

The Muck of Cities

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The modern notion of urban infrastructure derives from a medical analogy: the notion that the city is a body whose wellbeing depends upon functioning systems ensuring fluid circulation. The French doctor and economist Le Quesnay, fascinated by the effects of circulation and stagnation of both blood and wealth, was only one of several to draw a parallel between the systems of the human body and the infrastructure of the city when he compared the health of the individual human body to that of the political body, the organism formed by a collection of people.

The street is the primary collective space of the city. It is not only a conduit for movement, but also where people meet one another, conduct business, acquire goods, and discard refuse. Just as one speaks of “the street” in a political sense to indicate popular opinions, the street has a social dimension that complements its physical characteristics. Those with fixed homes, whether houses or apartments, enter the public realms when crossing the threshold between one's own building and the street. Those without fixed places of residence are said to live “in” or “on” the street.

In a sense, it is in the “negative space” of infrastructure: the space between and underlying a city's buildings, that urban life occurs, if urban life is understood to be the interface between the individual and the collective within the public realm. The compounding of the everyday life processes of so many inhabitants in a limited space transforms acts of cleansing and evacuation from private into public processes.

Italo Calvino, in his essay *La Poubelle agréée*, reflects upon the process of “taking out” the garbage. He argues that the act of moving household waste from the home to the street represents a kind of handshake between the individual and the collective.

This essay, part of a collection published by his wife after Calvino's death, gathers ten years of musing on the significance of the humble act of taking out the garbage, which he claimed was one of the few household tasks with which his wife would entrust him.

In many ways *La Poubelle agréée* can be understood as a counterpart to Calvino's *Invisible Cities*. A reflection on his years living in Paris, it is imbued with his fascination with the city and its legislative and social structures. While written in essay form, it parallels the fictional and seemingly fantastic *Invisible Cities* in that it evokes a sense of how a city is a portrait of its people, and how each city reflects the imperfect choices those people make about how to structure collective living.

Paris has a particular relationship with its own garbage. At times it resembles or has resembled various of Calvino's *Invisible Cities*, such as Beersheba, in which all the ingenuity of the inhabitants is lavished on the underground “technical” spaces, or Leonia, in which the inhabitants, in an endless quest for novelty, buy and discard with abandon. Their castoffs mount into a “fortress of indestructible leftovers ... like a chain of mountains” outside the city, threatening the city and its inhabitants with burial should the ring of detritus collapse.

As in other European cities, the accumulation of waste and related questions of urban hygiene gained attention in Paris during the period in which plagues ravaged Europe, roughly the mid-14th century until late in the 18th century. When the Black Plague arrived in 1348, Paris was the largest European city and faced particular challenges in addressing the mounting problems of urban hygiene.

The only major city in Europe outside Italy during this time, Paris had neither substantial remnants of the Roman urban infrastructure, as in Rome, nor a highly developed system of canals, as in Venice.¹ In addition, the Parisian people themselves seemed to resist changing their habits of waste disposal, which amounted to every putrid castoff landing in the city's streets and waterways. That which was not consumed by the pigs that roamed freely would absorb into the unpaved street surface, forming a rich and odiferous mud periodically scooped up and carted away by farmers to use as fertilizers.

Roman sewers existed on the city's left bank, roughly in the position of today's boulevard Saint Michel. They appear to have fallen into disuse by the 9th century. A succession of French kings sought to address recurring problems of street filth, which often resulted in impeded street traffic and even fatal accidents.

Philippe Auguste, famous for the construction of Paris's first complete ring of walls in 1190-112, ordered some streets paved in 1186. While paving made the street surface easier to clean, it also meant that the urban populations' detritus no longer could absorb into the street surface.

Sporadic attempts at legislating urban cleanliness during the twelfth through fourteenth centuries largely came to naught. When the black plague struck Paris in 1348, the teachings of Toxares, who had delivered Athens from the plague by removing waste and washing the streets with wine, served as the model for legislation requiring residents to sweep in front of their houses so that the refuse could be taken away. The rules were not obeyed. In 1395 the crime of dumping in the Seine carried severe punishment, but the practice continued. (Laporte 1978)

While a series of French rulers tried to establish cleaner streets through legislation and a patchwork of street-paving and sewer projects, with some exceptions the major infrastructure developments during the plague period were largely connected to military concerns (fortifications) and royal representation (aqueducts, fountains, and pumps to bring water to the royal gardens).

François I's campaign to cleanse both the French streets and the French language is documented by Laporte. François I's efforts aimed at the populace as a whole were largely legislative, and ineffectual. The physical infrastructure projects he effected, such as the quay along the Seine at the Louvre, were generally in relationship to his palaces.

The two Medici queens, Catherine and Maria, focused their attention on watering their respective gardens at the Tuileries and Luxembourg palaces. Henri IV devised impressive squares, but was murdered before he was able to complete his plans for introducing more fountains into Paris. It was only under Louis XV that an architect, Pierre Patte, laid out a comprehensive proposal for the design of the street section.

His drawing of a street section depicts the interrelationship between the architecture of the above ground structures (buildings, streets, and street furnishings) and the hidden world of the underground space, into which various fluids would drain from the space above.

Françoise Choay has identified Patte as an utopian seeking to "rectify" the city through science and technology, eliminating disorder and lack of hygiene for the wellbeing (*bonheur*) of the inhabitants. (Choay 218) Diana Periton describes Patte's vision of the Parisian street as "a section that empties the public space of everyday chaos. The unimpeded circulation of people, vehicles, water, and sewage means that it can be instantly evacuated..." What is left, she says, is a "haunting vacuum of wellbeing." (Periton 295).

Following a different trajectory than their northern neighbors in France, Italian architects went to the ancient sources for ideas of how to best protect the well being of city dwellers. There they found contradictory

advice, as Alberti indicates in his introduction to his discussion of cities in Book IV:

Everyone relies on the city and all the public services that it contains. If we have concluded rightly, from what the philosophers say, that cities owe their origins and their existence to their enabling their inhabitants to enjoy a peaceful life, as free from any inconvenience or harm as possible, then surely the most thorough consideration should be given to the city's layout, site, and outline. Yet opinions vary on these matters. (Alberti 1988: 99)

The passage underlines both the collective nature of the city (everyone relies on it) and the degree to which the city is a willed construction (based upon a choice of layout, site, and outline). The aim of this collective construction is the well being of the individuals who inhabit it or who rely upon it, even if they themselves do not inhabit the city, for "everyone" implies that even inhabitants of distant, rural areas rely upon the city and its public services.

The city, like the individual building, exists in Alberti's triadic organization as a physical construction of roads and walls, a social construction of politics and public services, and an "ornamental" construction: an expression of the beauty that is "a reasoned harmony of all the parts within a body." The parallel roles of the city as a collection of buildings and outdoor spaces and as a hub of intense interaction among people cannot be separated from the most basic matters of urban life. By Alberti's time one of the most pressing of these was how to manage the concentration of waste that such a dense settlement produces to ensure that inhabitants would not choke, stumble, or drown in their own refuse. Renaissance attempts to address this issue met with limited success, yet they play a central role in the invention of the modern city as a social, technical, and administrative entity.

Alberti introduces his discussion of the city by summarizing the recommendations of various

Roman authors regarding the placement of cities. He then establishes a set of recommendations intended to ensure that a particular location would protect a city against environmental and military threats.

The discussion of walls, roads, and bridges that follows is dominated by military concerns until Alberti arrives at the topic of drains, which he identifies as a part of road construction, almost as if to excuse the shift in topic to what we today might term "waste management." The drains to which he is referring are sewers, which he defines in structural terms as a kind of bridge. He evokes the great Roman sewers and then proceeds with a listing of ancient and contemporary cities suffering from inadequate sanitation.

In a passage that could have inspired one of Calvino's *Invisible Cities*, Alberti describes the beautifully designed ancient city of Smyrna which was rendered repulsive by a lack of a means to eliminate waste, and similar problems in Siena at the time at which he is writing. Then, touching on a theme developed by Alain Corbin (Corbin 1986) in his discussion of 18th and 19th century hygienic debates in France, he identifies two types of waste removal system, one that diffuses the waste into a body of water, the other that allows it to sink into the soil in a subsidence pit or cesspit.

Alberti's discussion of environmental aspects of the city thus focuses on two principal areas: the planning of the city in relation to the air quality of the location, and the management of the waste and runoff generated in the city by the concentration of inhabitants there. Renaissance architects after Alberti were frequently called upon to devise hydraulic interventions as part of their architectural practice.

Refuse continued to mount in the streets of European cities. Smoke from heating and industrial fires rendered the air thick and acrid. John Evelyn describes the corruption of the air of 17th century London in dramatic terms, stating that the city's "inhabitants breathe nothing but an impure and thick Mist, accompanied by a fuliginous and filthy vapour, which renders them obnoxious to a thousand inconveniences, corrupting the Lungs, and disordering the entire habit of their Bodies; so

that Catharrs, Phthisicks, Coughs and Consumptions, rage more in this one City, than the whole Earth besides." (Evelyn 1961)

Efforts at managing the hygiene of cities during the 17th century were sporadic and largely ineffectual. Paolo Ulvioni argues that the reaction to plague in Italy during the seventeenth century was uneven. (Ulvioni 1989) Measures taken to isolate and prevent the spread of disease caused their own damage. Like Ulvioni's, Carlo Cipolla's analysis of responses to plague demonstrates that the problems of urban hygiene were a central concern in seventeenth-century Italy. He shows how an awareness of environmental odors in the early seventeenth century provoked responses such as the formation of *Uffici di Sanità*, with broad powers of control of hygienic conditions, including housing of the poor. Cipolla described Northern Italy as a site of "feverish and intense activity" in the prevention and fight against the plague between 1348 and 1700.

We now know that fleas and rats spread plague, and that without these carriers the plague cannot exist. However, as Cipolla notes, the science of the time attributed plague to venomous atoms whose presence caused a "corruption and infection of the air that degenerated into poisonous, sticky miasma that could kill through contact or inhalation." The causes of corruption and infection of the air were thought to include "bad alignments of the stars, exhalations of swampy water, eruptions of volcanoes, dirty and rotten conditions, and the exhalations from corrupt and putrid bodies."

Miasma theory caused sanitary officials to burn furnishings and clothing considered contagious and to quarantine ships, merchandise, and people. A connection was made between the prevalence of the plague in the summer and the strong odors of cities and other inhabited places due to the heat rather than the increased number of insects.

Only in the nineteenth century, and still following miasmatic theory, did urban programs of waste removal, improvement of the sewage system, and street cleaning become widely implemented. These same interventions had preoccupied the Italian *uffici di sanità* from the fifteenth to the seventeenth centuries, and

had also been the subject of a series of failed attempts at legislation in Paris.

Inverting the Albertian model, in which the defects of buildings appear at the end of the treatise, Patte begins his 1769 *Memoires sur l'architecture* with defects and their remedies. His attention goes first to the street, in particular its paving and drainage.

Urban infrastructure also occupies an important place in Milizia's writing on architecture. Milizia begins his *Delle belle arti*. . . by upholding Roman Cloaca Maxima as an architectural high point (contrasted with the low point of Roman Baroque formal inventions of the generations preceding his own). He explains that Romans deified things in the public domain, naming a goddess Cloachina and a god Stercorus. The beauty of the cloache is that they respond to necessity and are not "sullied" by ornament.

In his *Dell'architettura*, Milizia devotes a similarly prominent place—his conclusion—to a discussion of laws governing architecture. (Milizia 1826-28) He first establishes the laws related to architecture deriving from the "*dritto di servitù*." This concerns the rights and obligations of the individual property owner. The laws of *servitù* include such issues as the distance that part of a building can protrude into a courtyard, how light and views are shared, management of water flows (from roofs, in canals, etc.), and the handling of refuse. Milizia cites the law of *dritto sterquillini immittendi*, or the right to place a cesspool near a neighbor's wall. He goes into specific detail about the placement and cleaning of cloache, cisterns, and fosse before ending his text with a brief maxim: *Vi dev'essere equilibrio* (there must be equilibrium.)

The second half of the eighteenth century saw the beginning of programs to promote the movement and cleanliness of urban air and water. Modern sewers, fountains, street paving and cleaning, and lighting (to prevent night dumping) were among the solutions implemented. Hospitals and cemeteries were sited to reduce their perceived capacity to render the air insalubrious. (Etlin 1977)

Innovations in indoor plumbing, first promoted in Britain, made their way across Europe toward the end of the eighteenth century.

Writing at the end of the 17th century, Perrault had raised the question of the meaning of the *cellas familiaricas* cited by Vitruvius. (Laporte 1978) Illustrations of privies appear as nearly hidden insertions in the treatises of Milizia and Danieletti. At the same time, Danieletti's teacher Domenico Cerato was promoting a design of fireplace chimneys attributed to Benjamin Franklin, whose efficiency would improve indoor and outdoor "air quality."

The theorist Carlo Lodoli, whose architectural teachings influenced Milizia, Danieletti, Cerato, and others in their circle, had cited the equivalence of function and representation in his teachings. In their interest in plumbing, sewers, chimneys, and related "infra-structural" aspects of architecture, Lodoli's followers demonstrated that an architectural function could be understood in the sense of bodily function (such as digestion or motion) as well as a function of the body politic. (Rykwert 1980:324)

Italo Calvino described imaginary cities in which the structures of what we call "waste management" are as essential to the city as any other attribute. Calvino renders these structures, be they legislative, social, or architectural, as having symbolic values. Calvino's stories of invisible cities are complemented by his seemingly mundane description of the most banal of urban acts in the real city: setting the garbage out for collection. That description hinges on the notion of "agreement." This delicate link between individual and collective determines how we manage "stuff" in the contemporary city.

Confronted with extraordinary environmental challenges, architects today seek to address them through what we have come to call "sustainable design." Investigations of alternatives in energy and materials have begun to yield viable solutions. Yet architectural choices must begin with an understanding of the hidden, invisible, or forgotten realm of infrastructure, beginning with our processes of consumption and expulsion, for it is there that some of the most far-reaching decisions affecting our environment occur. As Calvino has shown, these are not banal decisions, but are instead at the core of the poetics of collective dwelling.

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