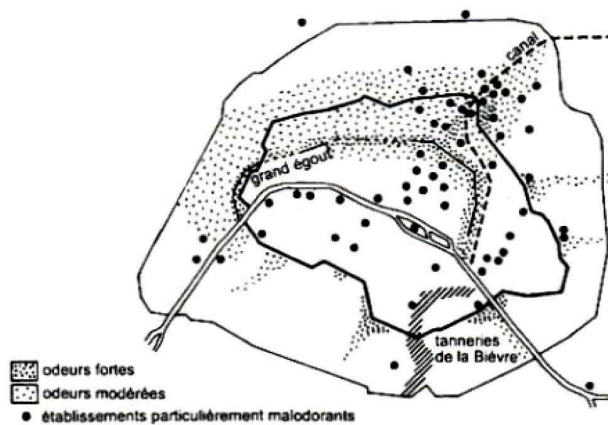


Figure 1. Some traces of odours inside Paris around 1810: the big black points stand for the smelly workshops.

“Every day the mud of the streets in Paris is black and often filthy; evidence of its presence is reinforced when one listens to and watches the city workers who lay and maintain the streets’ cobblestones; the sand was white when put as a layer under the cobbles but soon blackened and got impregnated with a very unpleasant sulfurous odour; the colour and the infection level reached were the result of several causes which need to be set out clearly as they provide an additional means of spreading valuable information to those in charge of transforming a beautiful city into a healthier city. All the greasy waters, all soapy waters, the amounts of food stuff, the urines and the animal wastes used to be strewn over the public highway in Paris and to remain there for more or less long periods. Therefore through decaying the chemical principles making up the compound it may generate a chemical reciprocal reaction and get melted with the plaster lime sulfate generally used in Parisian building works; the plaster may let out sulfuric acid, a part of the compound, and with ash

tended to generate other alkalis, alkaline sulfurs that blackened the sand and other objects in contact, and in that case, gave off an unpleasant smell similar to most of those from the sewerage system of the city" (D'Arcet, 1834, p. 172). The Napoleonic Empire turned Paris around from an administrative to an industrial city. The new atmosphere created by sulfuric oxide smells took possession of the Seine' right bank with its sulfuric acid and coal, while mercury fumes and chloride used respectively for gilding copper and felting hats poisoned the neighbourhood down and upstream as Paris became the first European producer of luxury items. Montfaucon became the world's leading craft district and its stench pervaded the Seine River extending up to the Sorbonne area.

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