

MAJOR THEMES
THE CITY AS CULTURE
(PROF. MARJATTA HIETALA)

**Innovation and Improvement in Infrastructures and Services as a Cultural Product of
Italian Medieval Cities
by Francesca Bocchi**

In our contemporary world to modernize, that is, “innovation” and “improvement,” is an action that concerns all that which is at the vanguard and is projected towards the future.

A project prone to give innovation and improvement indicates that the society which proposes it expresses the wish to overcome what it thinks is old and no longer in step with the times.

Also in the past there were moments in which the innovative thrust became particularly strong, which manifested itself in a project of improvement which then found significant achievements.

For that which concerns the city, the capacity to innovate was strongly conditioned by the cultural capacity to devise projects capable of conferring on the cities the grandeur of public and ecclesiastical buildings, but also of determining the surmounting of that which for them was already the “historical city.”



A «Terra Nuova fiorentina»: S. Giovanni Val d'Arno (Arezzo). Architect: Arnolfo di Cambio, 1296,

In the Duecento and in the Trecento, in the great urban building sites, the cultural formation of the artists had deep roots in the knowledge of the works of Antiquity, but also an awareness of the innovative demands of architecture and urban planning. In the middle of the Duecento Nicola and Giovanni Pisano worked on the sculptural decoration of the Duomo of Siena and the Fontana Maggiore of Perugia. At Florence the celebrated sculptor, architect and urban planner Arnolfo di Cambio (circa 1240-

1302), planned the *Terre Nuove* (centers of new foundation for defense of the territory) on the orthogonal pattern of classicism, and in the final years of the Duecento opened, on behalf of the commune, the works for the church of the Franciscans (S. Croce), for the new construction of the cathedral (S. Reparata, today S. Maria del Fiore), and for the construction of the communal palace (Palazzo della Signoria). In 1334, Giotto became the superintendent of the Florentine building sites and to him fell the task of the campanile of the cathedral. Between 1310 and 1330, Lorenzo Maitani was superintendent of the building site of the cathedral of Orvieto



Cathedral of Orvieto. Architect: Lorenzo Maitani, 1310-1330

The cities, however, also had need of other interventions, less ostentatious, but more efficacious on the level of modernization.

What does a city today put forward to improve itself, to become “modern”? it plans always more efficient roads of communication, implements the power supply system, and improves the quality of life of its inhabitants.

In the medieval Italian cities, especially in the 13th century and at the beginning of the 14th century, things went more or less the same way: always sought were more efficacious sources of energy and food, an urban structure was conceived that was always more responsive to a population in rapid demographic development, a city in which one had to manage development in a manner orderly and responsive to the needs of the population, which, then as now, needed to produce and to live in cities without dissipating resources and to pursue a good quality of life. To pursue these objectives meant reaching a balance between the development and consumption of resources, which became *culture* itself.

In addition to constructing aqueducts, subterranean *bottini* (canals) and canals, the cities also turned their attention to perfecting and developing a more complex system of rules concerning the management of the city and governance of its development, rules that might be applied to everyone, overcoming, if possible, all the *ad hoc* dispositions for every single case, as had always been done. This totality of norms, rules, dispositions, provisions, and deliberations flowed together into the communal statutes, sometimes in a manner well-enough ordered and very articulated, at other times with less attention, according to the level of interest which the matter aroused in the community to which it was directed and to the cultural maturity which it had reached.



Cathedral of Orvieto. Architect: Lorenzo Maitani, 1310-1330

All the Italian cities, which from the 12th century were constructed as autonomous communes (city-states), wished to give themselves as quickly as possible norms which would regulate their ordered growth. It was the period of the greatest urbanistic development, a development which would continue until the Trecento. In order to face in an efficacious manner the demands of the urban population, the city adapted itself, augmenting its area with a progression such that in reality urban necessities were then able to be satisfied up to the 19th century, and in many cases even to the beginning of the Novecento. But it was also necessary to render “modern” that which at that time was already the historical city, not only from the viewpoint of building renovation, but also with the systematization of the hygienic installations of the houses and the sewers of the streets, with the adduction of abundant potable water, with the systematization of great sewage drains, without damaging the waters of the surface which were used as water power.

For the most part, the legislation entered into some communal statutes in certain cities since the 12th century, but above all the process intensified between the Due

and Trecento. The great problems faced concerned exactly the development towards the future, to begin some defense of the public land which signified the defense of the common patrimony, but above all the regulation of water, hygiene and health, the defense of the urban environment by means of the safeguarding of the building patrimony, and the rules for avoiding pollution.

The 12th Century

In the laws of Milan (*Consuetudines* of the 12th century),¹ there is an important section which established the minimum distance of a foot (corresponding at Milan to cm. 43.5) between the wall of a house and the boundary line of the property, which permitted the draining of the rain waters and the opening of windows on the lateral walls of the house. It was, moreover, allowed to construct the buildings abutting one upon the other, so that there were no openings and windows in the walls in common, nor would the rain waters flow onto one's neighbor. This set of provisions, which seemed dedicated to resolving quarrels between neighbors, in reality contributed to modifying the aspect of the cities and to give them that continuity in street facades which is still maintained today, although the buildings have been replaced many times. In fact, the ancient norm which required a minimum distance from the property line in the construction of buildings had determined a certain interval between one building and the other.

Those spaces had become private passageways, which all the statutes of the following centuries, also those of other cities, record with local terminology (*androne*, or *chiassi*, or *intercaselle*, or *piazzole*, or *calli*, or *treseppi*, etc.) which separated one house from the other, allowing toilets and waste water from the houses to drain freely there. From that point the sewage was carried directly into the public street. The urban legislation of the Duecento was intended exactly to obligate the closing of such passageways and to put the drains underground, for reasons not only of decorum, but also for the hygiene and health of the citizens.²

The abutment of one house against the other, allowed by the Milanese laws and applied everywhere, is a sign of another type of building and of another patrimonial structure. In fact, the abutment of one building against another is typical of the apportionment (that is, the subdivision of land into parcels (*lotti*) for the construction of houses), which was carried out in moments of greater demand for houses, that is, in the epoch of urban migrations, of demographic explosions, of favorable economic conjunctures, at which time also the less strong social classes were able to gain, if not property, at least possession of land in the city on which to construct a house. This does not concern, certainly, the central neighborhoods where were located the seats of civil and religious power and the residences of the most powerful families. It concerned the peripheral neighborhoods, or those within the walls, if there was space, or immediately outside, if the commune had brought to that point the necessary infrastructures (defense, ditches, main trunk lines for the drainage of the sewers), transforming the areas thus included in the city from rural to urban.

¹ *Liber consuetudinum Mediolani anni 1216*, edited by E. Besta and G.L. Barni, Milan, 1949. It was compiled in 1216, but contains material for the most part going back to the middle of the 12th century.

² F. BOCCHI, *Attraverso le città italiane nel Medioevo*, Bologna, 1987, pp. 115-117.



A «chiasso», Assisi, Piazza del Comune

This phase of transformation was experienced more or less intensively by all the Italian communal cities in the course of the 12th and 13th centuries. Thanks to these interventions, entire areas were formed in which the city blocks are still today distinct by cadastral parcels in a form very extended and with street facades quite narrow, where the drainage of domestic sewage was no longer able to occur on the sides of the houses, in the small spaces between the houses, but with other urbanistic solutions.

Hygienic norms and anti-pollution dispositions (13th and 14th centuries)

The set of norms (laws) elaborated in order to define the management of the drainage of the waste water of the houses and the toilet facilities had a significant part in the history of our cities, not only because it is the sign which brought to maturity the idea that together with the decorum of the urban centers it was necessary to safeguard also public health, but also because with those decisions it contributed in a decisive manner to changing the face of the cities.

In general, as was said, the sinks and toilets of the houses drained the sewage freely into the lateral spaces which separated one house from the other. Before that epoch many sinks drained directly into the street, so much so that at Pistoia from the 12th century it was arranged to have them removed.³ It was then the responsibility of the

³ *Statuti pistoiesi del secolo XII. Breve dei consoli [1140-1180] Statuto del podestà [1162-1180]*, edited by N. Rauty, Pistoia, 1997 (statuto del podestà, r. 37).

inhabitants of the houses, if the rain had not already taken care of it, to provide for the cleaning of those narrow spaces, making all the sewage flow into the street. In the course of the Duecento this type of space between one house and the other began to be forbidden, and in the surviving legislation one finds another structure appear which was intended for the same purpose, carried out in the areas of new urbanization. This involved a canalization (main sewer or drain), that ran in the center of the city blocks, parallel to the facades and touching the internal courtyard areas, on the boundaries of the individual lots, which served to gather the domestic waste water.⁴ This drain represents in a certain sense a more mature element of the organization of services, since, with the sewage of all houses of the block flowing together, it permitted linkage with the water network of the city and the possibility of receiving periodically from the public administration clean waters for cleaning. Moreover, the central drain permitted placing the toilets in a place not visible from the street, so that the cleaning was secured both with rain water and with public drains.



Humiliati friars work in the textile industry, 15th century (Milan, Biblioteca Ambrosiana, ms. G 301)

This evolved system was the fruit of the necessity of removing from the streets the unhygienic and unaesthetic services which drained in lateral spaces, for which was elaborated almost everywhere a set of norms that required putting underground the drain which joined to the street, above all if it passed under a portico, and to enclose it with a wall, reaching as high at least as the second floor of the houses. These dispositions had determined some rather radical changes, since with the construction of the wall the private passages were eliminated and were unified with the facades of the houses. Moreover, the covering of the drains and the construction of the main drains, which opened into the street, in short time led to the complete reconstruction of the system of sewers which the Italian cities had had in Antiquity, but which in the

⁴ *Gli statuti di Bologna dell'anno 1288*, edited by G. Fasoli and P. Sella, 2 vols., Vatican City, 1937 and 1939 ("Studi e Testi", 73, 85), henceforth FASOLI-SELLA, II, p. 139.

early Middle Ages had in large part been lost⁵ by a lack of maintenance, replaced by open drains which polluted the air and were detrimental to health.

Already many cities in the Duecento had carried out at least the principal structures of the main sewers and had required private citizens to cover the drains, but only in the Trecento did the network of sewers become efficient.

The need to rationalize the system of public and private drains is particularly vivid in the statutes of Milan, whose norms reached maturity in the middle of the Trecento.⁶ The entire set of norms there elaborated had the purpose of “modernizing” the city, removing from it all that which remained that was “medieval.” In fact, artisans were forbidden to work outside of their stores; the widening and straightening of the streets was ordered, great attention was paid to hygiene and to the cleaning of the piazzas and streets and it was desired to avoid pollution of the air and water.⁷ The Milanese statutes of the Trecento tend to make Milan an orderly city, where the health of the citizens was protected, separating extraurban dumping for polluting products (leather working, dying and butchery) and regulating in a way quite advanced the drainage of toilets from houses that “made the air infectious.” The ancient system of drainage in the spaces between houses having been prohibited, and the downflow of rain waters having been regulated, the Milanese public administration reserved to itself the determination of the conditions of private drains, requiring that one make a request for each new installation, which, in any case, had to have a subterranean and deep discharge.

This set of norms signals a turning point in the hygienic-sanitary organization not only of Milan, but also of all other cities – in its principal lines it is that still in use – because it understood on the one hand the construction of subterranean main drains in order to channel the rain waters into the urban ditches, and on the other hand the installation in the houses of drains by dispersion into the land, if not of true and proper cesspools under the control of technicians of the commune.

Also the regulation of public hygiene is included in the legislative project of management of the cities with the purpose of improving the quality of life. That concerned not only the organization for the distribution of waters destined to the cleaning of the spaces between the houses, but also the capacity of the administrators to be convincing in their confrontations with citizens. In fact, citizens were not supposed to render unusable the wells of potable water with substances that polluted the substratum (the subterranean water). Moreover, they were supposed to act in such a way that the piazza – the political and public space par excellence – would be the model of the city. In the piazza, in fact, it was necessary to remove quickly any garbage, above all after the weekly market took place there. Measures were taken to distance from the center of the city the industrial activities which produced water, acoustic, and atmospheric pollution, and in order to impede the preparation of food products that caused bad odors⁸ and noise.⁹ Places were sought outside the city for

⁵ The city of Pavia is an example of the efficient maintenance of the ancient sewage system.

⁶ G. PORRO LAMBERTENGI, *Statuti delle strade ed acque del contado di Milano fatti nel 1346*, in *Miscellanea di storia italiana*, R. Deputazione di Storia Patria, VII, Turin, 1869.

⁷ F. BOCCHI, *Il disegno della città negli atti pubblici dal XII al XIV secolo*, in *Il Millennio ambrosiano. La nuova città dal Comune alla Signoria*, edited by C. Bertelli, Milan, 1989, pp. 227-236.

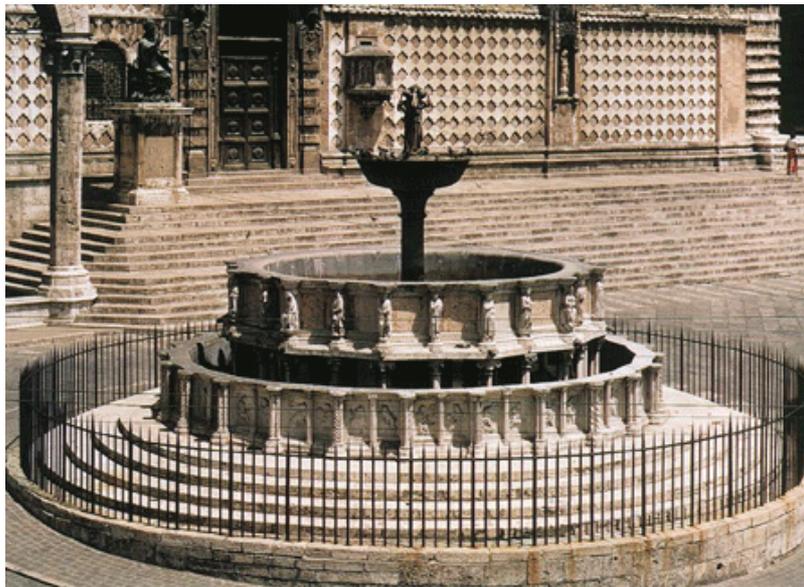
⁸ FASOLI-SELLA, II, p. 141.

public dumping where garbage was collected. Some cities did not forget to elaborate norms for respecting the natural environment from which came resources and other living beings.

The general set of norms is present in all the cities for which there has survived legislation. From the larger to the smaller cities, one notes a precise interest not only to regulate the improvement, but also to manage the daily life of the community in relationship to the urbanistic fabric. Moreover, the larger cities also elaborated a series of dispositions with which they safeguarded the urban identity itself. We do not know how conscious they were in this desire, but analysis of the complex of legislative activity which they carried out allows us to understand how much every act benefitted not merely from improvisation or spontaneity and how recurring was the awareness that the city had parameters of “beauty”¹⁰ which in the mentality of the epoch meant order and transmission of the idea of a “buon governo” that would reassure foreign economic agents.

The aqueduct and the *Fountain of the Piazza of Perugia*

The bringing of abundant potable water into a city has been one of the themes that has created a decisive turning point in the modernization of the cities.



Perugia, Fontana Maggiore. Sculptors: Nicola and Giovanni Pisano, 1287

⁹ *Statuta Communis Parmae digesta anno MCCLV*, “Monumenta historica ad Provincias Parmensem et Placentinam pertinentia”, Parma, 1857, p. 345, forbidding the spice-sellers from making *piperata* (pungent items) outside of their stores.

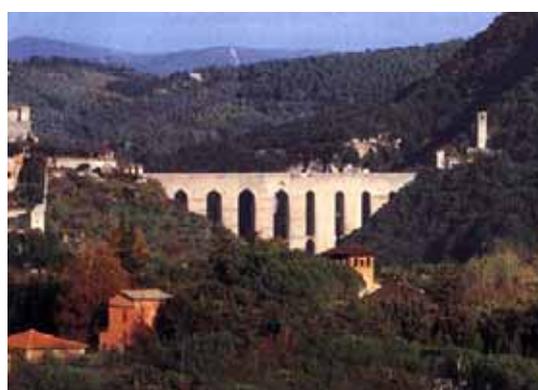
¹⁰ Particularly present in the Sienese statutes, but also for example at Ascoli, is the concern to safeguard the “bellezza della ciptà”, which was continuously evoked, even if at that time the interests of management of the urban territory were not only of an aesthetic character (book III, rubric 19: “De la pena di quilli che retene porci, scrofe et verri et che vando per la ciptà d’Asculi et de li becchari et hosteri che retinasse overo receptasse et cura havesse de verri et scrofe de le frati de Sancto Antonio”).

Muslim Palermo knew the realization of a system of canalizations of a sophisticated technology, the *qanat*, which permitted the bringing of water by means of subterranean canals, which collected the spring waters from the surrounding territory and from the water table. Water was then collected by the buildings of the city by means of numerous wells.¹¹

In north central Italy, the hydraulic technology of the aqueducts of the Roman age was not completely forgotten. The aqueducts were still visible with their mighty arches in the countryside and with their subterranean pathways. For very many centuries the economic conditions did not exist for realizing grand projects such as those ancient ones, but as soon as the conditions presented themselves, the occasion was not lost: that happened in the period of greatest development of the Italian cities, in particular in the epoch of the popular governments (second half of the 13th century).



Sulmona, Aqueduct (13th century)



Spoleto, Bridge-aqueduct (14th century)

The first great Italian project, which also used the experiences accrued in central Europe, was that of Perugia, envisioned and initiated in 1254-56 by Frate Plenerio and Bonomo da Orte. But there was, however, a flowering of similar initiatives in the same period in the cities in which the configuration of the mountainous land had always created difficulty in procurement: Orvieto, Viterbo, Sulmona, and then many others, to the underground aqueducts of Siena (Bottino Maggiore, 1334), which would become an amazing reality of hydraulic technique and an urban symbol.¹² To these one can add the complex system of adduction of water to the high stories of the Palazzo dei Consoli of Gubbio, described with great wonder by Leandro Alberti (1525-28): “a fountain, which goes up above all the buildings, and jets abundant and clear water in the middle of a large room, to the great pleasure of those looking at it. And the water is conducted from the said fountain through all the rooms of the said Palazzo.”

The bridge-aqueduct of Spoleto also returns as one of the undertakings of this epoch. This concerned works which present the recovery of classical models – transmitted

¹¹ P. TODARO, *Utilizzazioni del sottosuolo di Palermo in età medievale*, in *Palermo medievale*, edited by C. Roccato, “Schede Medievali”, nn. 30-31 (1996), pp. 109-128.

¹² D. BALESTRACCI, C. PICCINNI, *Siena nel Trecento. Assetto urbano e strutture edilizie*, Florence, 1977; D. BALESTRACCI, L. VIGNI, A. COSTANTINI, *La memoria dell'acqua. I bottini di Siena*, Siena, 2006.

through Vitruvius whose work always had a good and uninterrupted circulation in the Middle Ages – which in their time with their imposing arches recalled the ancient public utility.¹³ But also at Sulmona, city seat of a high functionary of the Kingdom of Sicily in the middle of the Duecento, the aqueduct was at one time useful and celebrated, as the classicism of the architecture of the emperor Frederick II, which evoked grand political and institutional models.



Siena, Bottini (subterranean canals), 13th-14th centuries

Modernization, however, did not consist solely of applied hydraulic technique, although decisive for the good recovery of projects, but was seen – as far as Perugia was concerned – also in the political capacity to understand what the road for improvement was, in the tenacity in pursuing it, and also through the alternative and complex events which followed the moment of decision, in the awareness that that was a path from which one could not and ought not to turn back.

The Perugian aqueduct of Montepacciano was 4,000 feet distant from the place of the taking up of the water to the piazza in which it would gush forth, but it had to overcome troughs and mountainous crests. The works were difficult and long, interrupted but completed in the Trecento by the celebrated architect Lorenzo Maitani. This comprised an imposing handwork with its arches, subterranean pathways and conduits of lead, but very delicate, even after the reconstruction, and even more delicate was the handwork of the fountain from which the water exited, to which the Perugian statutes of 1342 dedicated a large part of the fourth book: “De la fonte de la piazza. E del conducto d’essa. E de le citerne da fare.”¹⁴

¹³ G. ROMALLI, *L’acquedotto medievale di Perugia e l’adduzione idrica nelle realtà comunali centroitaliane*, in *Arnolfo di cambio e la sua epoca. Costruire, scolpire, dipingere, decorare*, Atti del convegno internazionale di studi, Firenze-Colle Val d’Elsa, 7-10 marzo 2006, edited by V. Franchetti Pardo, Rome, 2006, pp. 317-330. See also A. BARTOLI LANGELI, L. ZURLI, *L’iscrizione in versi della Fontana Maggiore di Perugia, 1278*, Rome, 1996.

¹⁴ *Statuti di Perugia dell’anno MCCCXLII*, edited by G. Degli Azzi, “Corpus statutorum italicorum”, II, Rome, 1916, pp. 263-268.

The fountain which was so much at the heart of the Perugians is that which adorns the piazza between the cathedral and the Palazzo dei Priori. It was planned by Fra Bevignate da Cingoli and sculpted by the celebrated sculptors Nicola and Giovanni Pisano, who completed it in 1287.

From reading the long rubric of the statutes, one sees that the concerns of the administrators were of a varied order: in the first place they decided that the use of the fountain was only and exclusively that of the drawing of water for drinking and that in no way should it be polluted. But equally important for the legislator was the protection of the entire aqueduct and of all the persons who gained access to the fountain in order to utilize its service.

To make these aims effective, the Perugian statutes identified a restricted zone with a radius of three feet around the stairs leading to the fountain, and mandated the construction of five or seven stone jars to be placed near the stairs themselves, where it was required to wash the pitchers and other containers before drawing the water, especially the exterior part of the bottom of the container which could bring forward polluting substances during the drawing of the water.



Perugia, Fontana Maggiore. Sculptors: Nicola and Giovanni Pisano, 1287, detail

Another device, whose purpose was to avoid contamination of the water and at the same time to furnish a service, called for the construction of thirteen copper ladles, each with an iron chain at every spigot from which poured forth water, in order to permit one to drink and to fill the containers.

Only the indicated implements were permitted for use at the fountain, in order to prevent anyone from damaging the handwork and polluting the water. Among other provisions, it was indicated specifically that it was forbidden to draw water with barrels that might be soaked with oil or must or otherwise soiled.

The prohibitions appear in large part tied to the fact that the piazza was also used as the market place. In fact, it was forbidden to use the water of the fountain to water

animals, who were not otherwise able even to approach the stairs, nor could one approach the fountain to wash oneself, to do laundry, to clean foodstuff, nor least of all was one able to draw water to make lime, or work leather, or prepare parchment, processes that were highly polluting.

Very high monetary fines were provided against anyone who might soil the handwork and the water and still harsher were the penalties for anyone who might damage it. A very precise reference was made to the sculptures, when the penalty was formulated against one who with stone, iron or wood “romperà ... alcuna de l'emagene sculpite” (will break ... any of the sculpted images) or the spigots, or the chains. For such a crime, a very high monetary sanction was provided, of 100 pounds, which, if the guilty person was not able to pay, was changed to amputation of the right hand.

Another concern of the Perugian statutes was that of protecting those who stopped at the fountain, with particular regard for the more helpless subjects, who were the women: “Niuno huomo faccia alcuna engiuria overo violentia ad alcuna femmena andante overo retornante da l'acqua trare.” (No man should make any injury or violence against any woman going or returning from drawing water.)

Those persons who damaged the subterranean conduits and were not able to pay the monetary sanction would have their right hand amputated, which became a capital punishment if the resulting damage completely blocked the flow of waters. For this, as for all the other crimes, fathers were responsible for their minor and non-emancipated sons, but if it was a woman who had damaged the spigots – which could happen, given that the drawing of water had always been a feminine task – “per tucta la piazza del comuno de Peroscia se degga frustare.” (She was to be beaten through the piazza of the commune of Perugia.)

The organization of services and the quality of urban life at Bologna in the Duecento

Recent studies on the full spectrum of interventions carried out by the commune of Bologna in the course of the 12th and 13th centuries¹⁵ draw attention to how the evolved activity of the commune shows, without any possible doubt, that even by the middle of the Duecento the level of control on the city which was put into effect by the public administration was very high: the land and the space belonging to the community could not be privatized in any way; the great infrastructures had already been accomplished (piazzas, markets, communal palaces, energetic supply of resources); the old streets had been straightened and widened, new ones were being developed on the periphery; private building activity was subjected to a general set of norms requiring that a part of the private land be assigned to public use with the construction of a portico;¹⁶ gutters, drains and the overflows of rain water were regulated.

¹⁵ F. BOCCHI, *Dalla grande crisi all'età comunale*, “Atlante Storico delle città Italiane”, Bologna, I, Bologna, 1996, pp. 49-114; F. BOCCHI, *Il Duecento*, “Atlante Storico ...”, cit. Bologna, II, Bologna, 1995. Cfr. furthermore F. BOCCHI *Bologna nei secoli IV-XIV. Mille anni di storia urbanistica di una metropoli medievale*, Bologna, 2008.

¹⁶ *I Portici di Bologna e l'edilizia civile medievale*, edited by F. BOCCHI, Bologna, 1990.

The commune of Bologna was therefore perfectly able to carry forward still further its own decisions in order to pursue those goals which were never indicated in any deliberation, but which were explicit in its effects: to render the city functional and efficient, in step with improvement.

Some examples of the accomplishment of this project concern the disposal of domestic waters and garbage.

Sinks, overflows [= rain which descends from the roof and falls into the street] **and toilet facilities.** Even the draining of domestic sinks could not be conducted without rules established by the commune. All the sinks, *situle* (buckets), troughs and iron gutters, which made the domestic waters fall into the public roadways or constituted a danger for passers-by, were prohibited. If the discharges happened in public piazzas in which there already were subterranean drains, they had to be connected to them. As for the sinks and gutters whose discharges emptied into *androne* (alleyways), it was necessary that there be at least a half foot (19 cm) of private property beyond the point of the fall of water. Control belonged to the *ministrali* of the neighborhoods, who were obligated to enforce the execution of the works or to denounce the defaulters to the designated officials, who punished them with a monetary sanction, with the obligation to correct the discharges and repair possible damages.¹⁷



Bologna, via Vinazzetti, «androne» closed

¹⁷ L. FRATI, *Statuti di Bologna dall'anno 1245 all'anno 1267*, in "Monumenti storici pertinenti alla Provincia della Romagna," s. I, 3 vols., Bologna, 1869-1880 (henceforth FRATI, followed by the date of the statute), 1255, I, pp. 200-201, book I, rubric 33: "Quod super viis non sint sayguatoria."

Gutters and overflows not conforming to established standards were the first victims of modernization, not only because the dripping of rain water could annoy passers-by or neighbors, but also because, urbanistic disorder having increased, they constituted a means of spreading fires to neighboring buildings and excessively restricted the air space, already normally narrow,¹⁸ thus, *ad removendum incendii timorem*, one proceeded to the widening of the streets and to the removal of the gutters.

Placed traditionally on the sides of the houses in tiny spaces that protruded from the wall,¹⁹ the toilets drained freely into the *androne*. The statute of 1250 dealt with the subject from two diverse points of view: on the one hand it took into consideration the public service which had to be organized in the most heavily-frequented places; on the other hand it expressed a concern to conceal the toilets from the view of passers-by, above all in the piazzas, at the city gates and at the great ecclesiastical complexes.

In 1255, the characteristics of the space between two houses (*androne*) were defined, which allowed the presence of toilets, not only in order to resolve some easily understandable problems of hygiene, but also so that, as the statute states “may be allayed and halted the hatreds and quarrels which break out because of the *androne* which have toilets and into which all other kinds of putrefaction are thrown.”²⁰ In fact, the quarrels between neighbors probably arose because agreement could not be reached on how to proceed and each one sought to manage in his own way the space which was held in common. The norms established that, if an owner had in the *androne* for his own space less than a foot in width (38 cm) and less than four feet in length (1.12m), he could not have a toilet there, because it was necessary to have at least another foot of distance beyond the wall of the toilet for drainage. Only in the instance in which there was present a strip of at least a foot of private property beyond the fall of waste matter, could one have a toilet constructed. This arrangement confirms a norm which had its origins in Antiquity, relative to the required space of at least a foot between the property line and the beginning of the masonry, in order to permit the opening of windows. If the resulting spaces were narrower, they were closed off, if instead, they were wider and if they were used habitually as passageways, they became public roadways.²¹

Polluting industrial wastes. A city in full economic expansion produced toxic waste, which polluted the air and water.

For these reasons it was necessary to plan the city by taking account of two diverse factors: on the one hand to maintain clean water, and on the other hand not to impede workers from production. It was not possible to obtain both purposes together; it was necessary to attain a correct balance between development and the damaging of the available resources. To accomplish this, the commune sought to separate those waters which were specifically dedicated to certain services, and to assign others to the disposal of polluting wastes.

¹⁸ FRATI, 1250. II, p. 403, book IX, r. 100: “Quod grondaria domorum contrate in qua habitat dominus Jacobinus de Allegracore debeat reaptari.”

¹⁹ From the dimension of the place derives the term in the Italian language (= small box or booth) and that of popular usage, *camerino* (small room or closet).

²⁰ BOCCHI, *Il Duecento*, cit., pp. 199-200.

²¹ BOCCHI, *Il Duecento*, cit. pp. 45-49.

An untouchable waterway was that of the Reno canal (excavated in the 12th century in order to carry water into the city), at least for the entire tract that crossed the city.²² Once having exited from the city walls, the water might also be contaminated, but not too much, since it was utilized for navigation towards the valleys of the Ferrarese territory. The water of the canal was therefore safeguarded by all possible norms, above all the water could not be polluted by any residue from leather processing, and the roadways which ran along the side of the canal could not be utilized for disposal of manure or other wastes.²³ The entire southern part of the city towards the hills, included between the last circle of city walls and the two canals (also excavated in the 12th century), which carried the waters of the Sàvena river, had to be kept as clean as possible, precisely in order to be able to serve economic activities during the day, and in order to clean the city streets at night. Safeguarding the urban waters made it necessary to relocate the polluting factories to the less inhabited areas in the valleys, after the waters had already served their purpose. Some areas of specific use were identified as locations for factories that performed polluting industrial activities.



*Area of the «Campo del Mercato», created in 1219
Vatican City, Sala Bologna, fresco 1575*

The area of the Campo del Mercato to the north within the city walls and the southern area of the strip of suburbs had available ample space and water, but in the area to the south – as I have said – it was necessary to protect the water. The statutes, in fact, hastened to prohibit the installation of any kiln or forge, above all for the working of silver and other metals, specifying that the prohibited area extended between the two branches of the Sàvena canal. The reasons indicated in the statute

²² FRATI, 1250, I, pp. 185-188, book I, rubric 26. The prohibition concerned also the soaking (retting) of linen, which was forbidden from Casalecchio to the fulling-mills of the Beverara.

²³ FRATI, 1255, I, pp. 204-206, book I, rubric 35, penultimate paragraph.

were those most clearly visible to the citizen, namely, the pollution and stench of the air: *quod area corrumpet et inflat*.²⁴

If not in the southern area, it was necessary that these factories be located in another place. In 1259, the northern area of the suburbs was identified, at the edge of the Campo del Mercato, where the waters of the Sàvena arrived after having served their tasks of water-power and water for washing of the streets.²⁵ There the forges for metal working and the lime kilns could be set up.

Conclusions

In the course of the Trecento, the urbanistic topics initiated in the course of the preceding century, when the city governments had acquired the strength necessary to impose the rules on everyone, were developed with rigor. The cities constructed aqueducts, straightened and widened streets, rationalized the sewage system, and established or completed new circles of walls. Using a present-day terminology, one could say that in that period the cities went from being “medieval” to being “modern,” since they no longer tolerated unauthorized building, invasions of public land, artisans who worked in the street, or pollution of the soil, air and water. In the middle of the century there was a dramatic interrupting blow, due to a crisis which culminated in the plague epidemic which struck all of Europe. However, the cities recovered rather quickly from that tragedy, replacing the crumbling buildings with edifices that were always less of wood and always more of stone and bricks.

The important legislative activity enacted by the communes during the central centuries of the Middle Ages then determined the urban structure of the Italian cities for centuries, and even today the majority of those cities preserve the characteristics that were carried out and protected at that time. The urbanistic interventions of the modern age for the most part have been limited to small adjustments, to improvements in building quality, to the widening of the streets, to amalgamation of cadastral lots for the construction of elegant palaces, but the Italian urban identity was not changed. In more recent times, some parts of the city have been sacrificed to redevelopment, to the flow of traffic, to the execution of town-planning schemes. But in general, with some exceptions, in Italy one knew how to reconcile the ancient and the modern, permitting the people of today to live in the cities of yesterday. That has been possible because through the centuries the city, in order to improve itself, had need of innovation in various juridical and technological sectors. It is the totality of the necessary competencies in diverse spheres that constitutes a totality making a cultural object of the city, that has produced efficient urbanistic structures from which emerge lofty monuments, the fruit of the culture of the city.

²⁴ FRATI, 1250, II, p. 231.

²⁵ FRATI, 1259-67, p. 230, addition to rubric 33 of book VIII.