From the Architecture Treatises to the Portfolio: The Etchings of Piranesi

Carlos L. Marcos(✉) and Andrés Martínez-Medina

Department of Graphic Expression, Architectural Theory and Designs, University of Alicante, Alicante, Spain
{carlos.marcos,andresm.medina}@ua.es

Abstract. Architectural treatises of the 15th–16th centuries managed to build a uniform and hegemonic theoretical corpus in a short period of time thanks to the invention of the printing press, which allowed the diffusion of copies throughout Europe as the 'Gutenberg galaxy' began its expansion. The first treatises were scarcely illustrated, but the presence of images increased with the development, at the same time, of printing techniques, from the replacement of wood-block printing techniques to the perfection of engravings on metal plates and etchings. A particular case are the Piranesi etchings depicting the Roman ruins, on the one hand, and projecting imagined or fantastic architecture within his carceri, illustrating unparalleled interiors, on the other. These portfolios of plates put in crisis the authority of text; replacing it for a culture of the image. The advance of etching techniques and the extraordinary quality of those made by Piranesi contributed to the success of his proposals in the definition of a drawn ideology and in the insertion of his standpoints in the architectural debate of the eighteen century. Enlightenment is witness to the decline of the classicist unitary theories that were replaced by a diversity of interests that, in part, were the result of a greater diffusion of prints, plates and drawings substituting written texts as sources of architectural invention. This reflection is closed with the latest autograph portfolio that would revolutionise the foundations of architecture at the moment in which the influence of drawings began their decline due to the possibilities that photography would deliver as a new means of disseminating architecture in professional journals in the era of the mass-media.

Keywords: Piranesi · Carceri · Etchings · Portfolio · Modern space

1 Introduction. Architectural Theory: Treatises, Drawings and Printing

Throughout the early Middle Ages several handwritten copies of the treatise *De Architectura* (better known as *The Ten Books on Architecture*) written by Marcus Vitruvius Pollio in the first century BC defining architecture as 'the art of building' (Kostoff 1998) were circulated. But none of these copies had drawings and the *editio princeps* of the book, without images, was published in Latin in Rome, in 1486. The drawings that originally accompanied Vitruvius' text at the end of each chapter were

C. L. Marcos (ed.), Graphic Imprints,
https://doi.org/10.1007/978-3-319-93749-6_79

lost in the passing of time (Rodríguez 1995, p. 35) and, without them, many of their explanations were confusing or difficult to understand.

The interest aroused by classical architecture, thanks to the dissemination of this manual throughout Italy and Europe by virtue of the printing press invented in 1449, and established the tradition of writing and publishing treatises that sought to develop a unitary theory of the arts and architecture emulating the work of the Roman architect. Thus, scholars and architects worked hard to build a doctrinal corpus based on the reflections of the book and the ruins that remained as witnesses of a past that was largely uncharted, but certainly magnificent. The printing press, with the substitution of woodcutting technique on wooden pieces (14th century) by the burin engraving on metal plates (15th century), would allow the inclusion of drawings and images with better graphic quality: first line drawings, then including graphics and textures. The text of Vitruvius had as many variants, as illustrated versions were printed.

It is the insurmountable narrative capacity of the graphic compared to the text in the realm of the material that which awakens the interest in drawing and graphic representation in Renaissance treatises. Beyond this unparalleled descriptive capacity, the drawings also allow the visualisation of systems of relationships in a unitary—Gestaltic—way and illustrate them so that these relations or quantitative information can be visualised (Tufte 2007). The illustration of Cesariano in his essay on Vitruvius on the Pythagorean theorem (Fig. 1) and the virtues of the Pythagorean triangle for, as an example, issues of setting out in architecture, constitute the demonstration in graphic form of the theorem itself.

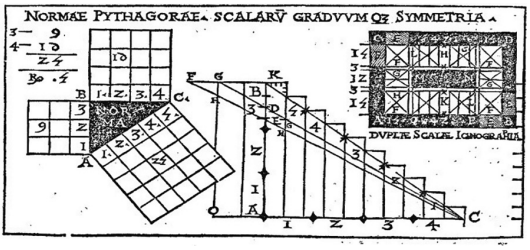

Fig. 1. Illustration of book 9 of Vitruvius by Cesare Cesariano (1521)

The role of the printing press in the diffusion of the theory of architecture was of decisive importance, as Carpo (2001) has shown. The printing techniques of Gutenberg's invention combined with xylographic printing made it possible to convert woodcut printed books into the main diffusion channel of architecture by reinforcing the role of text through the mechanical reproduction of images (Figs. 1 and 2).

It soon became indispensable to edit illustrated versions of Vitruvius (Carpo 2001, p. 16) when the technology allowed the mechanical reproduction of drawn plates, which established the importance of graphic expression in the theory of architecture. Some of the most notable are those of Fra Giocondo published in Venice in 1511 (first illustrated version), that of Cesare Cesariano edited in Como in 1521 and that of Daniele Barbaro in 1556 (Fig. 2), in whose illustration Palladio himself participated

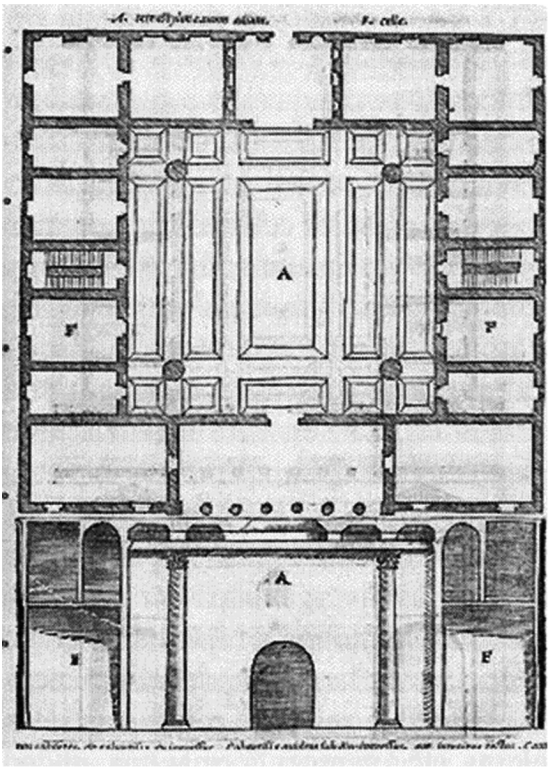

Fig. 2. Drawing by Palladio, Atrium with four columns. (*De Architectura*, Ed. Bárbaro 1556)

(Calduch 2017, pp. 12–13, 40). Note the vertiginous diffusion of text with the various Italian editions, some of which were reprinted in later years; all without further taking into account the translations that soon were to take place.

2 Theories: Texts, Drawings and Images

The treatise of Vitruvius is the first theory of architecture made in relation to the constructions of the classical world, establishing a relation between both of significance and meaning (Arnau 1988, p. 81). That is to say: the text, as a theory, is understood as a significant enhancer of the executed, architectural practice, which constitutes the true meaning.

Thus, the importance that the early authors gave to classical buildings, from di Giorgio onwards, will lead many of them to illustrate their own treatises with surveys of ancient ruins that intended to show the real authority of the practice exercised by architects of the classical period; in this, the case of Palladio is paradigmatic.

It is necessary to point out that, at the beginning of the Renaissance, architectural graphic representation was still incipient and the systems of representation by

projection were not yet known in all their depth. See, for example, some drawings lacking the projective rigor that appear in the treatises of Filarete or Serlio. Today we are not surprised by the immediate relationship between drawing and architecture, but the medieval masters did not use a graphic system that accurately anticipated the work, but followed their guild tradition based on oral transmission and their own experience (Carpo 2001, pp. 36–41), to which we can add the typological repetition of models. In the 15th century, to achieve a representation of architecture in a graphic form was a challenge.

One of the first intellectuals who posed this challenge was L. B. Alberti (1404–72). In 1435, he devoted his *De Pictura* to Brunelleschi, where he approached the conical (single-point) perspective scientifically, and in 1464, he finished *De Statua*. Between one and the other, in 1452, he finished *De re Aedificatoria*, a treatise that repeated the structure of The Ten Books. The manuscript was not printed in Florence until 1485, being translated into French (1512), Portuguese (1543) and Spanish (1582). The text was more theoretical and reflective than that of Vitruvius and, although somewhat scantly, included some drawings that tried to illustrate something of what was said in it. Alberti clearly differentiated perspective drawings with shadows and textures, typical of the painter, and those that show the true angles and measurements, more useful for the architect, which are not solely "judged by visual impression, but reflected by determined and rational dimensions" (Alberti 1991 [1485] II, Chapter I, p. 95).

Lotz (1985, p. 185) attributes to Antonio da Sangallo the systematisation of architectural representation using the three canonical views of parallel projection—plan, elevation and section—that began to be widely used as of 1520. However, there is a text from Rafael to Pope Leo X in 1519 regarding his survey drawings of the Roman ruins where he proposes the use of this system based on the three characteristic views of parallel projection to avoid the problems of deformation in foreshortening generated by the use of the perspective—central projection. This issue is very important because it was at that time when the two ways to represent material reality based on geometric projections would be established scientifically. The parallel projection facilitates the drawing of space avoiding dimensional deformation, and, therefore, it was the preferred system of engineers and architects. The central projection or perspective, on the other hand, generates drawings closer to what we see with our eyes. One system represents what things are, while the other shows them how they are seen (Arnheim 2005, pp. 126–127); both should be considered two different and complementary systems of graphic representation.

Many are the treatises of architecture and military engineering published during the *Cinquecento*. One of the most widely disseminated treatises was that of S. Serlio (1475–1554), entitled *I Sette libri dell'architettura*: a compendium of theoretical norms and practical advice that contributed to the coding of the five orders, published between 1537 and 1551 (quickly translated). The success of his later influence was due to the fact that his book was generously illustrated with plates that included a multitude of plans and elevations drawn with greater proficiency than those of Filarete.

Amongst these treatises a special mention is required of that offered by Andrea Palladio (1508–1580), entitled *I quattro libri dell'architettura*, published in 1570 in

Venice, and profusely enlightened with prints by the author. In addition to the theoretical text, in it were featured drawings of his own projects (not all built) and survey studies of ancient monuments, and even some contemporary work by Bramante. This guide was edited using the engraving technique to reproduce both general views and detailed studies. He used the dihedral system in a systematic way—with the exception of the covers and some construction details—with a very refined graphic quality for the time that introduced textures in order to show materiality, as well as shadows in elevations and sections—contravening the established drawing methods of Alberti. The successive translations and their various reprints bear witness to the dissemination of *The Four Books on Architecture* and the architectural theory that, in the hands of Palladio, turned out to be very didactic and easy to apply. It meant the appearance of 'Palladianism' (Arnau 1988, p. 177), something that, despite their enormous prestige, the treatises of Vitruvius or Alberti never achieved. Undoubtedly, the profuse and careful illustration of this work, together with the consistent use of a representation system that was applied as much in the surveys of ancient works as in the drawings of his own work (Calduch 2017, p. 190), resulted vital, placing his own architecture on par with the classic precedents.

Thus, the importance of the increasing number of drawings incorporated in publications against the first unenlightened versions of the treatises is proved to be a guiding strength of reference, something that is underpinned in the 16th century through the dogmatic Palladian influence. However, the most profound change in the influence of graphic expression in the construction of a theory of architecture will occur when the images emancipate from the text itself (or the text loses its prominence in comparison with the graphic discourse), acquiring the portfolio of plates an entity in its own right. This was possible with the development of the new techniques of etching that would allow the diffusion of sets of drawings outside of the purely textual corpus.

3 The Etchings by Piranesi as a Drawn Theory

Giovanni Battista Piranesi (Venice 1720–1778) was an excellent draughtsman or vedutista (Fig. 3). His discourse was fully inserted in the Enlightenment sharpening the architectural debate thanks to the undeniable graphic quality of his work (Sambricio 1972). An uncompromising defender of the legacy of classical Rome, he worked tirelessly as an archaeologist to value it, debating with his peers. His view of the Roman ruins was, however, very different from that of Palladio (Calduch 1998, p. 24). While he understood architecture as an abstract creation of an intellectual nature, displaying it with the three canonical views, Piranesi was more interested in narrating it with expressive images: the atmosphere, the spatial qualities and the phenomenology derived from his perception of architecture as a built object. The leading role of the illustration in the overall work of this architect is evident as a tool for justification and illumination of his theses. Piranesi (1998a, p. 21) himself writes about the dissemination of his ideology through etching: "we have no other option, to me or to any modern architect, but to explain with drawings the individual ideas".

Fig. 3. Piranesi: Trevi Fountain, *Vedute* of Rome, 1756

His graphic dexterity and *modus vivendi* as a *vedutista* could have relegated the importance of his work to mere imagery. However, an exceptional series of etchings, his *carceri*, captures an unprecedented version of architectural space that has left no-one indifferent from its publication, to the present. This, together with his more assertive drawings and free interpretations of the ruins of the *Campo di Marzio*, contributed to the consideration of his work by his anticipation of values characteristic of modernity. This exhibition of space as the support of parts for its own travel and his vision of void as a passageway, has contributed to the reinterpretation of its legacy by scholars like E. Kaufmann or M. Tafuri in the twentieth century. If there exists one reason widely agreed upon with respect to the Roman architecture that Piranesi insisted on highlighting and that throws a shadow over Greek architecture, it is the value of the closed and covered space as the protagonist. That unprecedented vision of the vaulted interior demanded good skills to graphically narrate it successfully; Piranesi dominated the pictorial techniques of perspective, light and shade, and engraving; three requirements to achieve this goal.

Of his first work, of 1743, *Prima parte di architettura e prospective*, two drawings stand out that anticipate the *carceri*: the most direct by the theme and the use of the single-point perspective, *Carcere oscura* (Fig. 4), and the one that advances an imagery of unlimited and excessive space, *Gruppo di scale*, whose link to the Baroque scenographic tradition is unquestionable (Tafuri 1976; Calatrava 1985, p. 34).

Regarding the plates of these years, in particular that of the *Tempio antico*, Tafuri (1976) states that it displays "a systematic criticism of the concept of the center", an architectural canon since Renaissance, something to be claimed in the c*arceri* too. In these, a constant displacement of the vanishing points from the framing of the image is also to be noted, something which contrasts with the treatment of space in the painting at the time and which strongly contributes to expanding the sense of depth, and the colossal scale of the depicted space.

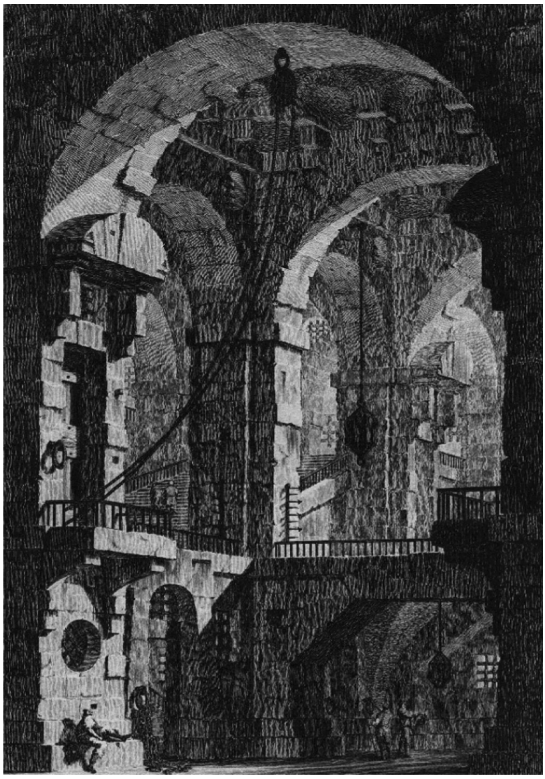

Fig. 4. Piranesi: Dark Carcere, *Prima Parte*, 1743

4 Carceri': From the Scenographic Perspective to Space as a Pictorial Topic Margins and Layout

Alberti (1976 [1435], p. 89) addressed the question of the representation of objects in space stressing the influence that light and distance have on their vision in his painting treatise (Fig. 5). A text that includes the scheme to resolve the problem of the central perspective and, with it, the measured representation of space. It even suggests the use of a grid similar to some of Dürer's drawing machines, through which to look and 'measure' the depth of objects in space. As Gentil (2010, pp. 29–31) has pointed out, the development of single-point perspective would not have been possible without monocular vision. For this same reason, Alberti's instrument was of difficult application, although, when adding the vision through a hole added by Dürer, its usefulness was key to solving the dilemma of the artist: deciding between the projected measurement of the foreshortening of the object, and its real dimension. Panofsky, in his text on perspective, affirms the conventionality of this type of representation as a symbolic form, nevertheless stating the utility of the perspective *voyeurist* method relied on the "consistent measure of the represented space" (1983 [1927], p. 22).

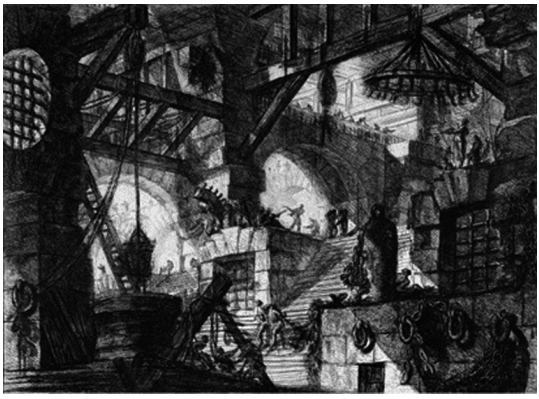

Fig. 5. Piranesi: *Carceri d'invenzione*, Plate XIII (2nd version), 1761

It would be Da Vinci (1993 [c. 1498], p. 88) who would point out in a more condensed way the three ingredients of perspective: the projective 'the linear construction of the bodies'—, the aerial—'the loss of determination of the figures at different distances'—and the chromatic—'the blurring of colours at varying distances'—, which during centuries would be applied in painting to represent depth, whose two-dimensional nature could do no more than turn into fiction.

Thus, in the pictorial tradition, there was an assimilation of space as a result of the relative positions occupied by the objects represented in it and their foreshortened dimensions. However, in painting this space used to be treated as a backdrop, as a setting for characters and their actions. Piranesi, with his *carceri* (Fig. 6), opens the narrative capacity of architecture to its interior space as the protagonist of the graphic discourse, showing it as an interior with its own atmosphere that becomes tangible: space as a theme in itself, alienated from its relationship with the exterior, showing its status as a place of confinement (Marcos 2014).

The perspective treatment of the first series published in 1745 as *Invenzioni Capric [ciose] di carceri* is different from that which characterised the Renaissance and Baroque painters. In the whole series, the perspective is at least of two vanishing points of oblique lines to the plane of the painting. Space emerges austere and stripped of adornment, defined by generous walls and resistant arches that form its limits: an immense emptiness travelled and visited by a few tiny, almost anecdotal, human beings that aggravate the dead-end space—prisoners or jailers are the same: captives of the time factory. The choice of the horizon at the eye-level of these characters reinforces the scalar impact on the observer of almost infinite interiors (Figs. 7 and 8).

The inversion of the elements of the scene substantially modifies the role of architecture: the human figure loses prominence in favour of space that is no longer the background that contains it, as in the painting of its epoch; architecture ceases to be the *tableau* of the occurrence of human activities. In his *carceri* everything is space. Piranesi accentuates the capacity for emotion of the architectural abstract space, forced by a giant scale that borders on the aesthetic of the sublime. These are interiors that reveal, at every moment, the consistency of their materiality and the action of time

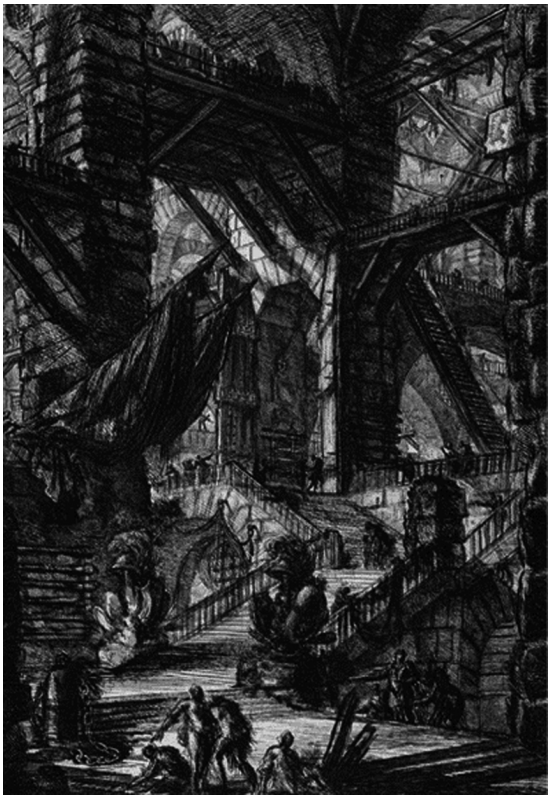

Fig. 6. Piranesi: *Carceri d'invenzione,* Plate VIII (2nd version), 1761

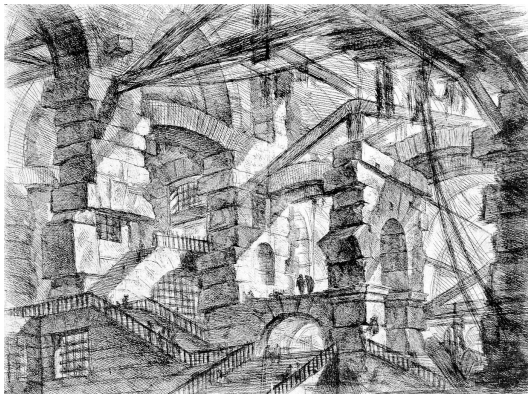

Fig. 7. Piranesi: *Invenzioni Capric [ciose] di carceri*, Carcere XIV (1st version), 1745

Fig. 8. Piranesi. *Carceri d'invenzione*, Carcere VII (2nd version), 1761

exerted on the limits that define them, an effect achieved by the use of irregular cut stones (among other elements), close to the imaginary of ruin, between wear and erosion, which Piranesi knows well from his archaeological work (Calatrava 1985, p. 32).

To achieve a greater 'abstraction' of these interior spaces, there is no concession to the formal classicist repertoire: the architecture drawn in the *carceri* has been devoid of any specific reference to a stylistic language and ornament has been reduced to a minimum. This stripped architecture is also an epiphany of modernity. In the whole series of the first edition there are hardly any elements that refer to the classical orders. The space is contained and held between fragments of bearing structures that do not show an order or a classical composition. The unknown air that can be smelt between the walls of the *carceri* manifests itself in the middle of the labyrinth of struts, pillars, arches, ropes and stairs: the authentic inhabitants of these gloomy dungeons.

The architectural space defined by Piranesi is configured with the deployment of construction and structural elements that represent a collection of items necessary for its articulation and the circulation within it. Stairs, bridges and walkways, rather than imposing order, contribute to shaping a chaotic, almost labyrinthine space, defying the classical canon of symmetry and hierarchy. The bulky presence of gadgets, pulleys,

chains and torture devices, describes an environment as that of a forlorn clock as a metaphor of imprisonment and punishment.

The proliferative perspective of the interior space in its ascensional route by innumerable staircases prevents the viewer from seeing a minimum of spilt sunlight. Faced with the established precepts of centrality, symmetry, proportion, regularity, order, balance and eurhythmy, Piranesi proposes decentralisation, asymmetry, disproportion, irregularity, disorder, imbalance and pure scenography. Thus, entailing the systematic denial of many of the values of classicism, which develops between the poetics of ruin and the Baroque scenography in the best tradition of the caprice genre, spread by Ricci, Tiepolo and Canaletto, with great control of light to achieve drama.

5 Unlimited Space as an Imagery for the Carceri

In the theatrical settings of Venice from the time before Piranesi, the famous set designer F. Galli-Bibiena (1656–1743) had developed a system to mount his sets using an oblique perspective to the canvas plane that generated two vanishing points of which he proclaimed himself the inventor (Terpitz 2000: 28). Apparently, Piranesi learned the technique of engraving and acquired experience as a vedutista with G. Vasi (1710–1782) who, in turn had been a disciple of F. Juvara (1678–1746), an architect who managed to oust the Bibiena family in the world of Venetian scenography (Calatrava 1998, p. 7).

The influence exercised by the Bibiena clan—with which some have linked Piranesi himself—and Juvara—of whom the engraver declared himself an admirer (1998a, p. 21)—is traceable in the creation of the *carceri's* imaginary and in the recourse to the oblique perspective. In this sense, it should be noted that the Bibiena family published a book with some 450 sketches of their set designs, including castles and prisons (Terpitz 2000, p. 28) that, in all probability, could have inspired Piranesi.

The trip back to Venice between 1743 and 1745, which, as Calatrava (1985, p. 29) points out, occurs between the publication of the Prima Parte and the first edition of the carceri, is considered the turning point in the trajectory of Piranesi who, probably, worked in the Tiepolo workshop at that time. It is surprising how in most of the views of Canaletto (1697–1768)—the most popular Venetian painter in Venice at the time—despite using the optical camera (Puppi 1981, p. 87), he almost always uses central point of view that is placed within the framing within the canvas itself. The use of the optical camera and the need to look through its orifice required a previous work of framing the view, as in photography.

Baroque painting had dominated the aerial perspective, but achieving it through drawing instead of painting was somewhat more complicated since the tones could only be constructed through cross-line textures and there was no possibility of veiling them. Canaletto, accustomed to drawing urban landscapes and observing his subjects at greater distances, achieves this effect of splendid form, not only in his painting, but also, by means of pen drawing, which, together with his perspective expertise and practice in the choice of framing probably made him another reference for the young Piranesi for his *carceri*.

The technique of light and shade, already used in antiquity, had been an expressive resource since the *quattrocento*: there was no better tool to convey the feeling of relief in the painting. In this regard, Leonardo states referring to the shadows: "He who ignores them will produce works without relief; and relief is the sum and the soul of painting" (Clark 1995). The study of cast shadows informs about the relative position in space of some objects over others. Combining both resources—light and shade—the recreation of the material reality and the adequate sensation of spatial depth in the drawing is achieved, a fact that stands out in the *carceri.*

Etching is an indirect engraving technique in which, the drawing is traced with steel tips on a plate protected by an acid-resistant varnish, leaving the metal plate exposed where the burin engraves. By submerging the plate in acid—depending on its concentration and exposure time—the acid penetrates and corrodes the metal—it literally bites into it—leaving the marks of the acid trace. It is important to observe here the innovation that Piranesi introduces in the engraving technique, in order to emphasise the narrative capacity of the space, a technique acquired with experience. Such an etching referred to by Focillon (2012, p. 15) in the following terms: "of the dark etching, that of the torrential shadows and the powerful beams of light. An etching that still did not exist but that Piranesi already sensed, already saw and needed to revive Rome". Piranesi revolutionised this technique using several thicknesses of tips and began to "use several acid bites, while in the *Prima Part* of 1743 or in the first edition of the 1746 *carceri* the plate was only bitten once, and by fairly weak acids" (Calatrava 1985, p. 56).

When observing the *carceri* in his two impressions (Fig. 9a, b), one can see the great advance the author has undergone over the two decades between the first and the second edition—much more elaborated and published in 1761 as *Carceri d'invenzione* —in his improved etching technique. In the latest version, the graphic effects of drama are amplified by the appearance of added pieces that increase the complexity and density of the interior space multiplying the vanishing points as well as forcing the contrast between light and shadow (Figs. 7, 8, 9a, b). The most disrupted plates provide different elements arranged in other ways that provoke more points of perspective amplifying, even more, the scenographic sensation. Eisenstein (2012, p. 57) points out that this movement of space is enhanced in the last edition of 1761 with the addition of more close-ups.

With regard to lighting effects, in almost all interiors, light and shade have increased their contrast, but not indiscriminately. The planes multiply in the distance towards the base of the lower part of the illustration, evidencing the effect of depth thanks to the successive bites of the corrosive acid on the plate to produce those effects of more intensity that were not in the original plates, whose contrasts of light and shadow are tempered in the different planes as they move away from the observer. Light is treated in a theatrical way since it does not respond to a single natural or artificial focus but it is modified by illuminating as required by the labyrinth space and without being able to accurately detect its origin. The foreground in backlight announces the dim atmosphere of the next as the luminosity increases towards the background. The multiplication of the layers in depth in the *carceri* amplifies the sensation of a space of greater dimensions, resorting to the same contrast technique with less intensity towards the background (Figs. 6, 8 and 9b).

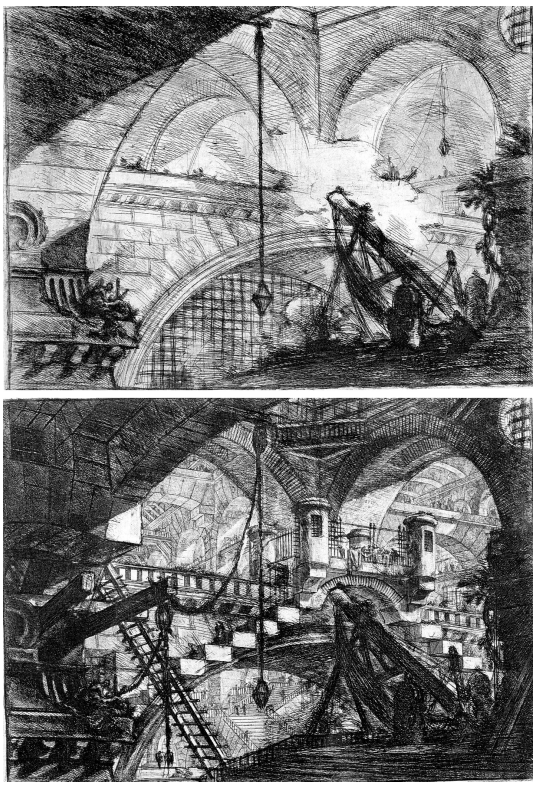

Fig. 9. **a** Piranesi: *Carceri* V (1st version), 1746 **b** Piranesi: *Carceri* V (2nd version), 1761

With his *carceri*, Piranesi highlights the fundamental role of drawing as a tool to conceive architecture and as a means of expression of architectural design. Piranesi anticipates a path to modernity by exploring new possibilities of architectural space. He abandons the order and the composition of the classicist formal repertoire, denouncing those who saw architecture as "a vile trade in which there would be nothing but copying" (Piranesi 1998b, p. 240). This discovery did not prevent him from defending the value of the ruins and the superiority of Roman architecture, both for their spaces and for the development of the constructive technology that made them possible.

6 Catharsis of Portfolios Emerging from the Crisis of the Treatises

The achievement of a quite unitary theory of classical architecture in such a short period of two centuries (15th–16th centuries), cannot be understood without the diffusion of treatises as a result of the expansion of Gutemberg's invention. Something similar, in the same sense of disclosure, happens with the impact of the series of etchings: it is possible through the development of printing techniques improving and

increasing the detail and quality of the graphic finishes. The etchings of Piranesi are at the crossroads of the change of the textual culture of treatises to the visual culture of the image. With the rise of the publication and the dissemination of architectural portfolio (of ruins, of monuments, of urban views—*veduti*—or of imagined architectures), treatises enter into crisis: images begin to impose over words and even to the asepsis of the architectural plans that had gained such prominence, especially in the cases of Serlio or Palladio.

Since the middle of the 17th century, the academic and professional world is nurtured on a series of compendiums of plates in which the qualities of drawing are more valued, the expressive capacity of the graphic techniques and the suggestions of the imagined or represented architecture is revered. Part of the eclecticism that would prevail in the 19th century could be linked to the proliferation of all kinds of architectural images from around the world and different epochs, whether collected as travel images, inventories of archaeological discoveries, history books or manuals of architecture. Not to mention the specific portfolios made by architects about their own work, many times projected and not built. This diffusion and this success cannot be understood, except in relation to the progress of illustration techniques: from xylography to engraving on a metal plate, form etching to lithography, which appeared in 1796 (Senefelder), or chromolithography, developed in 1835 (Engelmann). Two years later the daguerreotype would be born, opening the way to photography.

With his etchings, Piranesi opens two new lines. On the one hand, with his accurate survey plans of the ruins, classical antiquity (in front of the different paths through which his peers' contemporary architecture was based) founds Archaeology, which will support the Art History freshly, created by J. J. Winckelmann (1717–68) who looked towards Antiquity (Neoclassicism). On the other hand, with the interiors of imagined and fantastic architectures, it inaugurates another line of work for professionals, that of devising architecture through a series of utopian or visionary drawings that begin to circulate, replacing treatises as sources of formation, many of them of unrealisable pieces at the time. Consider the drawings by Boullée, Ledoux and Lequeu (Kaufman 1980) or, in the 19th century, by Schinkel, who perfected the techniques of graphic coding of architecture and stylised architectural graphic representation. Perhaps Piranesi inaugurated the architectural drawing understood as a genuine artistic manifestation marginal to the design itself.

However, this leap does not imply the abandonment of a theoretical discourse during the 19th century, when photography revolutionises graphic narration: it would be illustrated more and more profusely. The images, then and with increasing ease because of their reproducibility and distribution (Benjamin 1969 [1935]), acquire their own weight and sufficient autonomy until, at times, they detach themselves from the written discourse to suggest new interpretations. The books of Pugin, Ruskin, Viollet and Jones are more repertoires and collections of art and architecture of the past—except in a few illustrations that investigate a new and future architecture-. In this sense, the architects were more attracted and inspired by Otto Wagner's realistic drawings than his theoretical principles (1896); the graphic proposals in perspective of Sant'Elia (1909) were more powerful and seductive than his written speech in defence of a futurist architecture. The culture of the image had definitively permeated the architectural discourse.

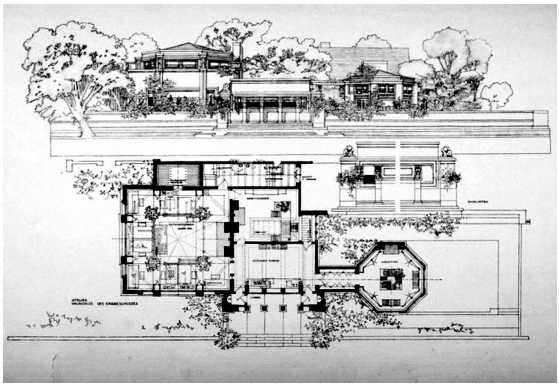

Fig. 10. Atelier F. Lloyd Wright, Oak Park, Illinois, 1889–93

Probably, the folder of architecture design that caused most impact in its time in the western culture for the diffusion of a new architecture was the one exerted by the publication in Berlin in 1910–11, on the part of the editor E. Wasmuth, of the portfolio of the early work of Frank Lloyd Wright. Titled *Ausgeführte Bauten und Entwürfe* (a collection lithographs: the *Wasmuth port-folio)*, it contained 100 plates and some words by the author on his own work (Wright 1998 [1910–11]) (Fig. 10). It is significant that the success of this portfolio, which would give a new direction to modern architecture focusing on the exploration of domestic interiors, was in the illustration of projects (drawn in dihedral projections and perspectives) as the swan-song of the autograph drawing at the moment in which photography had already established itself as the graphic documentary source of reality—as a scientific instrument-, and architecture journals would become the fundamental medium for the diffusion, not only of architectural ideas, but of contemporary news.

7 Conclusions

Piranesi used his drawing abilities as a vehicle to disseminate his ideology enriching the architectural debate of Enlightenment. Without his exceptional etchings, it is probable that his revolutionary ideas, somewhat chaotic and very controversial, would have succumbed in the course of history. In this sense, the transcendence of his *carceri* is unique; few times a portfolio of only 16 plates has had such impact on architectural theory, perhaps because of its unprecedented exploration of architectural space as the protagonist. It is not adventurous, then, to attribute the passage of the culture of a plan —a drawing—that had dominated the sixteenth century treatises to that of the culture of the image in architecture, prefiguring what in recent times photography has achieved as a vehicle of dissemination and propaganda of the first order. Finally, his interest in architecture as an object of perception anticipates the phenomenological current of contemporary architecture.

References[1]

Alberti LB (1976) Sobre la pintura. In: Torres F (ed), Valencia
Alberti LB (1991) De Re Aedificatoria. Akal, Madrid
Arnau J (1988) La teoría de la arquitectura en los tratados. Filarete, Serlio, Di Giorgio, Palladio, vol III. Tebar Flores, Madrid
Arnheim R (2005) Arte y percepción visual. G. Gili, Barcelona
Benjamin W (1969) The work of art in the age of mechanical reproduction. In: Arendt H (ed) Illuminations. Schocken Books, New York
Calatrava J (1985) Las Carceri de Giovanni Battista Piranesi: entre Clasicismo y Romanticismo. Diputación Provincial de Granada (ed) Granada
Calatrava J (1998) Piranesi, la Roma antigua y la teoría de la arquitectura. In: Piranesi GB (ed) De la magnificencia y la arquitectura de los romanos y otros escritos. Akal, Madrid, pp 5–17
Calduch Cervera J (1998) Palladio y Piranesi ante las ruinas. Revista Loggia 6:24–33
Calduch Cervera J (2017) Andrea Palladio. La arquitectura dibujada en los tratados. Publicaciones de la Universidad de Alicante, Alicante
Carpo M (2001) Architecture in the age of printing. The MIT Press, Cambridge (Mass)
Clark K (1995) Leonardo da Vinci. Alianza Editorial, Madrid
Da Vinci L (1993) Tratado de pintura. Akal, Madrid
Eisenstein S (2012) Piranesi o la fluidez de las formas. In: Huxley A et al (eds) Las cárceles de Piranesi. Casimiro libros, Madrid, pp 43–62
Focillon H (2012) Piranesi el visionario. In: Huxley A et al (eds) Las cárceles de Piranesi. Casimiro Libros, Madrid, pp 15–20
Gentil JM (2010) Looking from a hole or 'the nearwindow'. Revista EGA 15:26–35
Kaufmann E (1980) Tres arquitectos revolucionarios: Boullée, Ledous y Lequeu. Gustavo Gili, Barcelona
Kostoff S (1998) Historia de la Arquitectura, vols 3. Alianza, Madrid
Marcos C (2014) Imaginary prisons or space as a topic. Dissegnare, Idee e Imagine 48:44–55
Panofsky E (1983) La perspectiva como forma simbólica. Clotet-Tusquets, Barcelona
Piranesi GB (1998a) Dedicatoria a Nicola Giobe in Prima Parte di Architettura e Prospettive. Akal, Madrid, pp 21–22
Piranesi GB (1998b) Opinión sobre la arquitectura. Akal, Piranesi, Madrid, pp 235–242
Puppi L (1981) Catálogo de las obras. AA.VV. La obra pictórica de Canaletto. Barcelona, Noguer
Rodríguez D (1995) Diez libros de arquitectura: Vitruvio y la piel del clasicismo. Vitruvio. Los diez libros de la arquitectura. Madrid, Alianza Forma, pp 11–51
Sambricio C (1972) Piranesi y el «Parere». Revista de Ideas Estéticas 30(117):81–101
Tafuri M (1976) Giovani Battista Piranesi. L'utopie negative dans l'architecture. L'Architecture d'aujourd'hui, (184) March–April, p 93
Terpitz D (2000) Giovanni Antonio Canal, llamado Canaletto. Oldenburg, Könemann
Tufte ER (2007) The visual display of quantitative information. Graphics Press, Cheshire
Wright FL (1998) Ausgeführte Bauten und Entwürfe von Frank Lloyd Wright. Ernst Wasmuth Verlag and RIBA, Berlín and Londres

[1] The literal quotations of those texts originally not in English or which we did not have access to the English version have been translated by the authors.