Assemblage and aggregation: reading the ancient city and urban composition methods

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Abstract. *Some of the classical methods of analysis in urban morphology have been based on the reading of the historical city. Taking ancient Rome as an example, this paper examines how the reading of the ancient city also gave rise, from the Renaissance to the present, to different ways of designing modern urban form. In particular, the notion of aggregation, understood as a system of formative laws, gave rise to synthetic design methods tending to follow a continuing process. Today this statement seems far from obvious: indeed, one of the characteristics of contemporary culture seems to be the impossibility of a synthesis. The idea of assemblage, historically opposite and complementary to that of aggregation, is then examined. Intended as a gathering of autonomous and self-sufficient parts, this notion has had, and continues to have, great success among architects. It is suggested that the distinction between the two different methods of reading the ancient city, one based on morphological analysis and the other on perception, can contribute to understanding the current condition of urban design.*

Keywords: urban design, urban composition, ancient city, aggregation, assemblage, Rome

The interpretation of the historical city has been, over time, one of the main tools on which the classical methods of analysis in urban morphology have been founded. The study of Alnwick by M. R. G. Conzen (1960) is a key example. His interpretation is based on a notion of the organic growth of built form following an additive process consisting of a succession of increments from a given origin. The notion of 'additive process' is well known in linguistics where it indicates a series of operations performed on an original base. The notion originates from Edward Sapir's studies on language considered as a historical product (Sapir, 1921). The Italian translation of his work, edited by Paolo Valesio, appeared in 1969 and it is likely that it influenced the interpretation of the urban form transformation developed at that time by Gianfranco Caniggia, often in analogy with linguistics. For Conzen (1962) it is a sequence of activities whereby new forms are created, giving rise to the early idea of the urban landscape as an 'integrated entity'. This was developed later by the Conzenian school (Whitehand, 2010).

The same effort to understand the visible aspect of things not only for what they are, but in their historical growth, corresponds – albeit with variations reflecting different goals and cultural conditions – to the spirit of the Muratorian school. Using terms closer to their design interests, it studied the urban fabric as a system of aggregative laws that can be reconstructed, at all scales, after 'changing them into logical categories

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and inferring the parameters that will guide the reading' (Caniggia and Maffei, 1979, p. 58) (all translations from Italian-language sources are by the author).

The notion of aggregation, understood in these terms, gives rise to design methods that tend to form a continuing process. Thus reading the city as an aggregation is not just a method of investigation: bringing the diversity of the built landscape to unity is also a design choice. Today this statement seems far from obvious: indeed, one of the characteristics of contemporary culture seems to be the impossibility of a synthesis.

At the same time that some geographers and architects were reading the city as a form in the making, another method of reading the built reality as 'assembly' was successfully being practiced by designers based on the gathering of self-sufficient parts. As the terms 'assemblage' and 'aggregation' in the modern architectural tradition are not neutral, their study poses ontological problems that concern the fundamentals of the design discipline and have direct connection with urban and architectural composition. One could even distinguish, over time, two ways of conceiving this: on the one hand as a group of autonomous parts; on the other, as a connection of elements linked by a relationship of necessity, the form of which is subordinated to a law of proportion and congruence.

Terms and definitions

It is helpful to provide a morphological definition of the terms of the 'dyad' of opposite and complementary terms 'assemblage' and 'aggregation', specifying their meaning and their application in urban morphological studies. In linguistics, the term 'aggregate' is sometime differentiated from the term 'structure' precisely because it consists of independent elements (Dubois, 1979). In sociology, on the contrary, it means a meeting and collaboration of individuals with common interests and tendencies and, in chemistry, the association of molecules in a substance. However, in Larkham and Jones's Glossary of urban form (1991), now online on the ISUF website, these terms are not even reported.

Assemblage, from the late-fifteenth century French *assemblance*, is the act of gathering (in the literal sense of 'putting together'). The Oxford English Dictionary also gives the meaning of a work of art made by grouping together 'found or unrelated objects'. In architecture, assemblage can be defined as the collection of different autonomous elements at different scales. The sense here is of a composition made by grouping together elements in a loose way, not tightly set in a common, general form. The combination of elements is autonomous or able to be detached. The result is a configuration made by pre-formed objects. Similar modern terms include bricolage, patchwork, mixture and pastiche. They are used in some modern artistic techniques and borrowed from them by architecture. In this framework the term 'collage', a technique also adopted in the nineteenth century by avant-garde artists and consisting of assembling materials in an apparently casual way, is particularly important. It is the way of producing architecture widespread in contemporary culture, ranging from the research of Colin Rowe in the 1970s to the more recent experiences of Rem Koolhaas and Bernard Tschumi. In terms of urban morphology, these words correspond, using a Muratorian expression, to the extreme of irregular seriality intended as independent forms collected without a recognizable order. The notion of 'process' is lacking in the resulting composition. Defined in these terms, the assemblage is unpredictable. It is not possible to read the whole because no demonstrable law is identified.

'Aggregation' is an organized collection obtained by the conjunction of specific elements to form a whole. The late-Middle English term derives from Latin *aggregatum*, 'shepherd together', from the verb *aggregare*: *ad-* 'towards' and *gregem* 'flock': joining the flock, uniting with a constituted group. In classical morphology the term plays a central role in the Muratorian school. In this context, Maretto's introduction of the notion of 'relational modalities' is of particular interest. He argues that what allowed the historical

city to transform a plurality of forms into an aggregative unity is 'the structurally "open" character of the urban building type, its intrinsic *associative valences* that allow it to make [a] system with other similar types' (Maretto, 1980, p. 186).

The composition derived from it is made by grouping elements organically composed in a structure intended as an ordered system of rules recognizable through the process of 'reading'. The composition openly refers to the paradigm of the process and is predictable: knowing some parts, it is possible to reconstruct the general structure of the whole because it is possible to identify its underlying law. There is an affinity with linguistics, where the notion of predictability is the tool with which we consider the greater or lesser property of a sentence. In architecture it is obvious: while the general shape of a classical temple can accurately be reconstructed from the knowledge of some elements, in most contemporary architecture this is impossible. It should be noted that the transformations, according to this point of view, take place not only through growth (aggregations of parts into units) but also by 'dequantification' (disaggregation of the unit into parts), which explains the importance of the notion of 'substratum' as a form that subtends the built landscape originating from the ancient city (see the example in Figure 1), as is discussed further in this paper.

This duality concerns both the reading of the city and its production; *aggregation* and *assemblage* being the terms connected to the society that generates them. This is what this paper seeks to demonstrate, making use of an extreme acceptance of the two terms as opposite limits and taking into account how they are complementary, giving rise to intermediate forms of reading and design. Reviewing the history of the ways in which the elements have united to form buildings and cities shows that, even in the past, the two different interpretations have been given. The case of the ancient city, particularly of Rome, will be used in this paper since its interpretation has been used to develop some of the ideas that have shaped the history of modern architecture, from the Renaissance (for example by Serlio, Alberti, Palladio and Vignola) to the present (including Kahn, Venturi, Rowe and Muratori).

Figure 1. Base building urban fabric formed on the substrata of Pompeus Theatre (source: surveys by the Centro Studi di Storia Urbanistica, 1962).

The ancient city as assemblage or aggregation

To give a morphological order to the different readings, we can establish a 'dyad' of opposite terms by identifying, at one extreme, the definition of autonomous forms gathered without any common structure; and at the other, the definition of a form composed by parts necessary to each other, an organic aggregation of complementary forms in a unitary organism. Also, considering the intermediate forms, we could identify an indicative scheme of the different modes of reading, derived from the Muratorian method:

Assemblage
irregular serial (s) = autonomous forms gathered without order;

systematic serial (S) = composition of autonomous forms in ordered series (modular forms);
Aggregation
episodic organic (o) = aggregation of serial forms in organic structures;
totally organic (O) = organic aggregation of complementary forms in a unitary organism.

The term 'serial' is here used in the particular sense that each of the elements of the composition can be replaced without compromising the nature of the whole. Ordered in this way, the terms of the progression do not characterize successive phases, but synchronic ones.

The two different ways of interpreting the ancient city are, in fact, evident since the first experiments of cartographers who tried to reconstruct the original form of Rome (Figure 2). For example, the plan of ancient Rome drawn in 1538 by the German cosmographer and cartographer Sebastian Münster (Figure 2A) is a clear example of autonomous forms assembled without a common structure. It is obtained from the collection of separately perceived parts of the city, a gathering where the parts are objects that appear without any organic order(s). The bridges do not connect with any routes, no city gates are indicated and the seven hills are simply depicted as similar objects, each surmounted by its monument.

In contrast, in other reconstructions of ancient Rome it is possible to recognize a unifying thought that orders the elements within a general order. For example, the three drawings of ancient Rome by the cartographer Fabio Calvo in 1527 are an astonishing example of coincidence of reading and design. The reconstructions are probably linked to the project of Pope Leo X who, in 1519, had commissioned Raffaello to design a plan of ancient Rome. This sequence of drawings constitutes a true

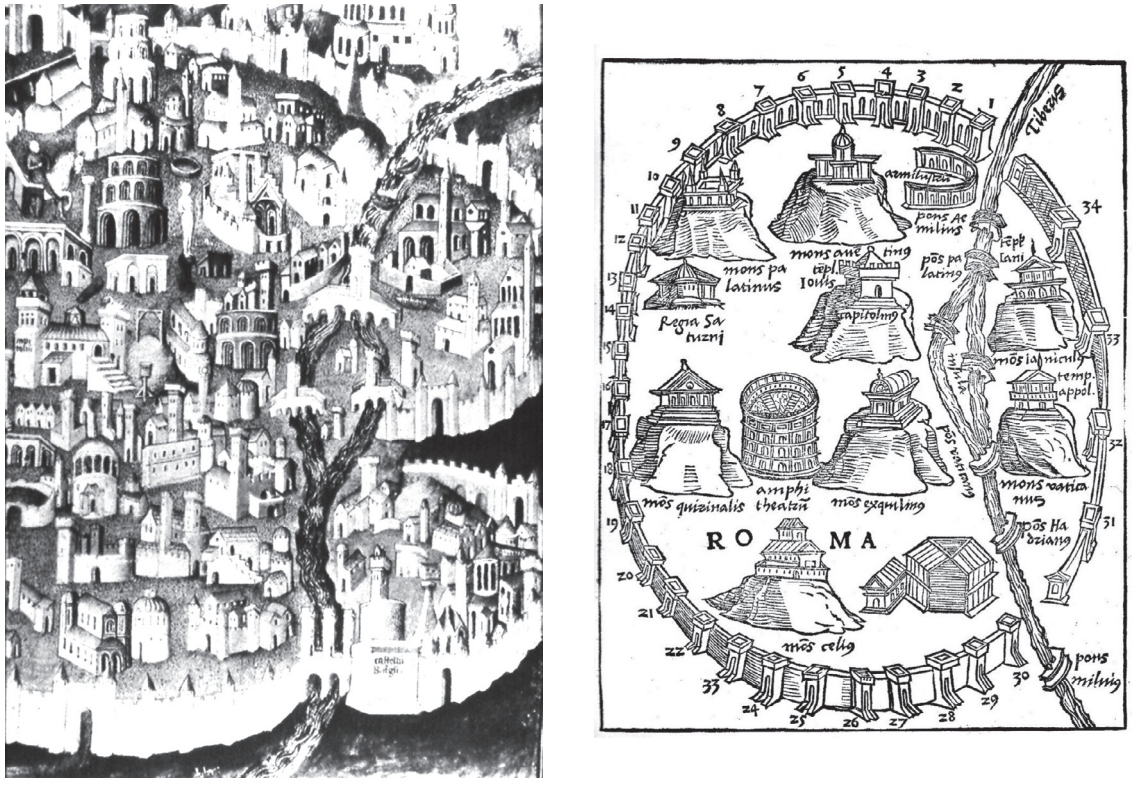

Figure 2. Plans of Ancient Rome. 2A (left) (source: anonymous, first quarter of the fifteenth century); 2B (right) (source: Sebastian Münster, 1538, reproduced from Frutaz, 1962).

formative process for phases of progressive organicity, based on successive doublings in the main parts of the structure (4, 8, 16) from the original 'square Rome', to the octagonal city of King Servius Tullius and to the sixteen regions of Imperial Rome.

In the first plan, *Roma quadrata* (Figure 3A), the parts are still objects, but they are arranged according to an ideal hierarchy. As in Münster's plan, it is a serial form, but ordered according to a design strategy. Attempting to interpret Plinius's description of the mythical Rome founded by Romulus, the four main hills occupy the four corners of the walled enclosure and correspond to the four main gates of the city. The octagonal Rome of King Servius Tullius (Figure 3B) is already organized around a centre, the *Umbilicus Urbis*, the navel of the city. The process is concluded by Imperial Rome (Figure 3C), again based on a doubling of the number of parts compared with the previous plan. The structure consists of regions, according to the ancient administrative division, each with its own gate. The whole structure is no longer an assemblage of forms, but is organically aggregated (O) around the central *Milliarium Aureum*, the 'golden milestone' erected by Augustus in 20 BC, a marble column clad in gilded bronze from which all distances of the cities of the empire were measured.

It is important to note that the structure is totally abstract. In fact there were fourteen, not sixteen, Augustan regions. Fabio Calvo, having a humanistic education, certainly knew this. He did, however, add the non-existent Regio Vaticana and the Campus Martius Maior to respect the law of organic progression in the number of sides. Evidently, his is not the product of a cartographer in the proper sense of the term, but rather a Renaissance idealised urban plan where nothing is left to the empirical solution (to the *ars mechanica*) and all the parts are brought together according to the principles of congruence and proportion of a classic architectural organism. It is known that the plans of ideal cities as urban organisms were designed to correspond to anatomical metaphors of the human organism (Marconi, 1973). This reference is rather complex. Some Renaissance

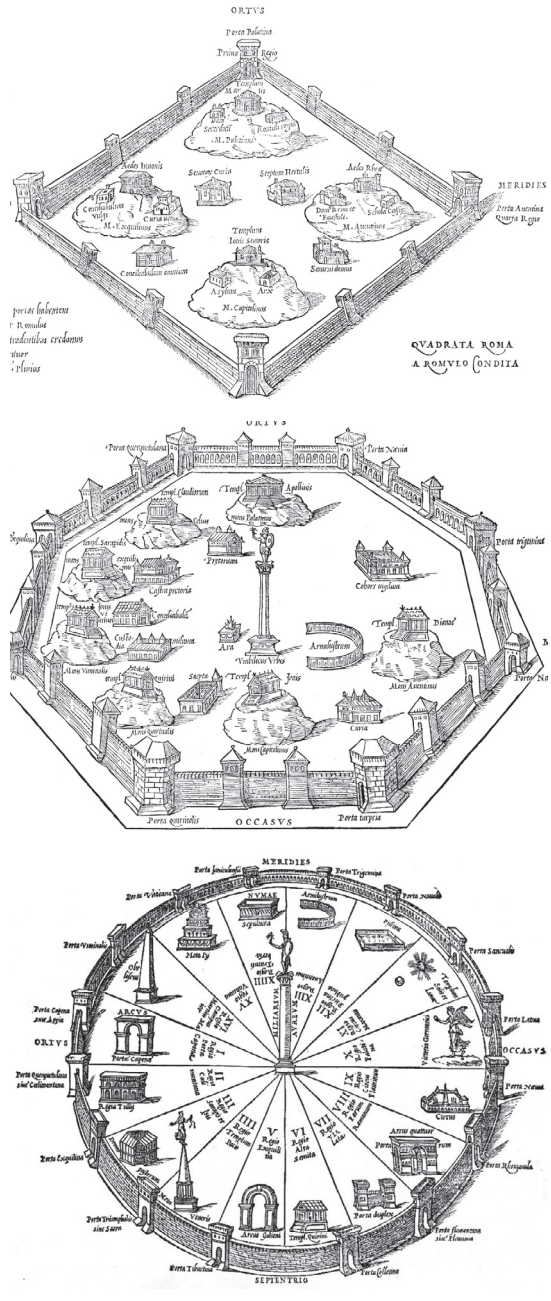

Figure 3. Plans of Ancient Rome (source: Calvo, 1527). 3A (upper) Romulus's Roma quadrata; 3B (centre) Octagonal Rome of King Servius Tullius; 3C (lower) Imperial Rome.

geometrizations were in fact based on the pentagon, while the ideal cities referred to here seem rather to relate to the Vitruvian *Homo ad circulum et ad quadratum* as interpreted in a long tradition of drawings, from Villard d'Honnecourt to Cesare Cesariano.

Calvo's plan of imperial Rome is an example of reading coinciding with design. It is easy to recognize the project of an ideal city in his plan. This can be compared with Francesco di Giorgio Martini's plan for an ideal city divided into sixteen radial sectors. Filarete's ideal city of Sforzinda (1457–64) also comprises 16 sectors converging on a main square. It has an eight-pointed star plan and is divided into 16 radial sectors by streets which converge on the central 'pole', where the special building (*edilizia speciale* in Caniggian typomorphological terms) of the city is concentrated. Sixteen nodes are placed at the intersections of an intermediate circular route with the radial streets (Averlino, 1460–4). It is interesting in light of the focus of this paper that a plan ideally referring to an abstract polygonal city with 16 sides has also been recognized in the tracing of the new structures of modern Rome (Spagnesi, 1979).

It is evident that, from the beginning of the reconstruction of ancient cities, there are two opposite readings: one based on the perception, as assembly / collection of elements, the other as aggregation / organization, that is the recognition of a general and abstract law, corresponding to a regulatory will.

The origin of interpreting the city as assemblage

A very relevant example of reading ancient Rome as an assembly of pre-formed elements is the work of Giovan Battista Piranesi. His 'informal' reconstruction of the Campo Marzio, published in 1762 under the pontificate of Clemente XIII Rezzonico, is, in fact, a modern city and is often considered to be the beginning of the crisis of the urban project as a completed form (Tafuri, 1980).

The Campo Marzio dell'Antica Roma is a city 'analogous' to the real Rome, to which the discovery of new parts of the Forma Urbis Severiana, the marble map placed in the Temple of Peace at the beginning of the third century AD, certainly contributed. Piranesi reproduced these fragments, which had been accumulating since the second half of the sixteenth century, in a table where the different parts seem crowded around the pristine river bends in which they should be placed, as in a puzzle (Figure 4).

Piranesi's ancient Rome is composed of autonomous elements, each with its own orientation and its own internal structure. There seems to be no influence of the many surveys he carefully carried out together with the

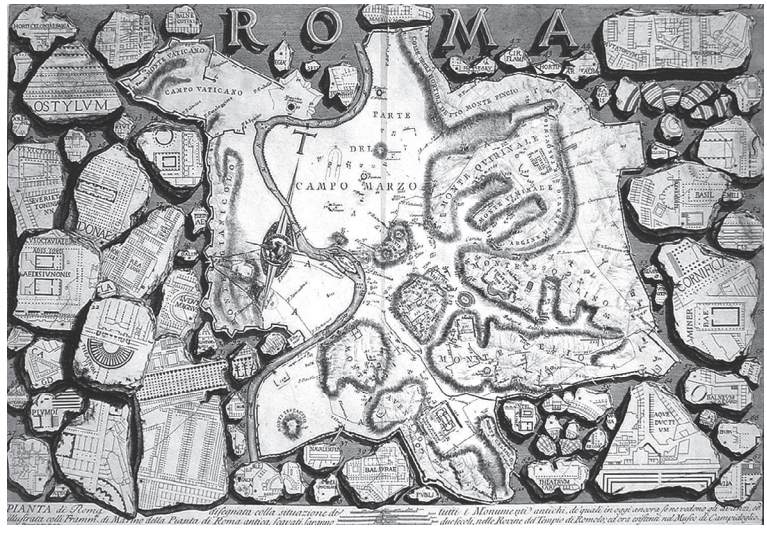

Figure 4. Ancient Rome: orographic plan with surrounding fragments of the Forma Urbis Severiana (source: Giovan Battista Piranesi, 1756).

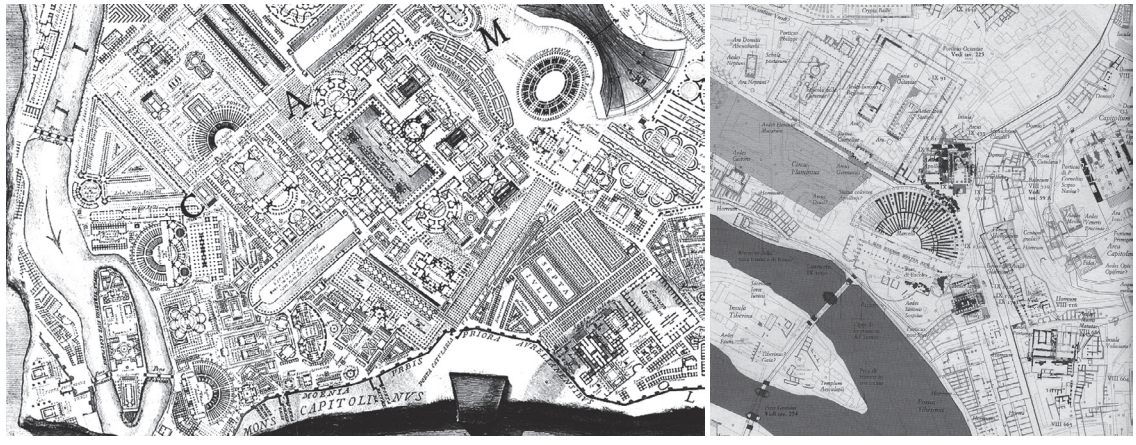

Figure 5. 5A (left) Piranesi's 1762 reconstruction of the Circus Flaminius, Maercellus Theatre and Insula Tiberina; 5B (right) archaeological map of the same areas (source: Carandini and Carafa, 2012).

Scottish architect Robert Adam. Indeed, the design seems to be the result of an intellectual work almost independent of the real city, in evident contrast with the accurate, organic plan that Giovan Battista Nolli had executed six years earlier and that was enjoying enormous success. The structures of the most relevant real monuments, those that determined the shape of the urban layout, such as the Mausoleum of Hadrian, the Pantheon, the Theatre of Marcellus, are treated as minor episodes.

According to a method that would be extensively reused in the second half of the twentieth century, the ancient city is a text open to extreme interpretations, which can be only approached with the instruments of perception. Piranesi's *Campo Marzio* is a miscellaneous composition, a collage of autonomous and self-sufficient objects (Figure 5). It is systematically (and polemically) lacking in everything that gives a structure to the fabric:

1. the layout of routes as a system that links buildings together, replaced by a set of interstitial spaces;
2. the hierarchy between the parties that establishes the order of the built environment;
3. the formation of poles and nodes, which give an urban structure to the city and a meaning to the placement of special buildings;
4. the housing fabric, basic buildings that allow the distinction of the continuous forms from the exceptions of the special buildings (a city solely of monuments).

The reading of the ancient city composed of autonomous parts generates the idea of 'freeing the monuments', of isolating them by demolishing the fabric that they themselves have generated. It is at the origin of a phenomenon that will become systematic, as in the five years of Napoleonic administration (1809–14). In this period, urban projects are elaborated according to the idea of two parallel and independent cities: the archaeological one, autonomous urban assemblies subject to restoration or simple conservation; and the modern one, for which the ancient is the object of 'embellishment'. It is well known how, in the inter-war years of the twentieth century, this idea took on the aspect of a political project with the systematic isolation of the city of monuments from urban life; a process known elsewhere as 'disencumbering' (Ladd, 2014).

Colin Rowe and assemblage as a reading / design method

Piranesi's Rome was an extraordinary legacy for modern architects, indicating a way to read the city by parts. The periodic rediscovery of

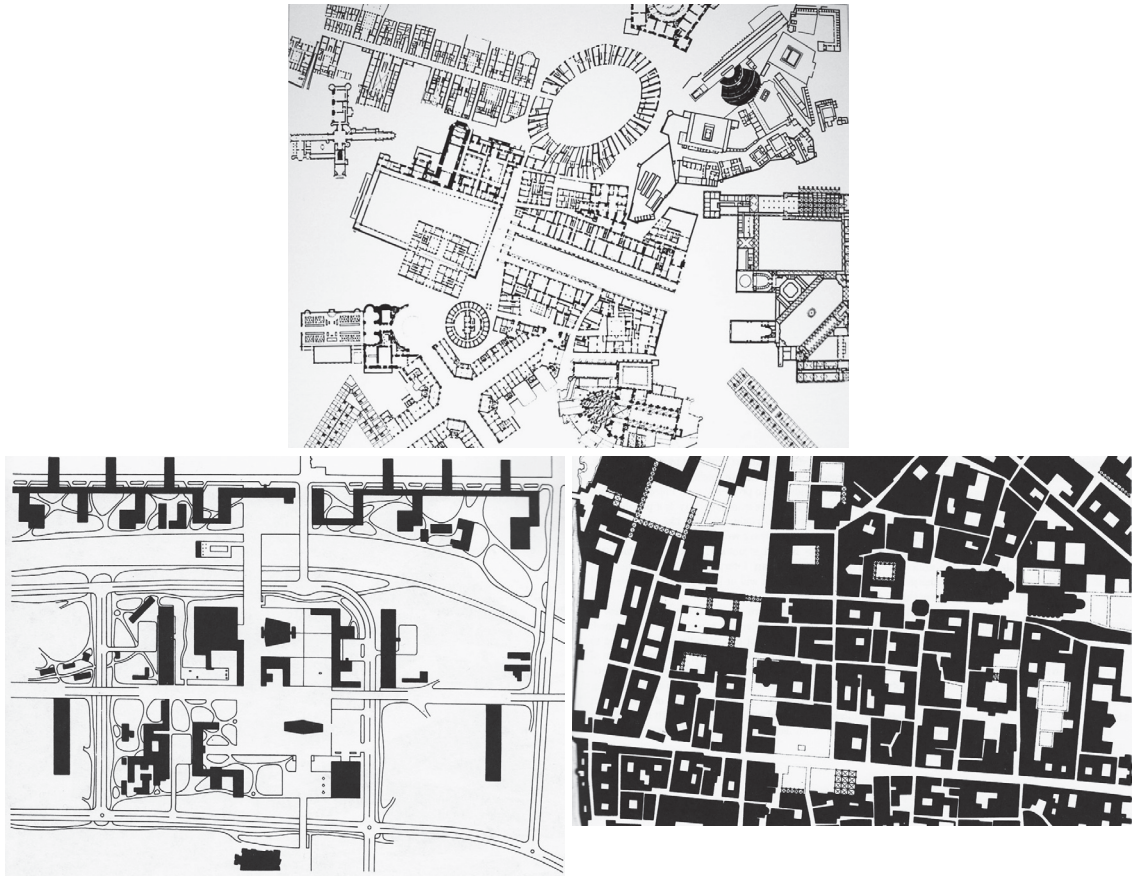

Figure 6. 6A (upper) David Griffin and Hans Kolhoff, 'City of composite presence', 1978, placed as a manifesto at the beginning of *Collage city* (source: Rowe and Koetter, 1978); 6B (lower left) and 6C (lower right) comparison proposed by Rowe and Koetter (1978) between the Le Corbusier project for Sant-Dié and the volumetric plan of Parma.

its relevance confirms how the impossibility of a unitary notion of the urban organism is at the centre of contemporary thought.

The most obvious heir to the Piranesian exploration is Rowe and Koetter's *Collage city* (1978). *Collage city* is an open gathering, derived from the individual perception of phenomena, which avoids any synthesis; in contrast with the unifying work of the planner (Figure 6). The authors declare that the unifying thought is anti-modern. It is expressed, in its extreme forms, by the many utopias that have been conceived over time, starting with Utopia, the 1516 work by Thomas More, in which the term was first used. Modern urban utopias are abstractions, from the ideal cities of the Italian Renaissance to Wright's Broadacre City.

Rowe and Koetter also establish a 'dyad' of opposite forms: a city composed in an open way and an ethical city, produced by abstract plans destined to fail, governed by rigid rules through which the elements are composed in a unitary way. On the one hand there is ancient Rome as interpreted by Piranesi, illustrating something – he says – 'of the "bricolage" mentality at its most lavish'; on the other, Filarete's Sforzinda, the city of aggregation where the parts bind together to form a unitary organism.

For Rowe and Koetter even in the baroque era, Rome was a city of buildings and urban spaces in conflict with each other, a 'collision of palaces, squares and villas, that inextricable fusion of imposition and accommodation, that highly successful and resilient traffic jam

of intentions . . .' (Rowe and Koetter, 1978, p. 106). But beware: Imperial Rome, they tell us, is not only the symbol of an assembly by parts, where monuments, the forums, the baths, lie side by side without rules. All interpretations are indeed possible. On closer inspection, the objects could also have links between them, depending on the reading angle. Ancient Rome is a city with 'multiple interpretability'. Rowe and Koetter's predilection for Luigi Canina's drawings is noteworthy. Among the many cartographers of ancient Rome they chose, so to speak, the most post-modern. As Giuseppe Riva (1842, p. 42) wrote, 'Canina delighted to fill its surface with all the streets, squares, temples, arches, libraries, basilicas and similar other things that you know well to have been, but which is not known where they were, not another direct that gives a lively imagination, thus making a picture that would belong more to the art of brushes than of compasses'.

Aldo Rossi joined this post-modern idea of interpreting built reality. Invited to comment on his architectural bricolage exhibited at the Venice Biennale of 1976 (Figure 7) entitled 'The analogous city' (a collective work performed together with Eraldo Consolascio, Bruno Reichlin and Fabio Reinhart), he wrote: 'Everybody can rediscover himself in fixed and rational elements, in his own history, and accentuate the peculiar character of a place, a landscape or moment' (Rossi, 1976). The historical reference is, inevitably, the 'Analogous Venice' that Canaletto had painted by freely collecting Palladian projects. Rowe proposes the multiple interpretation of built landscape as a method: the object found, extracted from the context of the original meanings and recomposed according to an individual vision. Rossi (1976) wrote that

> The definition 'analogous city' originated from a re-reading of my book *L'architettura*

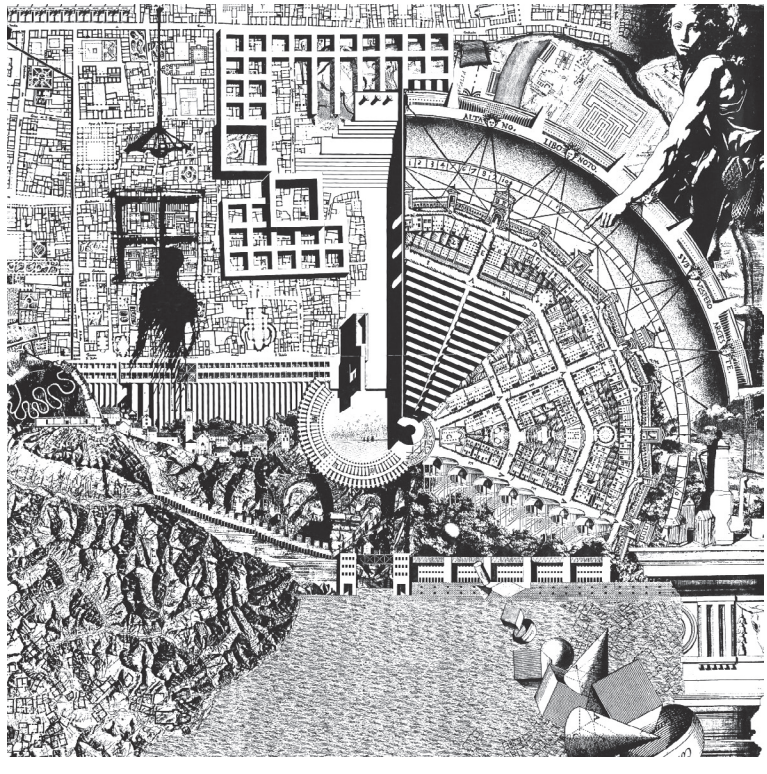

Figure 7. Aldo Rossi, Eraldo Consolascio, Bruno Reichlin, Fabio Reinhart, 'La città analoga' (The analogous city), bricolage exhibited at the 1976 Venice Biennale.

> *della città*. In the preface to the second edition, written some years later, it seemed to me that description and knowledge should give rise to a further stage: the capacity of the imagination born from the concrete. In this respect I stressed Canaletto's painting where, through a most remarkable collage, an imaginary Venice is built on top of the real one. And this construction takes place by means of projects and things, invented or real, quoted and put together, thus proposing an alternative within reality. In my opinion this painting has a major historical and political significance. Venice is shown as the analogous city of the Venetian Republic and of a broader modern nation. Everybody can rediscover himself in fixed and rational elements, in his own history, and accentuate the peculiar character of a place, a landscape or moment.

The real focus of *Collage city* is contained in the image of the bull's head produced by Pablo Picasso in 1943. The painter's commentary on his own work is also, in fact, a clear explanation of Rowe's thought. In an interview with André Warnod in 1945 Picasso said:

> Do you remember the bull's head that I displayed recently? Here's how it was conceived. I had noticed in a corner a handlebar and a bicycle saddle arranged in such a way that they looked like a bull's head. I put these two objects together in a certain way . . . In short, I made that handlebar and saddle a bull's head that everyone recognized as such. The metamorphosis was accomplished and I hope that another metamorphosis will be carried out in the opposite direction. Suppose my bull's head is thrown into the wreckage. One day maybe a boy, seeing it, will say: "Here is something that could serve very well as a handlebar for my bicycle". Thus a double metamorphosis will have been accomplished (Warnod, 1945, quoted in Rowe and Koetter, 1978, p. 138).

Saverio Muratori and aggregation as a reading / design method

Saverio Muratori seemed 'to find the Picasso's bicycle handlebars' bringing things back to their real meaning: art, like architecture and even the city and the territory, are not just individual creations, they are the shared aesthetic synthesis that concludes a forming process. Muratori's is also an architectural vision, but not an abstraction. Where everything seems independent and conflictual in Rowe's city, everything ends up joining together and collaborating in Muratori's urban fabrics; where truth is an impossible task for the first, everything is explained and demonstrated for the second.

Muratori was fully aware that the territory, the city, the modern urban fabrics have lost their organic character. His morphological reading was a critical one, an indication to change. If we know how to read it, this is also the sense of More's Utopia: he imagined a city without a place (u-topia, οὐ- τόπος) precisely because it is so abstract and perfect as to be impossible to construct in reality. Yet, in reality, utopia was not simply an impossible and useless model, according to Rowe's interpretation, but a criticism of the contemporary English society. Moreover, the meaning of the ideal cities of the Renaissance, Owen's Garden City and Wright's Broadacre City is also a critique. They disclose the forms of a better world for the life of men.

Muratori's work on Rome stemmed from the practical need to study the medieval neighbourhoods and their relationship with the new fabrics, but the need to extend the study soon becomes clear. The medieval city can be explained only as a derivation from the pre-existing – ancient – city, which thus ceases to be merely archaeology, but becomes a morphological transformation phase.

The study of Rome necessarily becomes the study of a method. With the advance of research, Rome is 'discovered' as an infinite set of aggregations of forms (Figure 8). It potentially contains all the possible phenomena, far more complex than those that are posed in contemporary urban planning having to do, for the most part, with linear and serial developments.

In the introduction to the *Studi per una operante storia urbana di Roma* (*Studies for an operating history of the city of Rome*; Muratori *et al.*, 1963) there is a short chapter entitled 'The problem of Rome as a method

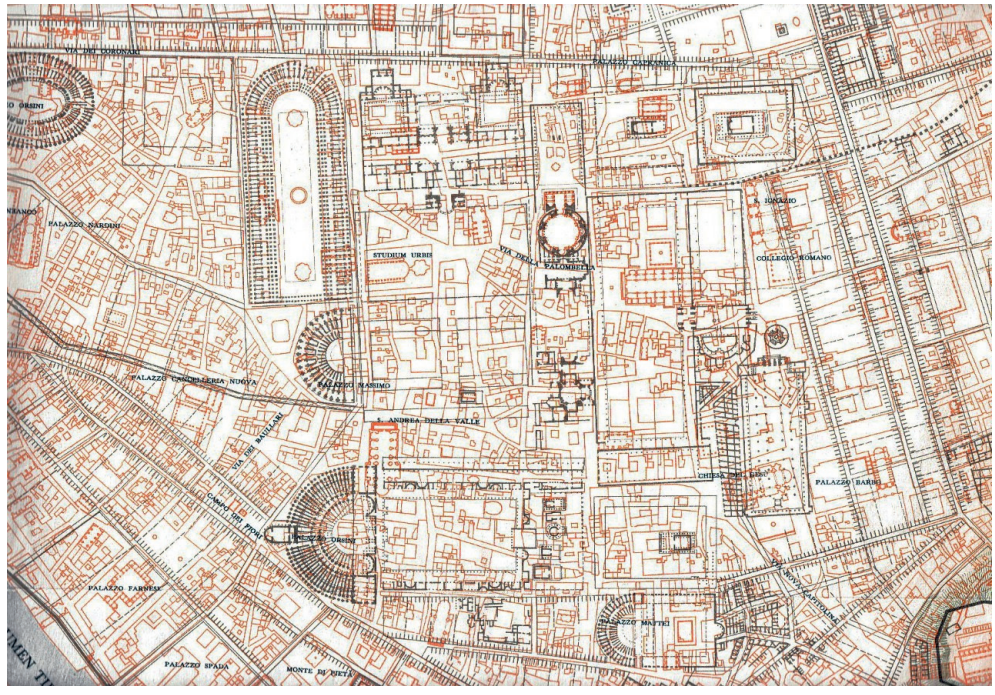

Figure 8. Muratori's reconstructive plan of the central area of Imperial Rome overlain on the fabric of the modern city (source: Muratori *et al*., 1963).

problem' (Muratori, 1963). This is one of the most relevant texts he wrote about Rome. They wrote:

> But it soon appeared that it was not a sample of heterogeneous juxtaposed in an order merely corresponding to physical case data in different cases, but of the results of a specific historical process particularly incisive and broad in extension, density and individual historical developments . . . So that each element always drew new validation and characterization of its original structure as the new increases were multiplied in an increasingly precise, irreplaceable, identified process of structure, insertion and implication (Muratori, 1963, p. 10).

Gradually the study of Rome becomes the study of a method (and of the theory that governs it) of which the city is both the source and the verification.

In the wake of the many past reconstructions, even Muratori's ancient Rome is a Rome based only in part on documentation, and therefore, in some way, it is a redesign (using his words). Although Muratori carefully studied the *Forma Urbis*, all other historical cartographies and investigated the fabrics on the spot, he filled the huge gaps in the documentation by following a general law recognized in the ancient organism. This can be seen, for example, in the structure of the northern area of Trastevere (Muratori *et al*., 1963), where the plan, admirably clear, is articulated, as the method requires, in matrix and building routes starting from the *Pons Aemilius* pole, from where the fabric develops into serial *insulae*, aggregated along the ancient route of the *Aurelia Vetus*.

In reality, there is little archaeological evidence to support Muratori's hypothesis (Figure 9). His is a 'redesign', the way in which the subject (the architect) interprets the object (the constructed reality) on a logical and scientific basis. The excavations of 1873–89 brought to light the paving of ancient Aurelia, others the remains of the Roman Fire Brigade Station and little else, as reported in Rodolfo Lanciani's plan of the archaeological excavations of Rome (Lanciani, 1893/1901, 1901), which was a basic document for all studies on ancient fabric at the time of Muratori's work.

Figure 9A (upper) and 9B (lower). Comparison between Muratori's Imperial Rome insulae structure overlain on the fabric of the modern northern Trastevere area (source: Muratori *et al.*, 1963) and Rodolfo Lanciani's map of the excavations carried out in the same area (source: Lanciani, 1901).

However, the notions of type, organism and process guide the redesign. Not only does the ancient city explain the forms of the current one, but also the current city, with its formative phases, explains the ancient. From the overlapping of the different formative phases it becomes evident how the present fabric is the product of organic transformations that ancient remains demonstrate.

For this reason the shape of the ancient city (any city), read as a product of an organic aggregation of elements, is not a set of elements without a recognizable order. It is predictable in the same way that, in an organically structured sentence, we know how to recognize the syntactic, grammatical and logical role of the missing words. Those words are part of a whole, they are necessary, to the text: they belong to a group of admissible words. These statements, in the climate of intellectual liberalism of the years in which Muratori (who died in 1973) proposed his method, sounded completely counter to the current dominant discourse, as were those of Caniggia, who developed Muratori's notions about aggregation in a systematic and didactically transmissible way.

Caniggia's study of the Tiber bend on which Via Giulia and then Corso Vittorio were formed is a particularly clear example (Caniggia and Maffei, 1984) (Figure 10). He proposed the reading of the existing city's formative process in order to reconstruct an organic continuity in its missing urban parts. Caniggia first reconstructed the fundamental characters of the 'early building fabric' and then the aggregative laws, starting from the hypothesis of the Imperial Age land subdivision that guided the configuration of the *domus* fabric. The aggregative phases are legible in the nineteenth-century Gregorian cadastre and in the actual fabric, through the medieval increases of the *domus* type that infill the court, finally giving rise to three row houses each. The new row house type is the aggregative unit on which the Renaissance city was founded, adapting the old fabrics to the new restructuring routes.

Caniggia exemplifies the coincidence between reading and project with a proposal for an intervention in the Piazza della Moretta area, on Via Giulia (Figure 11). The demolitions carried out here during the Fascist period are *riammagliate* (mended) with a fabric based on the (hypothesized) early structures of the imperial age. The ancient *domus* are transformed over time in different ways according to the hierarchy of the routes; also giving rise to row houses which, along Via Giulia, are fused together and transformed into *palazzetti* (small palaces). The building units are continuously renewed, but their aggregative laws are based on previous experience, in a sort of continuous recovery and self-correction. The project is a transformation phase (the most recent) of an ongoing process.

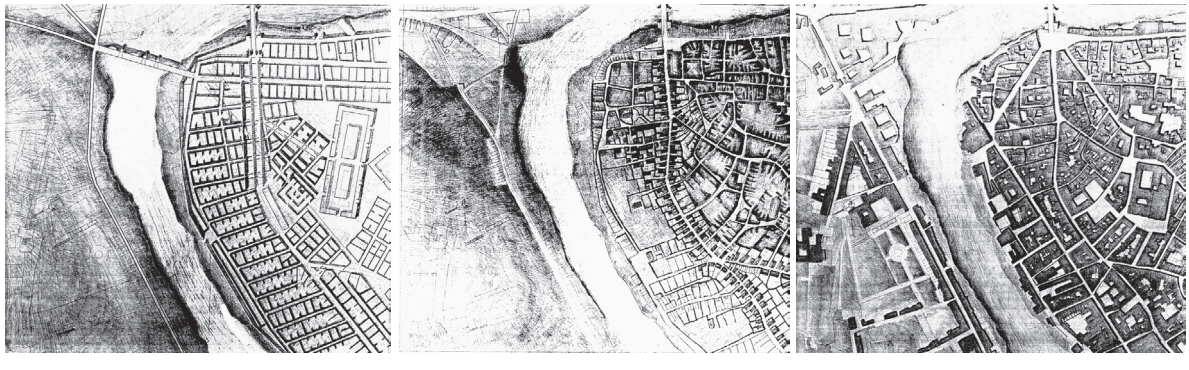

Figure 10. Caniggia's forming process hypothesis of the urban fabric in the area between Via Giulia and Via dei Coronari: 10A (left) early structure phase, 10B (centre) 'medievalization' phase, 10C (right) modern restructuring of the urban fabric before of the construction of Corso Vittorio, (source: G. Caniggia, original drawings, 1983).

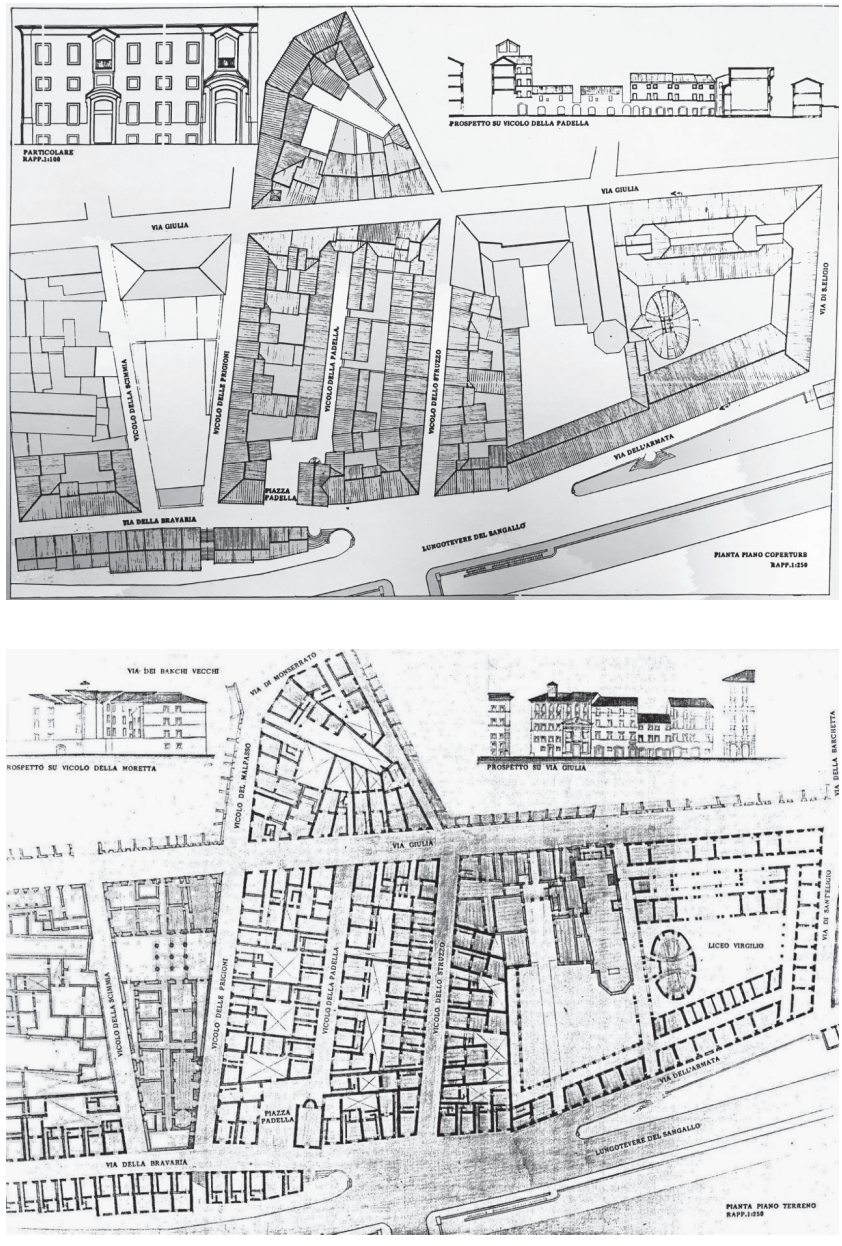

Figure 11. Caniggia's 'mending' of the urban fabric in correspondence to the demolitions performed in the inter-war period in the area of Via Giulia, Piazza della Moretta. The new design is a transformation phase (the most recent) of an ongoing process: 11A (upper) Roof plan, 11B (lower) Ground floor plan (source: G. Caniggia, original drawings, 1983).

Conclusions: The substrata as a text

This paper has sought to propose a distinction between two current different methods of investigation of the built reality, one based on perception and the other on morphological analysis, which correspond to two different design methods. It is a schematic subdivision, however useful to interpret the contemporary condition. It is evident that, in many respects,

this is not a symmetrical condition: today's architectural design production, that advertised by the media networks, is largely based on the forms perceived as objects (Eisenmann, 1984) and assembled in architectural and urban design projects.

The study of urban forms based on the notion of aggregation process does not, so far, seem to have produced equally convincing results, except for a niche readership of scholars of urban morphology. One of the problems seems to lie in the fact that the relationship of modern architectural design with history which, as has been demonstrated, is essential to the notion of aggregative process, has long been interpreted as a regressive approach, according to late-romantic parameters: the beauty of the remains of ancient city lead to admiration and imitation. The ambiguous fascination of ancient vestiges does not allow us to read their operating value. This is so much the case that Le Corbusier (1923) believed that Rome was a 'negative' example for the modern architect.

Indeed, the series of *insulae* that Muratori identified in the Trastevere area, the *domus* fabric that Caniggia read in the Tiber bend, are not just submerged features that appear as ruins here and there. They are the evidence of organic transformations, of an additive process based on the aggregation of elements that produced the current city. For this reason they should be studied with the tools of urban morphology: they are layers of successive stratified fabric that transmit essential knowledge for the contemporary project.

I argue that we should abandon the romantic term 'ruins' and instead use the more appropriate term 'substrata' (Strappa, 2015, 2019). In contrast to a ruin (from the Latin *ruere*, to collapse), a substratum (from *sub sternere*, to spread beneath) is recognised as a beginning, the living basis from which new organisms can spring. Substratum is the architectural and urban aggregation of elements underneath the current built form that contributes to the life of new buildings and fabrics also persisting in multicultural transformations (Gauthiez, 2019). It can be defined as the aggregation of elements once forming an architectural and urban organism which, despite having lost the internal organic relationship that bounded them together, nevertheless still transfer specific characters to the buildings springing from them. When a set of these characters are transmitted in a typical and recurring form, they can be defined as a 'substratum type'.

Again, the analogies with linguistics are evident, where 'substratum' is understood as the layer that precedes and influences the overlapping of a new language, as occurred, for example, with Etruscan and Latin or Celtic and English. However, we should note how the term, when used in architecture, indicates the basis of an action. It implies the presence of critical consciousness, the ability to interpret and choose and, therefore, an identification of what has already been given, of what 'lies beneath': the *sub-stantia,* the essence of a thing, according to the metaphysical Aristotelian concept of substratum.

The expression, then, not only contains the idea of rooting and the transmission of forms; it also refers to their universal being. This universality, a quality that the actual fabric did not possess, constitutes a fertile abstraction: an identification as well as a design, the way in which we give a new aggregative unity to the multiple and scattered forms of the remains we have inherited. For this reason, while the city of assemblage is the synchronic city where everything is coexistent and the parts are assembled to form ever new and timeless forms, the aggregative, organic city endlessly re-uses its substrata. In a more general and abstract meaning, the substratum could also be understood as a sort of matrix, a universal form the past conveys to us, perhaps not very different from the πρῶτον of the Stoics. If we extend the notion of substratum to that of a text from which we always learn new lessons (to the immaterial inheritance of the substrata) its definition involves new, broad, and useful meanings: every construction, on any scale, is an invention intended in the literal, etymological meaning of *invenire*, a finding. Any fabric is a re-aggregation, any building a re-construction, the city itself a rediscovery.

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