

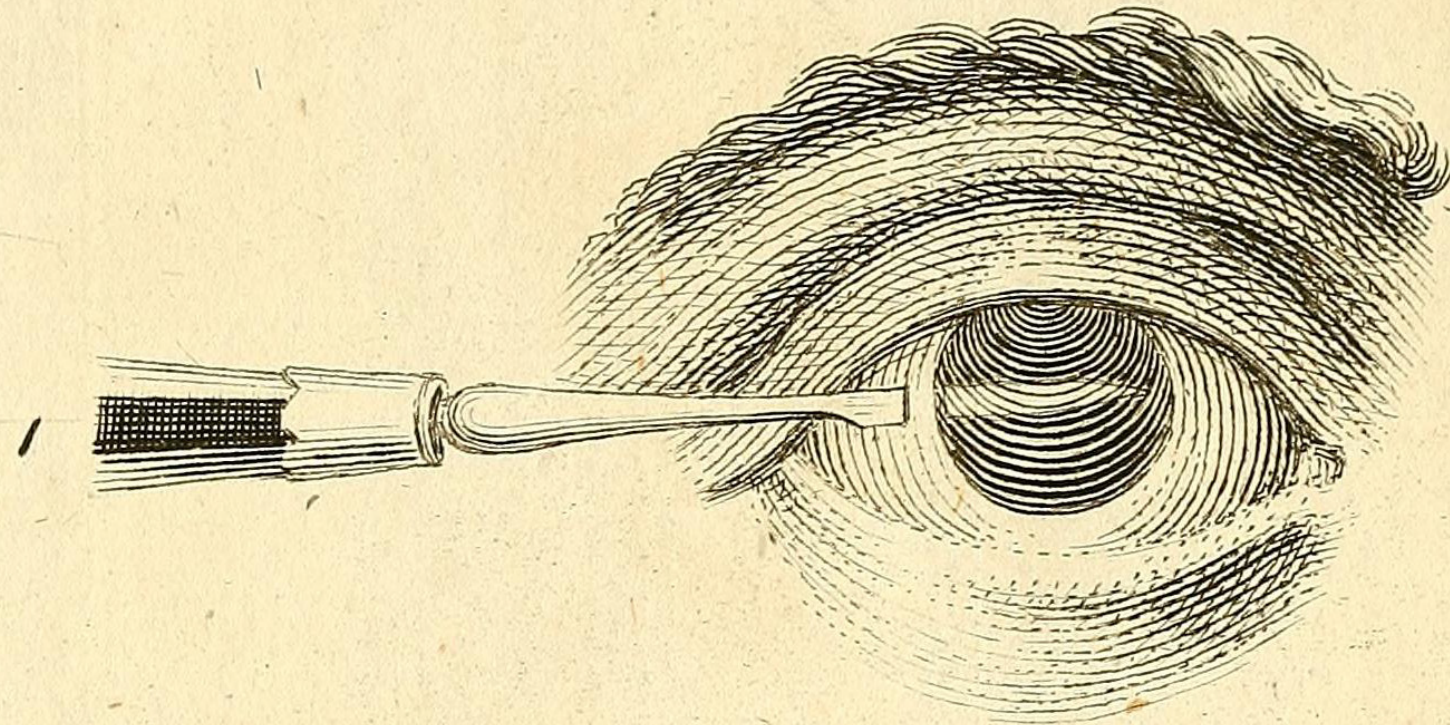
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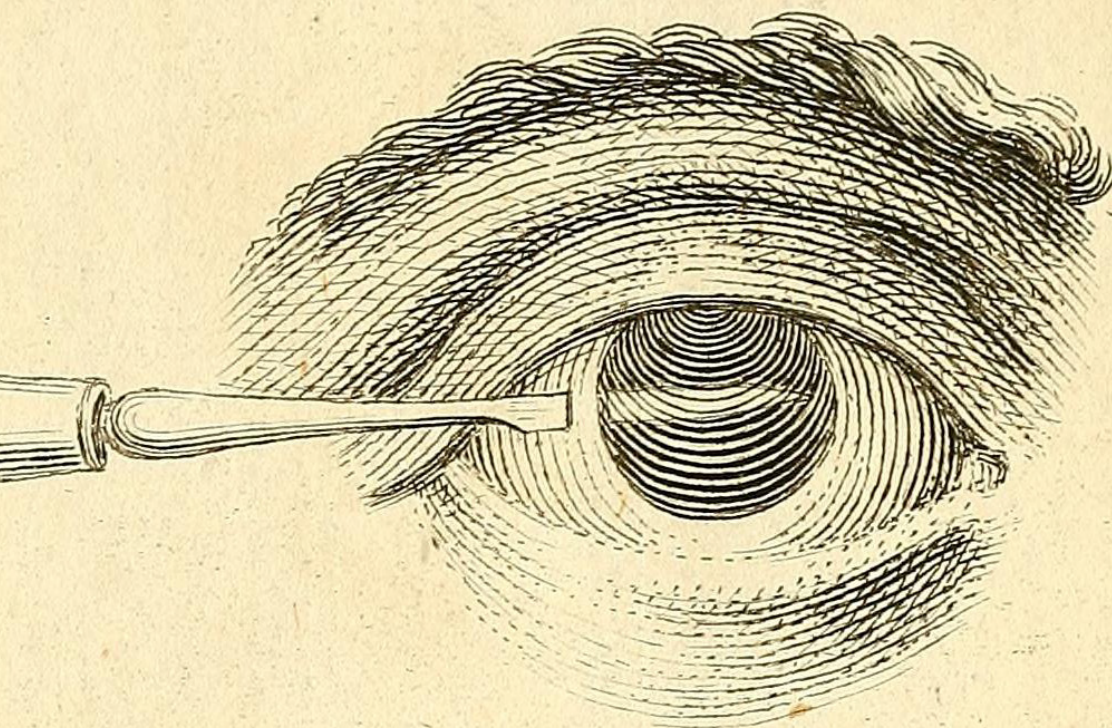
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diségno



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Gerard Vandergucht, *Cataract surgery and effects on vision, 1713, detail* (from William Cheselden, *Anatomy of the Human Body*, London 1750, plate XXXVI).

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Editorial

Francesca Fatta

Issue No. 16 of the journal *diségno* marks the handover of a scientific publication founded in 2017 and which has been running for 8 years. A balance sheet full of events and transformations, which now sees a mature journal witnessing the scope of a scientific disciplinary sector with strong ties to Area 08 - Civil Engineering and Architecture and beyond. Since its first issue, the journal *diségno* has aimed to play a critical role in the dissemination of knowledge and scientific progress of the field ICAR/17, now CEAR-10/A, by a useful editorial space to present research results and studies relating to the specific issue of representation. Just in last days, the news of the inclusion of *diségno* in class A List of Journals for Sectors 08/C1, 08/D1 and 08/E1 has been released. This is a goal achieved with patience, carefully following the criteria defined by ANVUR, focusing, from the beginning, on achieving a high standard of quality, tenaciously pursuing the goal of becoming a reference within our scientific field, and always keeping in mind the need to consolidate interdisciplinarity and good involvement of the international community.

This important recognition translates into the journal's solid reputation among scholars in the field, thanks in part to the adoption from the very first issue of the Open Science formula reserved for scientific journals, with dissemination following the principles of accessibility and transparency at all stages of the publication process.

Reading today the editorial written by Vito Cardone for the first issue of *diségno*, in which the motivations, structure and policy of the journal are described, we can consider the steps forward that have been made and the consolidated acquired. Regarding the need to fill the "inexplicable gap" of the absence of a UID scientific society journal until 2017, Cardone writes: "The process of designing the new journal has been long and very thoughtful. It was developed, following the decision to found the journal, deliberated by the Technical Scientific Committee of the UID in the November 2016 session, by

a specific Working Group of the Committee itself, also taking into account the numerous suggestions received from various colleagues after the important choice was announced".

After the start-up and launch phase, since 2019 *diségno* has taken further steps by creating interdisciplinary connections with the scholars of Area 08 and seeking the most qualified international contributions. Starting with No. 9, 2021, specific issues have been created that addressed both internal issues within the new declaratory (later approved by the CUN in 2024), and more borderline aspects that relate to other sectors in the same area of Civil Engineering and Architecture. According to a principle of more responsible involvement, it was decided to systematically identify editors also from outside the Editorial Committee, to strengthen the scientific contribution: Paolo Belardi (No. 9, 2021), Caterina Palestini (No. 10, 2022), Massimiliano Ciammaichella and Valeria Menchetelli (No. 11, 2022), Pilar Chías Navarro with Andrea Giordano and Ornella Zerlenga (No. 12, 2023), Paolo Belardi and Massimiliano Campi (No. 13, 2023), Alberto Sdegno and Pedro Manuel Cabezos Bernal (No. 14, 2024), Maria Grazia Cianci with Balmori Associates and Darío Álvarez (No. 15, 2024). These participations have given further impetus to external collaborations, both international and interdisciplinary, effectively fostering the number of submissions in response to calls and the journal's outreach beyond the disciplinary perimeter.

Another important aspect concerns the turnover that has characterized participation in the Editorial Committee and the Staff, giving several young people the opportunity to practice with the editorial aspects of a scientific journal.

With issue No. 16, a period that we can define as 'settling in' ends. Now it is the turn of a new direction with Ornella Zerlenga, elected UID president for the three-year period 2024-2027 and therefore, as the statute establishes, new director of the journal.

There are many people I have to thank and who have advised, helped, supported me in all these years, from the outgoing Scientific Committee, to the Editorial Coordination Committee that over the years has included Fabrizio Apollonio, Paolo Belardi, Massimiliano Ciammaichella, Enrico Cicalò, Andrea Giordano, Elena Ippoliti, Francesco Maggio, Alberto Sdegno; Valeria Menchetelli, current Journal Manager; and all the Staff who worked hard to edit the journal. The call for issue No. 16 took this handover into account and entrusted the curation of Enrico Cicalò and Valeria Menchetelli to address a thematic area that I consider particularly current: *Drawing as a Language*, related to the *Linguaggi Grafici* series published since 2018 by the Publica publishing platform, of which the two curators are among the founders. A debate that was resumed in 2022 as the theme of the UID conference held in Genoa, *Dialogues. Visions and visibility*, as well as in the experiences of the IMG conferences in Bressanone, Alghero, Milan, L'Aquila.

The choice to close this direction of mine by returning to graphic languages was determined precisely by the desire to resume the *incipit* of our beautiful declaration CEAR-10/A Disegno: "The sector deals [...] with the design and visual translation of concepts, ideas and narratives, as an expression of non-verbal language", given that the entire structure of research and teaching of Drawing is expressed through specific, targeted, codified, but also open, creative, relational languages. Cicalò and Menchetelli write on the Cover: "Drawing means using a language made of graphic signs but also of relationships, communicative intentions and interpretations of reality. In this perspective, drawing is not a simple illustrative tool, but is instead an expressive, cognitive and critical means, capable of giving shape to thought and transforming it into shared communication". An aspect that makes drawing a practice open to actions of visual design, synthesis and analysis of thought.

Contributions and columns in this issue propose a common, open, interdisciplinary and transversal reflection, aimed at stimulating new points of view and further research paths; the four *focuses* are divided into *Theory, History, Project, Experiences*, each introduced by an essay written upon invitation. For the first *focus*, Edoardo Dotto addresses the complex world of the theory of vision, highlighting how language—graphic or textual—ultimately influences our verbal thought or our imaginative capacity, with similar mechanisms in the two fields, and, through the words of Margherita De Simone and Vittorio Ugo, underlines how drawing can be identified as the "genetic nucleus" of architectural thought, founding the language of the project.

The essay of the second *focus* written upon invitation, dedicated to *History*, is entrusted to Manuela Piscitelli who considers the thought on which spatial culture is based in close relation with the graphic technique adopted in visual communication, from the representations of the Ptolemaic universe, to Renaissance perspective, to Cartesian space, up to abstract art. Enrica Bistagnino, for the *focus* on the *Project*, uses in the title of her essay the same word "hybridizations" contained in Manuela Piscitelli's title; an unsought coincidence that wants to make clear how the elements of the word reverberate on the visual sphere, "intertwining the linguistic-semiotic framework with the methods and terms of the analysis and formation of the image". The "drawing project" turns out to be an expression that projects onto the visual plane "themes and processes of the verbal linguistic code", so much so that drawing—as Bistagnino writes—becomes "a conformative medium of ideas and writing of project development".

Last *focus* is dedicated to the *Experiences* in the field of graphic languages, with a presentation essay by Elena Ippoliti that deals with the "intrinsically negotiating nature of every communicative exchange, extending this reflection to the aesthetic dimension". The text addresses the theme of the ambiguity of visual communication, of its undeniably elusive nature, "exploring the uncertain and fascinating territory in which image and word touch, overlap and sometimes exclude each other". The choice of the image that represents the first of the journal's columns was undoubtedly a consequence of the theme of the issue: *Les mot et les images*, by René Magritte, a surrealist manifesto that places images on the same level as words, commented by Michele Valentino. Another choice determined by the theme of the issue is the volume investigated by Daniele Colistra in the *Readings/Rereadings* column, that is *Vedere con il disegno. Aspetti tecnici, cognitivi, comunicativi*, by Manfredo Massironi (1982) (*Seeing through drawing. Technical, cognitive, and communicative aspects*), cited several times by the authors of the texts in the issue, in which the concepts of the artist and his research aimed at the psychological aspects of visual perception are taken up. As usual, the closing pages include *Reviews* of four volumes and some of the *Events* sponsored by UID.

I close by thanking the authors, reviewers and editors, as well as the curators; I wish a long life to the journal and its renewal under the direction of Ornella Zerlenga who, we are sure, together with the journal manager, the editorial board and the staff will be able to best face and manage the new editorial challenges that lie ahead.

And of course, long life to Drawing and to *disegno*!

Drawing as Language

Enrico Cicalò, Valeria Menchetelli

Introduction

Drawing and graphic communication can be taken as equivalent concepts; in fact, drawing always aims to convey a message through an alternative language to the verbal one, and its communicative nature is implicit. Starting from the formulation of this position, theorized 25 years ago by Manfredo Massironi in support of his famous taxonomy of graphic production [Massironi 2002], it is possible to observe how the disciplinary area of Drawing has evolved over time to become today a field of research not only capable of proposing effective graphic representations and translations, but also of providing answers to the questions emerging from contemporary society through problem-driven research [Abbott 2001] and a plurality of projects and

solutions in the form of graphic-visual artifacts. However, although this role has become central in relation to the changing demands coming from the community and although the multiple applications often identify answers of high specificity, the origins of drawing remain strongly rooted precisely in its primal nature as one of the most effective, versatile and widespread communication languages and, precisely because of this, capable of developing solutions for the most complex problems. Investigating the communicative matrix of drawing, understood as the common denominator of a wide and plural range of design declinations, is thus configured as a necessary act in the contemporary context of an increasingly diversified and specialized

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

research, with the intention of recognizing its origins, acquiring renewed awareness of it and reverberating them in the daily practice of representation and design. Drawing means using a language made of graphic signs but also of relationships, communicative intentions and interpretations of reality. From this perspective, drawing is not merely an illustrative tool, but is instead an expressive, cognitive and critical medium capable of shaping thought and transforming it into shared communication. Recognizing the identity between drawing and language then means restoring to drawing its role as a bridge between perception and production, between representation and thought, between silence and communication.

Language

Drawing, from its earliest expressions, originated as a practice of communication. Even before specializing as a tool of ideation or representation, drawing thus responds to a communicative intention, consequently assuming the structure of a visual language, endowed with its own rules and functional modalities autonomous and distinct from those of verbal language: drawing must therefore be interpreted not only as a means of graphically reproducing reality –although every drawing is never to all intents and purposes just a reproduction of reality– but above all as a semiotic system, capable of conveying information, organizing content and generating meaning. Drawing does not merely show, but structures a visual discourse that is encoded and decoded according to specific cultural codes. The communicative nature of drawing emerges clearly in the processes of ideation and design; each graphic stroke is a carrier of information because it represents, describes, hypothesizes and orders. In this sense, drawing actively participates in the construction of knowledge, acting as a form of visual thinking [Arnheim 1969]. In the act of drawing, complex cognitive structures are activated that enable abstract concepts to be processed, visualized and transformed into graphic artifacts; these processes involve visuospatial skills and the integration of perception and imagination, as well argued by cognitive psychology studies [Kosslyn 1994]. The mutual identification between design and language is thus made evident not only in the stages

of conception, elaboration and production of graphic-visual artifacts, but in general in all design processes that require norms of communication of designed forms, which always result in the definition of a system of signs codified in relation to specific needs. In 'shaping' the image of an artifact, choices are in fact involved concerning the graphic elements, their mutual relationships, the hierarchies established among them, the greater or lesser degree of iconicity, symbolic content, and morphological and expressive qualities. This system of choices actually involves the identification of all aspects that structure a linguistic system: an alphabet, interpreted as the range of producible and perceivable signs; a morphology, understood as the classification of signs into categories; a syntax, read as a system of rules pertaining to the structure and function of signs; and a semantics, defined as the association of meanings to signs and their aggregations.

The function of the graphic sign is thus to communicate a message; in intentional communication, the process requires at least two participants, an issuer and a receiver. The message is issued in a medium and is immersed in a set of shared conventions or codes, which will allow its encoding by the sender and decoding by the receiver or interpreter. This scheme is declined in the linguistic and semiotic context from the working model of the communicative process originally devised for signal transmission in telecommunications engineering [Shannon, Weaver 1949], according to which communication consists of the transmission of a message from a source to a receiver through a channel, considering the possible interference of 'noise' and the needs for encoding and decoding. It is therefore a process that involves a dynamic interaction between the production and interpretation of the sign, which are strongly conditioned by the specific communicative context.

Indeed, as a language, drawing is never universal, but is influenced by the cultural context in which it is generated and received; it thus conveys a vision of the world, synthesized and expressed through processes of selection, composition and signification that occur during the 'putting into form' of any graphic artifact. Drawing thus reveals its identity as a critical act and *modus interpretandi* of reality. In this sense, to speak of drawing as language is also to recognize its generative power and capacity to formulate hypotheses, models and alternative visions of reality.

In light of these considerations, the analysis of drawing as a complex system, in the context of which signs assume a conventional and codified role in relation to communicative intent, requires an interdisciplinary approach that interweaves semiotics, neuro-cognitive processes, psychology of vision and history of representation within an articulated framework capable of highlighting the functions that drawing itself plays within communication and the construction of visual thought.

Sign

Moving on from the intention of investigating the foundations of drawing as language, it is appropriate to recall the etymological derivation of the word 'drawing,' which, although now widely known and shared, is an indispensable starting point for undertaking any discourse on drawing as language. Drawing understood as a system of signs has, in fact, deep cultural origins that are reflected in its etymology. The relationship between the Italian words 'segno' and 'disegno' and the analogous ones between the corresponding German words 'zeichen' and 'zeichnen', English 'sign' and 'design', and French 'signe' and 'dessin' recalls the Latin etymological root that sees the union of 'de' (separation) and 'signum' (sign). Literally, therefore, to 'draw' means to separate, to scan signs. Over time, in all drawn languages, this process has been implemented following certain codes and rules, adopting particular alphabets and symbolic conventions, applying appropriate notational, descriptive, narrative and design strategies.

The rules defining the separation –and thus the association– of graphic signs are defined within the discipline of graphic semiotics, a specific declination in the field of graphics of the more general science of semiotics, which governs the relationships between signs and whose formalization in the modern era occurs by the Swiss theorist Ferdinand de Saussure and the American philosopher Charles Sanders Peirce.

Again, it seems necessary to recall the principles underlying the semiotics of graphic language, according to which a graphic sign can be interpreted as consisting of two elements: a signifier and a signified. Having defined this dyadic model, apparently elementary but rich in interpretative implications, de Saussure discusses the character of arbitrariness that distinguishes

a sign: it results in fact from the 'arbitrary' association of a signifier (the form of the sign) and a signified (the concept that is made to correspond to that sign) [de Saussure 1931, pp. 100-102]. In this regard, however, it is necessary to speak of a relative, or in some respects constrained, arbitrariness, since many signs are 'guided' by their referent: in the case of a word, the referent is often the sound associated with the word itself (think of the emergence of onomatopoeic terms, which are very frequent in the manifestations of language); in the case of a graphic sign, the referent is often the form of the real object with which the sign establishes a correspondence relationship (this referent determines, for example, the character of iconicity of the sign itself). And, even in the case of signs that do not establish a direct correspondence with a real referent, the form may turn out to be related to or driven by symbolic associations that distinguish the cultural context in which that sign was born and developed.

The triadic semiotic model proposed by Peirce introduces a further level of complexity, defining the relationships between three entities: *representamen* (perceivable aspect of the sign, which has the task of conveying its meaning), object (concept or entity, concrete or abstract, to which the sign refers), and interpretant (effect generated by the sign in the mind of the person who interprets it) [Peirce 1906]. In this theoretical framework, Peirce classifies signs into three categories, each with numerous possible subdivisions. The 'index' is a sign that arises as a result of, or is placed in contiguity with, its meaning: classic examples are the imprint or the trace, understood as a sign of a previous presence in a certain place. The 'icon' is a sign that presents a similarity or an assonance with its denoted, as occurs in the case of some road signs that present a schematic image of a real referent. Finally, the 'symbol' is a sign that has no apparent resemblance to its meaning, but operates within a series of agreed conventions. According to this classification, the drawing as a result of the passage of a tool over a surface is classified as an 'index', but the product of this action can instead be classified as an 'icon' –if the aim is to depict a subject– or as a 'symbol' –if the aim is instead to use it to communicate meanings other than simple representation– [Ashwin 1984]. Translating the three categories within the disciplinary field of Drawing, it is possible to provide a specific reading of some terms that are often used indiscriminately, but

which contain important declinations of meaning. The term 'representation' is linked to the concept of drawing as an 'icon', as a recording of an object or a visible phenomenon, and is specific to the so-called artistic or figurative drawing. 'Visualization' is instead more closely linked to making 'visually material' a form, an idea or a concept that otherwise exists only in the mind of the designer, but always in an iconic form. The concept of 'notation', instead, is more closely linked to drawing as a 'symbol' and is typical of technical drawing (engineering, architectural or design in a broad sense), which respects shared standards and symbolic languages.

Structure

In the preamble to the taxonomy proposed in the early 2000s, Manfredo Massironi states that he uses the terms 'drawing' and 'graphic communication' as synonyms, to refer "to any set of marks, produced with any suitable instrument for the purpose of communication without words" [Massironi 2002, p. 1]. His theoretical reflection, summarized in his best-known publications such as *Vedere con il disegno* (Seeing with Drawing) [Massironi 1989] and *The Psychology of Graphic Images* [Massironi 2002], is deeply influenced by the artistic experience gained in the 1960s within Group N [Feierabend 2009; Bartorelli et al. 2022]. The artistic collective, composed of Alberto Biasi, Ennio Chiggio, and Toni Costa, among others, initiated an intense season of visual experimentation aimed at the systematic exploration of the relationship between perception, graphic structure, and observer involvement. Setting aside the aesthetic function of the work of art, the object of investigation becomes the cognitive function of the visual language, which is explored through optical and kinetic installations, modular works with a dynamic character to which a role of perceptive verification is entrusted; drawing is not limited to representation but becomes an agent factor, stimulating a dynamic observation, generating interpretative ambiguities, building cognitive relationships. By foregrounding the work as an instrument of communication and interaction on the perceptual plane, drawing concretely experiences.

The experiments of Group N matured from a series of earlier reflections on the linguistic role of sign. Firstly, a significant study is the one developed by René Magritte

in *Les mots et les images* [Magritte 1929], which, by mocking the ambiguity that exists between image and word and the conventional nature of their relationship, shows how the two linguistic systems can interact in complementary or contradictory ways. On the operational and design level, Gyorgy Kepes, an artist and theorist of visual communication, describes in *Language of Vision* how visual forms are structured into language [Kepes 1944]: for Kepes, vision is an active process during which the eye organizes, interprets, and gives structure to an ever-evolving link between visual form and cognitive structure. A few years later, Rudolph Arnheim investigates in *Art and Visual Perception* the perceptual processes of artistic images by affirming the visual quality of thought and emphasizing the organizational activity of the mind that is activated by perceptual dynamics [Arnheim 1954]; the principles listed, borrowed from Gestalt psychology, act as a grammar that enables the observer to understand and interpret visual content.

Massironi selects the most relevant uses of drawing in human communication in different eras and for different purposes. These uses are represented in a diagram that visualizes the evolution of drawing languages as a river configuration in which different branches can meet, get lost or originate other branches. According to this diagram, the languages by which drawing declines are continuously subject to transformation, deformation, expansion, and reduction. Their flow is sometimes rapid and vigorous, other times slow and stagnant. The sources die out and then reappear. The flow proceeds ineluctably through two main tributaries: that of representational languages and that of nonrepresentational languages, both of which remain continuously active [Massironi 2002, pp. 2-4]. Beginning with Massironi's diagram, and consistent with its internal rules, an update of graphic production was then also hypothesized in light of the new graphic representations processed today with and for new digital technologies [Cicalò 2020]. The diagram thus drawn not only takes into account technological innovations but also complements and updates Massironi's taxonomy. This update, too, continues to highlight the possibilities of movement and exchange, as well as of new contributions, confluences and branches, within a liquid network and therefore in continuous transformation, in which the knowledge produced at one node passes through the various ramifications reaching all the others, almost pandering to the

principle of communicating vessels that restores unity to a system of nodes apparently unrelated but actually strongly connected.

The Saussurean approach first, and the classification of signs into icons, indices and symbols operated by Peirce in the American philosophical tradition [Peirce 1906], open the interpretative horizon towards a structuralist meaning of communication, which can also be applied to the visual sphere. In the *Treatise on General Semiotics*, Umberto Eco [1975] develops an extended vision of the sign, which includes not only verbal expressions, but also visual, plastic and graphic languages. According to Eco, images, drawings and visual configurations also participate in the 'universe of signs' and must be read in the light of the cultural codes that regulate them. In particular, Eco underlines the always conventional nature of the graphic image and highlights that its understanding depends on the existence of a code shared between sender and recipient [Eco 1975]. In the context outlined, the drawing is confirmed as a codified semiotic structure, which can be shaped on the basis of different levels of abstraction or iconicity [Moles 1972; Anceschi 1992; Wileman 1993] and that is capable of transmitting complex contents, even abstract and operational ones as in the contexts of design and science. The interpretation of such a structure requires skills, cognitive habits and knowledge belonging to the cultural system in which the drawing is produced; furthermore, the interpretation is dynamic, since the meaning changes according to the use and the specific function.

Code

Learning sign-based languages involves not only the processes of decoding perceived signs but also the complex process of encoding the signs themselves. Thus, learning drawing languages also requires the development of skills in both decoding and encoding visual information. It therefore makes sense to speak of graphic communication to refer to the component of coding messages that will then be decoded through the perceptual processes generally associated with visual communication.

The English language offers the possibility of declining literacy into at least four variants, 'literacy', 'oracy', 'numeracy', and 'graphicacy', referring respectively to

education in the languages of the written word, the spoken word, numbers, and finally graphic signs. These are often referred to as 'the four aces' that are played in the 'game' of learning but, when the time comes to discard one of them, the one chosen is always graphicacy [Balchin, Coleman 1966].

Visual perception and graphic representation can thus be regarded as two sides of the same coin. The gaze performs a round trip into the territory of visual communication, by which in one sense the signs of graphic representation are encoded and in the reverse sense the same are decoded through visual perception.

It is that same journey that connects visual perception and graphic representation and that is undertaken daily and continually in the face of messages whose transmission is entrusted to visual communication. Indeed, perception can be likened to a process of 'decoding' external reality by the observer; it involves an attribution of meaning and an acquisition of meaning. Graphic representation, on the other hand, can be seen as 'coding', that is, as a process through which graphic signs are chosen, constructed, and juxtaposed with the aim of conveying a given meaning [Massironi 1989].

Knowing the mechanisms of visual perception and the strategies of gaze allows one to strategically design graphic representation so as to consciously guide perception and make visual communication effective.

Design

Drawing also enables experimentation and exploration of alternative solutions, configuring itself as an autopoietic act: design takes shape in drawing, and drawing shapes design thinking.

The roots of drawing as a design code can be traced from the second half of the nineteenth century in the Anglo-Saxon context when, in conjunction with the Second Industrial Revolution, three different approaches to education in the field of drawing were emerging that would later characterize the English educational landscape of the second half of the nineteenth century: the first, linked to the tradition of the past, which saw the Royal Academy of Arts as the most representative institution; the second, linked to the new demands of industrial production, represented by the Schools of Design and the Department of

Science and Art; and finally, the third, non-institutional, which was recognized in the leadership of John Ruskin and focused on overcoming a utilitarian conception of drawing toward a recognition of its role as a means of refining vision, of acquiring and communicating knowledge on a par with reading, writing, and counting skills. Although different, these three conceptions have in common that they consider drawing as a language of form; however, it is to the second conception, linked to production, that we owe the first formalization of drawing as a design language, made necessary by the growing demand for skills in the field of reading and producing shared graphic codes capable of supporting new industrial production processes.

But drawing, in addition to being a useful design language, is itself a design.

The design of graphic languages is the area in which the communicative nature of drawing emerges most clearly, since it involves the definition of all the characteristics of a language: an alphabet (made up of lines, signs, symbols), a morphology (capable of organizing elements into categories), a syntax (consisting of a set of rules of usage) and a semantics (apt for the association of meanings). Examples include all the coded sign systems that find application in countless contexts, from architectural representation to road signs, from musical notation to cartographic applications.

Perspectives

In an age when digital technologies are profoundly transforming the way we design, communicate and represent, drawing maintains its centrality as a visual language. From digital twins to graphical interfaces, from concept maps to immersive representations, drawing

continually reconfigures itself as a system of signs that can adapt, innovate and communicate. In the light of these technological developments, drawing languages have evolved and are continuously evolving, taking on new declinations and physiognomies that are sometimes difficult to trace back to the conventional forms of graphic languages, their generative methods, and traditional theories. Today, drawing languages are expressed through new digital tools that also force the redefinition of theoretical and cultural tools.

Graphic languages today are increasingly becoming graphic-digital languages, based on forms of coding and computer procedures that are increasingly moving away from manual procedures based on the trace, on that relationship of contiguity inherent in drawing as an 'index' defined by Peirce.

These languages are being developed in digital environments that bring representation closer to programming, which make drawing languages increasingly similar to computer languages, more or less mediated by interfaces that recall traditional tools, methods, codes and alphabets.

These are the new forms of contemporary drawing, a drawing that continues to take on the meaning of speaking a language made up of graphic signs, but also of relationships, communicative intentions and interpretations of reality. In this perspective, drawing continues to transcend the traditional conception of an illustrative tool, continuing to be an expressive, cognitive and critical medium, capable of shaping thought and transforming it into shared communication. Recognizing the new identities of drawing and its languages then means confirming and strengthening its nature and that role as a bridge between perception and production, between representation and thought, between silence and communication that has characterized its entire history.

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Les mots et les images

René Magritte

LES MOTS ET LES IMAGES

Un objet ne tient pas tellement à son nom qu'on ne puisse lui en trouver un autre qui lui convienne mieux :



Il y a des objets qui se passent de nom :



Un mot ne sert parfois qu'à se désigner soi-même :



Un objet rencontre son image, un objet rencontre son nom. Il arrive que l'image et le nom de cet objet se rencontrent :



Parfois le nom d'un objet tient lieu d'une image :



Un mot peut prendre la place d'un objet dans la réalité :



Une image peut prendre la place d'un mot dans une proposition :



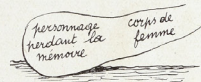
Un objet fait supposer qu'il y en a d'autres derrière lui :



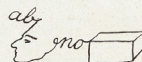
Tout tend à faire penser qu'il y a peu de relation entre un objet et ce qui le représente :



Les mots qui servent à désigner deux objets différents ne montrent pas ce qui peut séparer ces objets l'un de l'autre :



Dans un tableau, les mots sont de la même substance que les images :



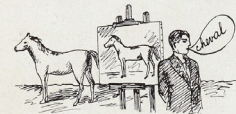
On voit autrement les images et les mots dans un tableau :



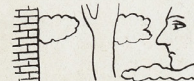
Une forme quelconque peut remplacer l'image d'un objet :



Un objet ne fait jamais le même office que son nom ou que son image :



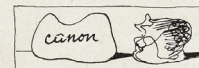
Or, les contours visibles des objets, dans la réalité, se touchent comme s'ils formaient une mosaïque :



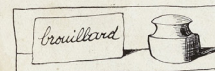
Les figures vagues ont une signification aussi nécessaire aussi parfaite que les précises :



Parfois, les noms écrits dans un tableau désignent des choses précises, et les images des choses vagues :



Ou bien le contraire :



René MAGRITTE.

Les mots et les images. Ambiguity and Disorientation in Language

Michele Valentino

In 1929, René Magritte published *Les mots et les images* in the magazine *La Révolution surréaliste*, a series of eighteen illustrations that offered a conceptual experiment on the relationship between text and image. With this exercise, the Belgian painter embarked on a radical reflection on drawing, positioning it not only as a visual art form or mimetic technique but also as a critical language with its own syntax, morphology, and semantics.

The image in question is a graphic-textual composition that takes the form of a rich intermedia document questioning the epistemological relationship between words and images. Presented in tabular form –three columns by six rows, arranged over two pages– and combining sketches and typographic or handwritten text, the series is reminiscent of both visual primers and comic strips. The illustrations are deliberately simple in style,

reinforcing the conceptual priority of meaning over artistic virtuosity. This choice is in line with Magritte's broader technique of visual disorientation, in which everyday objects are rendered ambiguous through juxtaposition or textual interventions. The absence of color further contributes to schematic clarity, inviting the viewer and reader to be analytical rather than aesthetic contemplation.

Les mots et les images is a philosophical treatise on semiotics articulated through the lens of visual culture. The image-text units systematically problematize the stability of the sign, presenting objects, names, and images in a state of mutual ambiguity. An example of this is the drawing of a leaf, which is labelled not as 'leaf' but as 'le canon': this association immediately destabilizes the viewer's expectations and cognitive associations.

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

Each matrix of the composition presents a different semiotic problem: the fungibility of names, the inadequacy of images to fully represent their referents, the ability of language to evoke invisible concepts, and the way social norms regulate the interpretation of visual and verbal signs. Some panels suggest that objects can exist without names or that words can function without anchoring themselves to referents.

The text sometimes takes on the voice of an impersonal narrator, making statements such as "*un objet ne fait jamais le même office que son nom ou que son image*" (an object never performs the same function as its meaning or image) (Magritte 1929, p. 33), referring to skepticism about the fixity of language.

Far from being a simple surrealist exercise, Magritte's work is a radical reflection on the epistemology of the sign. The illustrations, which consist of combinations of text and drawings that avoid direct correspondence, function as interrogative semiotic devices. The questions raised by the argument, which begins with what can be considered a visual essay, represent a foundational moment of what is now commonly referred to as visual culture.

Upon observing the proposed series, the first conceptual issue that emerges concerns the arbitrariness of the linguistic sign, as theorized by Ferdinand de Saussure [de Saussure 2020]. In Saussure's system, the link between signifier and signified is based not on natural necessity but on social convention. Magritte takes this view to extremes, pushing it to the point of paradox. In the cartoon in which the word '*canon*' is placed under the drawing of a leaf, the Belgian painter deactivates the denotative function of language, exposing its fundamentally unstable nature. The strength of the work does not lie in its surrealist provocation. However, in its theoretical power, it produces a perceptual and cognitive disconnect, making it clear that every relationship between word and image is culturally mediated and potentially subversive [Castelli 2017]. In this sense, the work takes the form of a field of semiotic tension, where the dissonance between 'textual' linguistic code and 'visual' linguistic code is not resolved but intentionally problematized.

Michel Foucault, in his essay *Ceci n'est pas une pipe* [Foucault 1988], interprets Magritte as a visual thinker engaged in the deconstruction of the relationship between text and image. According to Foucault, the Belgian artist

does not merely show the separation between language and visual representation but creates an epistemological structure in which both codes cancel each other out, revealing their mutual inconsistency. Drawing thus becomes a conceptual space, not subordinate to words but capable of generating meaning autonomously. Magritte, in fact, does not represent the object but questions it, deconstructs it, and problematizes it within a framework that is both visual and speculative.

From this perspective, Magritte's work is part of a genealogy that anticipates the demands of conceptual art. Like Joseph Kosuth in *One and Three Chairs* [Kosuth 1991], Magritte transforms the act of representation into an investigation of language itself, exposing the plurality of semiotic systems and their ideological dimension. He no longer creates images that represent the world; instead, he turns his images into reflections on the representation of the world, deconstructing the symbolic devices that govern what makes reality visible and intelligible [Mitchell 1994]. Magritte stages a crisis of the referent, revealing that every semiotic operation rests on a void—an absence that language alone attempts to fill.

Particularly relevant is the intersection between Magritte's work and some of Giorgio Agamben's reflections in his essay *Il linguaggio e la morte* (Language and Death) [Agamben 1982], where the philosopher investigates language as a place where an original negativity manifests itself. According to Agamben, human experience constructs language as a space in which the visible and the sayable intertwine through lack and separation. In this sense, readers can interpret Magritte's illustrations in *Les mots et les images* as speculative structures of thought. Rather than representing an external reality, they stage—through the short circuit between text and image—the constitutive distance between the sign and the referent. In this way, Magritte's works dismantle the equivalence between word, sign, and thing, revealing the unstable and constructed nature of the relationship between languages—whether textual or graphic—and the world they represent.

Manfredo Massironi [Massironi 2002] himself considers drawing to be an autonomous semiotic system capable of generating knowledge independently of linguistic mediation. Magritte fully anticipates this assumption: his images do not 'represent' the world but produce a critical shift from the standard view, inviting the viewer to question the codes through which meaning is articulated. The

use of words in place of images and vice versa, the association of objects with arbitrary names, and the composition of deliberately ambiguous scenes demonstrate how drawing can function as a metalanguage, questioning the very assumptions of visual representation.

The epistemic tension between word and image is further elaborated in the concept of 'iconotextuality', as formulated by William John Thomas Mitchell [Mitchell 1986]. In this context, *Les mots et les images* represent a pioneering and incredibly sophisticated example of that hybrid space in which the visual and the verbal do not complement or replace each other but co-produce a new meaning that is elusive and irreducible to either dimension.

Magritte's work is not only an aesthetic investigation but also an epistemological intervention on the very nature of representation. In *Les mots et les images*, the image becomes theoretical language, while language takes on an iconic value. This representation of reality gives rise to an epistemological questioning of the visual, and vision becomes a critical exercise. In this sense, Magritte anticipates many of the questions that still animate the debate on visual culture, regimes of meaning, and the politics of seeing.

In light of this reading, *Les mots et les images* emerges as both a founding moment in the reflection on visual culture and a conceptual laboratory that challenges the certainties of language and representation. Magritte's work, in its apparent graphic simplicity, acts as a veritable philosophical machine capable of triggering a short circuit between the 'referential' function of the text and the iconic function of the image. In this interruption of the conventional semiotic flow, a space opens up in which the visual is no longer subordinate to the text, and the text is no longer the guarantor of the image's identity.

In this sense, *Les mots et les images* takes on a maieutic function towards the observer: it does not instruct, but questions. The systematic misalignment between image and word acts as a device for semiotic dis-identification. In doing so, the work not only highlights the cultural construction of meanings but also their ontological instability. The word '*forêt*', paired with a representation

of the forest, or the term '*canon*' under a leaf, are clear examples of how Magritte dismantles the meaning of sign-object correspondences, revealing the arbitrariness of the linguistic code and, at the same time, the naivety of the eye that believes it is observing reality through its representation.

The work does not aim to eliminate meaning but to multiply it, to make it porous, fluid, and open to new multiplicities of meaning, inviting the viewer to become a critical reader of the devices of signification; in this sense, his work anticipates the practices of conceptual art and contemporary visual pedagogy, both of which deconstruct and remodel the representative symbolic codes inherent in graphic-textual languages.

This work undertakes an accurate deconstructive analysis of the conventions of visual literacy. By juxtaposing words and images in ways that undermine conventional correspondence, it lays bare the very mechanisms of representation. The viewer is invited not to consider what the images and words 'mean' but to engage in a metacognitive reflection on meaning.

If we look at René Magritte's entire artistic output, we can clearly see the complexity and dialectical tension between verbal language and visual representation. Far from being simple captions or comments, the words inserted into Magritte's paintings are a structural element, destabilizing any presumed autonomy of the image. While the painter claimed that images could exist independently of words, he deliberately inserted linguistic terms—often stripped of context—into his works. The ambiguity or even contradiction of these terms, as they relate to the object represented, reveals a profound philosophical intention: to undermine confidence in the immediate correspondences between sign and referent, between name and thing. This very friction generates the poetic effect of his paintings, compelling the viewer to question not only what they see but also what they believe they know [Roque 1989]. Magritte, therefore, does not merely play with artistic or linguistic conventions but makes them the subject of radical reflection, anticipating many of the ideas of post-structuralist thought and conceptual poetics of the late 20th century.

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DRAWING AS LANGUAGE

Theory

Furrows. Undermining the Limits of Our Language

Edoardo Dotto

Foreword

In the following note –without delving into the broader topic of drawing as language, or seeking to establish the connections between verbal and graphic forms of communication– I take the opportunity to organize some reflections that have emerged over recent decades. These reflections have shown a certain practical effectiveness in educational and didactic contexts, and are based on references that are not particularly recent, yet far from obsolete. They concern the possibility of consciously reversing the deep-rooted tendency of language –both graphic and verbal– to shape our imagination, transforming this limitation into an expansive potential [1].

Furthermore, the writing of these pages is guided by a personal commitment, made years ago, to seek a meaningful and objective interpretation of a seductive but rather cryptic image by Saul Steinberg, to which we will return, that seems to suggest a link between the practice of drawing and the conscious definition of the self.

To know (how) to see

Author of the highly successful *Anatomy of the Human Body* [Cheselden 1750], written at just twenty-five years old and continuously published in eleven

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

Fig. 1. Gerard Vandergucht, Portrait of William Cheselden, 1733 ca., graphite on paper. Vandergucht was the author who illustrated Cheselden's anatomical treatises: <https://en.wikipedia.org/wiki/William_Cheselden#/media/File:William_Cheselden_van_der_Gucht_circa_1733.jpg>.



editions from 1713 to 1778, British surgeon and anatomist William Cheselden (fig. 1), one of the most prominent physicians of the 18th century, succeeded in defining several innovative surgical procedures for the treatment of debilitating illnesses. Inventor of the first artificial pupil for treating certain ophthalmic malformations, Cheselden found a fruitful balance between research activity, clinical practice, and the detailed reporting of his experiences, which still stand out for the clarity of their descriptions and the sincere empathy he showed toward his patients.

At a time when clinical activity, lacking shared protocols, was often overrun by incompetent individuals, Cheselden's scientific and human legacy represents a rare example of lucid awareness. While the multifaceted John Taylor –the famous itinerant oculist– performed surgeries with charlatan methods and media hype, ultimately blinding two of history's greatest musicians, Handel and Bach [Zeraschi 1956; Zegers 2005], Cheselden's path shines in stark contrast.

In a 1727 article published in the *Philosophical Transactions* of the Royal Society, Cheselden reported on a surgical procedure performed on a young “gentleman that he was blind,” either born blind or having lost his sight so early that he retained no visual memory [Cheselden 1727]. The boy, thirteen or fourteen years old, suffered from thick cataracts that allowed him to distinguish day from night and perceive colors vaguely, but prevented him from recognizing even the most obvious shapes. After the opaque veil over his corneas was removed (fig. 2), and he gained (or regained) sight, he expressed a preference for simple shapes –smooth, regular geometric ones– which he soon learned to recognize. He focused on visually identifying faces and objects he had previously known through touch, now imbued with new meaning.

From a distance, however, he often confused dogs and cats and could only recognize them by touch, vowing to remember their visual form next time (“I shall know you another time”). He was sometimes disappointed when things or people he had imagined to be beautiful did not visually match his expectations. He struggled to recognize drawn forms of objects, except for geometric ones. Later, he had to train himself to understand the size of objects, especially large ones, like buildings, which even after a year he still could not judge by distance.

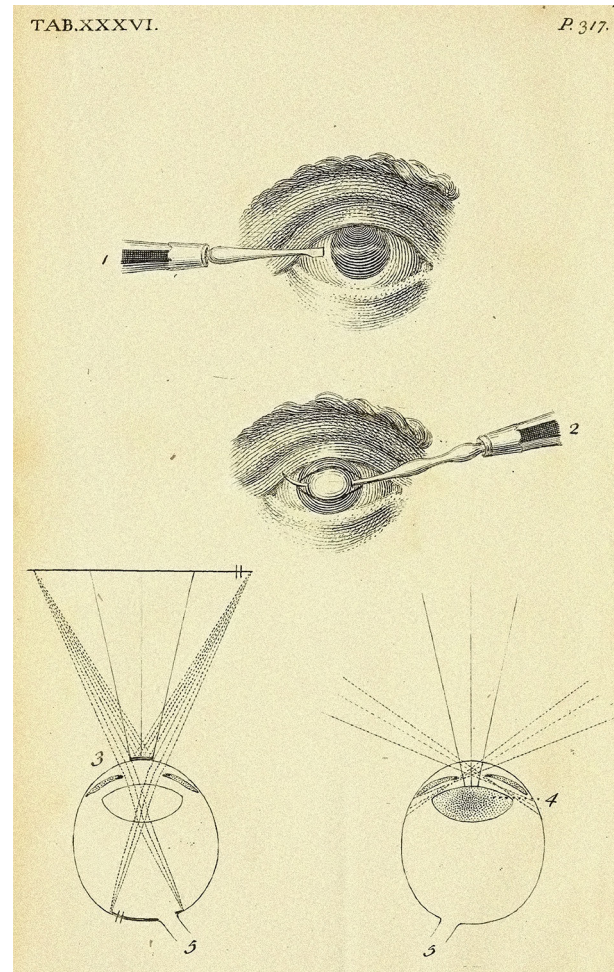
In much more recent times, Oliver Sacks described a remarkably similar case in the chapter *To See and Not See* from his *An Anthropologist on Mars* [Sacks 1995]. He recounted the story of Virgil, a fifty-year-old man who regained sight through surgery after having lost it at a very young age, retaining no visual memories. In the months following the procedure, Virgil's partner told doctors that he had to learn to see "like a newborn: everything is new, exciting, frightening, and he is unsure of what it means to see" [Sacks 1995, p. 129].

As medical knowledge has advanced, such cases have increased significantly, and techniques now exist to assist those who acquire sight later in life. Even centuries ago, similar conditions inspired reflections not only by scientists but also philosophers. In his *Essay Concerning Human Understanding* (1694) [Locke 1975], John Locke speculated that a man who gained sight as an adult would not be able to distinguish a cube from a sphere without the help of tactile experience [2]. George Berkeley, in his *Essay Toward a New Theory of Vision*, asserted that there is no necessary –structural, so to speak– connection between tactile and visual worlds, and that any correlation arises solely through personal experience [Berkeley 1920, pp. 46, 47].

Such adaptation, when sight is gained in adulthood, can be so challenging that some patients are overwhelmed and reject the intrusive nature of visual sensation. In these paradoxical reactions, one might hear echoes of H.G. Wells' *The Country of the Blind*, where a sighted traveler stumbles upon a community of blind people and assumes, as the proverb suggests, he will be their uncontested king –only to discover that sight, utterly unnecessary to them, is viewed as a burden and a barrier to social life, ultimately leaving him alienated [Wells 1973].

The accounts of Cheselden and Sacks –and the emotional parallels between the stories of the young gentleman and Virgil– lead us to reflect on how deeply vision is tied to cognitive mechanisms through which we recognize, name, and imagine the world. For those who gain sight later in life, at least in the beginning, the world appears as an incomprehensible cascade of colors and shapes devoid of recognizable meaning, a state that oscillates between the joy of new perception and the despair of disorientation.

Fig. 2. Gerard Vandergucht, *Cataract surgery and effects on vision*, 1713, etching. From *Anatomy of the Human Body* [Cheselden 1750, plate XXXVI].



These experiences resonate with ideas articulated in the writings of American linguist Benjamin Lee Whorf, a close collaborator of Edward Sapir active from the 1920s to the late 1940s. A scholar of Native American languages [Whorf 1977], especially Hopi, Whorf developed Sapir's idea that one's cognitive model of reality is shaped by the languages one speaks. Sapir suggested a relationship between the deep structures of a group's language and their worldview [3].

Though he divided his time between linguistic studies and his job as an insurance executive, Whorf worked to demonstrate this relationship by analyzing analogies between grammatical and syntactic structures and the speakers' perception of reality. The 'Sapir-Whorf hypothesis', as it became known, has drawn (and continues to draw) interest among experts [Sica 2022], despite the dominance of more universalist models like those of Noam Chomsky, who argued for an innate, largely uniform human capacity for language.

Nevertheless, despite skepticism and Whorf's untimely death, his ideas remain fertile and thought-provoking. As Whorf wrote, after linguists critically examined many languages, "It was found that the background linguistic system (in other words, grammar) of each language is not merely a reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of mental objects with which he is concerned" [Whorf 1977, p. 169]. Thus, language is not merely a technique for expression but a tool of thought that profoundly shapes each individual's approach to reality.

Whorf continued: "We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena do not present themselves to us as such because they are obvious [...] the world is presented as a kaleidoscopic flux of impressions which has to be organized by our minds –and this means largely by the linguistic systems in our minds" [Whorf 1977, p. 169].

Whorf's phrase –"a kaleidoscopic flux of impressions"– vividly evokes how the world must have appeared to the young gentleman or to Virgil, immersed in a newly discovered visual realm,

constantly bombarded by moving shapes and colors with no recognizable meaning, silent despite their clarity, and inaccessible in their abstraction. The visible world appeared as a "kaleidoscopic flow of images," one could say, that they could not organize, whose boundaries they could not perceive, and –most importantly– could not name, making it impossible to associate them with a linguistic identity that would allow interaction and cognitive control through language.

In an ironic *Dialogue on Method*, in which Paul Feyerabend interviews himself, the philosopher recounts a telling anecdote: "Some years ago I was walking toward a wall when I saw a disreputable-looking man approaching me. 'Who is that bum?' I asked myself, then I realized the wall was a mirror and I was looking at myself. Immediately the bum turned into an intelligent and handsome fellow" [Feyerabend 1993, pp. 113, 114].

We are able to see what we recognize. We judge what we recognize based on what we know, and this mechanism is supported by the linguistic structure of our thought and our knowledge, which allow us to narrate –or draw– in a specific way that is a direct expression of our cognitive capacity.

Words and images

It is probably unnecessary to argue in favor of the idea that there is a direct structural relationship between verbal language and drawing, especially today, when this can be indirectly demonstrated by the fact that –evident to all– generative algorithms capable of simulating linguistic interaction with a human subject, such as *DeepSeek* or *ChatGPT*, also produce plausible images, and that the training mechanisms of these systems are essentially identical and based on both images and written texts.

The relationship between language and the visual domain –which clearly extends in directions not explored here– seems to find, in the continuity between the organization of stimuli taken from reality, the immediate understanding of the world, and the elaboration of knowledge, a deep bond such that –whether we refer to words or to forms– without the ability to identify relationships among different

elements, reality ends up appearing incomprehensible, and at times even terrifying. Drawing –as a means of interpreting the visible, producing images, and serving as a vehicle for design thinking, capable of ferrying the vaguest ideas of form into the concreteness of tangible realizations– occupies a broad and articulated space that spans the countless directions in which visual expression manifests itself with innumerable facets.

If we consider certain categories of forms –those directly tied to drawing and architecture, and widely historicized– it becomes evident that a relationship exists between linguistic-narrative configurations and those that fall under the domain of visuality. Erwin Panofsky, in *Gothic Architecture and Scholasticism* [Panofsky 1990], demonstrated a direct analogy between the mature expressions of medieval architecture and the structure of tripartition, likely related to the Trinitarian ‘form’ of the Christian deity. Following this analogy, Panofsky identifies precise correspondences between the tectonic and spatial organization that permeates great cathedrals –for example, the vertical division into base, shaft, and capital – and the structure of certain Thomistic texts, or even Dante’s *Divine Comedy*. His analysis extends to a detailed exegesis of a drawing from the notebook of Villard de Honnecourt, in which the dialectical structures of Scholasticism find such a coherent expression in the planimetric organization of the church –designed by him “*inter se disputando*” together with Pierre de Corbie– that Panofsky concludes that “here Scholastic dialectics has led architectural thought to such an extreme that it almost ceases to be architectural” [Panofsky 1990, pp. 48, 49].

Similarly, when we speak of the “language of the architectural orders”, we are doing far more than drawing an analogy between verbal organization and that of forms, especially when considering the connotation that the teaching of the orders had acquired by the mid-nineteenth century. In those years, the many manuals on drawing the orders –published especially in Italy and England, where the echo of Palladianism had not yet fully faded– proposed an idea of classical form organization that was strongly hierarchical and seems to reflect the intuitions of Ferdinand de Saussure, which would soon lead to

the definition of linguistic structuralism. The forms of the five orders of architecture were structured on multiple levels, from that of individual moldings (such as the torus or scotia), whose combination determined simple profiles (like the astragal, for example), which in turn composed recognizable elements (such as a capital or a cornice), whose assemblage generated the entire architectural order. This order was structured through at least two hierarchies of successive tripartitions [Dotto 2011]. Likewise, in language, individual letters are composed into words, which constitute the parts of elementary sentences, which make up the periods, whose sequence unfolds the verbal narrative.

Domains (and domination)

If we can assume a close analogy between language and drawing, then it is probably necessary to turn our attention to an aspect of verbal language –a kind of “side effect” of its use– that has been widely recognized and ultimately implicates both the graphic field and the imagination of forms.

George Orwell, in the invaluable (and unsettling) appendix to his most famous novel, 1984, addresses the principles of ‘Newspeak’ [Orwell 1984, pp. 329-342]. As we may recall, in *Ingsoc*, the dystopian regime in which the story is set, a new language is artificially constructed, based on English, from which a series of terms is purged in order to make the corresponding concepts inaccessible –and therefore to exclude them from the possibilities of human thought– as they were considered dangerous to the maintenance of social order. Words like ‘revolution’ or ‘freedom’, while still technically present in the vocabulary, would have lost any ideological connotation, so that ‘revolution’ would only mean a rotational movement, and ‘to be free’ would simply mean ‘to be free from something’ (e.g., a dog free from fleas), but would no longer carry any reference to ‘political freedom’ or ‘intellectual freedom’, since those concepts no longer existed –not even conceptually– and thus necessarily lacked a word to express them [Orwell 1984, pp. 331–332]. Furthermore, “Newspeak had been invented to meet the ideological needs of Ingsoc” [Orwell 1984, p. 331],

and its primary purpose was “to make all other modes of thought impossible.” Orwell meticulously describes a series of strategies for turning language into a tool of control, showing how language itself, with its history and semantic density, actively enabled the individual to develop autonomous thinking. But in *Ingsoc*, “a person growing up with Newspeak as their only language would never know that equal had once had the secondary meaning of ‘politically equal’, and that free had meant ‘intellectually free’ [...] Many crimes and errors would be beyond the possibility of being committed, simply because they lacked a name and thus could not be conceived” [Orwell 1984, p. 331].

Already Cicero, in *De Oratore*, observed that the Greeks, not having the word *ineptus* in their language –because they did not acknowledge the seriousness of the vice of being, strictly speaking, inept (“*itaque quod vim huius mali Graeci non vident*”)– would not have been able to recognize it in others [4].

As is well known, Orwell’s text dates from 1948, and by that time Roman Jakobson had already explained –as Roland Barthes reminds us– that “a language is defined not so much by what it allows you to say, but by what it obliges you to say” [Barthes 1981, pp. 7-8]. And Barthes adds, “to speak [...] is not, as is so often repeated, to communicate: it is to submit: all of language is a generalized predetermination”; “it is simply fascist; fascism, in fact, is not preventing speech, but forcing speech” [Barthes 1981, pp. 8, 9]. Since every language constitutes a closed system “with no outside,” which one can exit only “through mystical singularity” –thus through the abandonment of language– the only way to move freely within it is to “cheat language, swindle language”. This cheating, Barthes continues, “I call: literature”.

Language, therefore, not only guides the formation of our thoughts, but even imposes the very way in which they are structured, deceiving us into believing that we move freely when in fact we are trapped in a directed current of references, concepts, thoughts (and even insights) that are only conceivable within the linguistic system assumed by our minds.

Even if we were to adopt a moderate, less absolute version of this condition, we probably could not go beyond what Borges pointed out in a late-1970s interview with Alberto Arbasino. When Arbasino

courteously invited the Argentine master to choose the language in which to hold their conversation, Borges replied that he could not choose, as he did not know the topics to be discussed. Each language, being linked to the mental attitudes of the peoples who created it, would prove suitable to reflect and communicate on a specific range of subjects [5].

Around the 1930s, Alfred Korzybski conducted some experimental research into this relationship, which led him to define the discipline –variously credited but mostly considered a “pseudoscience”– that he called *General Semantics*. Its basic premise is that human beings are limited in their knowledge not only by the structure of their nervous systems, but above all by the innermost structure of the languages they use. We cannot experience the world directly, but only through abstractions based on language and the impressions created within our nervous systems [6]. Korzybski –who developed effective linguistic protocols to treat the post-traumatic disorders of many Vietnam War veterans– understood the crucial importance of awareness of these mechanisms, whose conscious use could allow for a broader and more effective relationship with the sensible world. His ideas influenced many scholars, including anthropologist Gregory Bateson and the founders of Neuro-Linguistic Programming, John Grinder and Richard Bandler, who built several successful operational techniques based on these concepts [7].

According to Feyerabend, “the best protective device against the influence of a particular language is the practice of bilingualism or trilingualism” [Feyerabend 1993, p. 49], that is, the ability to adopt a critical attitude toward the thought structures each language imposes upon us. In this way, by observing each structure of thought from the “outside” of another language, one could attain greater openness, capable of allowing a broader understanding and perception, free from unconscious conditioning.

Over thirty years ago, during the writing of my thesis –where I used a design experience to explore certain hypotheses on how architectural drawing influences the imaginative realm– I tried to adopt, one at a time for several weeks, the handwriting and drawing style of some famous architects, attempting to imitate their graphic style as if I were a forger (figs. 3, 4). I realized that each specific drawing method

oriented my design process in a particular direction, making some solutions easy to imagine and others difficult to reach. The graphic language used –the specific idiom of each architect– seemed to contain solutions not only of a formal kind but especially of a structural nature, exactly as noted in those same years by Vittorio Ugo, who wrote that “the symbolic value of language –and of any language– resides more in its syntax, in its grammar and their rules, than in the words and their individual denotative or descriptive function” [Ugo 1994, p. 147]. Certainly, the results of such a ‘handcrafted’ and limited experiment cannot be taken as a sufficient sample, nor is it possible to imagine an assessment of such experiments, even if conducted more systematically, that would not be at least partially influenced by prior expectations. In any case, I was able to draw reflections similar to those expressed in clear and elegant words by Margherita De Simone, who at the end of the 1980s wrote: “representation is never neutral. The systems favored in the development of the design act as mediators of offerings, intervening themselves within the offer” [De Simone 1990, p. 194]. During a 1985 *Seminario di Primavera* (Spring Seminar), De Simone also recalled: “there is [...] a lovely expression by Tristan Tzara: ‘Thought is formed in the mouth,’ which means that, all in all, the tool is never independent of the way in which the implementation of a project is conceived, but ends up directly influencing it” [De Simone 1988, p. 23], so that drawing is identified as the “genetic core” [De Simone 1988, p. 231] of architectural thought, constituting “the language of the project” [8]. Language –whether graphic or textual– ultimately influences our verbal thought or imaginative capacity through similar mechanisms in both domains. In any case, it now becomes evident how this influence can have at least two distinct connotations. Vittorio Ugo, providing us with a perfect synthesis, writes that “every system brings together different elements into a unified whole and creates more or less flexible and intense connections and bonds within the fragmented field of empirical reality, attempting to collect it into a unity. In this, it is certainly ‘symbolic’, at least in the etymological sense of the term (from ‘sún-bállein’, to bind, to connect together). However, alongside this conciliatory function –and

still playing on the etymology– one can legitimately identify [...] an opposite and equally powerful ‘diabolical’ dimension. To the extent that the system seeks total comprehensibility and aims for complete exhaustiveness, it simultaneously tends to close in on itself, establishing an unbridgeable distance between its self-sufficiency and the actual course of the world. And it is precisely from the fact that the system comes into contact with the world only in a symbolic manner that its literally diabolical scope, its irreparable and definitive split, paradoxically derives” [Ugo 1994, pp. 147, 148].

Just as –and to the same extent that– language brings us closer to the reading of reality and the imagination of what is possible, it also excludes us from all other possibilities of understanding and invention.

Resignation, re-signification

There is no doubt, however, that the call for awareness of mechanisms of this kind –on which Korzybski focused his studies– can also be extremely useful in the field of drawing and the reading of forms and images. Being conscious of the limits and the power of our verbal and graphic language can give us significant advantages. If we understand that, likewise, the language we use and the way we draw have a direct effect on our thinking processes, influencing our visual imagination and the development of our ideas, then we can consciously guide, direct, and structure our education, fully aware that our way of seeing is formed during the phases of learning, gathering knowledge, and building our graphic and verbal language.

Many historical and exegetical studies on the work of modern architects –and also those from earlier centuries– show in a precise and convincing way the direct lineage between the forms and images they experienced during study trips, passionate investigations, and detailed analyses of places, authors, and architectures, and what those same architects –sometimes even decades later– conceived during their design careers. Fabrizio Foti, who insightfully investigated the origins of certain formal and conceptual patterns in Le Corbusier’s architecture, revealing their roots in what the Master had learned

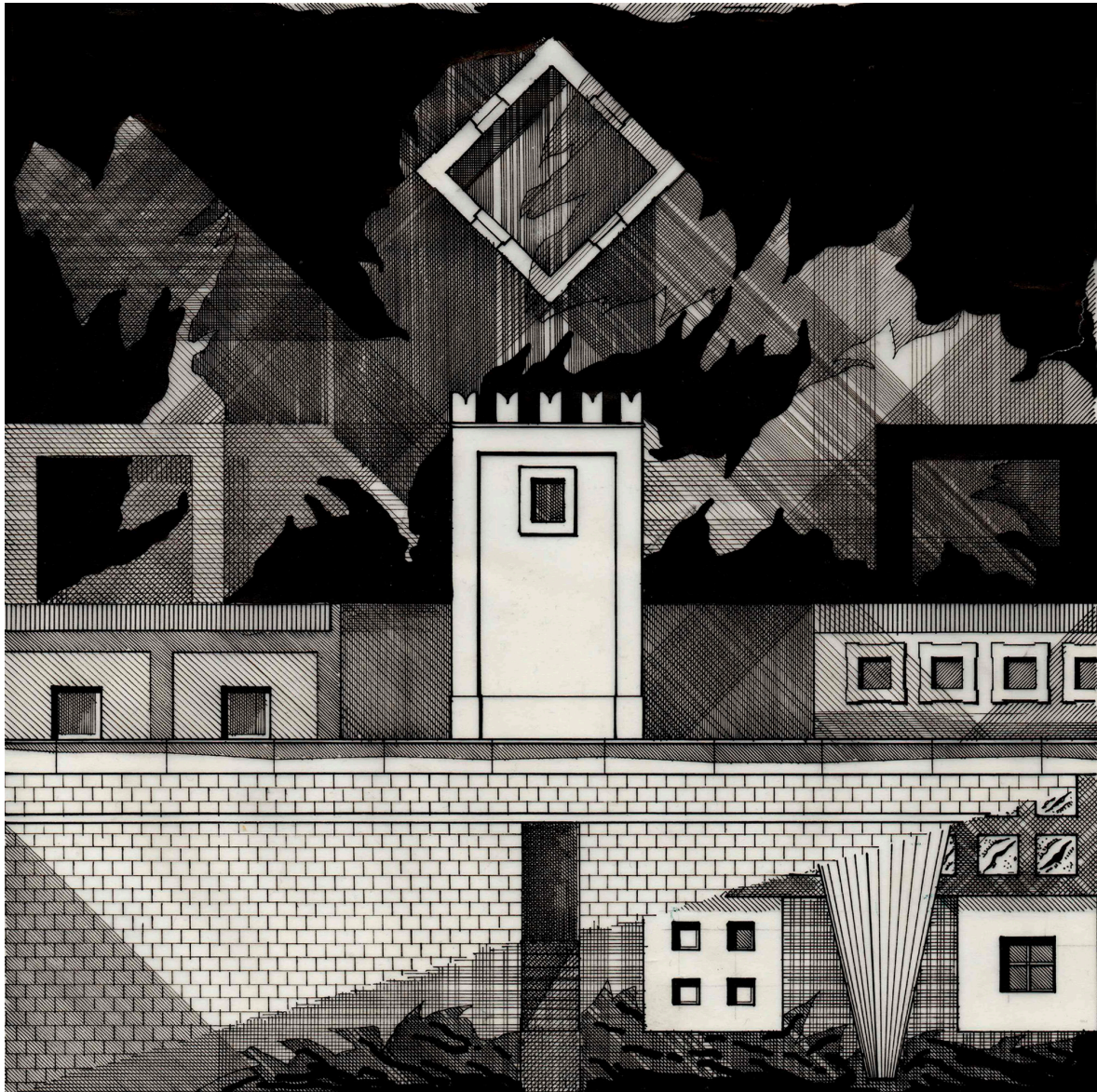


Fig. 3. Study drawing for the development of a graduation thesis, drafted by imitating the graphic language of Franco Purini. India ink on vegetal tracing paper (drawing by the author, 1993).

in his youth [Foti 2008], repeatedly describes this virtuous process as “a research direction aimed at forming a mnemonic repertoire and a poetic potential of a more general nature, a visual culture” [Foti 2016, p. 10], within which it invariably becomes evident that “drawing is [...] an action that supports observation and imagination: through drawing [...] we fix and specify in our minds information that fuels our mnemonic and intellectual capacity” [Foti 2016, p. 41].

The environment in which each of us grows intellectually contributes to the construction of both our visual and verbal language. Our curiosities, and the paths available in this environment that we choose to take (or paradoxically, avoid), complete and define the construction of our intellectual identity. Its linguistic connotation, on one hand, allows us to quickly access a wide range of possibilities, while on the other hand, it confines our capacity to imagine within the same tracks those convenient ‘rails’ had previously outlined.

To reduce the intrinsic limitations this entails, we must exploit the effectiveness of this very mechanism by consciously feeding it. In other words, we have the possibility to perform a semantic shift similar to the one (referring to much more urgent and delicate matters than the one addressed here) that Franco Berardi proposes when he considers ‘resignation’ as the first step of a ‘re-signification’, that is, the adoption of exegetical and operational tools capable of transforming an apparent limitation into a further opening of perspective [Berardi 2023, p. 168].

If we deeply understand the mechanisms discussed here –and which, upon reflection, we cannot help but have experienced –and accept them as a starting condition, we can prevent the independence of our thought from being at risk. Each of us can exercise a profound freedom in establishing the boundaries of our own will, defining –through study, travel, encounters, reflection, and reading– our linguistic domain, the space in which the mechanisms of language will allow us to operate. We are not free to act neutrally with respect to our language –whether graphic or verbal– but we can organize it, expand it, implement it, consciously constructing and defining our cognitive possibilities.

Fig. 4. Study drawing for the development of a graduation thesis, drafted by imitating the graphic language of Umberto Riva. Graphite on “cipollina” paper and talcum powder (drawing by the author, 1993).

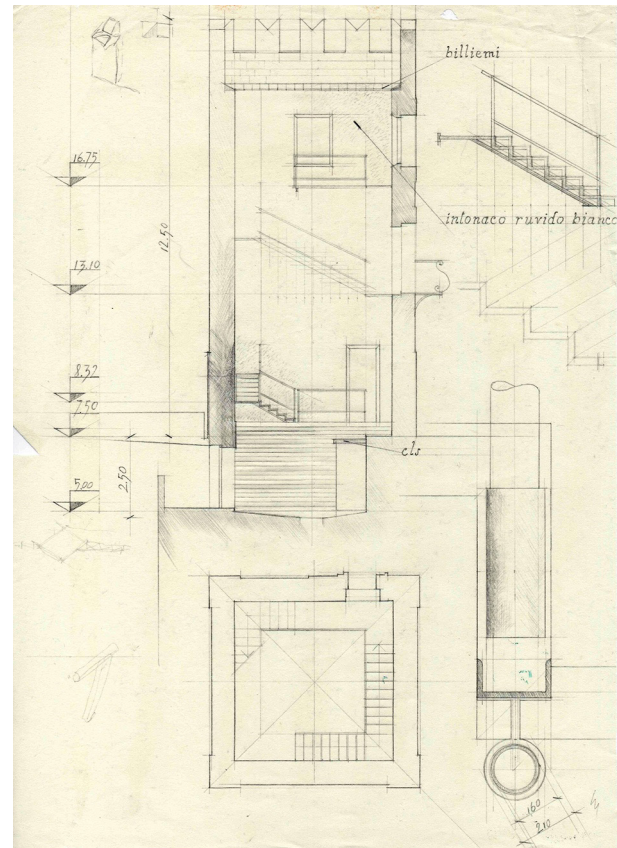


Fig. 5. Saul Steinberg, drawing from *The Art of Living* [Steinberg 1949].

Thus, even at the risk of engaging in a kind of “intellectual bricolage,” we can “give ourselves a form” –literally, ‘form ourselves’– just like those stylized characters drawn by Saul Steinberg (fig. 5), who, using the pen they hold in their hands, trace the contours of their own figure, continuously oscillating between the condition of subject and that of object. In the same way, by practicing this approach to education, we can shift from actively expressing our will to passively enjoying its outcomes –from laboriously carving the bed of our actions to flowing within it, comfortably.

Perhaps in this dual, oxymoronic condition –if lived with awareness– lies, for each of us, the possibility of charting a path for our future, or at the very least, etching the grooves that might guide its direction. We build our uniqueness through study, curiosity, and desire; this is the most powerful weapon to free ourselves from the homogenizing influence of language and to reverse it, transforming it into a path for shaping our freedom.



Notes

[1] The theme of the relationship between drawing and design thinking was originally and stimulatingly addressed by Giancarlo Carnevale [Carnevale 1988; 1991], who made it one of the central topics of his brilliant (and unforgettable) lectures in Architectural Composition. A concise personal summary for didactic purposes can be found in Dotto 2008.

[2] The topic was introduced by Locke only in the second edition of his work, published in 1694, following an epistolary exchange with the Irish scientist William Molyneux, who had raised the issue –since then known as the ‘Molyneux Problem’– to various intellectuals of the time. For a documented summary of the matter, see the essay by Alessandra Jacomuzzi at <<https://journals.openedition.org/estetica/2034>>.

[3] A short text by Sapir clarifying the terms of his hypothesis is quoted by Whorf in the epigraph to the essay *The Relation of Habitual Thought and Behavior to Language* [Whorf 1977, p. 99].

[4] The text by Cicero is cited in the work of Maria Pia Sica [Sica 2022, p. 11]. The verification of the quotation was carried out using a version of *De Oratore*, Book 2, Part IV, verse 18, available online: <<https://www.thelatinlibrary.com/cicero/oratore2.shtml>>.

[5] In *La spirale ostinata* (The stubborn spiral) Giancarlo Carnevale gives a detailed account of the interview Jorge Luis Borges gave to the young Alberto Arbasino [Carnevale 1988, note 19, p. 19]. A video of

another conversation between the two writers, held in 1977, is available online: <<https://www.youtube.com/watch?v=Y5vKy7LZpnc>>.

[6] The work of the Polish-born American anthropologist Alfred Korzybski (1879-1950) had a wide influence on 20th-century psychology and psychotherapeutic practice. His most famous phrase, “The map is not the territory”, often mistakenly attributed to other authors, summarizes part of his thought. For an introduction to his work and the outcomes of his research, a careful consultation of the website <<https://www.generalsemantics.org>> is recommended, which hosts texts, videos, and images that do justice to his brilliant insights.

[7] The part of Neuro-Linguistic Programming most closely tied to Korzybski’s insights involves the so-called *Metamodel*, developed in the 1970s by John Grinder and Richard Bandler. It proposes operational techniques for altering the perception of personal experiences by modifying the structure of the verbal narrative each person uses to represent himself. For an idea of Korzybski’s influence on the work of British anthropologist Gregory Bateson (1904-1980), see for example the essay *A Theory of Play and Fantasy* in *Steps to an Ecology of Mind* [Bateson 2018, pp. 218-235].

[8] The expression by Margherita De Simone is included in the transcript of a roundtable discussion held during the second *Seminario di Primavera* (Spring Seminar) in Palermo on May 25, 1985, and published in the conference proceedings [De Simone 1988, p. 177].

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The Songe, the Kanagawa's *Great Wave* and ISOTYPE. Notes on Drawing as a Natural, Cultural and Universal Language

Alessandro Luigini

Abstract

The contribution proposes a theoretical framework for the analysis of drawing, rooted within the studies of psychology and enriched by significant experiences of visual communication, both contemporary and historical. This approach is justified by considering architectural drawing as a specific declination of drawing understood as a broad language, thus allowing many fundamental observations on the nature, functions and processes of drawing already explored in general contexts to be transferred to the field of architecture. Relevant examples will be shown that illustrate the three main dimensions of drawing as a natural, cultural and universal language, with particular attention to some studies from the 1960s and 1970s that, although partly outdated, are still fundamental in the study of images and drawings.

The overall theoretical framework will then be declined in the specific context of architectural drawing, highlighting how it incorporates and utilises the three linguistic dimensions outlined above in an integrated manner.

The contribution will conclude with an articulated definition of the distinctive features of drawing understood as a natural, cultural and universal language, laying the foundations for future theoretical and practical reflections on drawing understood as a language.

Keywords: natural language, cultural language, universal language, learning, communication.

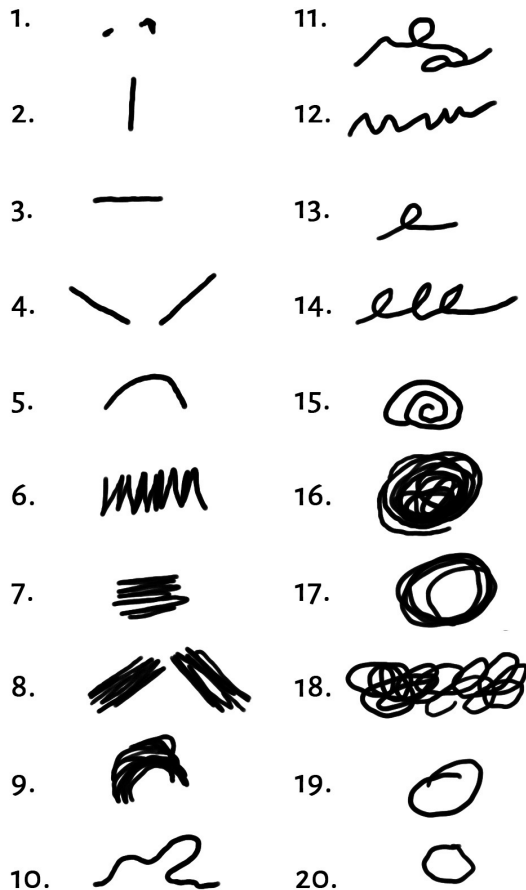
Prologue

Gilbert Durand introduces his *The Anthropological Structures of the Imaginary* with a genealogy of the persistent ontological devaluation of the image and the psychological devaluation of imagination –defined as a “mistress of error and falsehood”– within Western philosophical tradition, and particularly within the French context [Durand 1972, p. 13]. It was only in the early 1970s, as noted by Lucia Pizzo Russo [Pizzo Russo 1997, p. 9], that the image regained scholarly legitimacy in psychological studies, thanks to Allan Paivio and his *Dual Coding Theory* (1971). It should also be acknowledged that this period saw the publication of other seminal studies, among which we may cite *Visual Thinking* (1969) by Rudolf Arnheim and *Analyzing Children's Art* (1969) by Rhoda Kellogg. These works demonstrate that

the renewed interest of psychologists in the image reflects a convergence of perspectives among scholars operating in partially distinct fields – cognitivism, psychology of art, and early childhood education.

After several decades of renewed scholarly attention, however, other research domains have emerged, drawing the focus of the scientific community elsewhere. Nevertheless, the studies from the second half of the twentieth century, although in part superseded, remain a substantial and validated point of reference for contemporary research on drawing. This theoretical framework provides the fertile ground upon which further investigations into the fundamental features of drawing –as an act of imagination and as an act of imaging through graphic-visual language– may take root.

Fig. 1. The twenty basic graphemes identified by Rhoda Kellogg: 1. Dot; 2. Single vertical line; 3. Single horizontal line; 4. Single diagonal line; 5. Single curved line; 6. Multiple vertical line; 7. Multiple horizontal line; 8. Multiple diagonal line; 9. Multiple curved line; 10. Open wandering line; 11. Twisted wandering line; 12. Wavy or zigzag line; 13. Single loop line; 14. Multiple loop line; 15. Spiral line; 16. Circle with multiple overlapping lines; 17. Circumference with multiple lines; 18. Unfolding circular line; 19. Single crossed circle; 20. Irregular circle (Kellogg 1969, p. 18, Tab. 2). Author's drawings.



Finally, it is important to clarify that the reference to theories on children's drawing in the present discussion is underpinned by the conception of architectural drawing as a specialised and developed form of a basic graphic-visual language. While endowed with its own functional and disciplinary specificities, architectural drawing shares the same cognitive and perceptual dynamics that underpin the development of graphic competence from early childhood.

Drawing is a natural language

The pioneering contribution of Rhoda Kellogg (1898-1987) is primarily documented in *Analyzing Children's Art* (1969), the result of a systematic analysis of over one million children's drawings (ages 2-8). Kellogg identifies an evolutionary sequence in children's graphic marks: initially, they experiment with twenty basic graphemes, producing what are commonly referred to as scribbles (fig. 1). These should not be understood pejoratively—as in an evolutionist approach that prioritises the end product over the creative process—but rather as primary expressions of individual graphic activity. In this phase, the child explores the proximal space through visuomotor gestures, “knowing” and “measuring” objects while experiencing the intrinsic pleasure of leaving stable traces within their environment. Subsequently, these graphemes are combined into six diagrams, which are then paired and further aggregated into more complex structures [Kellogg 1969, pp. 17–80] (fig. 2). This developmental process, which typically takes place during the preschool years, leads to the production of figurative images, resulting from an increasing degree of sensorimotor control and expressive intentionality. These evolutionary dynamic forms a central element in support of our thesis.

Alongside Kellogg's work—which may be broadly characterised as adopting an aesthetic perspective—three further interpretative approaches to children's drawing can be identified [1]: Georges-Henry Luquet [Luquet 1969] investigates the relationship between drawing and reality from an evolutionary standpoint; Viktor Lowenfeld [Lowenfeld, Brittain 1967] analyses the development of graphic schemata from an artistic perspective; and Robbie Case [Case, Okamoto 1997] focuses on the spatial organisation of compositional elements. Each of these contributions enriches a complex understanding of drawing as a language in formation.

Among the more recent studies, the work of John Willats [Willats 2005] stands out for its formal analysis of graphic structures in children's drawings, privileging the description of graphic systems over inference about the underlying mental processes. While reaffirming the well-established idea that children tend to represent the world in a realistic and effective manner, Willats focuses on the projective models intuitively developed within their images.

His theory is articulated into two main categories: 1. *drawing systems*, which translate three-dimensional spatial relationships in the real world into two-dimensional relationships in the graphic representation; and 2. *denotation systems*, which concern what the lines in a drawing actually represent in the real world. Willats identifies a developmental progression of these systems, reflecting increasing complexity in the depiction of depth, which includes:

- Topology: a representational form in which spatial relationships between objects are inconsistent or indeterminate, lacking any hierarchical organisation of depth.

- Orthographic projection: a graphic mode that suppresses depth relationships, particularly the distinction between front and back, favouring instead the planar alignment of objects.

- Horizontal and vertical oblique projections: techniques that produce simplified two-dimensional views by flattening spatial relationships and diminishing the perception of three-dimensionality.

- Oblique projection: a system that introduces depth through the systematic use of inclined lines, while maintaining a conventional geometric structure.

- Perspective: a visual construction based on lines converging towards one or more vanishing points, used to simulate a spatial perception that is realistic and consistent with visual experience.

- Denotation systems describe what the lines in a drawing represent in the real world, and evolve from closed lines that indicate global volumes (e.g., head or body), to lines that represent distinct surfaces, and eventually to the use of compositional strategies –such as *threading* (connections between elements) or *line junctions* (linear joins in “L”, “Y”, or “T” formations)– which make edges and contours visible in a manner consistent with a perspectival viewpoint.

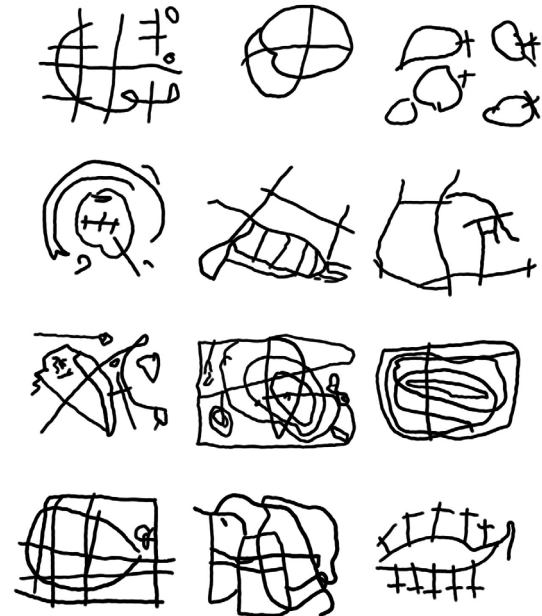
These theoretical models, summarised here in their main orientations, provide analytical tools for understanding the complex development of children's mark-making, which is characterised by spatial, schematic, artistic, linguistic,

and projective codes, as well as by the autonomy of early phases from formal instruction.

Finally, it becomes evident that the developmental trajectories observed by Kellogg, Luquet, Lowenfeld, Case, and Willats reflect the ontogenesis of graphic language which – ranging from prehistoric times and rock carvings to the contemporary era– appears to replicate, on an individual level, the historical phylogenesis of the species. This notion was already noted by Freud and Haeckel, who stated that “each individual in his childhood in some way repeats in abbreviated form the entire development of the human species, [...] the phylogenetic one” [Freud 2010, p. 186] (fig. 4).

Although the recapitulation theory has been discarded in biology, it remains a useful heuristic model for interpreting individual developmental processes within psychological and pedagogical frameworks. Kellogg devotes a specific chapter to the relationship between the development of

Fig. 2. Examples of aggregates generated by irregular shapes and Greek or diagonal crosses drawn by 3 or 4 year old children [from Kellogg 1969, p. 71, tab. 12]. Graphic elaboration by the author



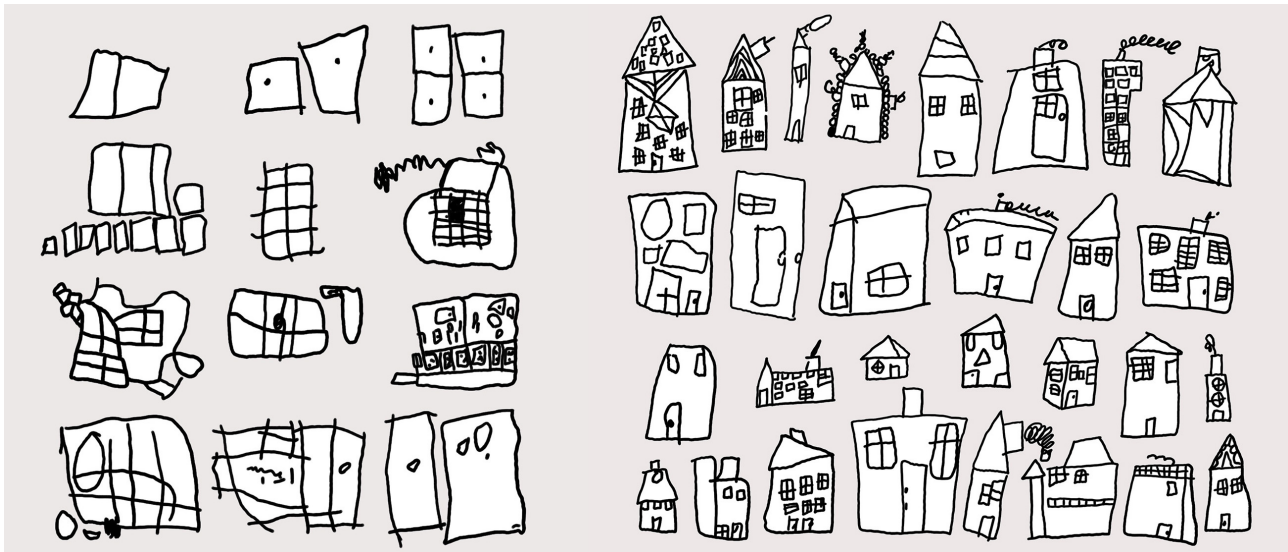
children's mark-making and prehistoric graphic language, lamenting the fact that, at the time of her writing, many scholars had interpreted certain signs found in rock engravings through conceptually inadequate frameworks, such as symbolism or perspectival thinking. A particularly emblematic case is that of Giedion, who describes as "perspective torque" prehistoric depictions of animals with frontal horns and bodies in profile, whereas "this type of representation is commonly found in children's drawings without being linked to a perspectival conception of object and space representation" [Kellogg 1967, p. 256]. Kellogg further emphasises that assigning a necessarily symbolic or linguistic value to certain marks excludes the possibility that they may have been created purely for aesthetic reasons [Kellogg 1967, pp. 265 ff.].

The comparison between the graphic development of children and the historical evolution of visual language, while contested in certain contexts, allows for the integration of insights from diverse disciplines, offering an interpretative framework through which to recognise, in the early stages of individual drawing, some of the key transitions in the history of graphic language evolution.

In parallel, between the late 1960s and early 1970s, other studies developed systems of graphic analysis and classification that may be associated with that proposed by Kellogg. Notably, Jacques Bertin [Bertin 1967], in *Sémiologie graphique*, introduced a taxonomy of fundamental graphic variables and defined aggregations capable of articulating a complete system of signification, intended for the representation and communication of data, relationships, and spatial phenomena. As shown in Figure 5, his theoretical framework exhibits structural affinities with Kellogg's approach, particularly in the identification of recurrent graphic elements and the ways in which they are combined.

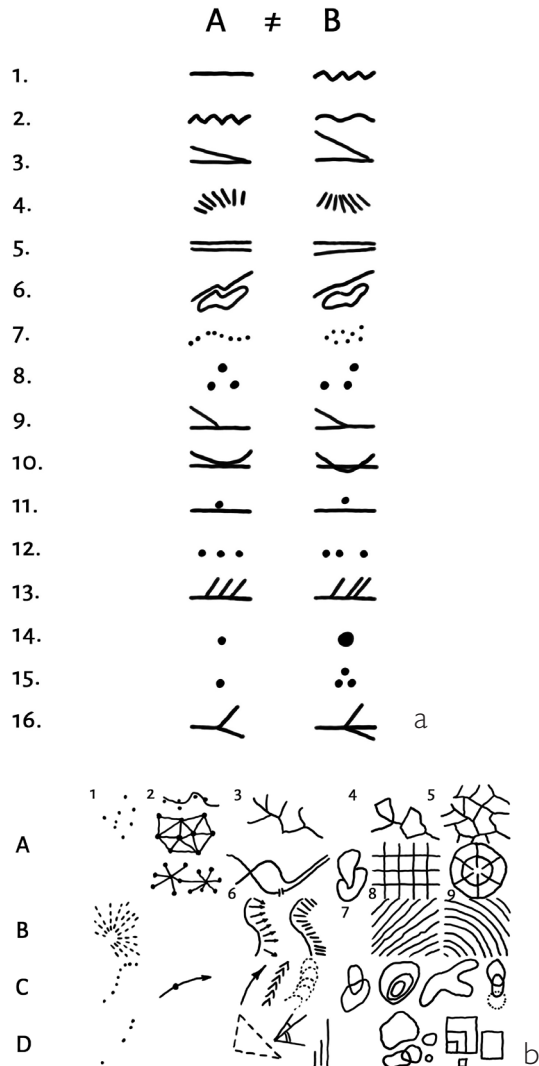
In the specific context of architectural drawing, the analysis of the reasons why we draw –derived from studies on the evolution of children's mark-making– proves particularly relevant. While it may appear self-evident that drawing is the privileged language for elaboration and communication in architecture, design, and the visual disciplines [de Rubertis 1994; Di Napoli 2020], it is nonetheless useful to investigate how the four fundamental functions of children's drawing –to communicate, to represent, to express, and to

Fig. 3. Representative case of associations and aggregates that are precursors of typical buildings in the art of 3- or 4-year-old children (left) and 5-year-old children (right) [from Kellogg 1969, p. 150, tab. 17 and p. 152, fig. 205]. Graphic elaboration by the author.



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Fig. 5. a) Main planar relations; b) Main planar figures and their standard graphical meanings [from Bertin 1967, pp. 303 and 421]. Graphic elaboration by the author.



silhouettes: in nature, in fact, the mark left by an element –animal, vegetable or mineral– often takes the form of its silhouette. For example, the trace left by an animal walking on bare earth reproduces the shape of its paw and thanks to this, our ancestors learnt to recognise the presence of prey or a predator. An immediate analogy is that with the projected shadow, which makes it plausible to assume a very remote time when man recognised his own shadow, or silhouette, as an image of himself.

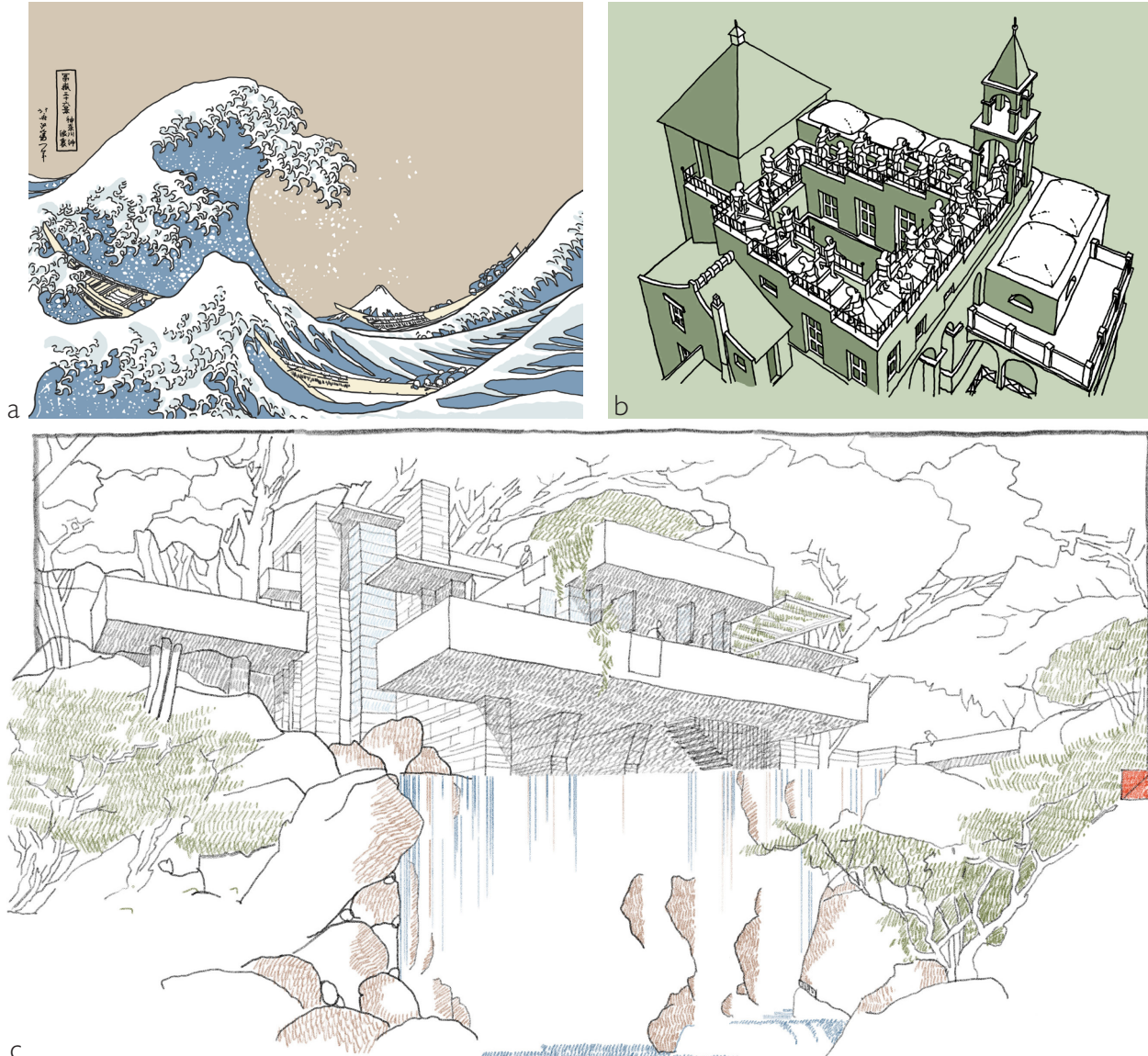
The analysis of the development of the infant sign, the persistence of the fundamental functions of drawing from infancy to creative activities in architecture and design, together with Kennedy's studies supporting the idea of a "discovered" drawing in nature, lead to the consideration of drawing, in some of its forms, as a natural language, which develops coherently in multiple contexts independently of formal learning processes.

Drawing is a cultural language

Drawing, as we have considered it thus far through stadial theories, the fundamental instances of drawing and primitive forms of visual perception, undoubtedly represents an essential but not exhaustive component of the vast and articulated graphic language that our civilisation has elaborated over time. If these primary forms constitute a sort of original and intuitive grammar of drawing, they are nevertheless insufficient to explain the complexity of the systems of signification that characterise the most stratified graphic images of our visual culture. Works such as *Kanagawa oki nami ura* (fig. 6a) –Hokusai's renowned *Great Wave– Ascending and Descending* by Maurits Cornelis Escher (fig. 6b), or one of the architectural perspectives of *Fallingwater House* by Frank Lloyd Wright (fig. 6c), embody levels of signification that transcend mere formal recognisability in relation to their referents. Similarly, even a simple graffito drawn with an unsteady hand, the sketch of a tree made by an amateur, or the icon of an application on our smartphone, all carry meanings rooted in specific cultural, aesthetic, symbolic, and communicative contexts that have been consolidated over time. In each of these examples, the graphic image is not only what it appears to be: it is also –and above all– what it evokes, recalls, and connects.

The evolution of the child's sign –which we have already used as a field of study that can provide useful scientific references for understanding drawing in all its forms– is

Fig. 6. Level of semantic stratification that can be acquired from graphic and visual language beyond the simple recognisability of the represented or communicated subject. a. Katsushika Hokusai, Kanagawa okinami ura (A Great Wave off Kanagawa), 1830-1831 ca. b. Maurits Cornelis Escher, Ascending and Descending, 1960. c. Frank Lloyd Wright, Fallingwater (Kaufmann House), Mill Run, Pennsylvania. 1934-1937. Graphic elaboration by the author.



initially a spontaneous and natural expression, but is soon influenced by environmental stimuli, interaction with other individuals and observation of the surrounding world. These factors reflect the cultural context in which the child grows up, determine significant differences between distinct communities and generate divergent modes of graphic-visual approach. Growing up in Italy, Japan or Papua New Guinea decisively changes the path of development of one's graphic language. Drawing, from a certain age onwards, therefore does not develop as a neutral form of language but as a product of a specific visual culture that also conditions the emergence of individual authorship.

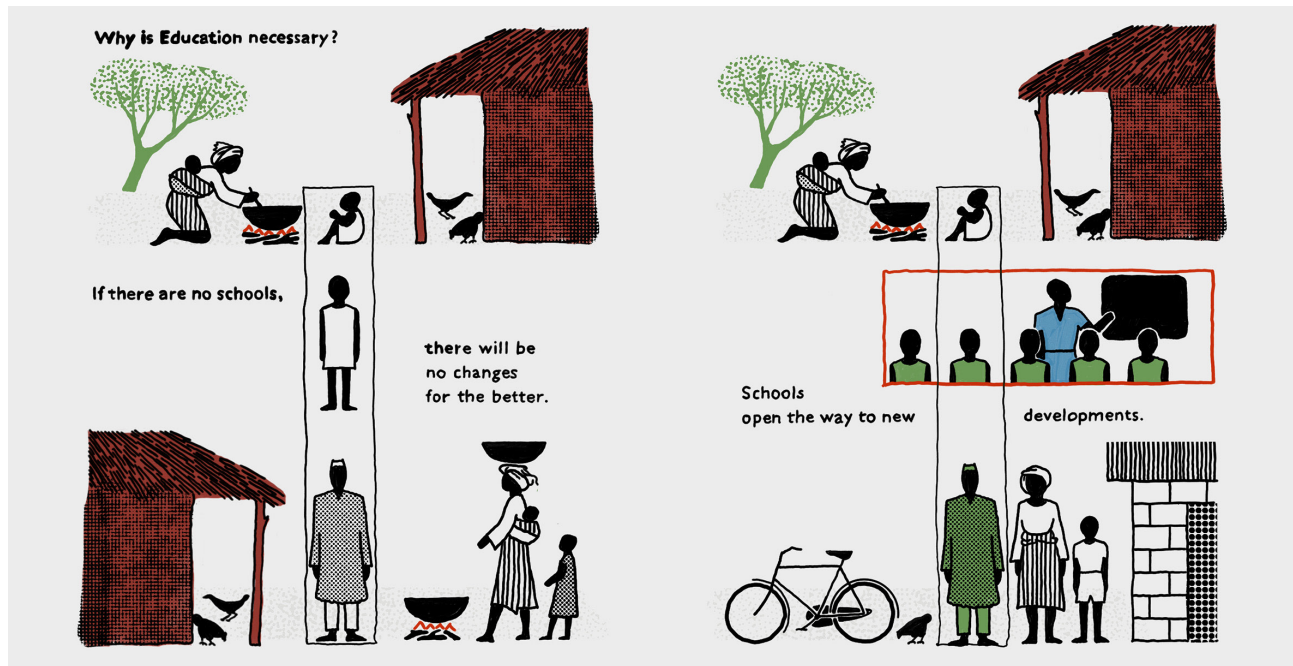
Even children's drawing, often considered to be free of external influences, is therefore the result of a collective construction: every stroke reflects a culture, every form is loaded with references. Authorship, in both children and adults –and therefore architects– emerges when the

individual more or less consciously reworks the shared visual repertoire, transforming it into his or her own language. Drawing, therefore, is not only representation and communication, but also interpretation and rewriting – hence expression– of visual culture.

Drawing is a universal language

In 1925, Otto Neurath founded the *Gesellschafts und Wirtschaftsmuseum* (Museum of Society and Economy) in Vienna with the aim of making the complexity of the contemporary world accessible to a broader audience, including the less literate social classes. In a Europe marked by the First World War and characterised by profound political and economic tensions, the project of “knowledge democratisation” assumed a strategic function in the pursuit of a

Fig. 7. The graphic-visual equipment is able to transmit a communicative content that could be difficult to convey through written language, which is little or not at all widespread in the territories for which the book is intended [from Neurath 1955, pp. 2, 3]. Graphic elaboration by the author.



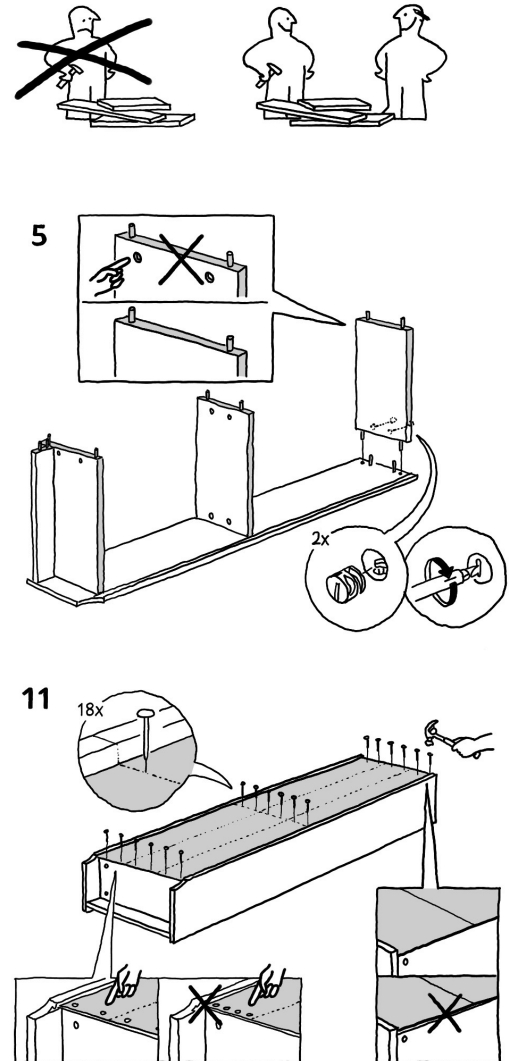
more equitable, informed, and participatory society. Neurath identified graphic-visual communication as an effective alternative to verbal transmission, which was hindered by the inaccessibility of written language for a significant portion of the population. With an explicit educational intent, he formulated the need for a graphic language capable of conveying complex content through simple, standardised, and immediately comprehensible forms.

In the following decades, in collaboration with the artist and engraver Gerd Arntz and an interdisciplinary team, Neurath developed the ISOTYPE system (International System of Typographic Picture Education), a pictographic code designed for the visual representation of quantitative and qualitative information using minimal written text. ISOTYPE did not constitute a mere collection of standardised illustrative images; rather, it emerged as an autonomous language endowed with its own syntax and semantics: each symbol held a univocal, defined, and systematised meaning, and could be combined with others according to precise rules to construct complex messages. Unlike narrative illustrations or decorative schemes, ISOTYPE pictograms adhered to principles of standardisation, comparability, and reproducibility. The principle of “the visualisation of numbers” – that is, the proportional correspondence between the number of symbols and the magnitude of the phenomenon represented – anticipates many current practices in data visualisation and infographics [Menchetelli, 2013; Luigini, Moretti 2019]. In the 1960s, under the direction of Marie Reidemeister –Neurath’s collaborator and wife, who played a pivotal role in the development of ISOTYPE– the Neurath Foundation participated in initiatives promoted by supranational organisations. Between 1961 and 1962, Reidemeister collaborated with UNESCO in the production of educational booklets aimed at rural communities in sub-Saharan Africa, characterised by high illiteracy rates (fig. 7). This application demonstrates the flexibility and intercultural effectiveness of the ISOTYPE language, capable of overcoming linguistic, alphabetic, and geographical barriers by providing immediate communicative tools to individuals otherwise excluded from access to knowledge.

The adoption of a systemic and non-verbal graphic-visual language thus emerges as a strategy of epistemological inclusion, consistent with the principles of universal education and collective emancipation that constituted Neurath’s primary objectives.

Within the context of high-iconicity and functionally operative graphic-visual languages, the instruction manuals for

Fig. 8. Some phases taken from the assembly instructions of the Billy bookcase by IKEA®. Elements of the graphic repertoire developed by the company are evident: circular balloons for detailed operating instructions and rectangular ones to signal potential errors, hands pointing to highlight critical points, grey areas to indicate unfinished surfaces. Graphic elaboration by the author.



IKEA® furniture (fig. 8) and LEGO® construction sets represent paradigmatic examples of what Abraham Moles defines as “constructive drawing” in his taxonomy of levels of iconicity [Anceschi 1992, pp. 26-38]. These graphic systems are conceived as action-oriented languages, designed to translate spatial and operational concepts into visual sequences that are easily interpretable by a heterogeneous user base, regardless of geographical location, educational background, or age. Their primary communicative function is to provide clear, direct, and universally comprehensible instructions, while minimising any potential interpretative ambiguity. A particularly significant aspect of these designs is their ability to completely exclude the use of written text, relying exclusively on the communicative and functional power of graphic signs. The IKEA® instructions, in particular, have over time developed a minimalist and strict graphic code that even dispenses with the use of colour. Most of the assembly boards are presented as an orderly series of black line drawings on a white background, with occasional grey backgrounds to indicate unfinished surfaces or elements to be distinguished within the structure (see fig. 7). The absence of colour, far from being a limitation, becomes a strategic resource, as it allows attention to be focused on the essential operation and

prevents misunderstandings due to print variability or visual perception.

It is a graphic system placed at a high level of iconicity, adopting projective models that are clear in their allusion to three-dimensionality and independent of the subjective position of the observer. This methodological choice aims to avoid discrepancies between the graphic representation—in particular the perspective one—and the actual visual experience of the user during editing, who may observe the model from different angles than the projection centre adopted. If a perspective model is adopted, the representation tends to maintain a wide main distance in order to minimise aberrations and ambiguities.

The success and effectiveness of these constructive designs attest to how graphic language can take on a strongly pragmatic value, performing a linguistic function in the Saussurian sense of the term, i.e. as a system of signs capable of conveying meaning, structured on shared and recognisable rules.

In their apparent simplicity, the IKEA® and Lego® assembly instructions represent some of the most advanced forms of universal graphic language, capable of facilitating the realisation of complex actions without resorting to words, confirming the potential of drawing as a direct vehicle of instructions, contents and three-dimensional spatial relations. In this sense, they stand alongside systems such as ISOTYPE, with its syntactic and semantic rules, capable of making knowledge accessible across geographical, linguistic and cultural boundaries.

Architectural design between nature, culture and universality

Architectural drawing, in the plurality of its operative forms, simultaneously activates—but from time to time with different intensities—the three fundamental dimensions of drawing understood as language, namely: natural, cultural and universal. This co-presence is particularly evident in figurative representations that can be traced back to the iconic



Fig. 9. Visual elaborations developed for the final version in competitive bidding process of the design of Project of the New Hospital in San Gavino Monreale, Medio Campidano (now Provincia del Sud Sardegna), 2015. Credits: Imprese: Paolo Beltrami spa, Simic spa; architectural design: AISE progetti (Ing. M. Rossi, Archh. A. Luigini, F. Cipriani, E D'Amico); plant design: Quality Engineering (Ing. A. Santalucia); technical design: Insight (Arch. R. Di Ramio). Architectural co-designer and coordination of 3D modeling and BIM are by the author.

code, in which visual similarity with elements of reality constitutes a central parameter of comprehension, as occurs in photorealistic representations—whether from renderings of three-dimensional models or generative processing in AI is indifferent— or in certain project sketches (fig. 9). In these representations, the natural dimension manifests itself in the ability to recognise iconic forms on the basis of spontaneously acquired perceptive skills, which can be partially traced back to the development of the infantile sign up to adulthood and are substantially devoid of formal didactic mediation. Contextually, the cultural dimension emerges in the activation of visual repertoires, prior knowledge and symbolic references belonging to the imagination of the author and his techno-cultural community of reference. Finally, the universal dimension is observable in the possibility of

transversal decoding of these representations, generally accessible by both expert and non-specialised users, thanks to the high degree of iconicity, often almost mimetic.

In the case of the drawing of architecture in the codified representations of plan, elevation and section—and all the variants or combinations with which we are familiar—the linguistic configuration is defined, according to Abraham Moles' terminology, as a "normalised constructive scheme", since it is founded on codified rules, symbols and projections—in fact, normalised—that require specific literacy (fig. 10). In this sphere, the natural component tends to be progressively marginalised, while the cultural and universal dimensions are pre-eminent. Indeed, normalised architectural drawing comes close to functioning as a true formal language, based on shared graphic conventions. In particular, architectural

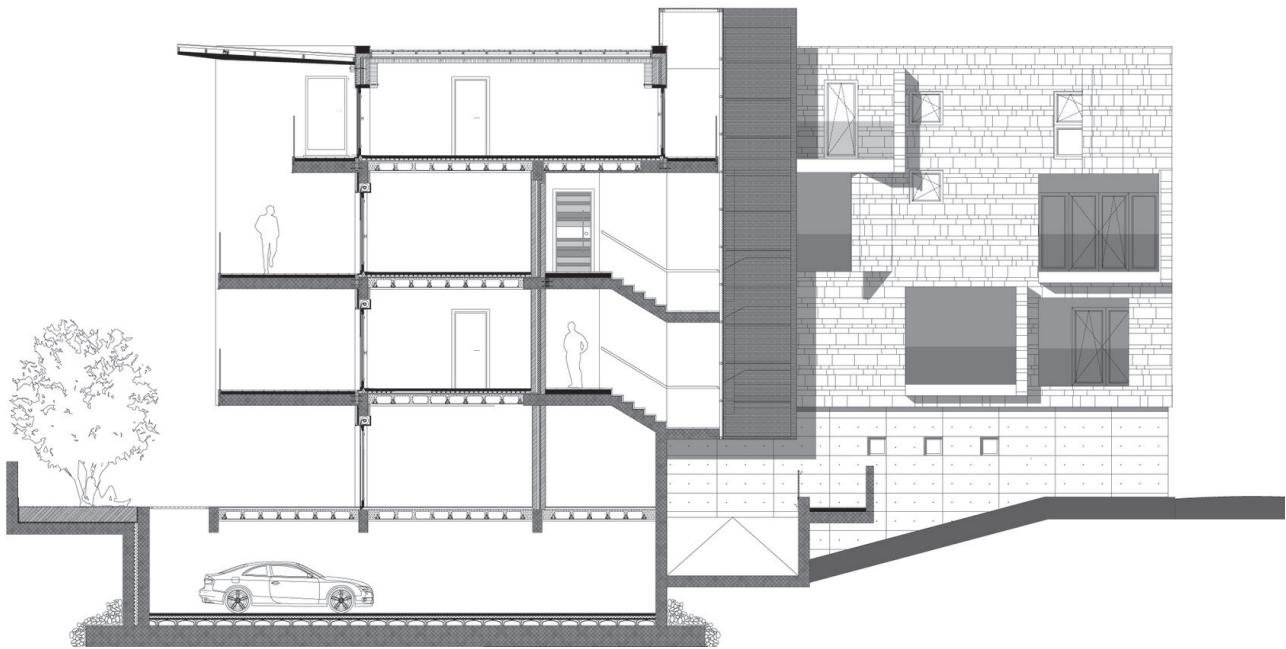


Fig. 10. Detail composition of cross-section and elevation, originally drawn at 1:50 scale, of a residential building in Pescara (2009-2012). Detail drawing by the author.

representation through two-dimensional drawings requires knowledge of the main projective models –mongial projections, axonometry, perspective, etc.– that allow us to allude, through two-dimensional signs, to three-dimensional objects and spaces. These models, as formalised cultural constructs, have a decisive influence on the comprehension at the mental stage of the represented space. Therefore, the decoding of normalised architectural drawing presupposes the acquisition, to a greater or lesser degree, of such models and conventions, without which graphic communication would be impracticable or partially inaccessible. Nevertheless, it is evident how, thanks to the co-presence of elements that refer both to the symbolic code and to the iconic code, these drawings are in part comprehensible –and therefore universal– beyond the cultural context of reference.

In the case of information modelling (BIM, HBIM, etc.) and integrated digital systems, the notion of universality takes on a further technical meaning, which can be traced back to the principle of interoperability (fig. 11). While three-dimensional and superficial modelling software operate mainly on the basis of the processing of geometric data, BIM systems require the sharing of a more articulated set of information – functional, temporal, descriptive, performance, etc. –that must be structured according to widely accepted standards– which must be structured according to widely standardised standards. In this context, universality is not based on perception or iconicity, but on a capacity for procedural integration between different information environments, aimed at multidisciplinary collaboration and a direct relationship between information model and, for example,

designed or constructed building. Digital representation is thus configured as a complex language, in which graphic communication merges with the structured transmission of data, confirming the hybrid and multi-level nature of contemporary architectural design.

Epilogue

The theoretical and analytical path outlined here aims to demonstrate the validity of extending the psycho-pedagogical interpretative framework –traditionally applied to the analysis of drawing in its original and evolutionary forms– to the specific field of architectural drawing. This interdisciplinary openness not only allows for a deeper understanding of architectural drawing as a complex and specific form of a language that begins to form in the first years of life but also encourages a more structured and conscious reading of its functions and articulations. In particular, the recognition of the co-presence of several linguistic modalities in the same graphic artefact, as well as the possibility of modulating their use in relation to the different graphic codes that can be used, is configured as a useful methodological tool for orienting both the production and the critical interpretation of drawing in architecture.

The considerations developed allow, finally, to draw a further and transversal synthesis regarding the origin of graphic languages, the rules governing their use and the forms of learning necessary for their acquisition, reinforcing the idea of drawing as a stratified and interdisciplinary field of study,

Drawing as Language	NATURAL	CULTURAL	UNIVERSAL
Origin	Innate, rooted in perception and motor skills	Learned, derived from social practices and cultural codes	Based on forms and symbols recognisable across cultures
Rules	Implicit, guided by perceptual principles and spontaneous gestures	Explicit, defined by historical, aesthetic, and technical conventions	Semi-standardised, designed to be interpretable in diverse contexts
Learning	Implicit, guided by perceptual principles and spontaneous gestures	Mediated, transmitted through education, training, and visual tradition	Hybrid: requires intentional design but aims for immediate understanding

Tab 1 - The table summarises the distinctive features of the three declinations of design as language.

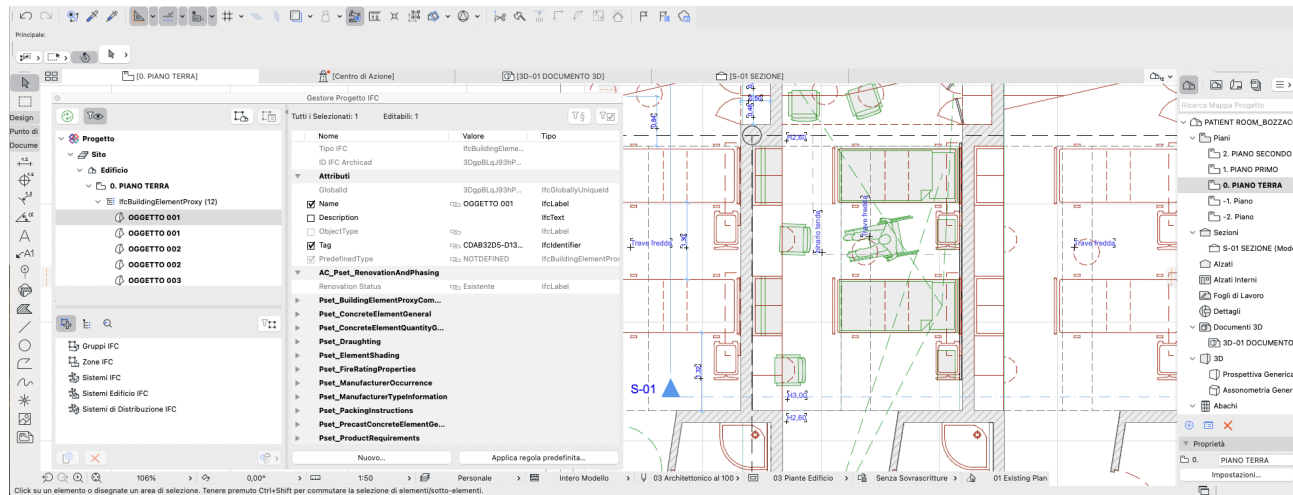
a language at the crossroads between nature, culture and universality, according to the following declinations:

- Drawing as a natural language emerges spontaneously in childhood, prior to graphic-visual literacy and formal instruction. It has an innate origin, rooted in visual perception and the motor skills of the graphic gesture, follows implicit rules based on common perceptual mechanisms, and is acquired automatically as part of the human evolutionary process in the forms we have previously outlined;
- Drawing as a cultural language relies on codes learned within a community, arising from social practices. It is structured around explicit rules –graphic conventions, styles, and systems of representation rooted in centuries of tradition– and

requires a mediated learning process through education and the transmission of a graphic and visual culture;

- Drawing as a universal language lies between the two aforementioned poles and is a language designed to be understood trans-culturally by using forms and symbols that, while requiring intentional coding, aim at immediate and shared comprehension. Its rules are semi-standardised, often derived from shared graphic-visual systems such as pictograms or graphical user interfaces. Learning in this case is hybrid: it involves conscious design by the author but relies on an instinctive and rapid reception by the recipient, who thus interprets the drawings in a substantially immediate manner, without the need for mediation.

Fig. 11. Screenshot of a BIM software and IFC parameters management. For credits see the caption to figure 9. Architectural BIM model by the author.



Note

[1] One of the themes on which Kellogg underline in several points in the book is the need for a purely aesthetic interpretation of child drawings as much as of rock engravings, as we shall see later in our discussion.

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Drawing and the Language of Creativity

Gaia Leandri

Abstract

This paper examines the communication of cognitive and emotional elements between a drafter and an observer through drawings. Although this topic has been explored from philosophical and psychological perspectives, it still lacks sufficient scientific evidence to determine its biological foundations. Electroencephalography (EEG) is now a recognized instrumental tool that can be used to assess the cognitive and emotional engagement of both the drawing's creator and its viewer. This study reports the results of experiments in which EEG recordings were made from four subjects who acted as both drafters and observers of drawings with presumed differences in cognitive-emotive content. As drafters, the participants were asked to create both a freehand drawing and a CAD version of an architectural landscape. It was hypothesized that the freehand version would carry a stronger cognitive-emotive charge than the CAD one. Qualitative and quantitative analyses of the EEG data showed that both drafters and observers exhibited parallel responses to the same image. These findings provide experimental support for the theory that specific feelings and perceptions of the drafter are transmitted to the observer, who responds as if him/herself were the author of the drawing.

Keywords: cognition, communication, electroencephalography, freehand, CAD

Introduction

In Western culture, drawing has been regarded since the Renaissance as an aesthetic medium for transmitting the perceptions, intuitions, and ideas of its creator. A widely held view is that drawing functions as a form of visual language, as the marks made by a tool on a surface can convey meaning to the observer. The etymology of the word *disegno* supports this interpretation, although it offers a somewhat reductive view of its many dimensions. While the signs of the alphabet are now conventional symbols, a traditionally defined language cannot evoke meaning in the same immediate and expressive way as a drawing. Drawing establishes a direct form of communication between the drafter and the viewer.

This idea was first articulated by Leonardo da Vinci, who, in his reflections on painting, and, by extension, drawing,

asserted that “the purpose of painting is understood by all generations across the universe, for it engages the sense of sight [...] it needs no translation into different tongues” [da Vinci 1817, p. 47, translation by the author] [1]. And again, “the painter will create countless things that words cannot name, for want of appropriate terms” [da Vinci 1817, p. 4, translation by the author] [2]. Leonardo's words transcend the theoretical and mechanistic boundaries within which drawing was once confined, seen merely as a means of developing techniques to represent visual reality. It was only in the last century that drawing began to receive serious attention from philosophers and psychologists as a distinct mode of perception, experience, creativity and communication. Initially regarded as a representation of something perceived in the visible world,



Fig. 1. Drawing as an inner language (drawing by the author).

drawing came to be understood also as a reflection of the drafter's imagination or as an attempt to formulate new ideas. The forms in a drawing are categories of thought that conventional language cannot fully express. Speaking about drawing, Merleau-Ponty said "It is more accurate to say that I see according to it, or with it, than that I see it" [Merleau-Ponty 1996, p. 126].

This insight underscores the idea that the human body, with all its senses, plays a central role in perceiving, thinking and drawing. Merleau-Ponty's theories linking the eye, mind and hand highlight the interplay between manual and mental activity. Historically, this connection has been acknowledged by both artists and thinkers. The Italian painter Cennino Cennini, in the fourteenth century, recognized the hand as both a creative and cognitive instrument, stating: "do you know what will happen when you practice freehand drawing? It will make you skilled and experienced, and will foster many drawings within your head" [Cennini 1821, p. 11, translation by the author] [3].

Similarly, Leonardo claimed: "whatever exists in the universe by essence, presence, or imagination, the drafter first holds it in the mind, and then in the hands" [da Vinci 1817, p. 7, translation by the author] [4]. These artists understood drawing as a process that reveals, through images, what cannot be expressed in any other way. Drawing is the act of invention, it is itself an invention. This mental process becomes a generative act through the drafter's body (fig. 1). Making a drawing and looking at it are two intertwined activities of bodily subjectivity. As Merleau-Ponty explains, "between the see-er and the visible, between touching and touched, between one eye and the other, between hand and hand a kind of crossover occurs" [Merleau-Ponty 1996, p. 125]. The hand's capacities: perception, action, cognition, social interaction and communication, demonstrate its centrality to drawing as a creative and intellectual endeavor. Even with the widespread adoption of computer graphics, the importance of bodily engagement and manual skills in the drawing process remains paramount. Pallasmaa asserts: "All students of design and architecture should first be taught to work with their internalized mental imagery and their hands before they are allowed to use the computer: [...] Without this mental internalization, however, the computerized design process tends to turn into a purely retinal journey in which the student him/herself remains an outsider and observer without having built a vivid mental model of the conceived reality" [Pallasmaa 2009, p. 99]. Calatrava echoes this sentiment: "With drawing, you are always working with the same two instruments, your hand and your intuition; even if it seems you have no conscious aim, you're continually trying to solve a real construction problem" [Carrillo de Albornoz, Calatrava 2018, p. 180].

The complex network of feelings and thoughts embedded in a drawing can be perceived by the observer, who apprehends what is communicated through interaction with the drafter's creation. A drawing that begins as a monologue becomes, in the end, a fruitful dialogue. Leonardo describes this process of visual communication succinctly: "those paintings, if the crafted acts are well proportioned with the ideas, will be understood as if they spoke" [da Vinci 1817, p. 12, translation by the author] [5].

It is interesting that theoretical reflections on the bodily and mental features of drawing, in its broadest sense, are now recognised as being firmly grounded in biological

principles, sometimes with surprising implications. For instance, line drawing, is a preferred method for sketching easily recognizable objects. This preference parallels the behavior of specialized neurons in the visual pathway that process the edges of an image, which correspond to sharp changes in luminance [Marrocco, Li 1977]. Evidence has been found that “visual processing is, both on neural and perceptual level, highly edge dominated” [Kilpeläinen, Georgeson 2018, p. 1593.1].

Similarly, the highly complex process of facial recognition seems to be mainly performed by well identified neurons [Freiwald, Tsao 2014; Gross 2002].

Research on the neural basis of movements and their preparation has long detected neurons involved in the fine motor control of the hand, whose movements represent the final stage of creative mental processes [Sobinov, Bensmaia 2021]. The numerous sensory organs pertaining to the hand are not only essential for precise movement execution, but also play a critical role in generating further ideas of movement [Leandri et al. 2022; Orth et al. 2017]. Since the early 20th century, advancements in electrophysiology have allowed for the non-invasive recording of neural activity of the brain cortex from the surface of the skull, which goes under the general name of electroencephalography (EEG), a completely safe technique. Two specific variants of electroencephalography have been instrumental in assessing cognitively salient perceptions and gestures. These are the Visual Event Related Potentials (VERPs) and Movement Related Potentials (MRPs), which are obtained by synchronizing movements or image presentation with the EEG recording. However, these techniques have yet to be applied to the creative process of freehand drawing, particularly as a communicative tool, or to the cognitive responses evoked in the observer by the drawing itself.

Aims of the research

This paper is the report of a series of experiments performed to fill such a gap, with a completely new approach using Movement Related Potentials (MRPs) [Shibasaki, Hallett 2006] and Visual Event Related Potentials (VERPs) [Luck 2014] recorded during both the creation and observation of drawings. The primary aim of this study was to detect and investigate the cognitive link that is supposedly established between drafter and

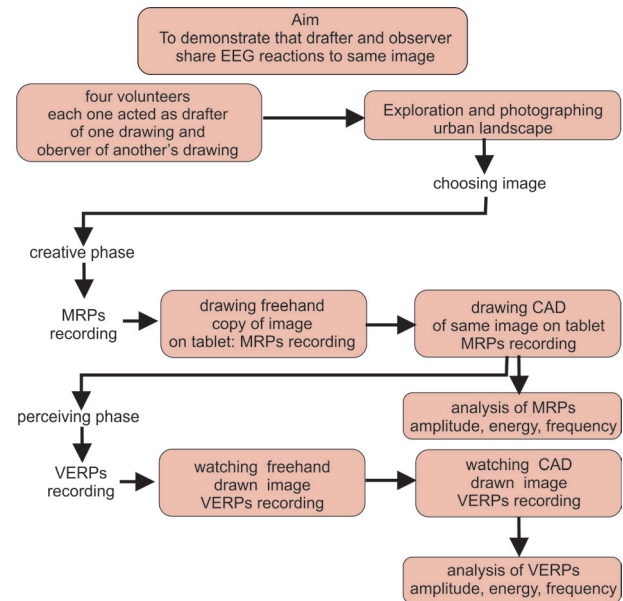


Fig. 2. General plan flowchart (elaboration by the author).

observer through the drafted image. A further aim was to ascertain the effect that different saliency attributed to the image could have on the recorded potentials.

Methods

This investigation is a proof of concept and feasibility study involving the fields of design, neurophysiology and neuropsychology. The experiments described in this paper are just a part of a larger set that is already under way and that are meant to confirm and integrate the results so far achieved.

General plan

Four subjects, experienced in the use of a drawing tablet for freehand drawing and Computer Aided Design (CAD), have been studied. They were of female gender, between 20 and 25 years of age, all right handed. They had no known neurologic or medical condition, and no history of alcohol or drug abuse. All of them provided informed consent to the procedure. The experimental procedure

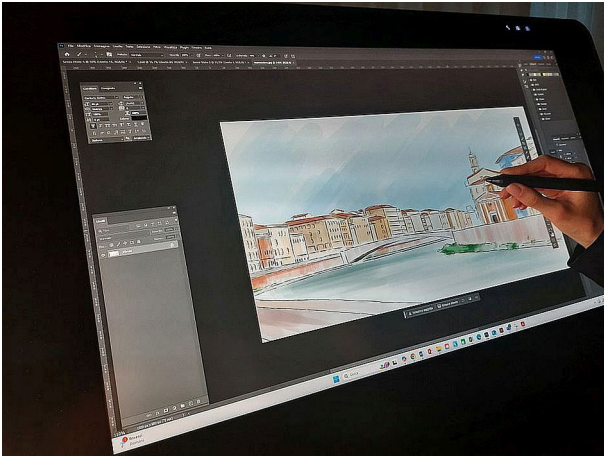


Fig. 3. Photography of freehand drawing on tablet to provide synchronization for recording MRPs (photograph by the author).

was structured in four stages, as follows. First stage: photographs of urban landscape were taken. Second stage: each subject chose one photograph, which inspired a freehand drawing, in color, drafted on a digital drawing tablet. The same photograph was used to draw a very simple CAD; during both activities, the electroencephalogram (EEG) was recorded to obtain the MRPs. Third stage: the freehand drawn image and CAD were shown to an observer (one of the four subjects, but not the author of the drawing) and VERPs were recorded. Fourth stage, offline analysis of MRPs and VERPs was performed to seek possible connecting elements between the drafter and observer recordings. The general plan is summarized in the flow-chart of figure 2.

Recording Movement Related Potentials (MRPs)

Two electrodes were placed on the scalp, the active one over the cortical projection of the right hand movements, and the reference at the left mastoid. Signals were amplified 50,000 times digitalized at 10,000 samples/s and stored onto computer disc. Only epochs of 1,000 ms before and 1,000 ms after movements were analyzed. Synchronism with the start of each drawing movement was provided by reading the 'pen down' event from the tablet driver. Approximately 150-300 movements were acquired per each

subject. The drawer was asked to draw with slow strokes, with a time gap of at least 3 seconds in between. The system automatically avoided recording faster strokes. Signal storage and further analysis were performed by dedicated applications. Figure 3 shows the tablet used to draw free-hand and CAD providing the necessary synchronism.

Recording Visual Event Related Potentials (VERPs)

The aim was to record the slow components linked to cognitive/emotional activity of the observer after the visual stimulus. The best derivation to such an end implies an active electrode at the vertex and the reference at one mastoid. Signal amplification, digitalization and storage were as for MRPs. Analysis times also were identical as for MRPs, 1,000 ms before and 1,000 ms after the stimulus. The visual stimuli were presented on a 24", 16:9 computer screen, with image dimension 1,500 x 800 pixels sited 80 cm in front of the subject. The protocol of image presentation was the traditional oddball type, where the meaningful stimulus image, also called 'target', was randomly presented in low probability fashion (20% in our case) amid a more frequent (80%) stimulus image of irrelevant content, called 'distractor'. In one session the freehand drawing was presented as the target image. The CAD image was the target in a second session. In each case approximately 150 presentations were performed. Figure 4 shows the sequence of images presented on the screen. The setup for recording VERPs is shown in figure 5. The electrodes are just two and kept in contact with the head skin by two Velcro strips in lieu of the usual annoying rubber head net. This way the subject is almost unaware of wearing the electrodes and concentrates better on the shown images.

Oddball paradigm random presentation for Visual Event Related Potentials (VERPs)

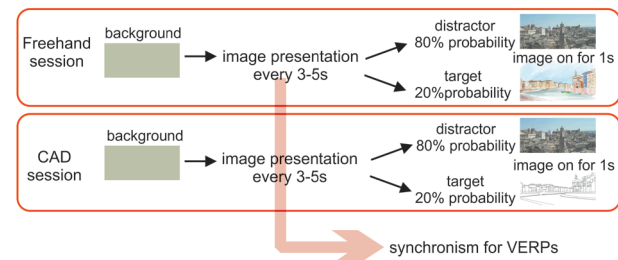


Fig. 4. Sequence of visual stimuli (flow chart by the author).

Offline processing

The EEG activity evoked by movements (MRPs) and image presentations (VERPs) has a very small amplitude and is obscured by larger, spontaneous random EEG activity, resulting in an unfavorable signal-to-noise ratio. To enhance this ratio, repeated movements and image presentations are employed, enabling the use of the statistical 'averaging' process to obtain reliable data. Statistical significance of the means derived from averaging single responses was assessed using one-way ANOVA for independent measures, with a significance threshold of $p < 0.05$. The amplitude and energy of the signal epochs of interest were calculated. Additionally, the single-sided, scaled amplitude spectrum (in μV) of the signal in the frequency domain was computed using the discrete Fast Fourier Transform.

Results

The EEG recording in drawing: the creative phase

Voluntary movements of the hand are preceded and followed by a well known EEG activity, called Movement Related Potentials (MRPs); its main feature is a negative slow rising deflection starting at approximately 400 ms before muscle contraction and is generated in those areas of the brain cortex devoted to initiate and plan movements. We recorded such activity in all of our subjects either during

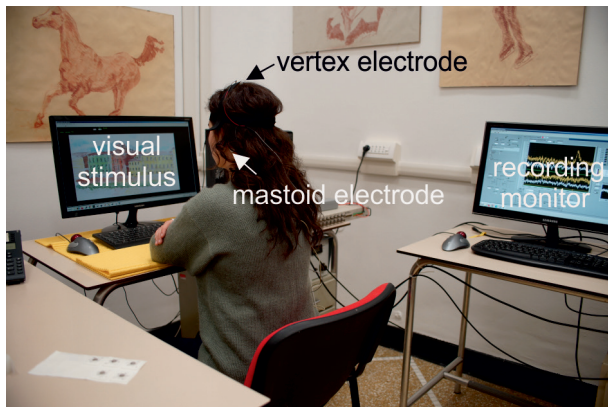


Fig. 5. Photo of recording VERPs, with freehand drawn image on the screen (photograph by the author).

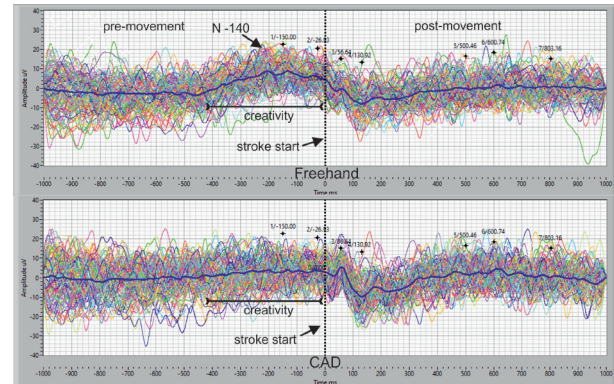


Fig. 6. The upper vignette shows the MRPs recorded during freehand drawing, the lower shows the recording during CAD drawing (elaboration by the author).

freehand or CAD drawing on the drawing tablet. But there were very significant differences between the two. In figure 6 the recordings from subject number 2 are shown. The upper graph depicts the 140 EEG epochs relative to as many movements recorded during freehand drawing and the thick blue trace is their mean. The dotted vertical line marks the time 0, that is the moment when the pen goes down and the drawing stroke is initiated. The graph time domain (X axis) goes from -1,000 to +1,000 ms (relative to the moment of stimulus presentation), with the negative values relating to pre-movement events and positive values to post-movement events. From the mark -400 ms a negative going deflection (in neurophysiology the negative polarity is conventionally represented by upward going deflections) can be seen, peaking approximately at -150 ms and therefore called N-150 (reported in the graphs of figure 6 and in table 1). Its amplitude and energy are the reflection of the overall neural activity taking place in the time span of the wave duration (mean values are reported in table 1). The post-movement waves reflect the activity of the sensory area, receiving impulses from the hand receptors, informing that it has moved. The lower graph reports the recordings performed during the CAD drawing. It is quite evident that the deflection before time 0 is almost absent, whilst the trace after time 0 shows better defined peaks, because is devoid of the interfering influence of the pre-movement MRP. However, post-movement activity will not be further discussed

MRP	N-150 amplitude		N-150 energy	
	mean	sd	mean	sd
Subject n.1 Freehand	10.29	5.73	9.95	7.31
Subject n.1 CAD	7.5	5.89	5.31	4.15
Subject n.2 Freehand	8.33	5.43	7.91	4.54
Subject n.2 CAD	5.29	4.38	6.72	4.91
Subject n.3 Freehand	24.34	6.12	46.34	14.01
Subject n.3 CAD	7.16	6.87	11.41	12.62
Subject n.4 Freehand	28.14	7.41	66.7	19.84
Subject n.4 CAD	6.67	5.33	9.43	5.35

Tab. 1. Mean amplitude of the N-150 peaks and mean energy of the signal region of interest for each subject (elaboration by the author).

here, as it is not directly relevant to the creative phase, though potentially involved in the feedback loop of a broad creative process [Leandri et al. 2022]. Table 1 reports the mean values of the main assessed parameters of the signal related to the freehand and CAD drawing. The first column lists the subject number and drawing modality (Freehand/CAD); the second and third columns report the amplitude mean value and standard deviation (sd) of the N-150 wave; the fourth and fifth columns report the mean energy and standard deviation of the pre-movement signal in the time domain between -400 and 0 ms marked by an underscore in figure 5. For the sake of simplicity, and in reference to its possible function, this region of interest of the signal has been labelled 'creativity' both in the table and in figure 5. Amplitude is reported in μV units referred to the 0 line, whilst energy is in conventional units. In all subjects larger values were always obtained during freehand than CAD drawing (ANOVA analysis, significancy $p < 0.05$). These results suggest that a larger population of cortical neurons, are involved in freehand drawing than CAD, possibly reflecting creativity [Leandri, Schenone, Leandri 2021]. A further analysis

MRP	Delta wave amplitude	
	mean	sd
Subject n.1 Freehand	2.48	1.34
Subject n.1 CAD	0.89	0.48
Subject n.2 Freehand	2.24	1.43
Subject n.2 CAD	1.05	0.67
Subject n.3 Freehand	1.94	0.92
Subject n.3 CAD	0.53	0.23
Subject n.4 Freehand	2.92	1.51
Subject n.4 CAD	1.45	0.89

Tab. 2. Mean amplitude of the 1 Hz (Delta) frequency of the MRP (elaboration by the author).

has been performed as to the involved EEG frequencies embedded in the recorded MRPs and VERPs. The detailed results are reported in figure 7. The graphs depict the mean amplitude (μV) of the 0-20 Hz frequency spectrum assessed in the pre-movement epoch (Y axis reports amplitude in μV and X axis frequency in Hertz). The data clearly show that in the case of freehand drawing (graph on the left) there is a prevalence of low frequencies (0.5-4 Hz: the EEG Delta rhythm), with a high peak of 2.24 mV at 1 Hz. In CAD drawing (graph on the right) the 1 Hz peak has amplitude of only 1.43 μV . In previous work where a different EEG modality had been recorded (continuous, spontaneous EEG) [Harmony 2013] it had been found that cognitive tasks implying insight were associated with power increase of Delta rhythm. On the contrary, if the task implied attention directed towards the external world, higher frequencies (Theta, Alpha and Beta) would prevail. These changes in EEG frequencies induced by insight had been interpreted as reflecting modulation of EEG frequencies by the cognitive activity. It was also observed that the power increase of one set of frequencies would inhibit the other, as if the cortical neurons would hamper

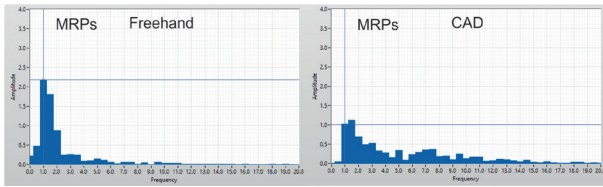


Fig. 7. Frequency spectrum of subject No. 2 during freehand (left) and CAD (right) drawing (elaboration by the author).

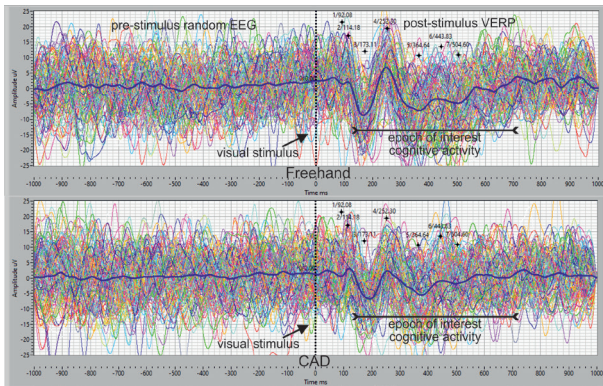


Fig. 8. Visual Event Related Potentials VERPs recorded during presentation of Freehand or CAD drawing in subject No. 1 (elaboration by the author).

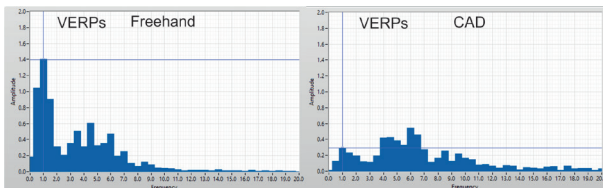


Fig. 9. Mean amplitude versus frequency in subject No. 1 while watching freehand (on the left) and CAD generated image (right) (elaboration by the author).

the less relevant, interfering thread of activity. It is straightforward, then, that freehand drawing, which requires much more insight than CAD, at least in the task performed by our subjects, is associated with more intense Delta activity. Looking at the graphs it may be inferred that the insight necessary to freehand drawing, reflected by the increased amplitude in the 0.5-4 Hz frequencies, also determines a decrease of amplitudes of the following frequencies (Theta, Alpha and Beta), starting from 4.0 to 20 Hz. On the contrary, the simple CAD task, not requiring insight, does not evoke Delta activity and the higher frequencies are allowed to thrive, especially the Theta and Alpha rhythms. Table 2 reports the mean frequency amplitudes (in μV) of all subjects, with their standard deviations, showing that the observation described in the example of subject number 2 is also true for the others. ANOVA analysis confirmed the freehand-CAD differences in all subjects at significant level ($p < 0.05$).

The EEG recording in the watching phase

The produced drawings, either freehand and CAD, where made to watch by the observer, who was one of the four volunteers, but not the author of the specific drawing. The position of the active electrode was at the vertex, the best site to detect the electrical activity elicited by cognitive or emotional processing of the visual perception, which is recorded as a series of positive negative slow waves occurring at approximately 300-600 ms after the stimulus [Luck 2014]. This type of evoked response is called an Event Related Visual Evoked Potential, as it is elicited by a visual stimulus. It is not a specific reflection of the stimulus physical feature, rather it is related to other more abstract properties, like surprise, emotional drive, aesthetic appreciation or other cognitively associated characteristics [Luck 2014].

In this research the attention has been focused on the set of waves occurring between 150 and 600 ms after T0, as the most representative components of the cognitive reaction to the visual stimulus.

In figure 8 the recordings of 142 responses to visual stimuli in subject number 1 are shown, with superimposed their mean value (blue thick trace). In the upper graph a freehand drawing has been presented, whilst in the lower one a CAD drawing has been shown. It is evident how watching the freehand drawing evokes a larger amplitude set of responses. In table 3 the mean amplitudes and standard deviations of the prominent peak are reported for

VERP	Late peak amplitude		Late peak energy	
	mean	sd	mean	sd
Subject n.1 Freehand	9.91	6.80	14.80	4.49
Subject n.1 CAD	8.15	6.28	11.80	3.94
Subject n.2 Freehand	10.44	8.06	20.40	1.08
Subject n.2 CAD	9.23	7.26	16.00	5.47
Subject n.3 Freehand	23.99	9.23	45.90	10.30
Subject n.3 CAD	13.66	8.45	23.50	8.45
Subject n.4 Freehand	22.81	11.91	69.50	17.00
Subject n.4 CAD	9.30	7.56	36.60	12.20

Tab. 3. Mean amplitude and energy of VERPs in subject No.1 while watching freehand and CAD drawings (elaboration by the author).

each subject, which show a significant difference between the two conditions (ANOVA $p < 0.05$). More important than the peak amplitude is the energy calculation of the signal in the whole time span 150-600 ms, as its result is determined by the cumulative activity of discharging neurons, with a much more comprehensive relation to the stimulus than the instantaneous amplitude measured on one of the peaks. This is reported in the fourth column of table 3 as a mean value, with standard deviation in the fifth column. Differences between freehand and CAD are highly significant, in agreement with the behavior of amplitudes. Even in the case of the VERPs potentials the EEG frequencies have been investigated. In figure 9 two frequency-amplitude graphs of the means obtained in subject 1 are shown, calculated as in figure 7. On the left is the result watching the freehand drawing, and on the right is the outcome of CAD. Even on the observer's side it is evident that the watched freehand drawing is related to a significantly larger amount of Delta EEG frequencies than the CAD. On the other hand, though we did not statistically analyze the higher frequencies, the latter show an inverse trend, that is to say they seem to be of lower

VERP	Delta wave amplitude	
	mean	sd
Subject n.1 Freehand	2.75	1.23
Subject n.1 CAD	1.92	0.34
Subject n.2 Freehand	1.39	0.87
Subject n.2 CAD	0.54	0.28
Subject n.3 Freehand	2.12	1.58
Subject n.3 CAD	0.81	0.47
Subject n.4 Freehand	1.69	0.98
Subject n.4 CAD	1.12	0.41

Tab. 3. Mean amplitude of the VERPs 1 Hz (Delta) frequency (elaboration by the author).

amplitude in the freehand case. Such behavior parallels the one detected in MRPs while drafting the two images. Amplitudes of the delta frequency peaking at 1 Hz, in all subjects, are reported in table 4. All differences between freehand and CAD have been ascertained as significant ($p < 0.05$) with ANOVA analysis.

Conclusions

The reported findings are suggestive of common electroencephalographic features present in the creator and in the observer of a drawing. Changing the features of the drawing from freehand to CAD changes the electroencephalographic recordings in both characters to a very similar extent. In making the freehand image the drawer is afforded a wide range of possibilities to express his/her perception, emotion and mind. Thus, the drawing is not merely a representation of the external world, but it is imbued, either consciously or unconsciously, with those cognitive and emotive entities that prompted its creator. This is especially true as freehand drawing implies a

strong motor activity by the hand, which has long since been considered a source of inspiration in itself, feeding the proprioceptive brain circuits as recently demonstrated [Leandri, Schenone, Leandri 2021]. The making of CAD is much less meaningful, usually requiring less insight and definitely fewer hand movements. Its generative simplicity is reflected in the sparsity of its constitutive elements, just points and lines, which only communicate the contours of objects and little more. It is no surprise, then, that the observer's perception of the visual primitives of the CAD does not excite the association areas devoted to cognitively processing the image. In the reported experiments the involvement of motor and visual association areas of the cerebral cortex is quantified mainly by the energy of the electroencephalographic signal either before movement in the case of the drawer, or after image presentation in the case of the observer. In both cases, freehand consistently induced a deeper and broader cortical involvement. Another parameter that can be measured in the electroencephalogram is its frequency, with low frequencies (Delta waves) indicative of insight, a hallmark of association area activity (association areas of the cerebral cortex are regions of the brain that handle complex cognitive functions both on the motor and sensory side). It is worth mentioning that the insight activity competes with attention directed towards external objects. Whilst insight increases the very low frequency Delta waves, attention

to the outside world diminishes it while increasing higher frequencies, like Alpha or Beta rhythms. Therefore, the finding of high amplitude low frequency (Delta rhythm) and small high frequency waves suggests insight both in the creation and in the visual perception of freehand drawings. In contrast, CAD making and watching were associated with small amplitude low frequency waves, and larger high amplitude frequencies, clear indicator of attention directed towards external objects. It may be deduced that freehand drawing is internalized, but CAD seems rather to be exteriorized. These conclusions, drawn from experimental data, fit well with the long-established theories on the role of the communicative power of the drawing, which reaches its maximum in the freehand drawing, where the creative pulse can be transmitted to the observer. The limitations of this study are inherent in its exploratory nature, as a pathfinding investigation intended to guide future experiments. The current findings are based on a small number of participants, and increasing the sample size, both for creators and observers, will be essential to provide a more robust foundation for the observed effects. Assessing both intra- and inter-subject variability will be critical, and this should involve multiple trials within the same individuals. With a larger dataset, statistical evaluation of variability and reliability will become feasible. These aspects are planned for inclusion in the full-scale research program, which we aim to undertake as soon as possible.

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ternal and Child Health (DINOGLI) at the University of Genova. Help in the experiments has been provided by Dr. Sara Massucco and Dr. Viola Bruzzone.

Notes

[1] The original text in Italian reads: *"la pittura ha il suo fine comunicabile a tutte le generazioni dell'universo, perché il suo fine è subietto delle virtù visive [...] non ha bisogno d'interpreti di diverse lingue"*.

[2] The original text in Italian reads: *"infinite cose farà il pittore, che le parole non potranno nominare per non avere vocaboli appropriati a quello"*.

[3] The original text in Italian reads: *"sai che t'avverrà praticando il disegnare di*

penna? Che ti farà 'sperto, pratico e capace di molto disegno entro la testa tua".

[4] The original text in Italian reads: *"ciò che è nell'universo per essenza, presenza o immaginazione, esso [the drafter] lo ha prima nella mente, e poi nelle mani"*.

[5] The original text in Italian reads: *"Le quali pitture, se saranno ben proporzionati gli atti con i loro accidenti mentali, saranno intese, come se parlassino"*.

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Is Architectural Drawing a Language? Symbols, Signs, Pictograms, Ideograms and Drawings

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Abstract

Articulate language was established in the 20th century as the superior model of thought. It claimed a monopoly on the model of rational thought, even advocating a homomorphism between language and brain structure. We defend here the autonomy of architectural drawing over any linguistic discipline with the arguments that will be developed in six fields of debate. This analysis will argue why, stricto sensu, architectural drawing should not be considered a language. In our view, drawings do not 'mean' anything; rather, they either represent or shape the world. The lack of correlation between a syntactic and semantic field denies one of the basic principles of language. Drawing, especially architectural drawing, is based on the mathematical analysis process of Euclid's geometry and does not require deductive reasoning based on logical or natural language. Neither does conceptual art based on language models seem to have produced remarkable works of art, nor has the attack on the visual brought even some of what was promised. Goodman's symbol system models have provided a more useful way to understand the specifics of architectural drawing as part of a representational symbolic system, beyond 'languages and notations'. Finally, neuroscience posits the coexistence, without privilege, of a visual cognitive style as distinct from verbal cognitive style.

Keywords: architectural drawing, language, symbolic systems, graphic thinking, Nelson Goodman.

"In vain do we extend our view into the heavens, and pry into the entrails of the earth; in vain do we consult the writings of learned men, and trace the dark footsteps of antiquity; we need only draw the curtain of words, to behold the fairest tree of knowledge, whose fruit is excellent, and within the reach of our hand." [Berkeley 1992, p. 53].

Introduction

The 20th century was marked by the emergence of semiology, accepted as a general model for many fields of knowledge. The enormous impact that the development of modern linguistics had at the end of the 19th century meant that all artistic manifestations, whether visual, plastic or literary, were subsumed into a single set of activities that could be assimilated in their structuring to verbal language. Ernst Cassirer reminds us that Benedetto Croce, in

his 1902 work [1], identified artistic activity with linguistics. The indifferentiation between the study of linguistic problems —of general linguistics— and aesthetic problems since Croce has made its weight felt during an important part of the 20th century. He reduces the entire artistic structure to a single form of linguistic production: "Croce insists that there is not only a close relationship between language and art, but a complete identity. According to his way of thinking, it is arbitrary to distinguish between the two activities. Whoever studies general linguistics studies, according to him, aesthetic problems and vice versa" [Cassirer 1968, p. 145]. On the other hand, analytical philosophy gave language a legitimate status as a model of human thought, giving rise to the 'linguistic simile', to which the theory of architecture and drawing were not alien, both being considered as a form of writing, with

the subsequent application of methodology and literary criticism. The attack on the visual, *ocularcentrism* and formalism did the rest. It was not until the second third of the century that post-structuralism questioned the legitimacy of the 'linguistic simile'. Nelson Goodman's neopragmatist analysis of symbol systems provides very relevant disquisitions on the consideration of all symbols, including, indistinctly, verbal languages, graphic languages and musical notations. Recently, neuroscience has highlighted both verbal and visual ways of knowledge.

Discussion

Many discussions have been fought to establish and overturn the hegemonic authority of the 'linguistic simile' in Western culture up to the situation we find ourselves in today. Without wishing to be exhaustive, we will point out six manifestations of the intellectual debate that have a bearing on the visual arts, architecture and architectural drawing.

As a hegemonic model of human thought

Logical positivism (scientific logical language) and analytical philosophy (natural language) bring the novel idea of a certain isomorphism between brain and language. The issue we address here is to discern whether or not architectural drawing is, properly speaking, a language. Certainly, architectural drawing is based on projective geometry. Geometry is a branch of mathematics that is rooted in the greatest monument to deductive thinking that has survived since antiquity. Euclid's *Elements* [Euclide 1991] is perhaps the best example of the power of the human mind for deductive thinking. Based on a few definitions, it is one of the intellectual pinnacles of cognition. Against this background, it is hard to understand how the recourse to the 'linguistic simile' based, at best, on logical statements whose premises have obvious weaknesses and inconsistencies compared to the powerful thinking apparatus that is geometry, has been so vehemently accepted.

We cannot affirm that the *Elements* were originally accompanied by drawings, although, already from the first book, after the Graphic demonstration of the Pythagorean theorem of the axiomatic part (23 definitions, 5 postulates and 8 common notions), the geometrical demonstrations that are described for their graphic construction follow.

Proposition 47 corresponds to the graphical proof of the Pythagorean theorem which, in fact, was already known in Egypt and appears in its graphical version in the *Rhind papyrus* (1650 BC) (fig. 1). We know that some manuscript copies preserved during the Middle Ages were accompanied by illustrative drawings or diagrams. In fact, since the printing revolution, as early as 1482, an illustrated text of the *Elements* was published by Erhard Ratdolt in Venice translated from the Arabic by Adelard of Bath. This 'need' to illustrate the text with figures is already symptomatic of the limitations of verbal languages in the field of geometry; but, above all, it is revealing of the gestalt quality and holistic vision derived from visual perception: any of the graphic versions of the Pythagorean theorem does not require proof or, to be precise, constitutes the graphic proof of the theorem itself (fig. 2).

Words are pictures: languages, alphabets, pictograms and ideograms

We will focus here on the question concerning the substantial difference between verbal languages and graphic representation, whose problematic approach lies in the association between sign and meaning. Verbal languages are based on this association and require a considerable level of abstraction: a word –a precise sound composed of a combination of phonemes– is associated with a meaning. However, not all cultures have achieved a system with the same level of abstraction.

The earliest recorded attempts were logographic languages, a hybrid between graphic and textual, where each word was represented by a specific logogram. Egyptian hieroglyphs dating from before 3000 B.C. are the most figurative of these languages. Chinese uses pictograms and ideograms which constitute a synthetic figurative representation of objects and beings –a 'literal, albeit schematic, copy of their referent' [Koriat, Levy 1979, p. 355]–, while ideograms represent more abstract ideas and concepts. The first recorded dictionary of Chinese logograms, the *Shuowen Jiezi*, was compiled by Xu Shen, who also classified the structure of sinograms –the name given to Chinese logograms– into six different categories [Gándara 2014]. The most relevant for our purpose are the first three: the iconic ones, based on the similarity with the referent; the ideographic ones, which represent more abstract concepts; and the ones that combine the two previous ones.

Man', 'tree' or 'enclosure' illustrate well the iconic type, in which a graphic schematic representation of the referent can still be easily inferred (fig. 3). It is likely that the similarity between the referent and the original ancient Chinese script was greater than it is today, as, over time, the evolution of writing has blurred that similarity [Hew et al. 2012, p. 219], as was also the case with the ancient Sumerian pictograms which became stylised through their use and evolved into the characteristic cuneiform script, progressively more regular and simplified over the centuries [Torri 2012, p.127] (fig. 4). 'Above' and 'below' belong to the ideographic type, in which the ideogram represents an abstract concept described in logical or associative terms and, in this particular case, its logic is easily understood by comparison. The third type combines, for example, two or more pictographic characters to metaphorically represent a new meaning through the

association of different ideograms, as is the case with 'prisoner'—a man in confinement— or 'forest'—the grouping of several trees—. The real revolution in written languages came with the use of the alphabet (fig. 4). Thus, a specific and limited set of signs made it possible to represent a virtually unlimited number of words.

However, all these signs refer to a meaning; that is the basic relationship between all these verbal languages. Moreover, looking at the different characters and logograms, it is easy to deduce the arbitrariness of both the form of the linguistic sign (for example, the alphabetic characters and the sounds they represent) as well as the association between signifier and signified. On the other hand, in graphic representation systems, in drawings, there is no arbitrariness: the projected lines correspond to the apparent edges or contours, which correspond to the projective process that guarantees the univocal correspondence between a point

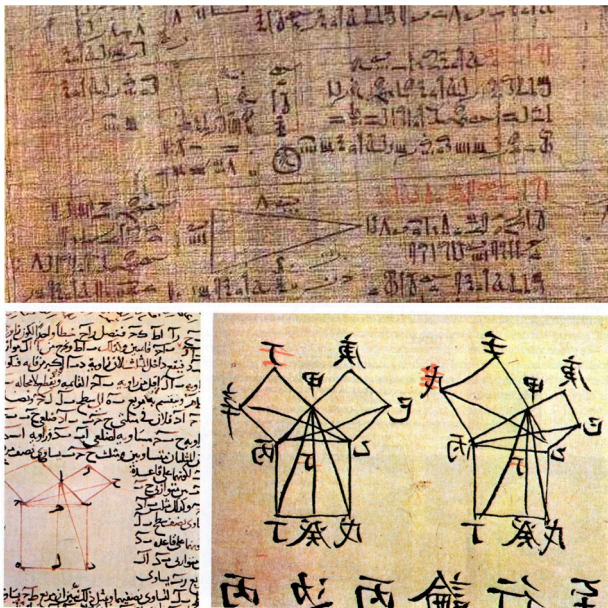


Fig. 1. Top: Scribe Ahmes, detail from the Rhind Papyrus, showing an explanation of the Pythagorean theorem (1650 BC). Below: Reproductions of fragments of translations of Euclid's Elements (1.47) where the Pythagorean theorem is graphically demonstrated [Cabezas et al. 2011 pp. 60-61].

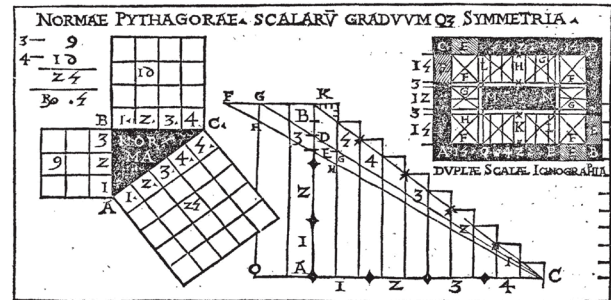


Fig. 2. Graphic demonstration of the Pythagorean theorem. Top: Cesare Cesariano Vitruvius [Cesariano 1521] and the Pythagorean triangle (3,4,5). Below: graphic elaboration by the authors, 2025, synthetic graphic demonstration of the theorem, general case, inspired in Frank Wilczek's dual complementary diagrams version [Wilczek 2016].

of the three-dimensional referent and the point of its representation on the plane or its projection on the retina.

The ‘linguistic simile’ and the problem of meaning

This sometimes operative metaphorical approach, and not quite so in some instances, has been applied to the visual arts in a generic sense, and also to architecture understood as a ‘language’. Accepting the possibility of the existence of something similar to a syntax, the core problem lies in demonstrating the existence of a relationship between the syntactic and the semantic fields. The arguments in favor of the existence of the relation have been dismantled at the end of the 20th century on the basis of the development of powerful theories of representation in architectural drawing. We will give an account of the main arguments we are aware of: Robin Evans [Evans 1995, p. 179] points out the non-representational value of architectural drawing, as opposed to its use in painting and sculpture, since it is usually drawn prior to the existence of the architectural work: “The subject-concept [the building or space] will exist after the drawing, and not before”.

Aware that the ‘linguistic simile’ obscures rather than clarifies the understanding of architectural drawing, he poses three critical arguments.

In the first place, he proposes to rescue architecture from the methods of literary criticism which, in the case of Derrida’s work, comes to establish itself as a sub-genre of criticism by presenting architecture as a form of writing. Evans writes [Evans 1995, p. 139]: “To claim, following in the footsteps of Jaques Derrida, that architecture is a form of

writing, is not something remarkable in itself after twenty years of insisting on the language model”.

Secondly, he points out the use of linguistics as a theoretical support, as a way of self-protection of the work produced by architects in the face of the criticism that he coins as the ‘linguistic alibi’.

Finally, he acknowledges the contribution of Peter Eisenman, who considers the existence of a certain deep syntactic structure –generative grammar– in the sense established by Chomsky, akin between language and architecture [Gandelsonas 1998] as a ‘useful analogy’. Evans admits the sincere effort and the steps taken by Eisenman, although he opposes a naive identification: “All things with a conceptual dimension are like language, just as all grey things are like elephants” [Evans 1997, p. 168].

Roger Scruton [Scruton 1979] accepts the existence of a certain syntax and a possibility of correspondence of signifiers with a semantic field for some cases of highly codified classicist architecture, taking Summerson [Summerson 1963] as an authority on this matter, who also refers to classical treatises; but he denies the existence of a relationship that can be generalised to all works of architecture. Elsewhere [Scruton 2017, p. 146], he analyses the process of constructing the meaning of the works, albeit far from the ‘linguistic simile’. He dismisses the need to call ‘grammar’ what is traditionally called ‘style’. His strong argument is about how a sentence with incomplete syntax cannot convey meaning; whereas an incomplete architecture manifests its stylistic unity with all its meaning. He concludes that in architecture it is the dependency between the parts and the whole that which gives meaning.

Jorge Sainz [Sainz 1990] takes as his basis the structuralist analysis by Mounier and the semiological analysis by Umberto Eco. His conclusion is clear: architectural drawing only fulfils one of the six conditions that a system of symbols must fulfil in order to be considered a language and he points out the non-existence of an associated semantic field. He states that “for the followers of Saussure it would be one more of the sign systems of a non-linguistic character”. It is also worth making a distinction between three ways of approaching architecture itself, as Sainz points out [Sainz Avia 1990, p. 21]: texts (theory), drawings (praxis) and architecture itself (built work). To suggest that architecture possesses a meaning as if a work were a signifier with significance produced the excesses of historicist postmodernism led by Venturi [Venturi 1982] in the 1970s.

pictogram	人	man
pictogram	木	tree
pictogram	□	enclosure
ideogram	上	above
ideogram	下	below
compound ideogram	囚	prisioner
compound ideogram	森	forest

Fig. 3. Table of Chinese ideograms and their meanings.

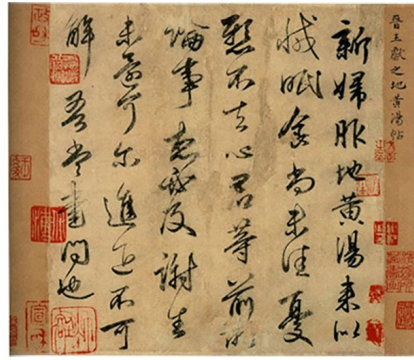


Fig. 4. Left: sumerian cuneiform inscription. Center: Tang Dynasty (copy of 新婦地黃湯帖) by Wang Xianzhie. Right: alphabetic characters from an inscription from the era of Trajan (c. 114 A.D.).

The attack on the visual

Structuralism and the 'linguistic simile' advanced in parallel, strengthened by the support of a theory with aspirations of becoming a universal epistemology, and was the favourite tool of the theoreticians in the face of the old formalism, where artists and some critics took refuge. Art theorists such as Joseph Kosuth [2] then, or Nicolas Bourriaud [Bourriaud 2009] recently, –both with a sociological background–, have recounted how the crisis of the value granted to the visual as opposed to the conceptual or relational took place. Bourriaud [Bourriaud 2009, p. 104] turns to Robert Morris [3] to explain it: "Conceptual art thus affirmed the end of the primacy of the visual in the perception of the work of art."

Kosuth's own installation (fig. 5), as Magritte had done earlier in his famous *Leci n'est pas une pipe* (fig. 6), already implies a revision of the problematic and elusive relationship between the work and the representation of reality, as well as its autonomy with respect to the referent that it uses as a pretext to conform itself. Kosuth's own 'real' chair, which is referred to in the photograph, a projection after all, and also in the accompanying text, forms part of the work. But even in this installation, we can observe the incomparable supremacy of the graphic over the verbal when it comes to describing material reality. In fact, the merciless critique of the pre-eminence of the visual in art [4] has constituted the central nucleus of the theoretical-artistic debate during the second half of the twentieth century or, to be more precise, from 1968

onwards; and the leading role fell to French theorists with structuralist and psychoanalytical roots. Authors such as Martin Jay [5] attribute this to the strong influence that French thought had on American art criticism. He points to two vectors that sparked the revision of what he calls 'ocularcentrism' [Jay 2003]: on the one hand, the enormous influence of the work of Marcel Duchamp [6], and on the other, the thought of philosophers with structuralist roots that arrived in the USA at the end of the 1960s, fundamentally the works of Ferdinand de Saussure, Claude Lévi-Strauss and Roland Barthes [Barthes 1986]. Jay identifies three critical lines. We will focus on the debate around the first line, which opposes language and textuality to visual perception. The possibility of 'reading' a painting, a building, a drawing was imposed on the simple idea of 'looking'.

In the artistic practice of these years –grouped as conceptual art– the boundary set by Duchamp of 'art as an idea' was crossed to extend it to art as a philosophy, as information, or as linguistics (fig. 5). The characteristics common to all the activities enacted by conceptual artists can be recognised in the following words of Robert Smith [7]: "Despite their extreme diversity, what united most conceptual activity was an almost unanimous emphasis on language or linguistically analogous systems, and the conviction –confident and puritanical in some circles– that language and ideas were the true essence of art, that plastic experience and the delectation of the senses were secondary and inessential, if not obtuse and unmitigatedly immoral" [Stan- gors 1986, pp. 214-215].



Fig. 5. Joseph K. *One and Three Chairs* (1965). Folding wooden chair, photograph, enlarged dictionary definition; chair 82.2 x 37.7 x 53 cm, photo panel 91.4 x 61.2 cm, text panel 61.2 x 62.2 cm. Collection of MoMA, New York. Larry Aldrich Foundation Fund.

Fig. 6. Magritte, *R. Ceci n'est pas une pipe* (1928–1929). Los Angeles County Museum of Art (LACMA).

Here we identify, in our opinion, one of the most successful campaigns to overthrow the hegemony of the linguistic and conceptual approach to the 'arts of drawing' which had dominated the Fine Arts since the days of Vasari and which had its roots in the time of *L'Accademia delle Arti del Disegno*, the consequences of which are still being experienced today.

The transition from the structuralist model to the symbolic model. A theory of representation versus a theory of signification.

"Allographic art has not emancipated itself by dint of vindication but by dint of notation" [Goodman 1976, p. 118]. In the 1960s and 1970s, Maldonado writes [Maldonado 2004, p.34]: "architecture was then understood as a system of visible signs. All architectural discourse was presented as a discourse on signs. Some studies directly proclaimed the birth of a new discipline: the semiology of architecture" and the establishment of something akin to an architectural semiology was pursued.

Nelson Goodman overcomes the disconnection between the syntactic and semantic fields –pointed out by Scruton in the case of architecture– and the idea of drawing as language.

Goodman's symbol systems go beyond the scope of language to encompass any kind of symbol, including drawings and, in particular, architectural drawings [Goodman 1976]. A symbolic schema correlated with a field of reference would provide the minimum semantic requirements to be considered a symbolic system. Modes of referencing include exemplification and denotation, the latter encompassing both description, characteristic of linguistic systems, and representation, characteristic of representational systems. A symbol system in its fullness would attain the status of a notational system, and Goodman himself states that we should refrain from considering figurative systems as languages, 'however tempting it may be'.

A discontinuous, syntactically and semantically differentiated digital system, if it is also unambiguous, will be a notational system. The non-projective, dimensioned sketch made by Coderch of the pines and carob trees located on the plot where he will built the Ugalde house is an example of a digital drawing (fig. 7).

On the other hand, analogical systems: dense, continuous, syntactically and semantically undifferentiated; are

the opposite of a notational system. A figurative graphic system—and any projection is necessarily one—is based on similarity (fig. 8).

In addition to this radical distinction: linguistic systems vs. representational systems, Goodman distinguishes between allographic and autographic arts. A work will be autograph if, and only if, the distinction between the original and its most exact copy is important. Architectural paintings and sketches are autographs; scores and plans are allographs. Goodman differentiates two broad groups of architects' drawings: sketches—images produced to reflect the appearance of the finished building—and architects' plans, which: "would be a combination of a sketch and a script" [Goodman 1976, p. 200]. They are a mixture of specifications written in ordinary discursive verbal and numerical language with a sketch: "Since a plan is a drawing, with lines and angles subject to continual variation, one might think that technically it is a sketch. But on the plan, measurements appear in words and numbers" [Goodman 1976, p.

200]. And he concludes that numbers do not violate the conditions of notation, due to the usual limitation to two decimal places, and this "supposes a sufficient restriction for finite differentiation, and therefore they will count as notation, and, consequently, the drawing will not be analyzed as a sketch, but as a digital diagram and as a score" [Goodman 1976, p. 200]. In this way, Goodman recognizes the notational status of the architect's drawing, which he assimilates to musical scores.

The notational system of architectural drawing was already anticipated by Alberti in his *De re-aedificatoria* published as early as 1485, laying the foundations for the representation of architecture by means of parallel projections and granting the status of the architect as responsible for a task of an intellectual nature through the mediation of drawing as a tool of control and planning [Carpo 2011, p. 20]. Not long after, the representation of architecture was refined to constitute the canon proposed by Castiglione and Raphael de Sanzio in their famous letter to Pope Leo X in 1519 [Castiglione 1978]. The systematic use by architects for centuries of the section, the plan and the elevation points to the solvency of a representation system based on the parallel projections of three canonical and complementary views (fig. 9).

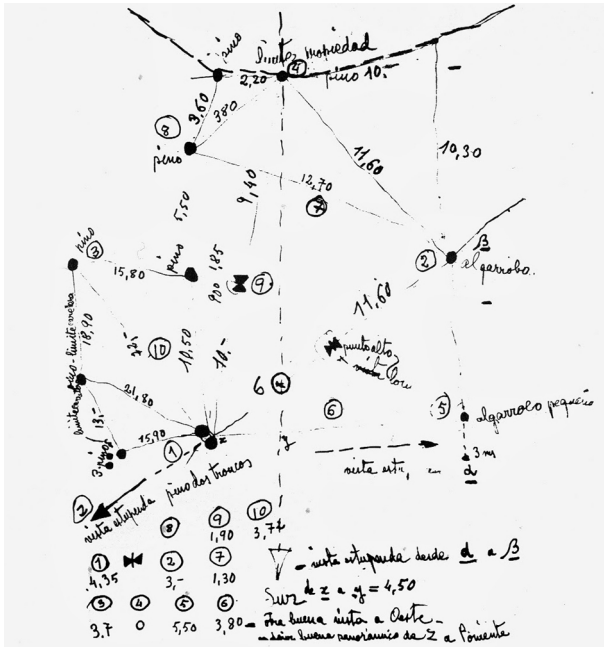


Fig. 7. Coderch, J.A. Sketch of Casa Ugalde, 1948.

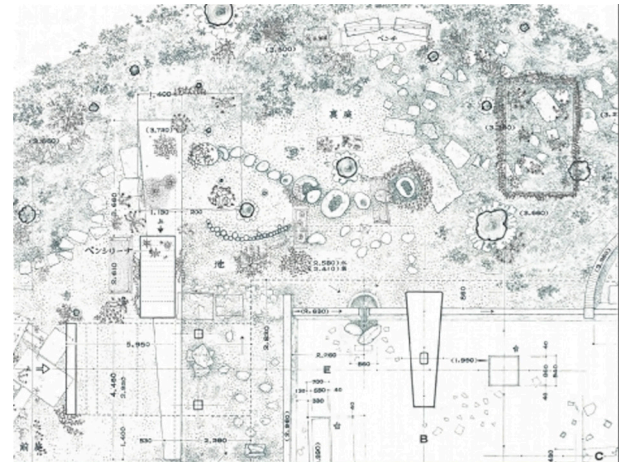
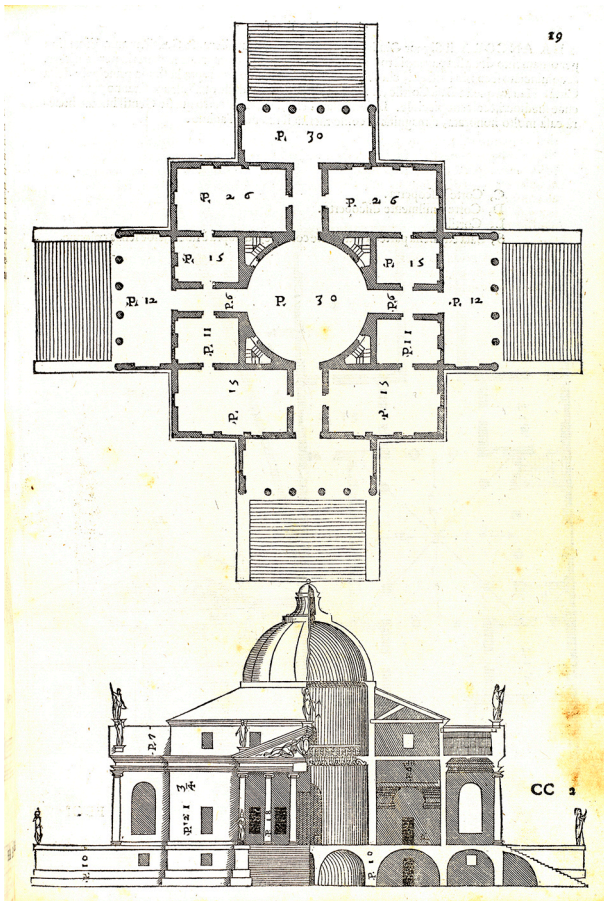


Fig. 8. Ishigami, J. Japanese Pavilion at the 2008 Venice Biennale.

Fig. 9. Villa Almerico (Villa Rotunda), from *I quattro libri dell'architettura* [Palladio 1570, p. 19].



Epilogue: A Cognitive Model

Finally, we briefly note the current trend in the study of cognitive processes to understand the world. Howard Gardner [Gardner 2011] expands the field of human intelligence beyond linguistic or logical-mathematical intelligence. Chomsky, a disciple of Goodman, initiated the transition from language as a system (Saussure) to language as an innate mental process. Later, neuroscience took over the study of human cognitive processes. According to Benjamin Bergen [Bergen 2012], the revolution begins when the 'language-meaning-thought' binomial breaks down, anticipating that 'meaning', rather than being related to abstract symbols, could be something intimately intertwined with individual experiences of the world's reality (embodied) through simulation. Furthermore, he argues for the existence of different cognitive styles: verbal and visual, present in all individuals to a greater or lesser extent. Graphic thinking would find in drawing a vehicle for elaborating ideas and developing knowledge linked to the material world.

Conclusions

We have presented a set of arguments put forward in the debate surrounding the classification of architectural drawings as a type of language. If we examine this debate, we see that it is a derivative of other, more profound issues, such as the consideration of architecture as a language, the visual and spatial arts as a language, and even the identification of language with thought, whether formally logical or heuristic, encompassing all human epistemological processes. If we observe its temporal course, we see that it emerged in the late 19th century, reached its zenith in the 1960s and 1970s, and lost its vigor towards the end of the century. Architectural drawing is the repository of a set of specific characteristics that mark its own autonomous line. The identification of human thought with a linguistic model based on the formal logic of scientific language advocated by logical positivism in order to maintain the rigor of deductive thinking, in addition to being challenged by some of its proponents—including Wittgenstein—seems unnecessary for architectural drawing, given the geometric-mathematical roots of its relationship with rational, deductive thought. The projective nature of architectural drawing establishes a direct link between the object of thought and

its representation through a logical process based on Euclidean geometric support.

The “linguistic simile” requires compliance with a set of rules specific to a linguistic symbolic system that architecture, neither as a work nor as a drawing, fulfils; specifically, the necessary relationship between the syntactic field and the semantic field, since architectural works and drawings do not “mean” anything.

The development of Goodman’s symbolic systems model distinguishes between clearly differentiated modes of reference: descriptive and representative denotation, separating verbalized language from graphic representation and placing them in two independent spheres. Furthermore, the specific study of architects’ drawings has allowed for a precise classification of them based on their analogical or digital nature, and their allographic or autographic character; which is much more precise than any linguistic interpretation.

Notes

[1] Aesthetics as the Science of Expression and General Linguistics, with its first edition in Italian in 1902 and the first in Spanish in 1912, with a prologue by Miguel de Unamuno [Croce 2014].

[2] Joseph Kosuth built his artistic production within a theoretical framework that explained and legitimized his work, which would become the conceptualist manifesto *Art After Philosophy*, published in 1969.

[3] Robert Morris (1931–2018) was a sculptor, writer, and conceptual artist. He is considered one of the leading theorists of minimal art, along with Donald Judd.

[4] On the aesthetic predominance of language, see Chapter VI of José Jiménez’s book, *Images of Man. Fundamentals of Aesthetics*. 1986, Madrid: Tecnos. S.A. José Jiménez Jiménez is Professor emeritus of *Aesthetics and Theory of the Arts* at the Autonomous Univer-

Finally, the development of new currents in cognitive psychology establishes a disparity in models of human intelligence where formal thought is disassociated from the monopoly of logic, language, and mathematical reasoning [Gardner 2011] to open up to cognitive styles specific to human beings where verbal abilities are equated and separated from visual abilities, both necessary for a correct formulation of the configuration of the world.

The use of the linguistic simile that considers architectural drawing as a language should not, in our opinion, be used in a literal sense. Although its use in a metaphorical or instrumental sense may be useful, we must be aware that such use can contribute to disseminating a confusing idea that runs counter to the intrinsic and autonomous value that architectural works and architectural drawings possess by nature.

sity of Madrid. He was the founder and director of the Institute of Aesthetics and Theory of the Arts. In his youth, he studied in depth the philosophy of symbolic forms of E. Cassirer [Cassirer 1968].

[5] Martin E. Jay is Professor of the *History of Ideas* at the University of California, Berkeley, where he has taught since 1971. Born in New York City in 1944, he graduated from Union College, studied at the London School of Economics, and earned his Ph.D. in Philosophy from Harvard University.

[6] The disdain for Duchamp’s “retinal art” extended to both realist painting and the two-dimensionalism that he initiated against Impressionism and later extended to “abstract painting.” See: [Jiménez 2013, 1:25:00].

[7] Robert Smith is the author of the text “conceptual art” selected for the Nikos Stagos anthology referred to above.

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Giovanni Anceschi and the Theory of Schematic Representation. Drawing as a Graphic Language

Andrea Lancia

Abstract

*The theme of representation constitutes a specific domain in which the discourse on drawing and that on graphic design engage in dialogue, blurring the boundaries between the two disciplines. In particular, reflection on the graphic language of schematic representation plays a fundamental role in distinguishing between the cognitive value and the configurative value of drawing, depending on the context in which it is applied and the purposes it serves. Starting from this premise, the article offers a reconstruction and analysis of Giovanni Anceschi's research work, developed along a trajectory that begins with his 1966 thesis at the HfG Ulm on the subject of schematization in scientific, encyclopedic, and popular publishing, and culminates in the more complex 1992 text entitled *L'oggetto della raffigurazione*. The designer's point of view provides a perspective on graphic language that combines the descriptive and analytical stance of the theorist with the operative and functional role of the practitioner. Through a discussion of the foundations laid by the Ulm approach, the taxonomic method employed, and the choice of scientific representation as a theme, the article identifies insights that may contribute to the current debate on methodology and epistemology in graphic design in relation to drawing.*

Keywords: graphic language, drawing, graphic design, Giovanni Anceschi, design.

Introduction

The term 'grafica' and the term 'disegno' seem to belong equally to the history of representation. In the field of that kind of Drawing which, in a well-phrased expression by T. Maldonado [Maldonado2018], we might define as 'con la D maiuscola', it is increasingly common to hear 'grafica' mentioned within discussions of representation [1].

As demonstrated by the intellectual trajectory of Giovanni Anceschi, placing emphasis on this issue can also prove valuable for the field of graphic design. His reflection, in fact, situates itself in a specific liminal zone, where the study of graphic languages becomes a meaningful contribution both to reflections on drawing and to the "foundation of a discipline of graphic design" [Anceschi 1981, p. 3, translated by the author].

In particular, the study of that specific graphic language which is schematic representation proves useful even

today for clarifying methodological and epistemological questions concerning the disciplinary status of what is now referred to as communication design. The goal here is to analyze Anceschi's research trajectory on schematic representation. The focus is on the context in which his studies were conceived and developed, the method he employed, and the subject matter he selected and investigated; the intent is to formulate a critical reflection, exploring the potential to revisit and update concepts that are worth questioning once again.

The philological evolution of his work unfolds in three key moments: i. the drafting of his diploma thesis at the HfG Ulm, written in German between 1966 and 1967 [2]; ii. the partial Italian translation of the thesis included in the collection *Progettazione visiva: convenzioni e procedimenti di rappresentazione*, published in 1981; iii. the reworking

presented in his *L'oggetto della raffigurazione* from 1992. This constitutes a path of integration and refinement: on one hand, from the initial draft to the final publication, the discourse is updated and enriched through engagement with contemporary authors and a more mature historical-theoretical perspective; on the other hand, and for the same reason, it is streamlined in certain sections that suffer from the obsolescence of a dated case study and from a level of depth consistent with that of a diploma thesis.

1966: The diploma thesis at the HfG Ulm

The 1966 thesis was supervised by Abraham Moles, with Tomás Maldonado and Herbert W. Kapitzki as co-advisors [3]. It bears the title *Schematische Darstellungen für didaktische Ausstellungen (Rappresentazioni schematiche per le mostre didattiche)* and is divided into two parts: *Schemata* (schemes) and *Ausstellung* (exhibitions). The project begins with a reflection on the stages in which scientists use representations to communicate events, processes, and objects, and then constructs a taxonomy of the forms of schematization employed in popular scientific publishing. This exercise is followed by an analysis of the manipulations enacted by the designer when selecting and producing the most suitable schematic representation; finally, the exhibition is analyzed as a communicative flow, and several types are defined.

This contribution must be contextualized within the design culture of the Ulm School, particularly regarding visual communication and the novel interest given to that subset identified as 'non-persuasive communication'. This definition was formulated by G. Bonsiepe [Bonsiepe 1965, p. 24]: "So far the notes on persuasive communication. Its counterpart, non-persuasive communication is an almost untouched region. The world of sign-systems for traffic and displays on machines, the world of communication for educational purposes, the world of visual representation of scientific facts offer rich opportunities and challenges to the visual designer. Here, communication is not primarily economically motivated as in persuasive communication with its advertisements, billboards and TV spots". On the other hand, as E. Bistagnino [Bistagnino 2018] explains, the role of drawing disciplines at Ulm, specifically, that particular domain known as Design Drawing, is not irrelevant [4]. Anceschi himself [1981, p. 3, translated

by the author] explains that his work "aims to take shape as an interweaving of empirical observations, taxonomical classifications, and conceptual tools applied to the problem of producing functional representations". In this sense, the study of graphic representation methods serves to construct, in disciplinary terms, what we might define as 'operational drawing', a theoretical foundation for the creation of graphic artifacts, in the spirit of the 'operational semiotics' developed by T. Maldonado [Maldonado 1959; Maldonado 1974] at Ulm. [5] Rather than 'design drawing', it would be more accurate to speak of 'drawing for design' [6].

The influence of the research being developed at the Ulm School at the time is evident first and foremost in the main theoretical tool Anceschi uses to categorize schematic representations: the levels of iconicity, a framework that A. Moles was working on during those years and which he would formalize a few years later [Moles 1972a]. Moles

Fig. 1. G. Anceschi, diagram illustrating the distribution of seven categories of schematic representation based on their degree of iconicity [Anceschi 1966]. Fondo Tomás Maldonado, Fondazione Giangiacomo Feltrinelli, Milano.

							67	perf. abstraktion
						13	3	feldschema
					52	5	3	flussdiagramm
				49	6	0	0	schaltschema
			26	7	11	10	2	konstr. schema
		104	25	15	34	45	11	strich-schema
13	9	0	1	3	12	0	0	ret. foto
ret. foto	strich-schema	konstr. schema	schaltschema	flussdiagramm	feldschema	perf. abstraktion		

employs empirical categories, creating a taxonomy of a population of schematic representations that appears to “to precipitate and cluster around specific (12) constellations of essential features of the expressive and graphic language employed” [Anceschi 1992, p. 27, translated by the author].

The role of taxonomy in design research and practice was, moreover, another fundamental trait of the Ulm approach, as Anceschi himself emphasized years later [Anceschi 2009, p. 207, translated by the author]: “But, as Maldonado also states, taxonomy is a scientific gesture which is, in a certain sense, the primary and initial scientific act, as anyone with experience in conducting research and projects knows perfectly well”.

Of the twelve levels identified by Moles, Anceschi selects seven and uses them to map a total of 526 illustrations, also allowing for mixed categories composed of two or more levels (fig. 1) [7]. The sample was drawn from three sources: two of encyclopedic nature namely, the seventh volume of *Epoche, Atom und Automation* (1965), dedicated to cybernetics and automation, and *L'Être vivant* (1964), focused on biology; the third source was all the 1957 issues of *Scientific American*, thus closer to the field of popular scientific publishing.

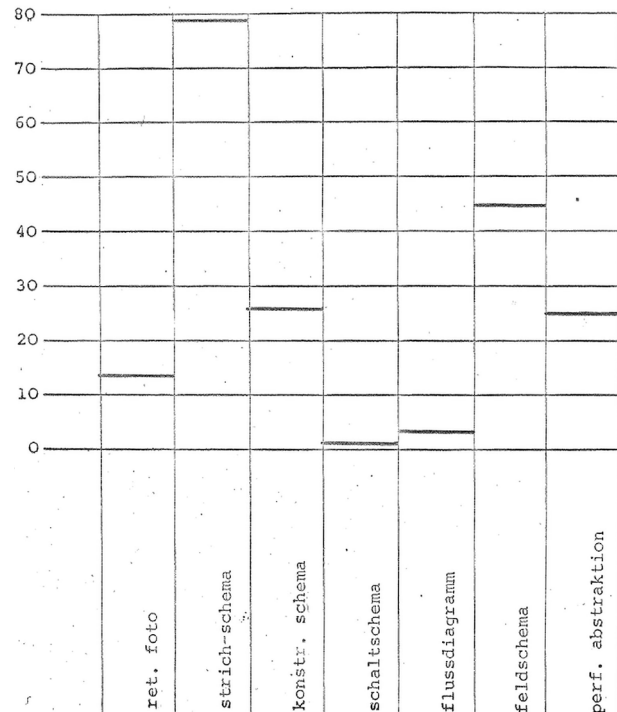
From this intersection of types of schematic representations and scientific disciplines, Anceschi derives findings in which the relationship between what needs to be represented and the graphic schematization language used becomes clear (fig. 2). For example, he writes the following regarding biology: “It is important to emphasize the high value of the category of line-based simplification in relation to science’s inherent tendency to describe the objects (organisms, cells, etc.) it studies. Secondly, the strong relevance of the mixed category of line-based simplification and constructive drawing stands out as a sign of the need to show how these objects are structured. The significant role of the mixed categories of line-based simplification and field schematics is tied to the necessity of depicting the forces, movements, fields, etc. associated with these objects” [Anceschi 1966, s. p., par. 1 *Biologie*].

The other fundamental part of the thesis is where the author adopts the point of view not of the viewer, but of the producer of the schematizations [8]. Anceschi essentially attempts to define the *Darstellungskonventionen* (representation conventions) enacted by the designer. He divides the manipulations into ‘necessary’ (related to projection methods and color choices) and ‘active’ (where

the producer directs the viewer’s attention to certain elements of the representation), the latter further classified into ‘comparative’ and ‘elliptical’ based on how emphasis is placed on the selected parts.

He finally links to these latter manipulations what he calls ‘additional signs’, applied later on another ‘level’ of the representation, a category significantly expanded in 1992. It is particularly in this phase of the thesis, especially in the section concerning perspective, that Anceschi most directly engages with the world of drawing in relation to the operational intentions of the graphic designer, to the point of nearly overlapping the figure of the designer with that of the draftsman.

Fig. 2. G. Anceschi, diagram illustrating the distribution of seven categories of schematic representation within the field of biology [Anceschi 1966]. Fondo Tomás Maldonado, Fondazione Giangiacomo Feltrinelli, Milano.



1981: The partial Italian translation of the thesis

As previously mentioned, in 1981 Anceschi published a partial Italian translation of his thesis, where a key element is the updated bibliography. Of particular note is the inclusion of J. Bertin's work [Bertin 1967], which represents one of the foundational attempts at an operational semiotics in the field of graphics, whose 'visual variables' have become an essential point of reference for any discussion on 'information design' [9]. However, the most significant theoretical element is the attention paid to the debate on iconicity between T. Maldonado [Maldonado 1974] and U. Eco [Eco 1975] [10], which a few years earlier had revealed a contrast between the conventionalism typical of Eco's Italian semiolinguistic approach and the logical-pragmatic perspective with which Maldonado explored the propositional value of iconic representation. In this reference by Anceschi, who seems, at least in terms of academic training, to side with Maldonado, there is a renewed intent to consider the object of his study "composed not only of normative and cultural codes and conventions, but also of the conceptual operations and technical procedures that contributed to its production" [Anceschi 1981, p. 5, translated by the author].

This is not a literal or didactic translation; many concepts are clarified and/or expanded. One example is the retitling of the two parts of the thesis as 'theory of schematic representation' and 'expository flow'. The title of the book in which the thesis appears *Progettazione visiva: convenzioni e procedimenti di rappresentazione* makes explicit the focus of the text and Anceschi's position, who by 1981 had been working as a graphic designer for over ten years.

1992: *L'oggetto della raffigurazione*

The book Anceschi published in 1992, entitled *L'oggetto della raffigurazione*, can be considered the culmination of his research trajectory.

The text is extensive, almost labyrinthine in its linguistic [11] and taxonomic definitions, and also quite diverse in content: it includes a previously unpublished first section, which constitutes the actual development of his thesis, as well as a series of reprinted illustrated essays by the author on related topics [12]. Here again, the work opens with an update on the various attempts that, following Moles' contributions, have furthered the taxonomic exploration of representation methods [13]. Particularly noteworthy is Anceschi's focus on the work of

Manfredo Massironi [Massironi 1982] [14]. The writings of both authors share much in terms of topic and intent: for instance, Massironi's classificatory attempt to organize types of drawing in relation to communicative function parallels Anceschi's taxonomic approach; moreover, Anceschi incorporates into his argument the concept of 'hypothetigraphy', coined by Massironi [15].

In *L'oggetto della raffigurazione*, Anceschi returns to the Ulm theme of the cognitive value of images, updating it with insights from the study of writing systems and graphic structures, especially those of Cardona [Cardona 1981]. He frames this as: "To think of drawing as a particular case, or rather as one of the poles of notation, that is, a graphic system consistent with the discipline of computer science and the anthropological theory of writing" [Anceschi 1992, p. 1, translated by the author].

In the same vein, the discourse on 'conditions and procedures of representation' is significantly expanded: the systematization of necessary and active manipulations is far more detailed and enriched with examples, ranging from the technique of collage as the limit of identifying an object of representation, to caricature as a tool of comparative manipulation. However, the main theoretical development lies in the domain of 'additional signs', which Anceschi explores in the chapter on the 'double level', tying it to Genette's paratextual theory [16] [Genette 1987], as a basis for a topological reflection on complex figurative texts. Having introduced this topological dimension, Anceschi focuses on the value of diagrams as 'places of knowledge' [Anceschi 1992, p. 91]. The diagrammatic and abstract nature of schemes, typically viewed as non-figurative, can in fact be 'enriched' by increasing their iconic component [17], or conversely, they can originate from within a figurative representation and be 'stripped down', de-figurativized, returning to a diagrammatic character. The latter case is exemplified by what he calls 'allegorical catachreses' [Anceschi 1992, p. 96], those representations typical of 'ancient schemes' in which the ladder, wheel, river, or tree were used as archetypal figurative devices to schematize complex concepts, structures, processes, or systems, essentially employed in the organization of knowledge [Anceschi 1992, p. 104].

This reflection leads to identifying the diagram as any operation in which the visual articulation of a graphic space attempts to 'fix' the object of representation, ultimately linking the materialization of knowledge to a 'topical device' [Anceschi 1992, p. 103].

This assumption is a direct outcome of Cardona's theorization on graphic systems [Cardona 1981], which entails the inclusion of representation within the world of

writing –and, consequently, the inclusion of writing within the world of image– as part of the revision of the phono-logocentric paradigm. In Italy, this revision had been especially championed in graphic design discourse by Giovanni Lussu [Lussu 1991], and later by Luciano Perondi with his concept of ‘sinsemia’ [Perondi 2012].

The crucial and concluding moment comes when Anceschi introduces the distinction between *Abbildung* (representation) and *Gestaltung* (configuration): “In a certain sense, the adoption or abandonment of iconicity appears to entail a shift in operational status – from representation [...] to configuration [...]” [Anceschi 1992, p. 111, translated by the author].

However, he cautions that every representation always contains some degree of configuration, suggesting that drawing a clear line between the two is, at the very least, extremely complex [18]. Ultimately, Anceschi affirms the fundamental cognitive value of schematic representations, while distinguishing it from the configurative value they acquire within the design process, value that derives from the operational status in which they are embedded.

Conclusions

From this reconstruction of Anceschi’s research, at least three conclusions can be drawn that are worth reintroducing into the current disciplinary and epistemological debate, conclusions which, as mentioned at the outset, concern method, subject matter, and approach.

The first point to highlight is the importance of the taxonomic and classificatory process in Anceschi’s concept of research, clearly shaped by the Ulm environment. In addition to Moles’s work on levels of iconicity [Moles 1972a], Anceschi seems to draw on *Theorie des Objets* [Moles 1972b], as well as on Moles’s earlier attempt to define structural and functional complexity [Moles 1962]. The necessity of cataloguing objects –the objects of representation– according to Moles’s method is already evident in the very title Anceschi chose for his 1992 text [19].

The methodology of typological classification finds a particularly fruitful dialogue with representation, both in terms of representational methods used for the classification of knowledge –as historically exemplified by Linnaeus [Linnaeus 1753; Linnaeus 1758]– and, as is the case here, in the classification of the representational methods themselves. In this latter domain, taxonomy plays a

fundamental role in bridging theory and practice. This is especially true when the semiotic-pragmatic approach – focused on the user experience [Morris 1938]– is linked with the technical-design perspective centered on the producer’s operational viewpoint.

The second point concerns the potential demonstrated by the encounter between drawing and graphic design within the domain of scientific representation. One of the earliest structured research attempts in this direction in Italy was the monographic issue of *Grafica* magazine in 1990, dedicated to the image of scientific knowledge, introduced by a text by Massironi himself [Massironi 1990]. This topic, particularly regarding the idea of seeing the invisible, has continued to be the subject of debate [Zoppè 2014; Cicalò 2020; Menchetelli 2022] [20], and one interesting case is the SciVis project [21]. A significant part of any discipline that requires the representation of its objects of study lies in the collaboration between taxonomic analysis, representational methods, and design-based graphic choices. Too often, especially in the STEM fields, this responsibility is left solely to scientists: “a scientist must engage with the visualization and production of graphs and presentations, which play a significant role in various stages of the scientific writing and communication process” [Anzilotti, Napolitani 2014, p. 43]. A recent and notable example of this interdisciplinary potential can be found in biosemiotics, particularly in the analysis of tree diagrams in relation to microbiome studies [Burgio, Ralfaetà 2024], and, from a very different perspective, in the field of botanical illustration [Bruni 2014]. Although some space for study already exists, the opportunities offered by areas such as educational publishing [22], and, as we saw with Anceschi, popular scientific publishing, deserve greater theoretical and practical attention.

The final consideration concerns the approach Anceschi inherited from the HfG Ulm, and it reopens the central question from which we began: what role does drawing play in design when it is understood as a graphic language? If Anceschi’s analysis of schematic representations has helped clarify this issue, it has certainly done so by distinguishing the cognitive value of representing from the project-based value of configuring. This is a distinctly epistemological point that deserves renewed attention in the contemporary disciplinary debate, as it highlights how the value of drawing shifts depending on the purpose and the disciplinary context in which it operates. In design, its role is undeniably operational.

Notes

[1] For further reading, see the series *Grafica*, edited by Enrico Cicalò, and the monographic issue *Graphichs of the Img Journal*, no. 2, 2020.

[2] Every thesis submitted at the HfG Ulm was divided into a practical and a theoretical part. In this essay, references to Anceschi's thesis concern only the theoretical, research and analysis component. For an overview of students and theses at Ulm, see <<https://hfgulmarchiv.de/personen/>> (accessed 13 February 2025).

[3] The thesis was written in 1966 but officially discussed in 1967. The year of writing was chosen as the reference point, in line with the other texts by Anceschi analyzed, where the author himself maintains this preference.

[4] For further reading, see the monographic issue on *Design Drawing*, in the scientific journal *Disegno*, n. 11, 2022.

[5] For a detailed account of the semiotic approach at Ulm, in relation to that of Charles W. Morris at the New Bauhaus in Chicago, see Mattozzi [Mattozzi 2024].

[6] Perhaps for this reason, Anceschi's work is increasingly cited in image analysis [Menchetelli, 2024] and semiotic discourse [Manchia, Zingale 2024], as well as in contributions on visual culture. The same attention does not appear in design literature. A recent exception is the use of Anceschi's reflections in discussions about designer door handles [Bagnato, Maiorano 2022].

[7] It is worth noting that, later, Anceschi [Anceschi 1992] writes that the illustrations are 256, likely a typographical error.

[8] Anceschi explores the graphic languages of scientific representation by identifying illustration as a 'staging' conducted by the 'director', a figure he alternately calls designer, draftsman, schematizer, graphic designer, or illustrator.

[9] In addition to Bertin, Anceschi surveys several texts relevant for collecting paradigmatic cases, such as A. Lockwood [Lockwood 1969], E. A. Hamilton [Hamilton 1970], W. Herdeg [Herdeg 1974a; Herdeg 1974b].

[10] For contributions that addressed and updated this debate, see O. Calabrese [Calabrese 1985], U. Eco [Eco 1997], T. Maldonado [Maldonado 1992], G. Anceschi [Anceschi 2009].

[11] Anceschi frequently uses rhetorical or linguistic devices to condense complex reflections, often as wordplays, such as '*rilevativo/rivelativo*', the opposition between '*rappresentazione/rappresentanza*', or the distinction between '*fenomenologico-descrittivo*' and '*ontologico-funzionale*' drawing, as well as the notion of '*catacresi allegoriche*'.

[12] This work by Anceschi not only significantly expands the ideas initiated at Ulm, but also cites and reprints a series of his essays written throughout the 1980s. These help reconstruct the intersection of themes

and insights that culminate in the unpublished section of the book. Among others, Anceschi wrote for *Grafica* and *LineaGrafica*, key journals in the discourse on graphic design at the time; for *Il Piccolo Hans*, a journal of psychology and psychoanalysis; collaborated with *Scienza 84*, a major outlet for Italian science communication in that period, and also contributed to *Quaderni Di*, a journal on drawing.

[13] References are made in particular to S. H. Eshes [Eshes 1977] as well as the empirical communication studies by D. Zillmann [Zillmann 1965] and R. Lindekens [Lindekens 1976].

[14] During those years, the two collaborated in the journal *Grafica. Rivista di Teoria, Storia e Metodologia*, where Massironi wrote three articles on representation: the first on the concept of 'context' [Massironi 1986], the second on writing [Massironi 1988], and the third on the representation of the unseen in science [Massironi 1990]. Anceschi was the editor of the journal from 1985 to 1989 [Lancia 2023].

[15] *Ipotetigrafia* refers to "that graphic product which contributes to visually shaping hypotheses formulated to explain the behavior or functioning of natural conditions, intuitively or experimentally observed, and which it serves to model" [Massironi 1982, p. 126, translated by the author].

[16] This concept derives from structuralist literary semiotics, referring to the value of graphic or textual elements that surround a text, both narratologically and commercially.

[17] For an update on this topic in relation to infographics, see V. Burgio [Burgio 2021].

[18] The author seems to attribute to graphic design a particular quality that is less apparent in product design, a quality resembling the concept of 'surface transparency' introduced by Omar Calabrese in his analysis of graphic texts [Calabrese 1981]. Calabrese emphasizes the different levels of detachment between the 'model' and the final artifact in the two design fields. On the complex and not merely terminological distinction between '*figurare*' and '*configurare*', see R. Riccini [Riccini 2022].

[19] A similar path, though with a different approach, was attempted by Renato De Fusco in *Semiotica per il design* [De Fusco 2005].

[20] See the issue *Scrittura e immagini nel dominio della scienza* of *Progetto Grafico*, n. 25, 2014. For an international perspective, see among others G. R. Bertoline [Bertoline 1998], K. Suzuki [Suzuki 2002], and W. J. T. Mitchell [Mitchell 2015].

[21] For further information, see <<https://www.scivis.it/>> (accessed 12 February 2025).

[22] For further reading on graphic design for educational publishing, see *Progetto Grafico*, n. 20, 2010.

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Drawing as a Language in the Design Process: a Cognitive Bridge Between Thinking and Representation

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Abstract

The design process is inherently representational; drawing and similar tools reduce cognitive load and enable the generation, recording and reuse of ideas. This process supports the internal dialogue that fosters innovative solutions. Representations have both external forms, such as drawing and modelling, and internal forms, such as imagination and thought, while language is a crucial tool that guides the processes of thinking and doing. While verbal expressions convey abstract thoughts and provide insight into the problem, visual representations concretise abstract ideas. This study analyses the transitions between verbal and visual representational languages, examining how ideas are transformed into representations, what comes to the fore, and what is left behind in this process. The ways designers structure ideas, the gaps that occur in the transitions between representational languages, and the ways they cope with these gaps are revealed through an examination conducted through drawing and physical modelling. The study positions drawing as a bridge between languages, moving it beyond being a mere representational tool in the design process, and focuses on the role of drawing in framing, organising and translating design ideas, making it an indispensable component of the discovery process.

Keywords: design process, representations, verbal-visual, drawing, inter-language.

Introduction

Design is a complex process in which the designer expresses his thoughts, dreams and experiences in a concrete world. Representations play a critical role in this process, regardless of their form. For design to take shape, ideas must be externalised. Images designed in a person's mind cannot turn into a design unless they are externalised to a physical space or environment; in the context of design, this refers to the place where the design is realised. It is crucial to transfer ideas to an external environment quickly. There are several reasons for this. These are: especially in the early stages of design, ideas may be straightforward; since the mind works in a constant state of flux, the designer's ideas need to be transferred to external memory so that they are not lost; ideas may be vague and are tried to be clarified

by transferring them to an external environment; the designer makes representations to make sense of his ideas or dreams or to be able to transform them into something different, to open his ideas to new possibilities. Schön defined the design process: "as a reflective conversation with the materials of a design situation" [Schön 1992, p. 133]. According to Harrison and Minneman [1996], the materials, objects or external design representations change the dynamics of idea generation and development as part of design communication [Brereton 2004]. Not all designers' objects are of a single type and can take various forms. They differ in terms of purpose, consistency and level of abstraction [Grignon 2000]. They can give a holistic and detailed expression of the designed 'thing', or

they can be partial; they can only draw attention to selected elements [Goldschmidt 2004; Herbert 1988]. In this context, representations of design refer to the various media and methods used to transfer design from the mental to the physical.

During the design process, especially during design education, students use verbal representations to convey and organise their thoughts and visual representations such as diagrams, drawings, mock-ups and models to explain these ideas. Therefore, it is said that design includes both verbal and visual expressions. The design process necessarily translates meanings between these two languages [Tomes et al. 1998].

Understanding or investigating how ideas are created, matured, evaluated, developed, modified or sustained in the context of representations is necessary. Drawing enables designers to engage in a reflective dialogue with themselves and other representations, like Schön's [Schön 1983] concept of 'reflection in action', where visual representation becomes an active site of knowledge production rather than mere documentation. This study examines drawing as an interlanguage that mediates between verbal thought, visualisation and physical modelling and positions it as an active agent in design cognition.

Integration of visual and verbal representational languages

Architects use language extensively throughout the design process [Avidan, Goldschmidt 2013]. In the design process, the integration of verbal and visual representations creates a stronger narrative [Barelkowski 2010] in designers' practical expression of their dreams to themselves and others. Verbal representations illuminate the 'how' of designs, encouraging future actions, problems and possibilities for solutions; visual representations, on the other hand, enable ideas to gain a physical dimension. Transitions between verbal and visual representations expand designers' cognitive flexibility [Dong 2007; Özçam 2022].

However, the interaction between verbal and visual languages is essential for transforming and bringing ideas to a conclusion. Internal ideas and the final representation can often differ from the original image. When this idea starts to be expressed in verbal and visual representation languages, a transition, change, or translation process begins [Tsow, Beamer 1987; Rykwert 1998]. In such cases, there

is a lack of understanding of how designers think and act (creating representations such as drawings and models) to explore possibilities to move forward [Cash et al. 2023].

The most crucial relationship between verbal and visual languages is that they simultaneously support each other and work to strengthen expression. As Pellegrino [1995] stated, there are forms of relationship between visual form and existential form (imaginary and representation), such as difference and similarity, closeness and distance, importance and silence (we can say explicit or implicit) [Cikis, Ek 2010]. In this interaction between verbal and visual languages, drawing serves as a bridge that provides an iterative back-and-forth movement between internalisation and externalisation, serving as both a means of production and interpretation.

Inter-language relationships in the design process: verbal expression –drawing– model relationship

In the design process, there is a complex but complementary relationship between verbal expression, which allows designers to explain their ideas with words and concepts, and visualisation, which enables the ideas to become concrete [Woo 2021]. Design is a process that inherently involves both visual and verbal expressions and the translation processes between these languages; in other words, design is a process that transforms one set of representational languages into another [Goel 1995]. In this process, it is thought that there are creative gaps in the transitions between languages [Bolt 2004].

In the design process, verbal language has functions such as shaping, organising thoughts, and allowing the designers to share their ideas with themselves and others [Lee et al. 2019]. Therefore, they are tools to reach the designer's mind. Verbal expressions form the basis of the abstract ideas' designers want to convey. The interaction between verbal and visual languages in the design process creates a cognitive bridge [Fan et al. 2023]. Therefore, the design process involves the serial production of a series of representations until a 'satisfactory' end is reached [Goldschmidt 2004]. There is an iterative movement between thinking (verbalisation), drawing, and physical models. This movement is a dynamic back-and-forth loop of representational changes. The relationship between verbalisation –Drawing– physical model is reflective and contains transitional relations (fig. 1). Drawing is emphasised in these relations

as both a reflector of thoughts and a flexible tool that supports and interprets production.

A design process involves creating an image of an imagined object or artefact through expressions and representations. Since each representation may contain a seed of the final product, it carries the meaning of something that develops upon them but is not yet fully present in the intended state [Binder et al. 2011]. Designers objectify and manipulate each seed by producing various representations of the design. The main work of the design process is to transform these representations until the final product is obtained through these expressions.

Designers use various visual languages, including narratives, graphics, drawings, and 3D objects, to facilitate creative discoveries [Porter 2004]. Understanding the relationships between these languages resembles a translation process, as transferring architectural representations is not always straightforward and may not align perfectly with the primary source [Rodeia 2019]. Designers' choice of language depends on their focus and desired effects, with architects primarily using drawings and models in the early design stages [Grignon 2000].

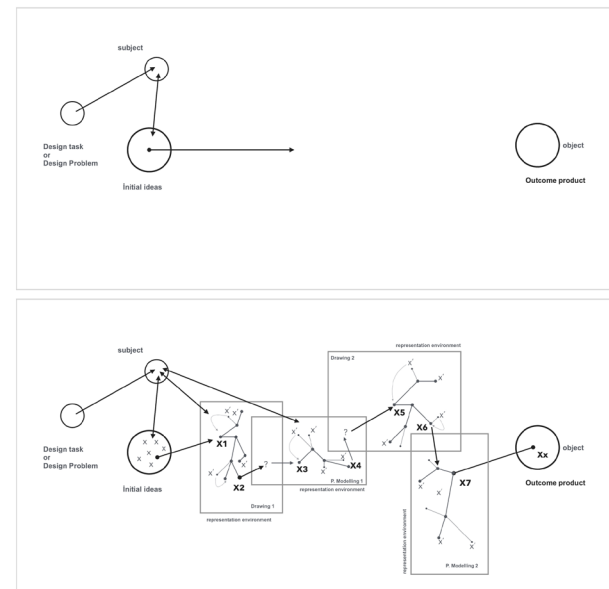
Research emphasises the importance of visual thinking, mainly through drawing and visual tools, in solving design problems [Arnheim 1969; McKim 1997; Goldschmidt 1991; Goel 1995]. Drawing is vital across disciplines [Krippendorff 2005; Schön, Wiggins 1992] and facilitates reflective conversations and collaboration [Goldschmidt 1991; Van der Lugt 2005]. It enables designers to experiment and reinterpret their work [Schön, Wiggins 1992; Oxman 1997]. Models like 'seeing as' and 'seeing that' [Goldschmidt 1994] and the 'imagine –see– draw' cycle [McKim 1997] illustrate this process. Drawing serves as an effective tool to connect the past and the future, helping with problem-solving and expressing ideas.

Drawing is a crucial tool that reflects designers' intellectual and physical experiences and creative processes [Magalhães 2014]. Like drawings, models range in their interpretability –from rough drafts to production-ready forms [Hornecker 2007]. While it is commonly thought that models, including digital ones, primarily 'communicate' design ideas rather than 'produce' them [Starkey 2007; Evans 1986], modern design studios showcase models that can be as fluid and changeable as sketches. Design practice integrates various physical and digital materials, organising representations through imagination and realisation. Producing, transforming and evaluating representations [Visser 2010] is carried

out to emphasise different aspects of the design by switching between various levels of abstraction, different environments, scales and materials to expand the design space and narrow the concepts [Binder et al. 2011].

The objects of design (drawing and model) not only concretise the design but also shape it by activating internal processes. Drawing is a field where mental processes and imagination become visible and gain meaning, in addition to being a representation of design. For Song [2011], drawings are a tool through which designers express their imagination, especially during problem structuring and solving in the early stages of the design process. Therefore, within the scope of this study, drawing is considered to assume the role of a bridge between design thinking and the physical model. While drawing allows the designer to concretise their ideas on the one hand, it also provides a basis for transforming these ideas into a physical form on the other. Drawing is an intermediate form between abstract thoughts and concrete implementation. However, this gap also brings difficulties and opportunities for designers when

Fig. 1. Creation of representations, decisions, and transitions until a satisfactory conclusion is achieved in the design process.



transitioning between drawing and modelling. While drawing is the first intellectual step in the design process, a model is a physical representation of the design. While drawing provides a tool for concretising abstract ideas, a model shows how these ideas will come to life in the real world. Drawing also serves as an active site of meaning-making, like a linguistic translation process between verbal and visual cognition. Drawing acts as a visualisation tool and a linguistic interpreter, allowing designers to reframe and develop the ideas they want to build. Students' iterative construction through drawing suggests that it functions as a 'meta-language' – a flexible, evolving system through which ideas are translated, questioned, and transformed.

Transitions between verbal expression, drawing and physical model in the design process

Design begins with an idea [Gonçalves, Cash 2021]. Verbal language helps clarify the designer's thoughts, addressing ambiguities and detailing concepts. Studies highlight the impact of verbal expression on visual representation [Avidan, Goldschmidt 2013; Cikis, Ek 2010]. A design task study using the think-aloud method captured designers' initial thoughts to explore their transition between verbal and visual expressions, particularly the role of drawing as a bridge in this process.

The research focused on developing ideas through iterative cycles of drawing and modelling, assessing their progression or decline. A field study involving six architecture students included a two-stage design task in which participants verbally expressed their thoughts and a written report task at the end of the process. These sessions were recorded, documented, and analysed by correlating drawing and physical modelling actions with verbal expressions. Although the sample size is limited, it allows for a unique qualitative analysis of individual design processes, and insights into cognitive shifts and inter-representational movements in design thinking provide a foundation for future studies.

Design Task Phase 1: "Something Flowing from a Crack in the Mountain".

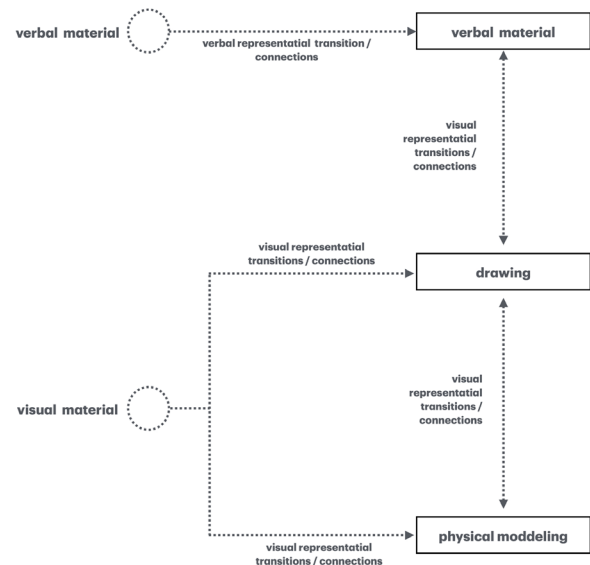
Design Task Phase 2: "What if Something Flowing from a Crack in the Mountain Becomes an Art Gallery?"

Task for stage 3: Students were asked to prepare a report by considering the entire process and reviewing the drawings and models they had made.

Schön's [Schön 1983] 'reflective practitioner' paradigm is vital for understanding and examining the design process. This paradigm has two important reflection concepts. One of these is 'Reflection in action', which aims to understand the relationship and cognitive activities between the thoughts and actions of designers throughout the process. The other is 'Reflection on action', which reconstructs the designer's thought processes on that action after the action is completed. Cowan [2006] adds the concept of 'Reflection for action', which determines future intentions, as a third process. Within the scope of the field study, students explained their initial ideas before the action (reflection for action). Then, they explained how they drew and modelled with a loud speech protocol (reflection in action) accompanied by a camera recording. Finally, at the end of the process, they wrote a report explaining what they thought and did (reflection on action).

To understand and capture the complex transitions in the design process, Paivio's [1986] dual coding theory was expanded into a tripartite framework of verbal expression –drawin– physical modelling (fig. 2).

Fig. 2. Verbal –Drawing– Model transition and connections relationship diagram.



Gonçalves and Cash [Cash 2021] conducted an analysis study based on the binary coding system to reveal the connections between ideas. Eight archetypes of connections between ideas were used in this study, and these eight archetypes are Shaping Ideas, where early ideas affect later idea formation with a few backlinks; Incremental Ideas, which are closely tied to the previous concept and progress from one idea to another with minor changes; Tangent Ideas, which lack connections to previous and future ideas, ideas with many connections, connecting multiple front and backlinks; Bridging Ideas, which have three different variations: Balanced, where front and backlinks are similar; Foresight, which has many front links; Hindsight, which has many backlinks; Combinatorial Ideas, which connect many previous ideas and create convergence before creating more ideas; and ideas that emerge late in the session and produce a final concept based on the combination of previous ideas with many backlinks (fig. 3).

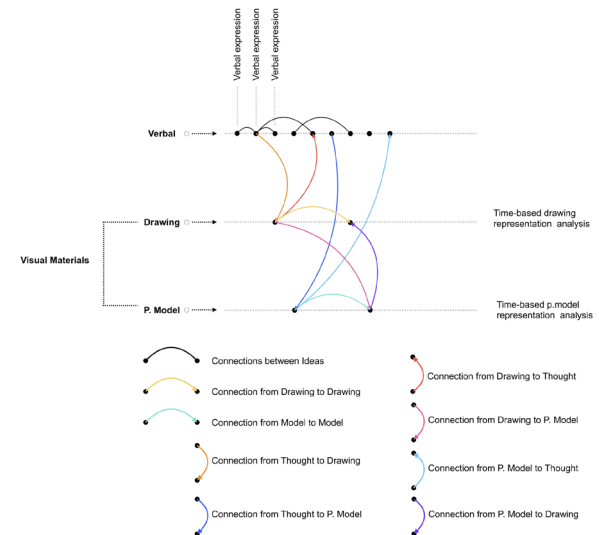
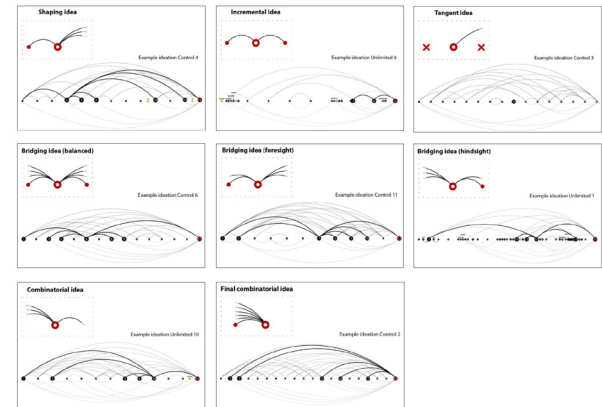
Gonçalves and Cash's [Cash 2021] qualitative connection cluster analysis was considered a triple system of verbal – drawing and model within the scope of this study. The students' routes were extracted with the nodes and bridges in the verbal-verbal transitions between the ideas themselves in the verbal-visual transitions between verbal-drawing and verbal-physical model, as well as visual-visual transitions between drawing and physical model.

The students' protocols were organised into sentences using a temporal system and linked to the verbal sentences where drawing and modelling began. The study examined the transitions between verbal expressions, drawings, and models through Linkography's forward and backward connections. By framing the connections of how ideas are created, connected, evaluated, judged and synthesised [Gonçalves, Cash 2021], verbal-verbal connections were represented by associating them with drawing and model representation connections. Within the scope of the study, how designers switch between verbal-visual and visual-visual languages is discussed, and what role drawing plays in this process is discussed. The formation, development, and evaluation of ideas in the iterative cycle between thinking – drawing – and physical models were examined about the progress, changes, and transitions in representations.

Based on the theoretical synthesis of Paivios [1986] dual coding theory and the Gonçalves and Cash's [Gonçalves, Cash 2021] typology of idea connections, this study proposes a new analytical model to examine transitions in student design cognition. The model extends the binary

Fig. 3. Eight archetypes of ideational connections [Gonçalves, Cash 2021, p. 12].

Fig. 4. Cognitive mapping of reflective transitions in design: integrating binary coding theory and connection typologies through forms of representation.



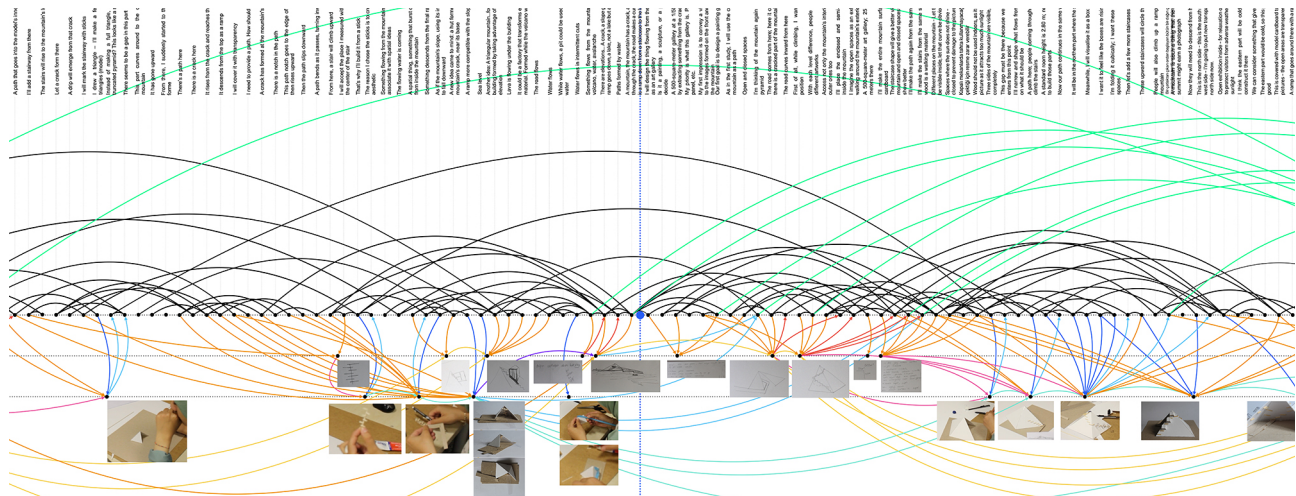
structure into a tripartite framework composed of verbal expression, drawing, and physical modelling. Within this framework, verbal-verbal, verbal-visual, and visual-visual transitions were mapped using Linkography-inspired representations of forward and backward connections. This tripartite model allows the mapping of cognitive movements between these three forms of expression (fig. 4). Drawing is not only a visual representation but is also seen as an interpretive or communicative tool that provides transitions and translations between verbal thought and physical expression.

Evaluation

Subject 1 began the drawing process after generating ideas, creating a drawing and taking notes with each selection. Subject 1 initial organic mountain evolved from a triangular to a square structure. The second triangular mountain and road significantly influenced the students' concept and model production, resulting in a drawing with more nodes and foresight bridging. When considering how to create something (stairs), the student quickly turned to drawing and produced a model based on that. After completing the first stage, subject 1 drew

the model and adapted his second stage drawing to fit the task. It is seen that the student used the students' drawings mainly before starting to produce the model by developing and maturing the students' ideas and reaching a decision with them. Subject 1 used drawings to refine uncertainties before transitioning to the model. When the entire model process was over, the student used it as a second language to describe the gaps his existing model could not describe (transparent spaces facing south, the interior space being spacious, etc.) or, in other words, expressions (fig. 5). Subject 2 quickly translated his initial ideas into a drawing, which guided the subject's modelling process. As the subject's concepts evolved, he made detailed decisions, such as placing a crack in the design. At the end of modelling, the subject created additional drawings, including top-view perspectives, to capture ideas not fully conveyed in the subject's initial perspective drawings. While colouring to enhance the subject's work, the subject experienced an A!Ha! moment, leading to a new concept (Flowing image) that clarified the subject's ideas. In the next stage, the subject created drawings to explore the model's interior and spaces (open, semi-open, and closed), introducing the axis concept. The subject concluded by reviewing and emphasising his drawings (fig. 6).

Fig. 5. Analysis of subject 1 related to verbal-drawing-physical model transitions.



Subject 3 did not have his first ideas in mind at first. However, the only idea that came to the subject's mind, "there may be a crack in the cave depending on the size of the mountain", was first realised with a digital drawing. Subject 3 then reproduced the same drawing by hand. This triggered more thinking. Subject 3 wanted to show the circular form in the subject's first drawing in 3 dimensions. However, with the physical model materials the subject added later, he had a 3-dimensional production that moved in a different direction. Since the student could not make time, the subject continued with the student's physical model to the second stage. New ideas emerged while creating the model, and the student supported these new ideas with a few detailed drawings at the end of the process. We can see that this drawing formed a balanced bridge node between the thought and the model (fig. 7).

Subject 4, unlike the other subjects, started by trying to express his first ideas with a model. However, since the modelling process was long, the student drew to express the vague ideas that came to mind (for the vague image of a 'flowing thing' rather than a mountain). The student first expressed this with a drawing by seeing a 'new thing' in the student's physical model (mountain topography) and focused on the student's ideas. Then, the subject shaped his model accordingly. When a new idea (mountain topography) came to

mind during the process, the subject expressed it by drawing. However, the subject continued by making choices in the student's drawings ('I will continue with this for now' (field notes, Subject 4). In the second stage, the student continued the subject's ideas with the model, but it was seen that he drew to make decisions about vague 'spaces' such as a 'flowing thing'. When the student's drawings were examined, it was seen in the subject's first ideas: A mountain with a steep slope, a moving flowing thing gushing out of rectangles. The linguistic equivalents of these expressions can be read in his drawing, but it is also seen that the subject has added other small mountain additions to his drawing. In addition, although the statement "mountains are not important to me", what flows is more important; it is seen that the subject thinks about the mountain form the most in his drawings (fig. 8).

Subject 5 starts the study by taking notes and drawing. It is seen that the student adds ideas to the same drawing by drawing them in his drawings. It is possible to read a similar transfer of the subject's first ideational expressions through the language of drawing. In addition, the student records and thinks about the subject's research by drawing and taking notes. There are variations regarding cracks in the subject's first drawing, and in the second drawing, the students decide on the idea that 'the crack is an opening

Fig. 6. Analysis of Subject 2 related to verbal-drawing-physicality model transitions.

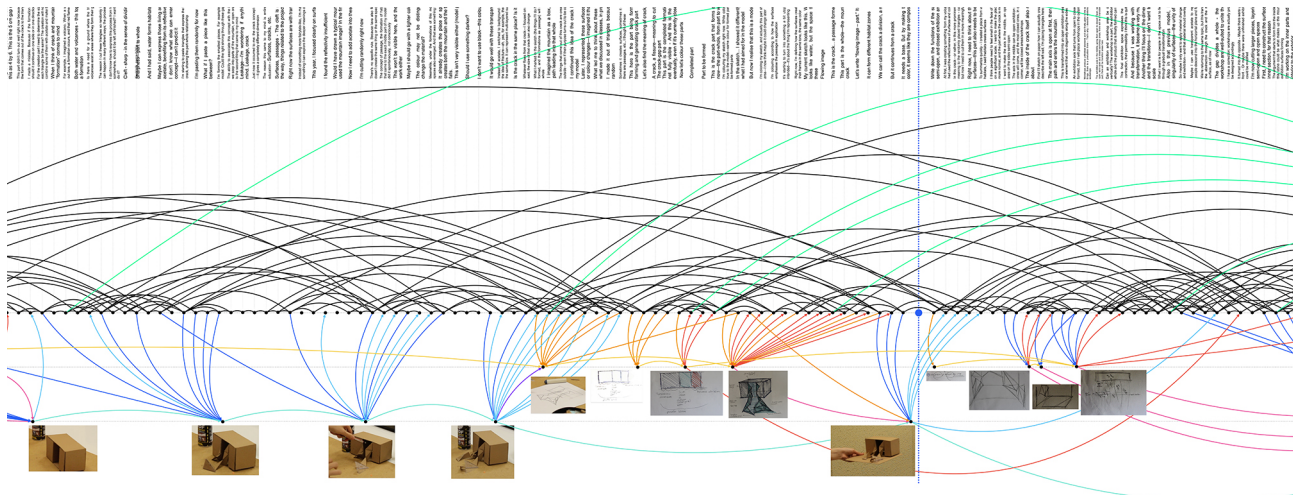
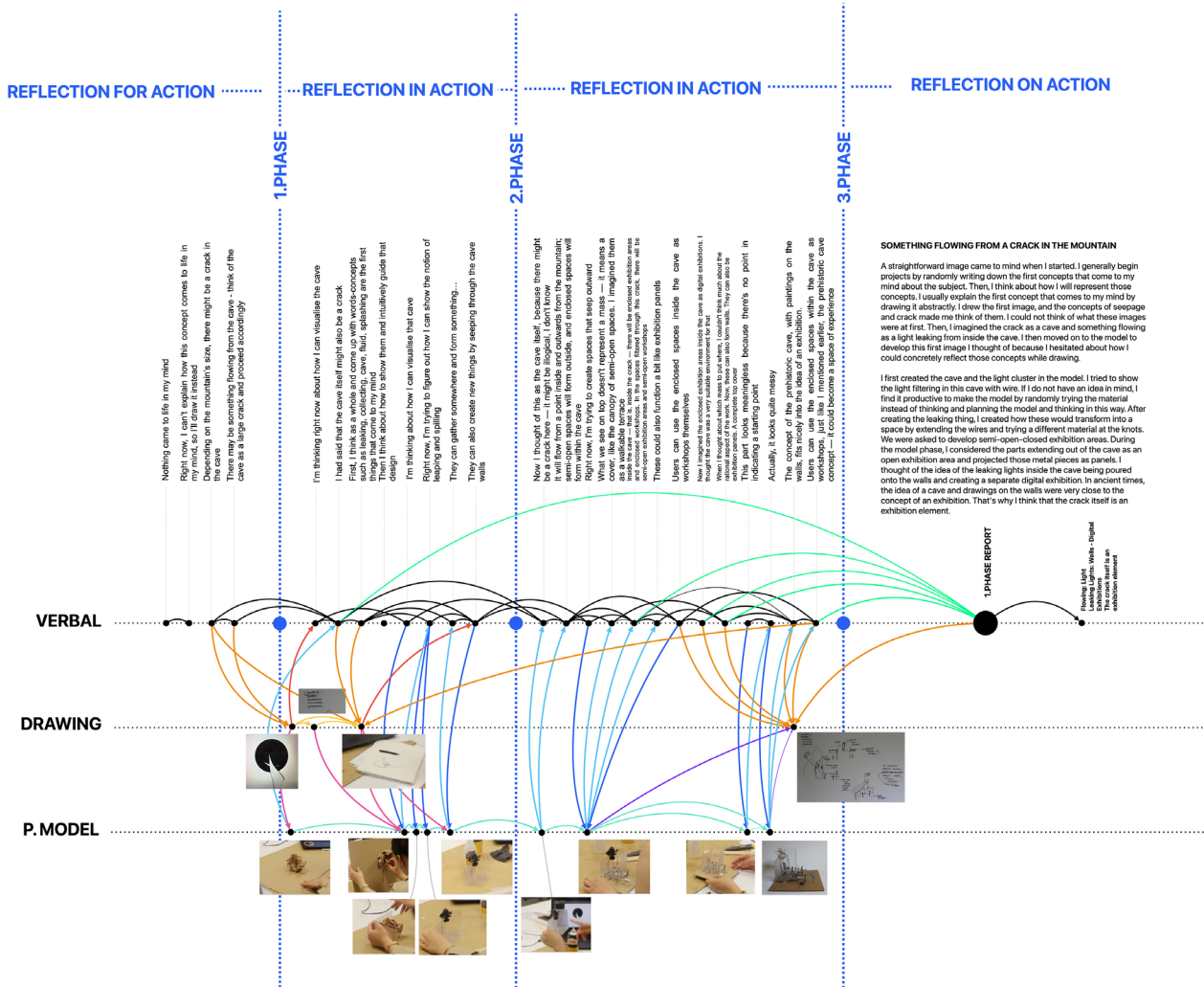


Fig. 7: Analysis of Subject 3 related to verbal-drawing-physical model transitions.



where a paraglider is made.' However, although there are more realistic mountain and crack expressions with organic lines, the student has transformed this organic drawing language into a model language in the form of a rectangular prism in the model. At the end of the model process, the subject added textural elements such as rope to his drawing and clarified the subject's concepts in the drawing. At some point, a new idea ('cave') came to the subject's mind. Although he expressed it with a model, he did not reflect it in the drawing. In the second stage, subject 5 had a similar solution to the first. The subject used the drawing paper to take more notes and made diagrammatic drawings while solving the locations of the spaces (semi-open spaces inside the open space, open spaces outside, etc.). In addition, Subject 5's gaining knowledge and inspiration through the research process and expressing them as a visual language with drawing and writing is an effort to show the information he acquired in another language (fig. 9). Subject 6 tried to deepen the subject's first ideas and between them by using drawing paper to take notes and draw. In the drawings, the student attempted to produce

a physical model consisting of a crack and surfaces that should be at a point but with an empty interior, even if the subject used organic form in solid forms. In the first stage, the student used drawing and taking notes to brainstorm for a long time. It is seen that each drawing of the student bridges. However, the drawing the subject drew towards the end of the first stage is an image that appeared in the subject's mind during the model making. This image has many connections, and he reproduced it as a drawing by giving it meaning from the model. At the end of the process, the student drew a section to complete the parts where the model language was inadequate (fig. 10).

Conclusions: Drawing As A(N) – (Inter)Language

This study shows that drawing has a vital place in interlingual translation. Acting as a balancing tool between languages, drawing exists in a space of density and ambiguity, revealing focal points in the chaos of ideas. In the chaos of ideas, it shows the focal points in the mind. On the other hand,

Fig. 8. Analysis of subject 4 related to verb verbal-drawing-physical transitions.

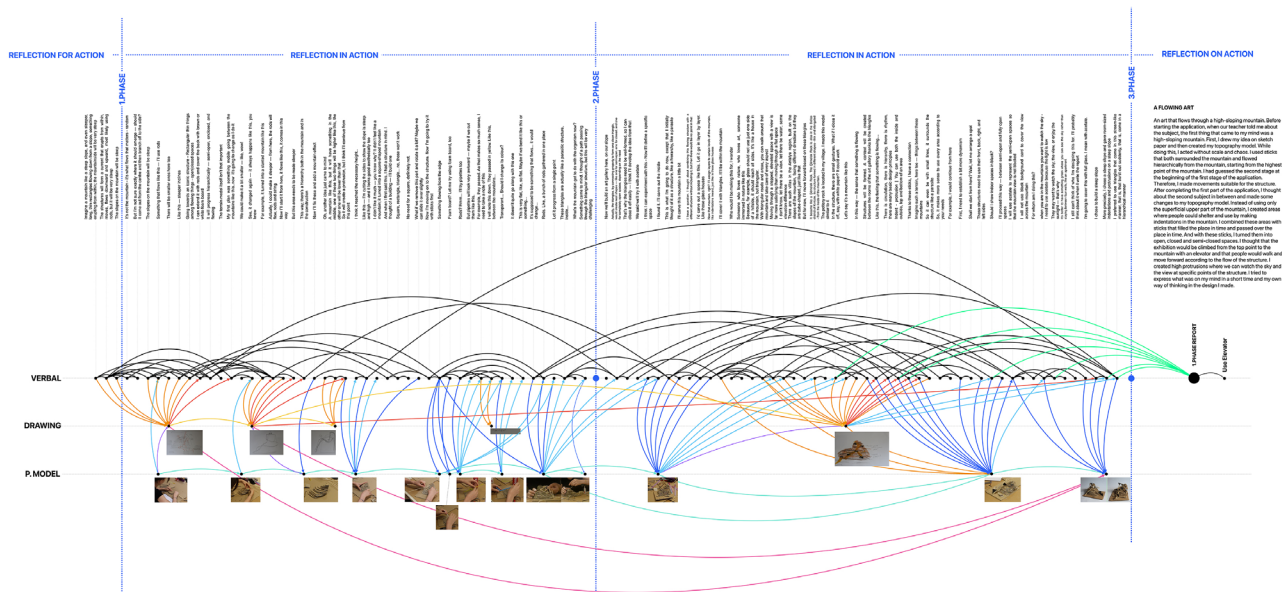
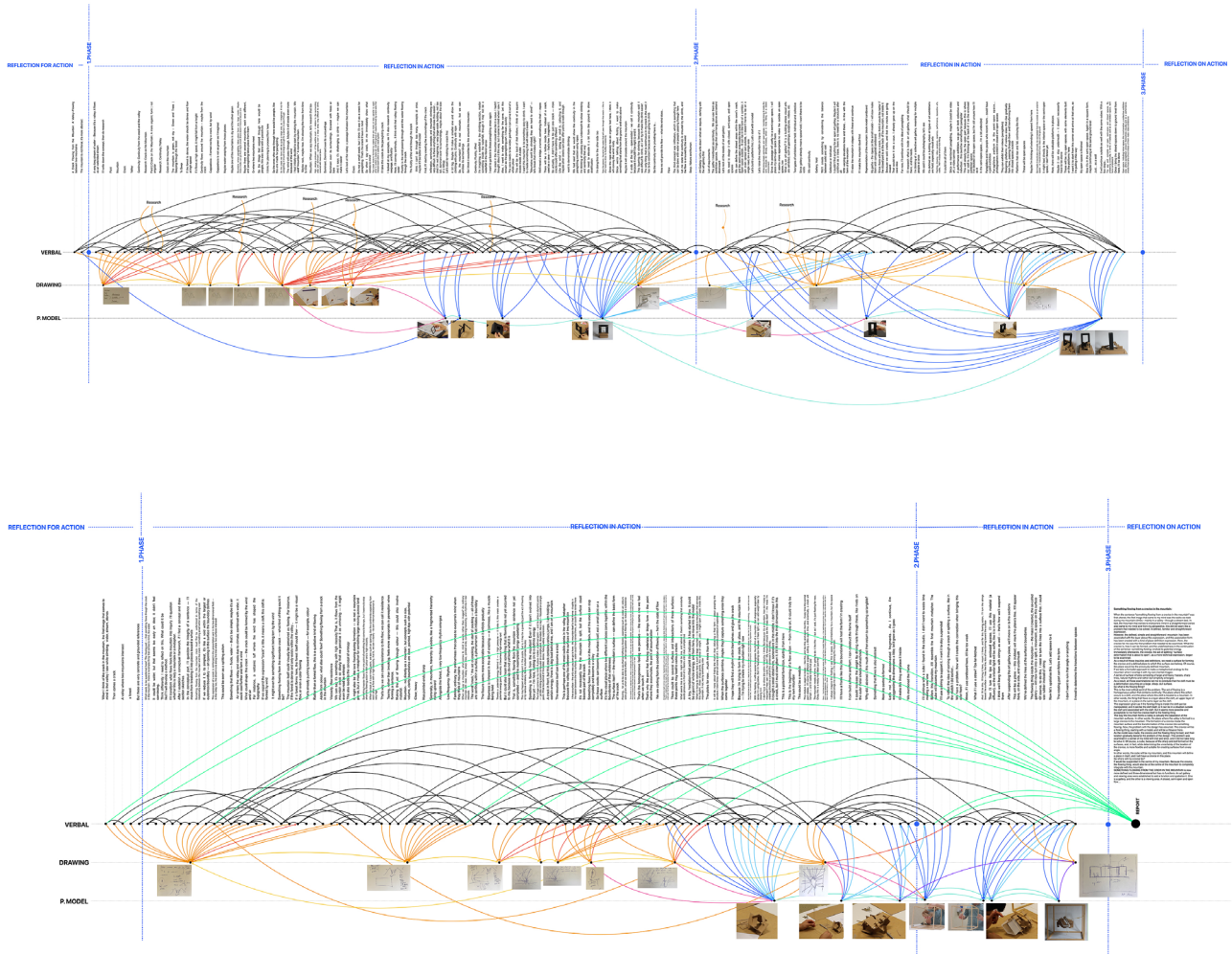


Fig. 9. Analysis of Subject 5 related to verbal-drawing-physical model transitions.

Fig. 10. Subject 6's analysis of verbal-drawing-physical model transitions.



it interprets what the model cannot say. In this reflective dialogue process, embodied expressions participate in reinterpretation, as various researchers noted in the previous sections. This is a reinterpretation both by the designer and others. Just like Umberto Eco's [1992] concept of 'Opera Aperta' (a text or a work does not have a fixed meaning; the reader or the viewer reproduces it), drawings can be reinterpreted and reproduced like languages (just like each student interprets the thing flowing from the crack in the mountain differently, or if we break it down into its building blocks, they interpret the 'mountain' or the 'crack' differently). While language produces different meanings with the words in its context, drawing also produces meaning with its visual components and participates in a dynamic meaning-production process with both the designer and the viewer. This study highlights the role of nodal points in these transitions. These transitions show how designers generate new meanings as they shift between different representational languages. Drawing is also a cognitive activity that activates thought processes and bridges internal and

external representations. Modelling tests these ideas or two-dimensional linear expressions in a more concrete and physical environment. In this way, it can be said that the gaps between ideas or the gaps formed during the transition to the model are integrated by being supported by drawings. In the future, a more in-depth investigation of these transitions, how designers manage these transitions, the dynamics of the process and how drawing initiates a translation process will help develop new strategies to understand designers' creative processes and the importance of emphasising the reflectivity of drawing in design education. This study positions drawing as more than a representational tool; it is an active interpretive language that shapes design cognition. Drawing can be seen as an open system that allows for reinterpretation and transformation, like a language (text-artwork), where meaning is produced through interaction. This research will support future studies on how the language of drawing can shape new pedagogical strategies in architectural education by highlighting nuanced cognitive transitions across the verbal, visual, and physical domains.

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History

The Graphic Language as a Hybridization of Art, Thought, and Technique

Manuela Piscitelli

Introduction

Drawing has always stood out as one of the main tools of communication, capable of expressing mental or real images instinctively or through codified systems, by means of lines and marks. Beyond being a document that conveys information about the depicted object, it is also a source of insight into the style, personality of the author, and the time and place in which they operated. Each culture, in fact, adopts its own communicative codes for graphic representation, which reflect their conception of space and the modes of decoding visual language [Ackerman 2003].

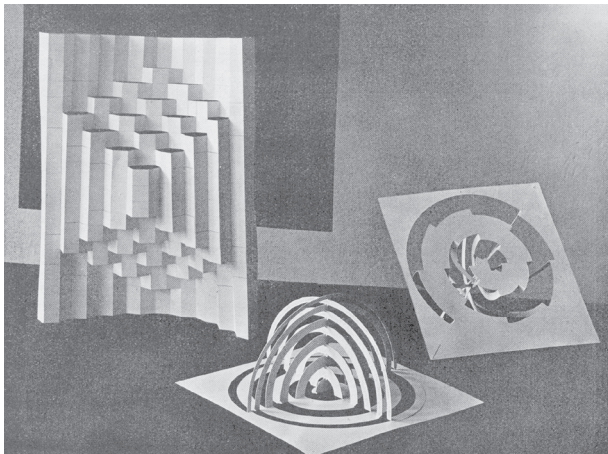
For example, in the transmission of medieval knowledge through illustrations, the cultural aspect prevailed over the naturalistic one, to the point of adopting conventional,

non imitative codes. What may at first glance appear to be a lack of ability to depict realistically is instead a form of complex communication, carrying multiple levels of meaning –a synthesis of the values and knowledge of an era [Pastoureau 2012]. Realism, understood as visual resemblance between sign and object, is only one of many possible methods of representation and necessarily implies the adoption of a conventional system that enables isomorphism. The semiotic relationships between an object and its depiction are broader, encompassing the cultural codes at play in the identification of the graphic sign [Groupe µ 2007].

Likewise, clear connections exist between the scientific conception of space, representation techniques, and the

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

Fig. 1. Exercises in resistance and construction without cutting, made with paper. From Bauhaus, no. 2-3, 1928, p. 5.



material form of architecture across different eras [Francastel 1957]. The most emblematic and well-known examples include the relationship between the Ptolemaic universe, perspective, and humanist architecture; or between Cartesian space, Monge's projective system, and the progressive emergence of an a-perspectival and increasingly abstract and analytical architecture [Panofsky 1961].

Alongside the philosophical framework underpinning spatial culture, the adopted graphic technique plays a crucial role in visual communication, influenced by the tools available. These techniques are themselves shaped by contemporary artistic experimentation, which inevitably permeates the architect's graphic language, even though it pursues different communicative objectives.

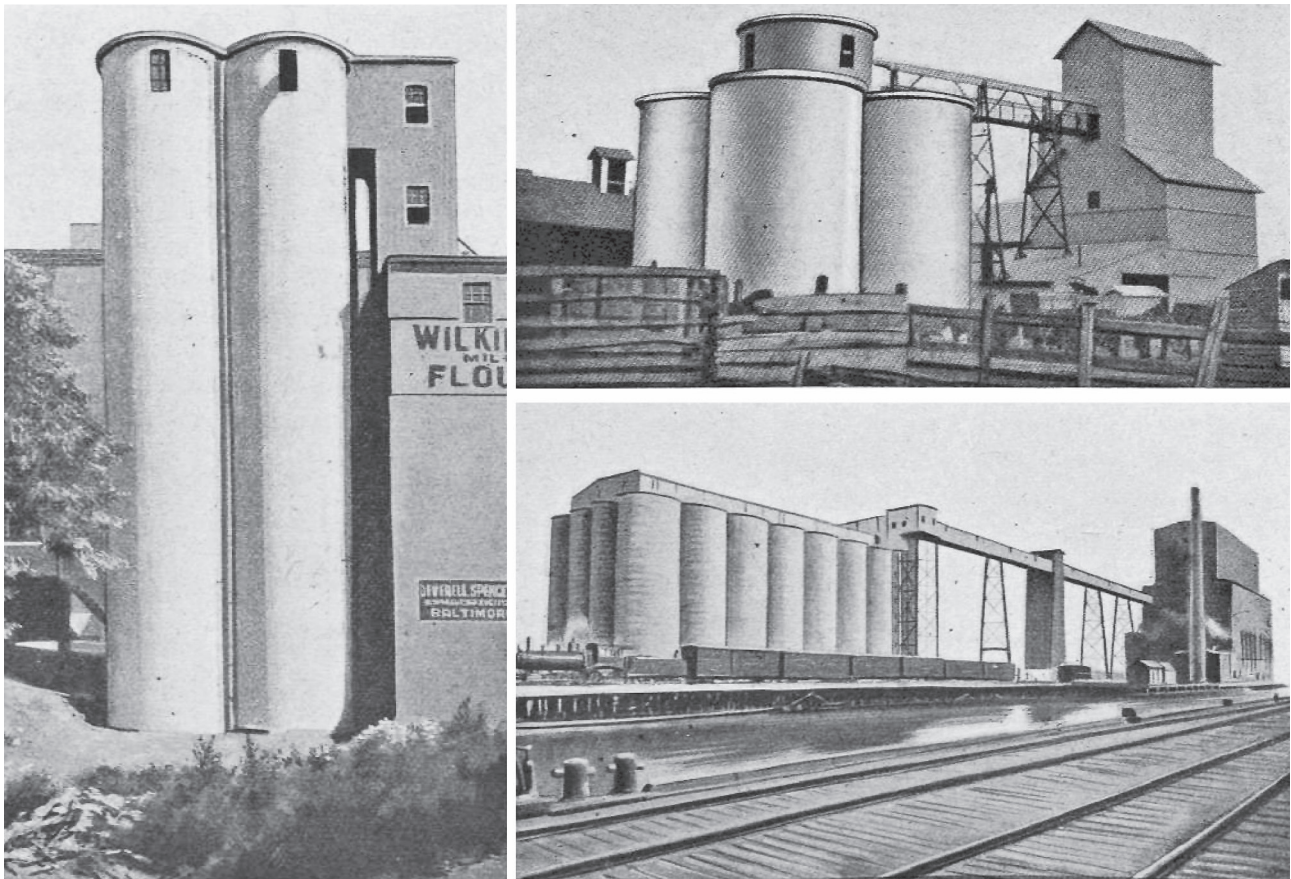
The following notes refer to a specific historical moment in which the hybridization of art, thought, and technique takes on particular significance, diverging from traditional modes of representation and laying the foundations of contemporary visual culture.

The innovation of modern graphic language

The period between the 1920s and the 1940s marks a turning point in the field of project representation and communication, seeking tools capable of expressing not only the new forms but above all the new idea of modern architecture. The transformations that led to the birth of modern visual culture were fuelled by the avant-gardes, initially artistic and then architectural, and developed over a relatively short and intense time span [Benevolo 2002].

The ideological ferment of the early twentieth-century avant-gardes encompassed all cultural fields—from literature to art to music—committed to renewing artistic language by breaking with tradition. The fields of art, architecture, design, graphic, and typographic research influenced each other or merged, as in the celebrated Bauhaus school, giving rise to intriguing experiments that fused craft culture with modern industrial technology (fig. 1). The forms produced were not merely works, objects, or spaces, but expressions of a thought system and a new understanding of the artist's role in society. "The architecture of the modern age can be seen as the symbolic representation of ideological and

Fig. 2. Photographs of American silos accompanying Le Corbusier's article titled *Trois rappels à MM. les Architectes*. From *L'Esprit Nouveau*, no. 1, 1920.



political changes, to a degree hardly found in other periods or cultures. Ideas created buildings; ideas destroyed them" [Frampton 1986, p. X].

Precisely because it is an expression of an ideology, the modern architectural project cannot be observed solely through its material expression; the way it is represented and communicated becomes equally important, both to the small circle involved in the debate and to the broader public to whom it is addressed. From this perspective, numerous innovations emerge, driven also by the availability of new tools and techniques for communication and printing.

First among these is photography, which, although experimented with by architects during the 19th century, assumed an important role in project representation during this period, also as a working tool. Frank Lloyd Wright, for example, rearranged the furniture in his house and studio to photograph different configurations and discuss the images with colleagues.

Le Corbusier, with his *Oeuvre complète*, was the first architect to create a reasoned catalogue of his work using photography with the explicit aim of promoting his projects and ideals [Fanelli 2009]. Furthermore, he used photography as a base for graphic reworking that highlighted specific elements, and as a tool to disseminate his ideas and architecture, even employing retouching to reinforce the demonstrative impact of his arguments. His unconventional approach to printed pages led him to reuse everyday images in *Esprit Nouveau*: extracted from industrial catalogues, advertisements, newspapers, art books, and science books. Any image that visually attracted him was decontextualized and reproduced to illustrate his ideas, even without a direct or obvious connection, and without a hierarchical division of illustrative material by genre or style.

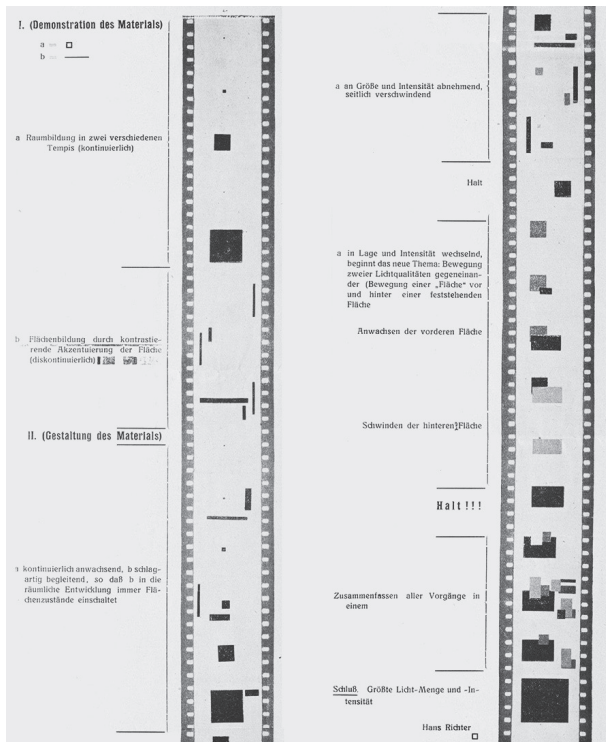
The visual language he adopted drew heavily on the emerging mass communication culture and made significant use of recent developments in advertising techniques, where maximum impact was achieved through striking visual material. Just like in advertising, images did not serve to illustrate the text but to create associations of ideas through their juxtaposition, capturing the viewer's attention and lodging in memory.

One of the most famous examples of image reuse is that of the American silos (fig. 2), featured in an article published by Walter Gropius in the *Werkbund Jahrbuch* of 1913 [Fabre 1982]. This operation went beyond

Fig. 3. Mies van der Rohe, photomontage of the glass skyscraper project on Friedrichstraße, 1921. From Bauhaus Archive, Berlin.



Fig. 4. Hans Richter, frames from an abstract film. From *G*, no. 1, 1923, pp. 2, 3. Original frames arranged in a single column, re-laid out by the author.



the simple circulation of images –common among the avant-garde– of objects that few architects had actually seen firsthand. The silos images were presented entirely isolated from their surrounding context because the interest was solely in illustrating the visual concept discussed in the article: the beauty of pure forms in architecture –cubes, spheres, cylinders, cones, pyramids– as primary shapes revealed in their purity and plasticity by light.

More broadly, it has been observed that the Modern Movement was the first in the history of art to rely on the circulation of photographic images rather than on direct personal experience or surveys [Banham 1986].

The step from using photography for architectural representation to its hybridization with drawing was short. The first 'photo-perspective' –the superimposition of a perspective drawing onto a photograph of the context following "a procedure that draws from photography every valid suggestion to make the image compatible with visual perception" [Stockel 2007, p. 228]– dates to 1910. That year, the competition announcement for the Bismarck Monument on Elisenhöhe hill explicitly required competitors to present perspective drawings inserted onto photographs provided by the committee.

In the artistic field, the technique of *collage* –composing fragments of images into a communicative synthesis where the individual elements acquire new meanings through their recombination– emerged shortly afterward. The first example is Pablo Picasso's *Still Life with Chair Caning* (1912), a *collage* combining oil paint, oilcloth, paper, and rope on canvas, where various elements from everyday life are recombined into a visual synthesis that grants new meaning to the pictorial space [Poggi 1992]. The difference between photomontage (in all its variants) and *collage* lies in the formal coherence and plausibility of the final product [Waldman 1992].

In 1921, Mies van der Rohe entered a competition with his project for a glass skyscraper on Friedrichstraße in Berlin (fig. 3). His intention was to interpret glass as a reflective surface that would vary under the effects of light. Since the building was to be constructed on a triangular plot, Mies opted for a prismatic shape with a slight angling of the front surfaces to accentuate the play of reflections. His design considerations were expressed through the drawings created to present the project, at

Fig. 5. Bauhaus-film dedicated to Marcel Breuer's chair. From Bauhaus, no. 1, 1926.

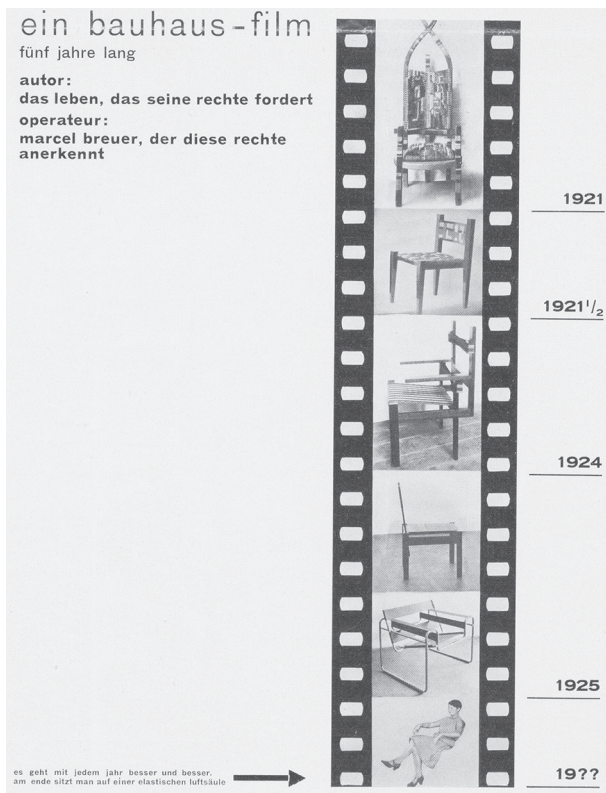
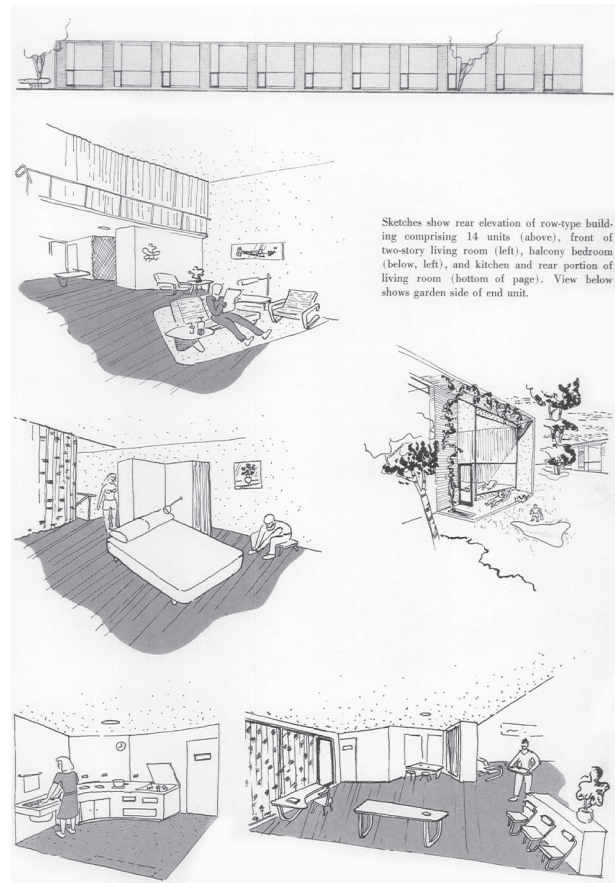


Fig. 6. Joseph Amisano, Row Type Apartments, project presentation sketches. From The Architectural Forum, September 1942.



a time when he did not yet have the appropriate technologies to produce these effects in built form. Through photomontage, he created a complex image, alternating light and shadow, as if the luminous crystal building were illuminating the darkness of the metropolis [Mertins 2010]. In the photograph, the street appears dark and almost deserted, save for a few silhouetted figures enveloped in shadow. In the background to the right, the skyscraper is shown as a luminous and soaring form, perfectly integrated into the perspective construction, yet completely decontextualized from the surrounding buildings –as if to emphasize the distance between past and modern architecture. The realistic execution of the perspective representation allowed him to use photomontage to insert the work into the context, giving the illusion that it had been actually built. The skyscraper's position in the background made the lack of fine detail believable. The vertical volumes are clearly defined in their size and spatial arrangement, subdivided into horizontal bands, and the presence of glass is suggested by the transparency effect.

During this period, many buildings were conceived only to be experienced on paper, and perhaps precisely because of the expressive freedom this allowed, they were perceived as the new paradigm of Modern architecture. The circulation of ideas was made possible through an intense relationship with the media: magazines, exhibitions, competitions, expos, all conceived as moments of image dissemination. "The history of the avant-garde in art, in architecture, in literature can't be separated from the history of its engagement with the media. And it is not just because the avant-garde used media to publicize their work. The work simply didn't exist before its publication" [Colomina 2012, p. 199].

This was not just a functional use for promotional purposes. For the first time, each medium contributed to defining a new language through which to enrich communication. One example is the first experiences with film, used by avant-garde figures to help define the new visual code of modern architecture. The research of German painter and filmmaker Hans Richter on the development of an abstract film (fig. 4) was directly related to Theo van Doesburg's architectural compositions in his program to search for elemental form. Film, as an art form based on time and movement, was conceived as a paradigm for other art and creative forms [Bury 2009].

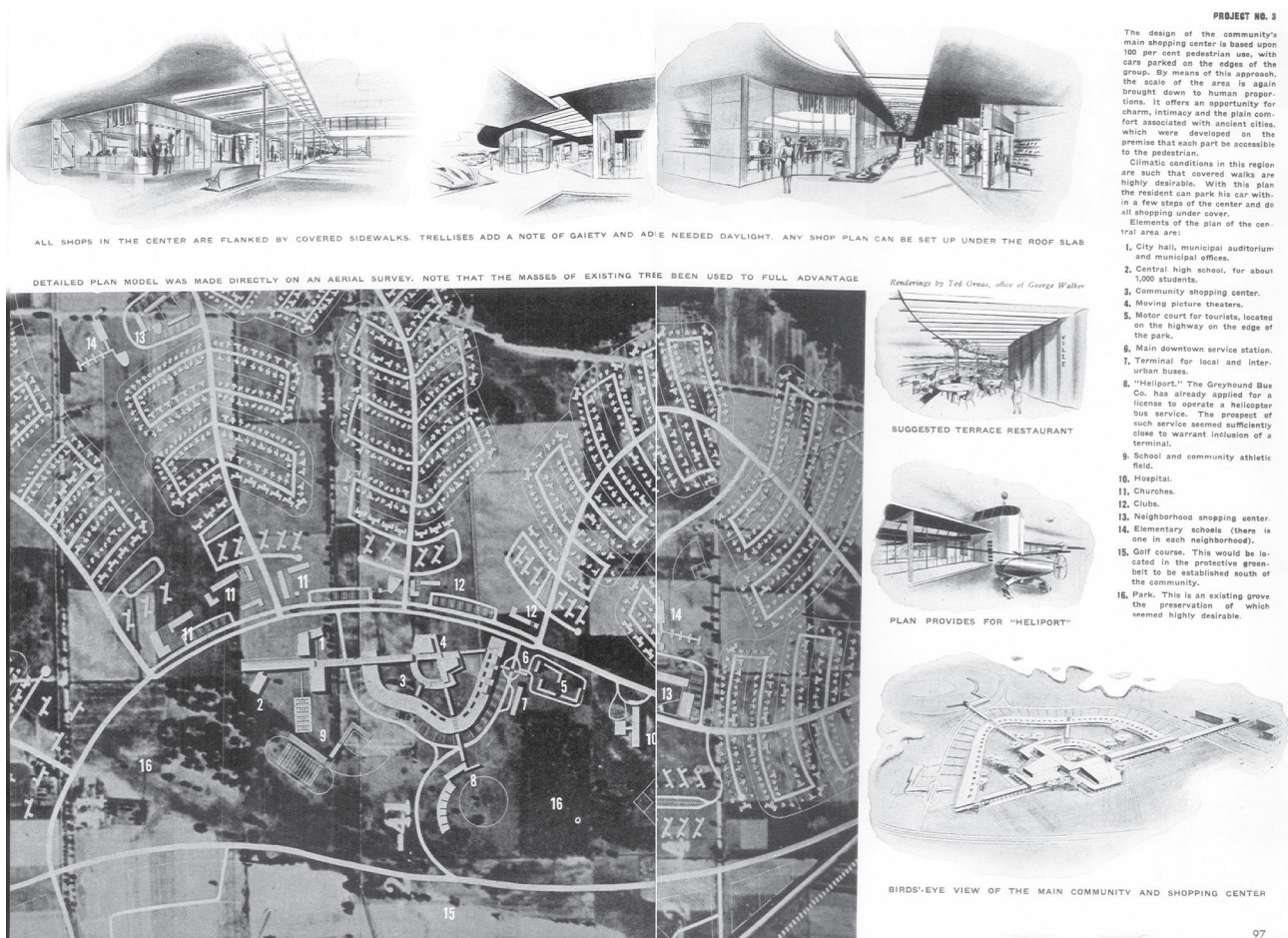
The Bauhaus also showed interest in the nascent technique of cinema, through its namesake magazine, as a communication tool capable of conveying a message across time and space. The *Bauhaus-film* (fig. 5) was authored by life itself: through a sequence of frames, it narrates the transformation of the chair by Marcel Breuer, showing examples from 1921 to the famous Wassily Chair designed in 1925, with the innovative use of steel tubing. The final frame of the sequence points toward future developments with a model of an invisible chair to take shape in an indefinite future date: "19??" [Breuer 1926, p. 3].

The early 1940s marked a transitional phase from architectural culture to planning culture. Many ideas from the Modern Architectural Movement were transferred into the context of urban planning, through which architects began to envision the postwar city. For many avant-garde designers, the projects took on a visionary character, and the modes of representation shifted once again, adopting a style closer to image-based storytelling. "Where a traditional painting represents through visual means, and architecture through visual and spatial means, planning represents its object, the city, through a complex omnibus of images, maps, charts, texts and publicity (which may itself represent the plan, becoming a representation of a representation of an intended object, the city, or of a process)" [Shanken 2009, p. 17].

At the architectural scale, graphic language evolved from descriptive to narrative, with drawings reminiscent of comic book style, developing a story through multiple images in sequence, often accompanied by handwritten notes. These were small axonometric, or perspective views populated by characters who took visual precedence over the environment, almost to emphasize the importance of spatial experience in shaping architectural form (fig. 6). The drawings were simplified, using only a few essential lines to convey spatial ideas. Photographs and drawings interacted in a tightly reciprocal relationship, each image adding a layer of meaning to the overall narrative.

At the urban scale, drawing and photography hybridized and complemented each other through photomontage techniques, showing aerial views of city portions where new building designs were inserted (fig. 7). These works were no longer presented in isolation; instead, various visual languages contributed to the transmission of

Fig. 7. Project for a satellite city in the Detroit area. From *The Architectural Forum*, October 1943.

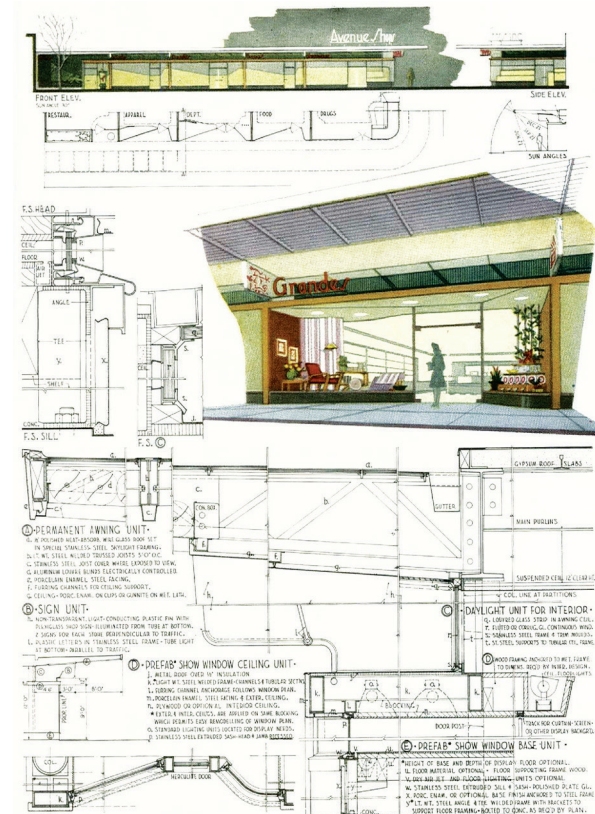


information: fragments of photographs, drawings, charts, textual notes. Communication became richer and more dynamic, suited to different levels of reading by people interested in diverse aspects of design, and understandable even to those without specific training in drawing interpretation. The result seemed intended to engage not only professionals, but a broader public with visually appealing and accessible graphics [Piscitelli 2024]. By the early 1940s, all the elements of the new visual language of modern architectural avant-gardes –experimented with since the 1920s– were fully integrated into the international graphic language (fig. 8). In particular, the shift had occurred from simple project representation to its narration through the integrated use of all expressive means available.

Conclusion

The visual language of the early twentieth century renewed previous modes of representation through the hybridization of various graphic techniques, incorporating technical, design, and compositional data that underpinned it. The representation of the architectural project progressively evolved toward greater clarity in the presentation of graphic materials –often accompanied by written notes– through the visual synthesis of multiple communicative elements (text, drawing, photography), assuming the freer, more dynamic, and engaging traits of image-based storytelling. World War II stripped Europe of the leading role it had held during the avant-garde period in fostering new forms of expression in art and architecture. The United States, by contrast, drew new vitality from the wartime period to envision the postwar city. The centre of research and renewal thus shifted from Paris to New York, and America assumed the central role that a socially and culturally exhausted Europe could no longer fulfill. Nevertheless, postwar design continued to draw upon the circulation of ideas developed in Europe in earlier decades. The post-World War II era opened the way for new graphic experimentation, which in the 1960s led to a second phase of strong innovation in visual language. However, the experiments of the Modern Movement remain a fundamental point of reference in the development of representational culture.

Fig. 8. William H. Scheick, project for the Store Fronts of Tomorrow design competition, awarded honourable mention. From *The New Pencil Points*, February 1943.



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Drawing as Language in Panoramic Sketches Created During the Spanish Civil War

Santiago Elía-García, Ana Ruiz-Varona, Rafael Temes-Cordovez

Abstract

The article focuses on the analysis of panoramic sketches drawn during the Spanish Civil War in Aragón. These sketches are perspective drawings that depict the warfront landscape as perceived by combatants from strategic positions on both sides of the contact line. They are elongated graphic documents, generally of large dimensions, created by specialists integrated into the participating Spanish and Italian troops.

These sketches are part of the cartographic material necessary for the meticulous study of the terrain where military actions took place. The prolonged stagnation of the front in Aragón allowed for precise delineation of the relief profiles and the placement of positions, trenches, and fortifications. The sketches served as a means of communication between the message sender, the draftsman, and the receiver, who projected operations onto the territory.

The technical quality of the documents and the validity of the transmitted message are evaluated. The authors' ability to express the complexity of the territory through the language of drawing is assessed. The phases of their creation and their characteristics are investigated. Additionally, the calculation procedures, graphic techniques used, and methods available for obtaining duplicates are analyzed.

Keywords: landscape, graphic expression, Spanish Civil War, territory, chorographies.

Introduction

This research utilizes panoramic sketches as primary sources, which depicted the Aragonese territory during the Spanish Civil War. Panoramic sketches are perspective drawings of the landscape, created during the war to represent the territory as observed by combatants from the battlefield [Elía-García et al. 2023].

From the onset of the conflict in July 1936 until March 1938, the warfront in Aragón divided the territory from north to south into two equivalent halves: the Republican zone to the west and the insurgent zone to the east (fig. 1). During this period, the contact line remained relatively stable, with few variations [Maldonado 2007]. This stalemate situation caused the various units of both armies to observe each other from their defensive

positions. The panoramic sketches are the result of this meticulous observation and form part of the cartographic material created to understand the relief and its occupation [Nadal, Urteaga 2013].

After gathering a significant sample (fig. 2), which has been organized and classified based on the author's origin and the section of the front represented, the graphic expression of these panoramic sketches is explored, focusing on the use of drawing as a tool for knowledge and communication. All of this aims to serve strategic planning and decision-making. The working tools employed are analyzed, and common norms and standards in the graphic language used to convey the complexity of the combat territory are identified.

Reading panoramic sketches

Panoramic sketches were not created as an end in themselves, but as a means to convey information. These sketches served as a tool within a broader process that neither began nor ended with them. Straight or wavy lines, appropriately arranged on paper, generated contours equivalent to the reality of the territory at the front. In this way, just as the reading of alphabetic signs in written language evokes concepts in the reader's mind, the observation of drawings played a similar mediating role, evoking in the recipients of the graphic message the experience of perceiving the landscape [Jiménez Caballero 1992].

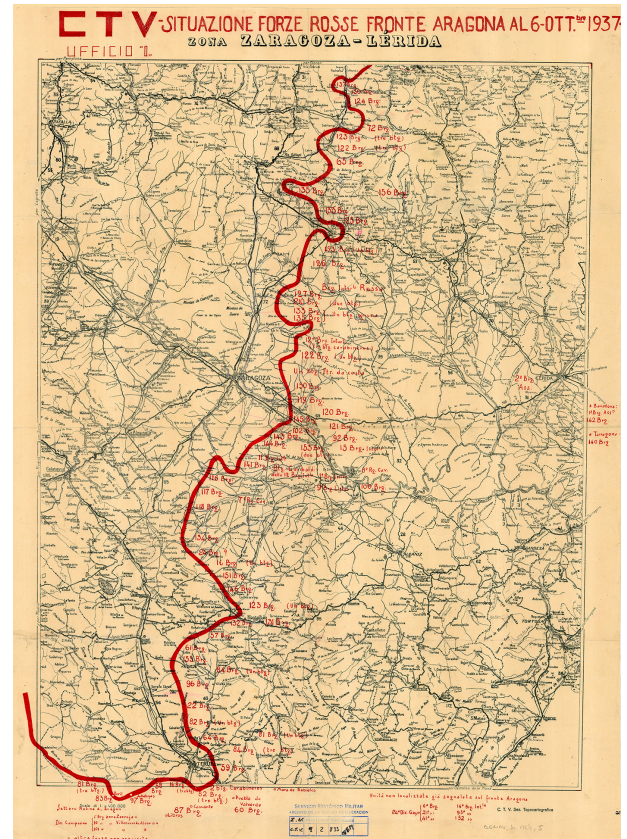
In these landscape representations, the laws governing perspective are recognized, a set of graphic resources that, when applied in drawing, reflect the image of reality as seen by humans. According to Panofsky, perspective was not only a technical revolution of the Renaissance for drawing the world but also the symbol of a new way of understanding it, based on reason rather than mystery [Panofsky 1999]. Similarly, panoramic sketches can be interpreted as the rationalization of a landscape that appeared overwhelming to the draftsman, who, through drawing, was able to synthesize it to make it more comprehensible.

The aim is to identify the characteristics of the graphic language used in the panoramic sketches of the sample, abstracting from the context in which they were created and the military origin of their authors. Thus, attention can be focused on the drawn lines and common aspects identified in each phase of the creation of the sketches, from initial decisions and data collection to the reproduction of the drawing and its use as support in strategic planning. Four distinct phases in the process of creating and using panoramic sketches have been considered.

Preparation phase

Given that the activity of drawing is intrinsically linked to vision and reflection on what is being represented [Ching, Juroszek 2007], those responsible for creating the sketches necessarily had to acquire adequate knowledge of the territory to be depicted. Before drawing any lines, the authors had to examine the territory and make a series of preliminary decisions, some of which become evident upon observing the sketches themselves.

Fig. 1. M.1308.5, Aragón Front Line, October 6, 1937. Left: Insurgent zone, Right: Republican zone. Archivo Militar de Ávila.



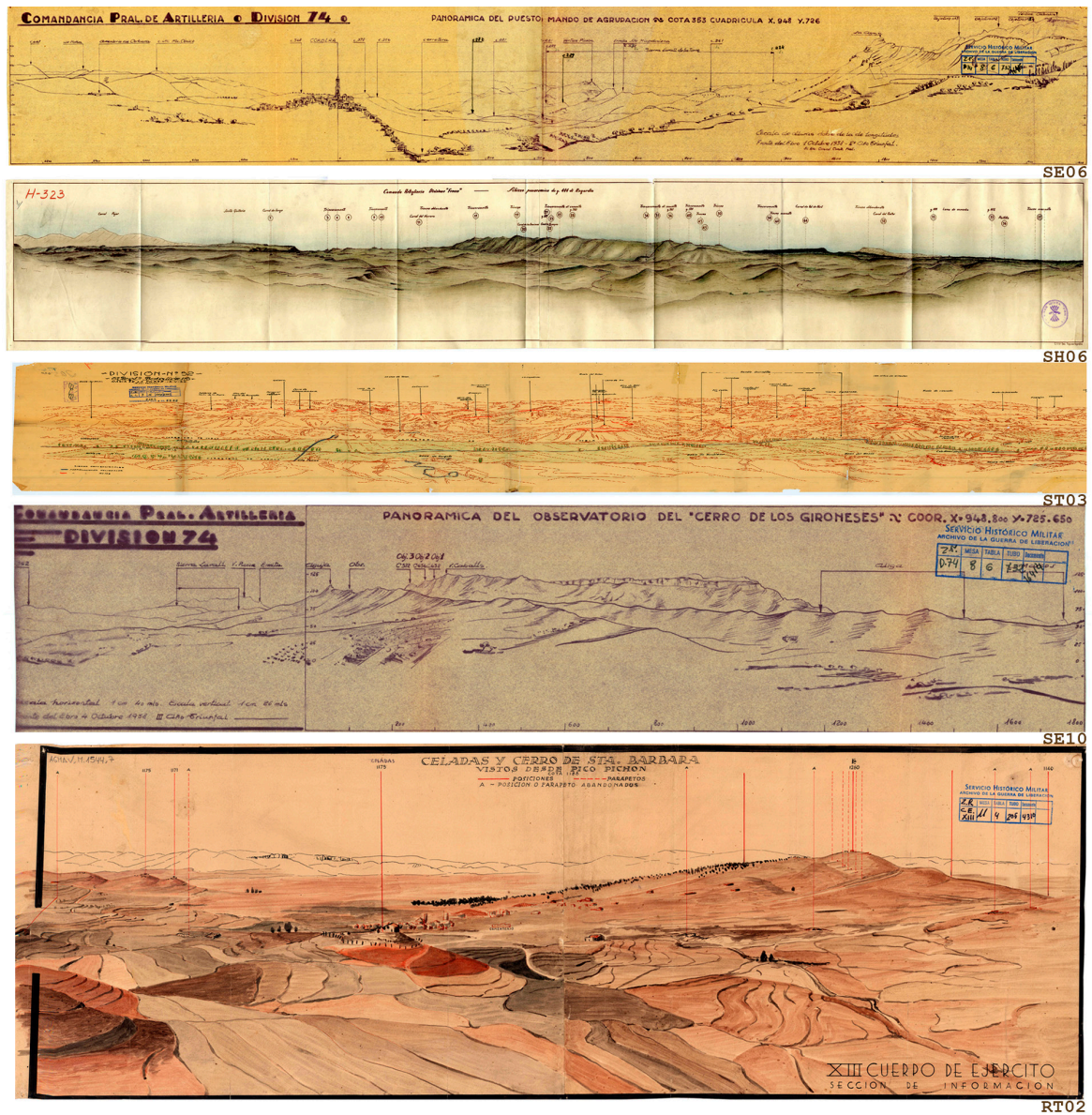


Fig. 2. Sample of panoramic sketches from the Spanish Civil War included in the study material. 1937-1938. Archivo Militar de Ávila.

All the examples contain expansive landscapes, full of nuances, distributed along elongated supports. This necessitates that their examination is not immediate but requires a careful look from one end of the paper to the other. It is evident that the vantage points had to be selected based on the visual possibilities they offered over the surrounding territory. Additionally, given the circumstances of the war, the choice of location implied understanding of the orography and the conditions for protection against potential enemy attacks.

Similarly, the authors decided on the framing of the perspective and identified the elements that would dominate the scene and limit it at its edges. The expectation of achieving the greatest effectiveness with the least amount of graphic resources led the draftsmen to recognize what, being present before their eyes, would not be included in the sketches. All circumstantial elements, such as people, clouds, cast shadows, vehicles, or weaponry, were omitted, and attention was focused on the strip of territory under study, avoiding the immediate area around the observation point, as sectors more or less distant were always represented.

In the panoramic sketches, it is evident that the draftsmen had prior knowledge for constructing these perspectives [Gómez de Salazar 1911; González de la Vera 1912; Prats 1937]. This results in homogeneous outcomes regarding the systems of representation and drawing alignment. However, despite starting from a common methodological base, the graphic quality of the sample sketches varies considerably, with some examples standing out due to the greater experience of their authors, who drew their sketches with more skill and dexterity.

Another consideration before drawing focused on the proportions of the perspective, as the author had to decide whether to distort them or not. For relatively flat terrains, it was advised to exaggerate the heights relative to the horizontal distances [Prats 1937], so that the configuration of the relief would be reflected more intensely, and the message receiver could assimilate it more quickly and effectively.

In several examples from the sample, this recommendation was followed, as indicated in annotations, graphic scales, or alignment grids. However, this distortion in the proportions of these sketches only becomes evident in a direct visual comparison with the current landscape (fig. 3). Examples have been identified that contain sketches made from life, recognized as data collection. These somewhat

untidy drawings were made quickly, with short, repeated strokes, and are filled with disordered annotations, indicating they were taken from the observation point (fig. 4). This suggests that the primary source of information for drawing the sketches was direct visualization from the actual location.

Drawing phase

Panoramic sketches, being drawings, represent the record of their authors' actions and were influenced by their intellect, skill, and interests [Seguí de la Riva 1993]. Once separated from the hand that shaped them and transformed into graphic objects, they can be observed and studied independently.

Most of the analyzed sketches approximate the definition of drawing proposed by Ching and Juroszek [Ching, Juroszek 2007], who describe it as a process for representing something—in this case, landscapes—by tracing lines on a support. According to this interpretation, the line constitutes the essence of drawing and establishes the fundamental difference with painting or surface coloring. Through reading the lines that form the represented landscapes, it is possible to reconstruct the path followed by the draftsmen in creating them.

To draw these lines, a relatively limited repertoire of drawing tools was used. On one hand, the texture, thickness, and variable intensity characteristic of the pencil are distinguished, primarily used to shape the initial sketches and some final perspectives, where the smudges resulting from graphite wear on paper can be seen (figs. 5.1-5.3). On the other hand, the definition, precision, and continuity typical of ink lines, generally black, are evident, resulting from the use of pens, nibs, or some type of marker, with which most of the sketches were defined in their final version (figs. 5.4-5.6).

Although the main structure of the perspectives was constructed with gray or black lines, it was common in the original examples to use color occasionally to add chromatic value and highlight specific aspects (fig. 6).

Red was frequently used to highlight positions in the territory or distinguish the roofs of buildings in the landscape. Blue was applied both to watercourses or bodies of water and to subtly tint distant mountain profiles. To a lesser extent, green was also used to highlight vegetation masses. Some of the perspectives in the sample were even fully colored using a wide variety of drawing tools, such as colored pencils, pastels, or watercolor.

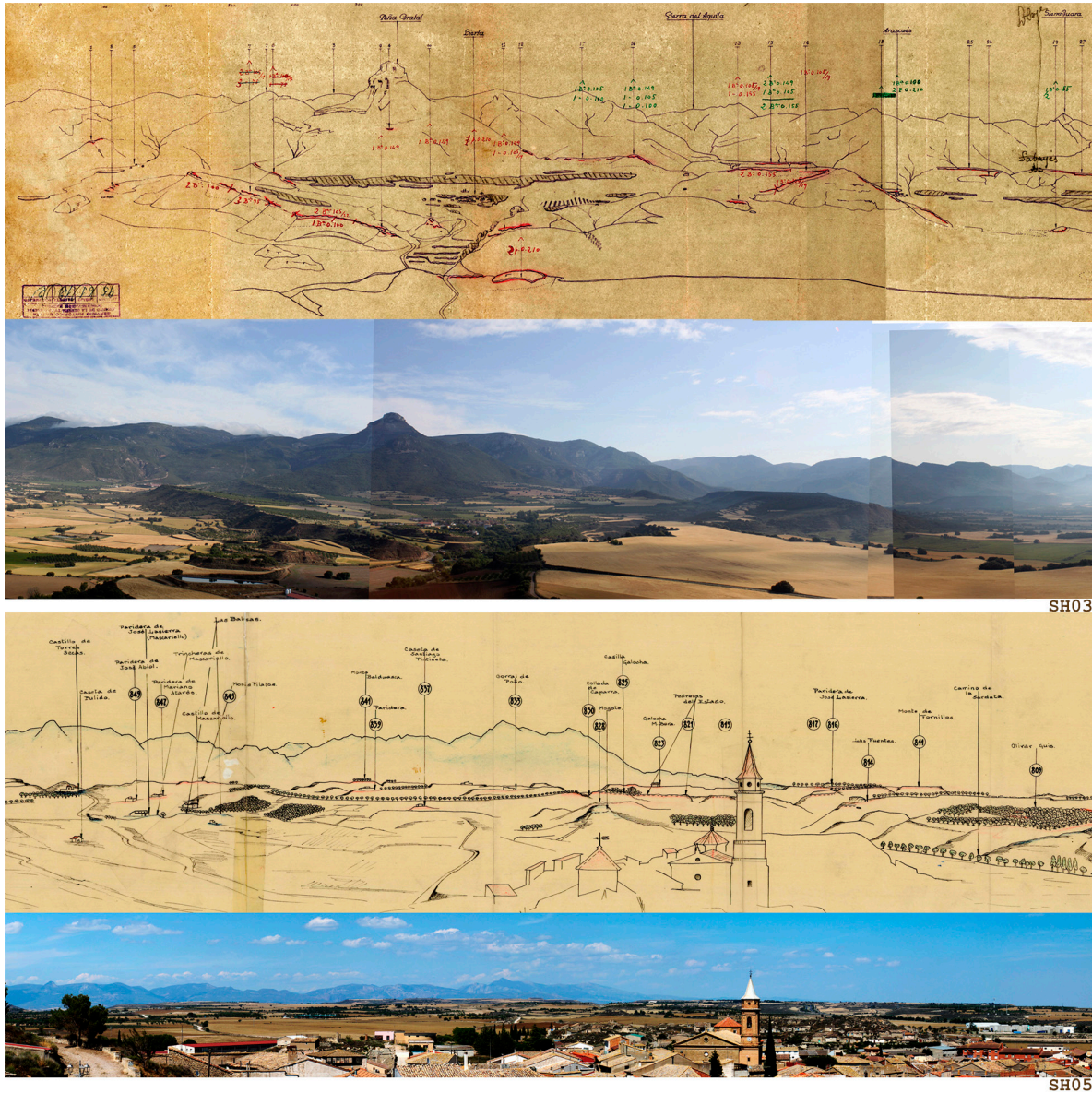
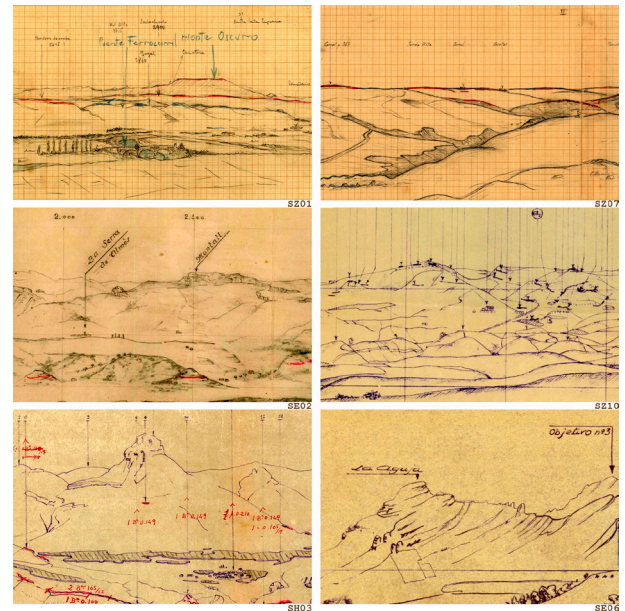
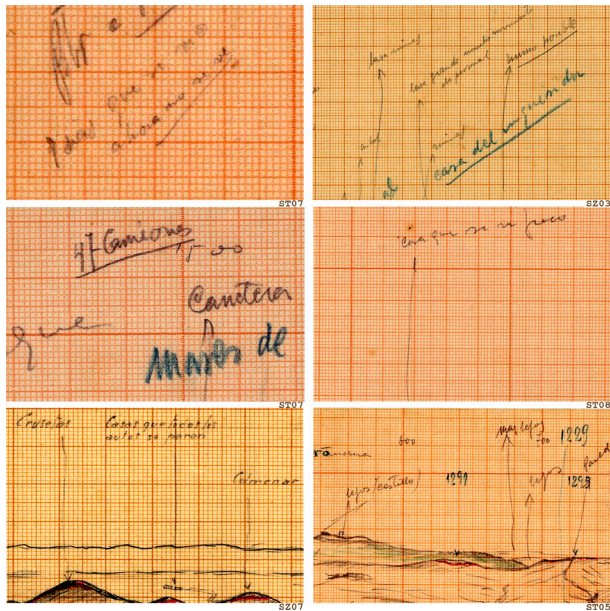
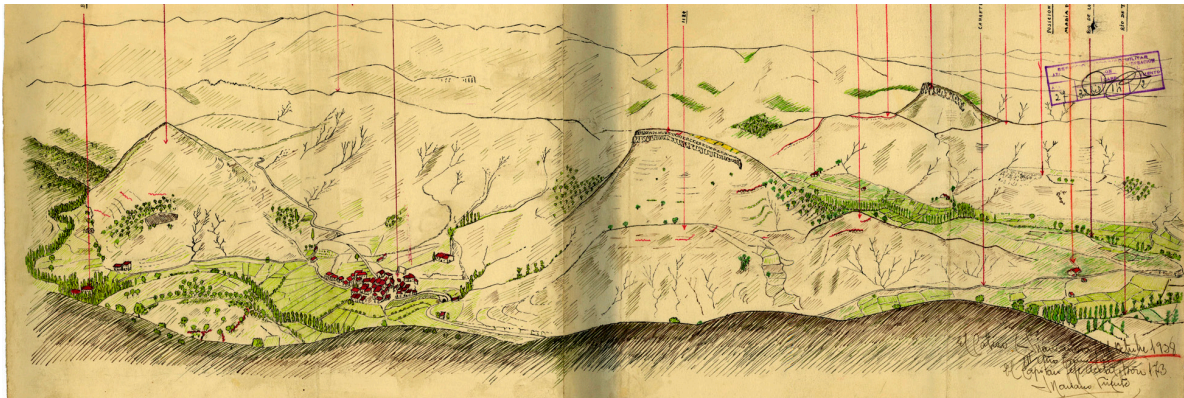


Fig. 3. Panoramic sketches with exaggerated heights. 1937-1938. Archivo Militar de Ávila. Current photograph (graphic elaboration by the authors).

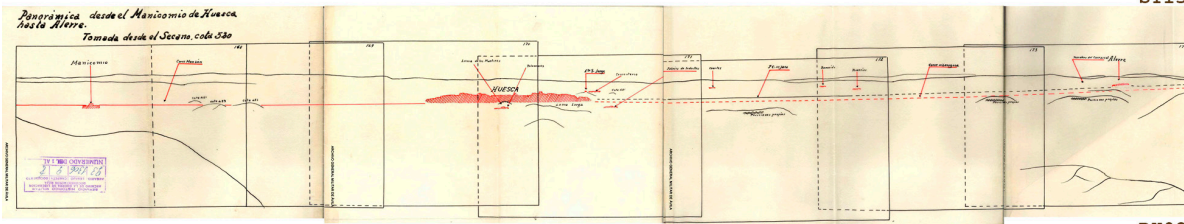
It is observed that the authors were sensitive to the basic laws of perspective, which is reflected in the continuous tracing of contours, the gradation of the size of elements and their level of definition according to distance, as well as in the organization of objects relative to the viewpoint and the horizon line. However, it is difficult to identify in the landscapes the vanishing lines that typically

In the absence of more precise measuring instruments, the draftsmen were trained to apply simple distance estimation strategies without moving from the observation point. This allowed them to capture on paper an approximate impression of reality as it appeared to their eyes, accurately placing the elements of the scene and controlling the proportions of the terrain's volumetry. Drawings show traces of these methodologies. In some sketches, auxiliary marks made before drawing the

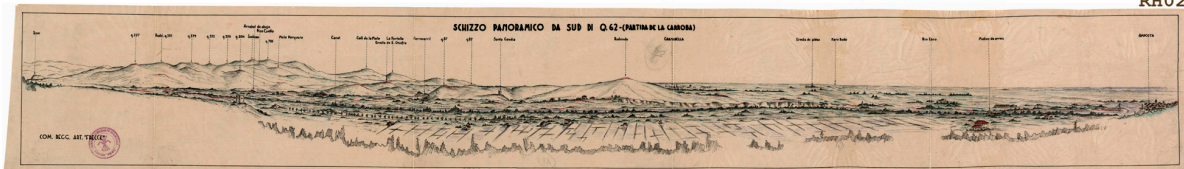




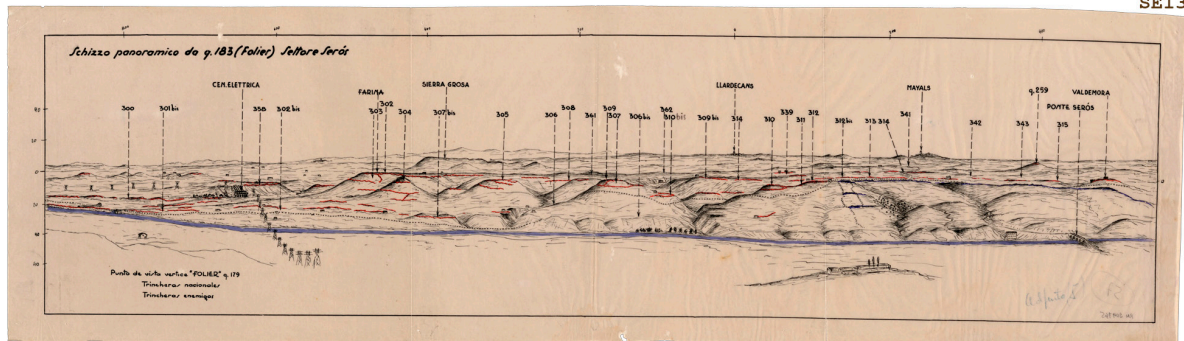
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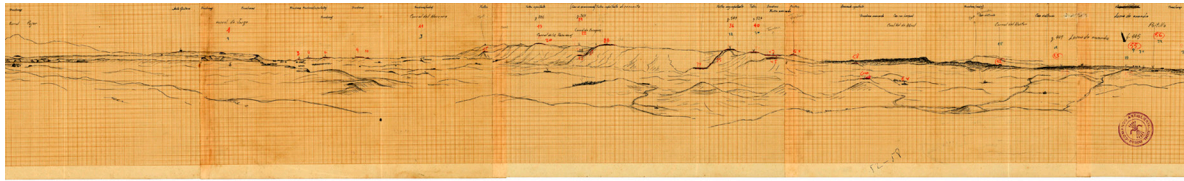


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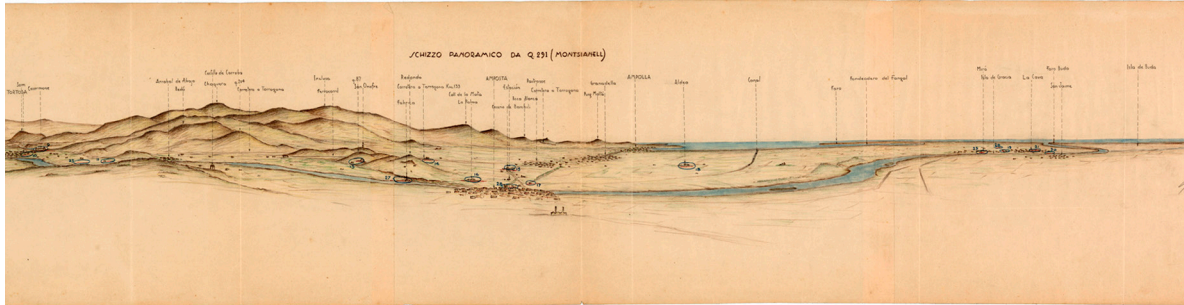


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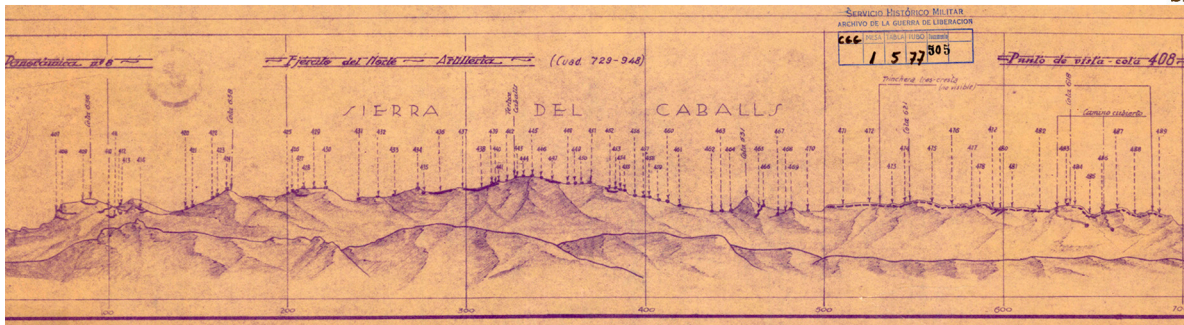
Fig. 6. Sketches with occasional color incorporation. 1937-1938. Archivo Militar de Ávila. Instituto Cartográfico de Cataluña.



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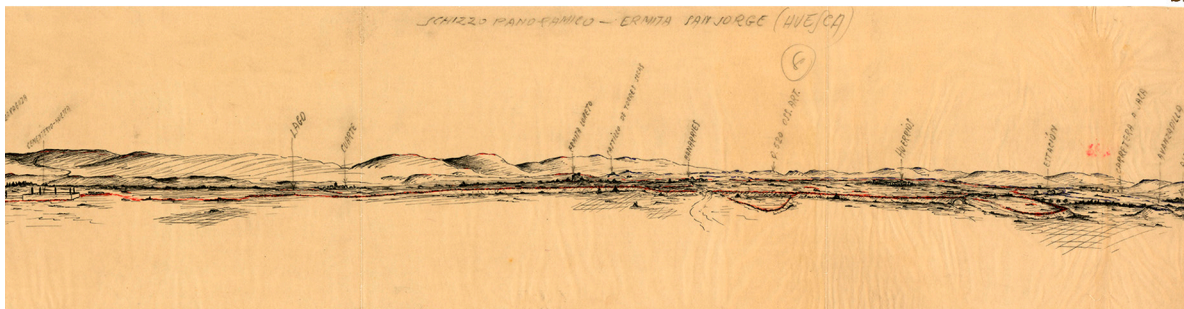


Fig. 7. Types of Paper: Graph Paper (1), White Paper (2,3), Tracing Paper (4). 1937-1938. Archivo Militar de Ávila. Instituto Cartográfico de Cataluña.

landscape were left un-erased, supporting the alignment of the main shapes, whether reference lines drawn from notable points in the territory or calibrated grids, made by hand or integrated into graph paper.

In addition to drawing the main lines that defined the contours, graphic techniques were used to represent the surface characteristics of the territory. Through line valuation and tonal gradation of the drawings, the perspectives were enriched with textures and conveyed the sensation of light, mass, and space in the landscape [Ching, Juroszek 2007].

Graphic techniques allowed the draftsmen to establish the internal hierarchy of each sketch, reflecting aspects such as texture, volume, scale, and occasionally, color, with varying precision [González Presencio 1992]. In most sketches, graphic resources were used to capture the landscape's qualities monochromatically. The draftsmen had to convert the chromatic values of reality into equivalent tonal values, using only pencil or pen, and mainly employing hatching techniques.

Some examples stand out for the skill with which their authors applied these hatching techniques, excelling in the tonal variety achieved through loose, confidence, and balanced strokes (fig. 9). The craftsmanship of their authors is also recognized in the tools used to apply ink to paper. In the sketch of figure 9.1, the subtle modification of line thickness, caused by varying pressure and the ability to fade the end of strokes by reducing thickness and intensity, suggests the use of some type of flexible pen. This way, the result effectively represents curved surfaces, tonal gradation, and ranges of light and shadow. In the sketch of figure 9.2, the range of line thicknesses and gray tones suggests it was drawn with different instruments, explaining the variety in stroke types. Thus, the depth of the scene is more vigorously captured, with thicker and darker contours and hatching in the foreground, which soften as they recede from the observer.

Some sketches show traces of the drawing process, such as corrections and adjustments that completed

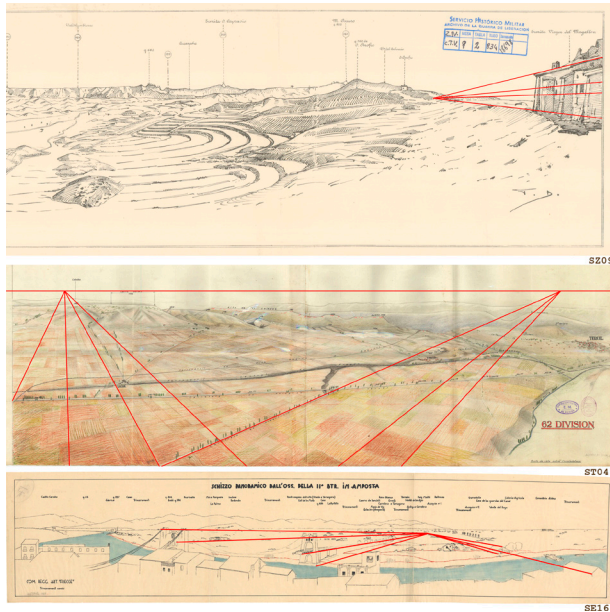


Fig. 8. Vanishing lines in red on sketch. 1937-1938. Graphic elaboration by the authors own on original. Archivo Militar de Ávila.

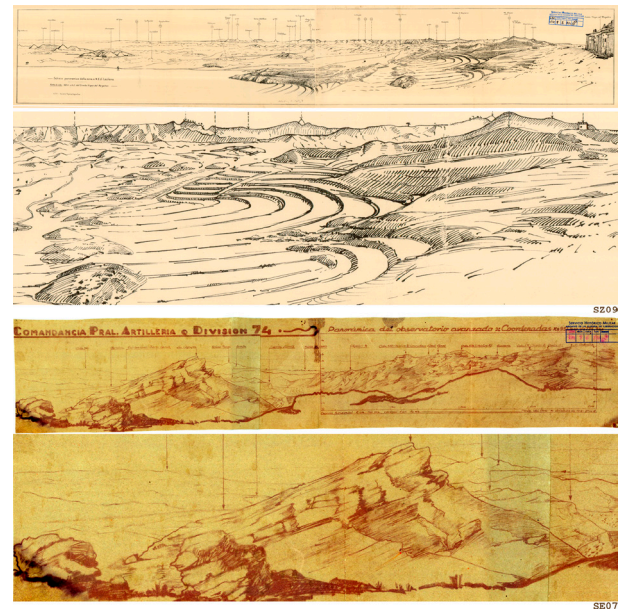


Fig. 9. Panoramic sketches that stand out for their skillful shading. 1937-1938. Archivo Militar de Ávila.

or corrected the initial contours. This is justified by the challenge of representing broad, formally complex scenes filled with information that the draftsman had to synthesize. This way, it is evident that the act of drawing is intrinsically linked to thought and involves continuous decision-making [Barbadillo 1999]. These corrections illustrate the process experienced by the draftsmen, who attended to the changes suggested by the drawings as they took shape [Seguí de la Riva 1993].

The main difficulty faced by the draftsmen was avoiding wasting time on the multitude of details present in the reality they had to represent. These details, although striking, did not always have the importance they appeared to have. The authors had to focus their energy on faithfully reproducing what was essential and important [González de la Vera 1912]. This is the impression offered by the graphic set selected in this research, justifying the extended use of panoramic sketches over photographic panoramas. Aside from the greater dimensional possibilities of the sketches and the ease of acquiring the required tools for their creation, the significant difference was that photography presented totalizing images, while sketches expressed a smaller fragment of reality. This fragment had been consciously processed by the draftsman's particular mind [Ching, Juroszek 2007], allowing for greater effectiveness in message transmission in a given context.

Duplication phase

Among the selected panoramic sketches, those that are printed replicas on paper are distinguished from the original examples. To ensure that the resulting copy was faithful and legible, the reproduction machines of the time required specific conditions for both the drawing and the type of paper used. Therefore, the sketches intended to be reproduced with these machines had to be outlined according to these conditions. The use of color was discarded in them, as the reproductions were monochromatic, and graphic techniques were limited to assigning tonal values to the perspectives, serving only those drawn with sufficient intensity.

With multiple copies of each panorama, more than one example containing fixed information about the landscape configuration of the same area was available (figure 10.1). Variable information, such as the location of units in the territory and possible troop movements, could be recorded on these documents. Additionally, the

reproduced sketches could be distributed to support war planning at several locations simultaneously.

The means of reproduction influenced the way of drawing. In the sample, there are sketches that were defined and detailed as unique examples, as they were not going to be duplicated or distributed. In these, graphic techniques were used to add color and set the scene. However, other sketches were made considering the limitations of reprographic machines. In these documents, monochromatic ink drawing and hatching techniques were prioritized to give the perspective volume and depth. Thus, soft shading or color marks that would have disappeared or lost their properties in the duplication were avoided (figs. 10.2-10.5). Some examples worked under these parameters, once reproduced, were completed and richly colored, resulting in very expressive scenes that contrasted with their clearer twin perspectives (fig. 10.1).

The procedures for copying plans required the original to be drawn on tracing paper; as demonstrated by the panoramic sketches in the sample, of which duplicates are also preserved. Thus, the original document consisted of a set of opaque continuous lines distributed on transparent paper. To obtain an exact copy, in scale and detail, of this drawing on white paper, another type of specially prepared paper, such as ozalid, ferrogall, or ferropress paper, was used [Prats 1937]. The tracing paper with the drawing and the specially prepared paper were subjected to a light exposure and development process, whereby the opaque lines of the former were marked on the latter. Depending on the machine used for this process and the type of receiving paper, copies with different color shades were obtained. The selection includes many dark brown copies, but there are also black and bluish-toned ones (fig. 11).

Application phase

Once planned, drawn, and, if necessary, reproduced, the panoramic sketches were intended to play a decisive role concerning the graphic information they contained. Fundamentally, the sketches served as a means of communication between the sender; that is, the draftsman, and the receiver; who planned operations over the territory. Specific actions were projected in the drawings, and in some examples, traces of this purpose can still be observed.

The panoramic sketches were meant to stimulate the knowledge of the graphic message receiver. A well-executed sketch resulted in an attractive outcome that

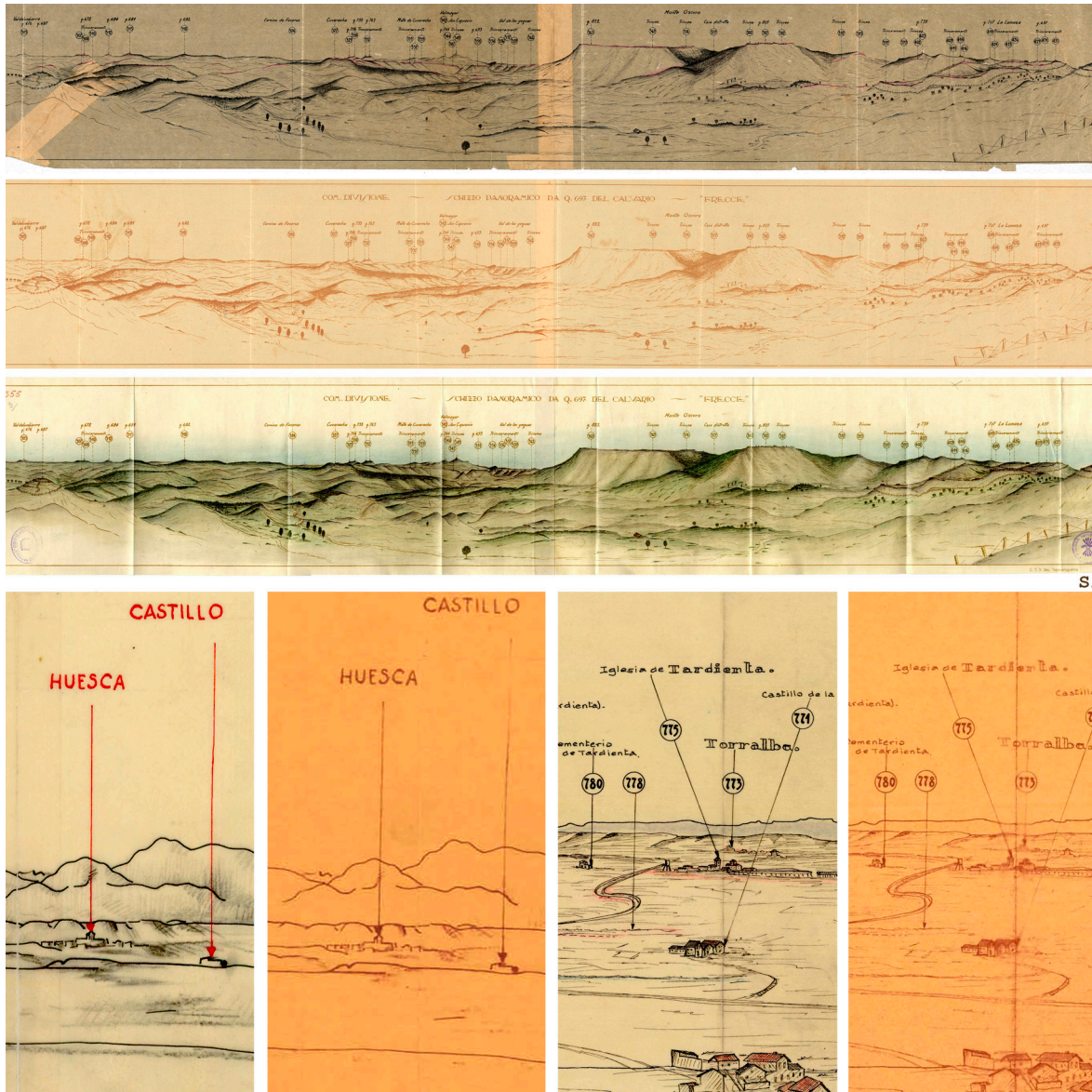


Fig. 10. Original panoramic sketches and duplicated versions. 1937. Archivo Militar de Ávila. Instituto Cartográfico de Cataluña.

captured the observer's attention and induced a reaction, fostering their imagination [Barbadillo 1999]. It was essential that the visual information provided was easily understandable by the recipients, which depended on the author's knowledge and skill. The ability to graphically represent reality as it was seen could replace the need for explanatory texts, legends, and topographic symbols [Ching, Juroszek 2007]. This differentiated panoramic sketches from other types of terrain representation, such as maps and topographic plans, which were more abstract and less realistic documents, requiring greater preparation for proper reading.

The sketches have endured to the present day as evidence that a drawing can remain on paper for a long time without losing its communicative potential. As drawings, they served to fix the knowledge that their authors poured into them, preventing it from being lost, and acted as a source of ideas that provoked a reaction in the observer [Barbadillo 1999]. Evidence of this is that in several sketches, at least two different types of hands can be distinguished: those of

the individuals responsible for depicting the landscape and those who interpreted it. Thus, on a homogeneous base defining the configuration of a territory, new traces were added, usually in color, highlighting aspects not included in the original (fig. 12). These new superimposed marks illustrate the thoughts and conclusions that the sketch triggered in the mind of the message receiver.

The recipient of the sketch, after understanding the formal complexity of the represented territory, could incorporate new data from various information sources. In this way, the user of the sketch transformed the nature of the drawing by placing it in a specific context. A timeless and fixed view of the place became the reflection of a particular and dynamic situation, as it could even include the representation of planned or already executed movements. Thus, the sketch could be subjected to multiple interactions, as many as copies, reflecting changes over time.

Panoramic sketches fulfilled their function both away from the place they represented and from the observation point itself. On one hand, they were documents that

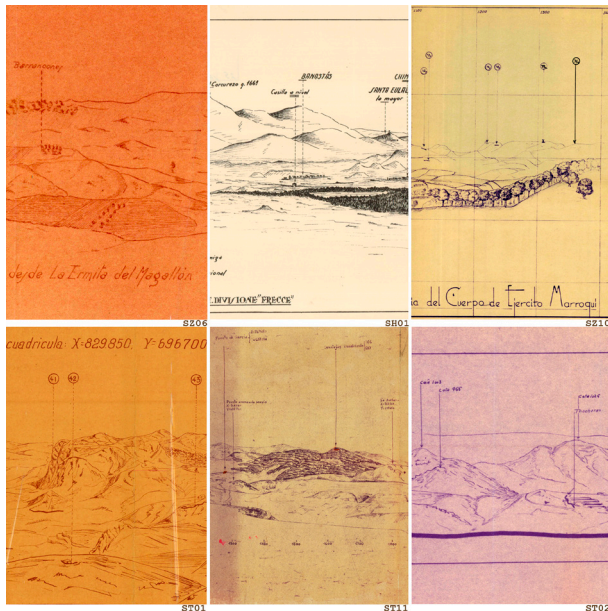


Fig. 11. Fragments of copies in brown (1,4), black (2,5), and blue (3,6). 1937-1938. Archivo Militar de Ávila.

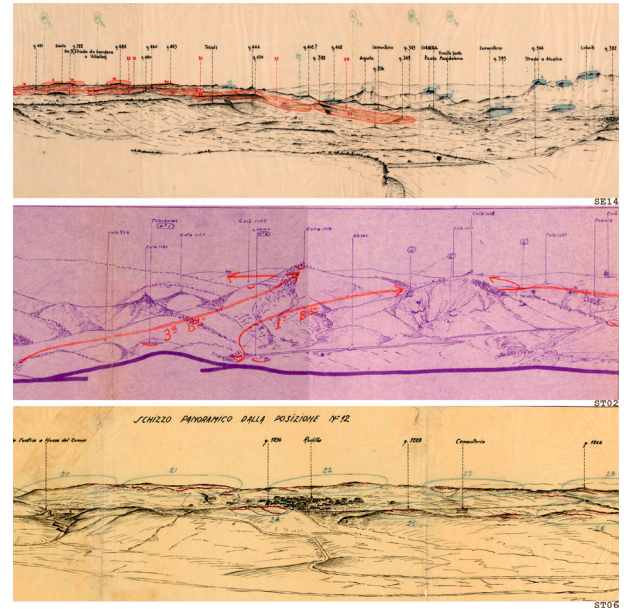


Fig. 12. Copies with added colored strokes. 1937-1938. Archivo Militar de Ávila. Instituto Cartográfico de Cataluña.

conveyed a three-dimensional image faithful to the reality seen from a specific strategic point to distant locations. Being easily interpretable graphics, they supported the reading of other less immediate sources, such as maps or written reports. On the other hand, the sketches offered an alternative view to direct observation of the territory, reflecting the trained eye of specialists who depicted only the necessary aspects. In this sense, the sketches acted as an instruction manual, revealing how to observe the territory to intervene in it.

Conclusions

Panoramic sketches were not an end in themselves but a means of communication between the draftsman and the person responsible for planning actions over the territory. Through drawing, the former transformed the image of a complex reality into a synthetic and comprehensible graphic document, containing only the necessary information for the latter.

The common characteristics of the graphic language used in panoramic sketches have been described. The training received and the expected essentiality in the result predisposed the authors to use line drawing. This type of

drawing was further enhanced by the limitations imposed by the plan reproduction machines of the time.

The tracing of lines on paper was not simply a translation of what was observed but required a prior process of study, understanding, and recognition of the territory, as well as deliberate planning of the document's composition. Most drawings identify similarities in the tools used, the methodologies employed to outline the contours, and the graphic techniques applied to qualify the scenes. It is deduced that a strict calculation of perspective would have required working conditions and initial information difficult to obtain during the war. Compliance with the laws of perspective was achieved thanks to the draftsmen's experience and prior knowledge.

It is inferred that the sketches could be used both to provide a fixed image of a place, which could fulfill its function anywhere, and to guide an observer from the observation point itself. Thus, in the face of the immensity of a complex and silent landscape, there was a graphic guide that helped to discriminate against those elements that were truly of interest.

Beyond the lines, technique and history converge in these drawings, demonstrating the utility of drawing to satisfy one of the most remote needs of human beings: to know and situate oneself in the surrounding territory.

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Graphic Design as a Universal Language: Symbols and Codes in the Vision of Gio Ponti

Alessandro Spennato

Abstract

Graphic design was a tool for Gio Ponti to synthesise his design and communication, bringing together art, architecture, and design in a consistent visual language. This study looks at the role of graphic design in his work, highlighting its function not only as a means of representation but also as an independent code capable of conveying complex concepts. Through an iconographic and semiotic analysis of his works, the influences of the Bauhaus, Futurism and Italian Rationalism are explored, contributing to the definition of his graphic style, characterised by modularity, geometry and an innovative use of colour. The research also investigates the relationship between editorial graphics, architectural production and industrial design, demonstrating how Ponti's style has become a constantly evolving visual matrix. Finally, the potential for mutation of his language in the contemporary context is analysed through digital graphic experimentation and new branding and interactive design applications. The article highlights how graphic design for Ponti was not merely a means of representation, but a form of visual thinking capable of transcending eras and contexts, confirming itself as a fundamental reference point for contemporary design.

Keywords: graphic design, visual language, Gio Ponti, symbols, geometry.

Introduction

During the 20th century, graphic design underwent a significant transformation, establishing itself as an autonomous and strategic language of contemporary visual communication. Among the figures who have left a distinctive mark on this process is Gio Ponti, who integrated art, architecture and design into a coherent and innovative expression system. The breadth of Ponti's output, which ranges from everyday objects to monumental architecture, finds one of its main focal points in editorial graphics, mainly through the magazines *Domus* and *Stile* [Rossi, Buratti 2016, p. 333]. In these contexts, Ponti not only promoted new ideas of living and design, but also developed a graphic language based on visual synthesis, compositional modularity and

the narrative value of drawing. His approach to graphic design is rooted in the broader modernist tradition of the early 20th century. The Bauhaus, with its ideal of integration between art, technology and industry, and Italian Futurism, with its dynamic forms and typographical experimentation, were theoretical references that profoundly influenced his research [Spennato 2024, p. 129; Ghianda 2020]. However, Ponti distinguished himself by interpreting these stimuli according to his vision. He developed a graphic language based on geometric, symbolic and chromatic elements capable of communicating complex concepts with immediacy and effectiveness. Line, form and colour in his sketches and compositions (fig. 1) take on a narrative and

conceptual function: for Ponti, drawing is not simply representation, but a “vision of the project” [Ponti 1957, p. 17]. As recent studies [De Caro 2022] highlight, Ponti’s graphic practice can be interpreted through ‘heretical language’, where the sign escapes its purely descriptive function to become a poetic construction, an active device for design and communication. His aesthetic, while essential, is rich in cultural meanings, proposing a visual code capable of crossing materials, formats and contexts, from ceramics to architecture, from editorial graphics to furniture.

This article aims to analyse the role of graphic design within Gio Ponti’s design practice, exploring its evolution about the cultural, technological and artistic transformations of the 20th century. Through an iconographic, semiotic and comparative approach, we will investigate how his graphic works – sketches, textures, covers, modular structures – contributed not only to the definition of an Italian modernist aesthetic, but also to foreshadowing many of the trends in contemporary graphic design, particularly in the fields of branding, digital design and visual interaction. Starting from his historical and cultural context, we will examine the influences, techniques and visual strategies that made Ponti’s graphic language so exceptionally original, also paying attention to its recent reinterpretation through digital tools, motion design and interactive installations, confirming the vitality and transformative power of his design legacy.

Historical context

The Italian twentieth century was a century of profound cultural, economic and social transformations that decisively shaped the development of architecture, design and the visual arts. The succession of historical events – from world wars to fascism, from the economic boom to the emergence of the consumer society – created fertile ground for experimentation in design, in which new languages and new aesthetic paradigms took root. During the 1930s, Italian Rationalism promoted a modern architecture based on essential geometries, functionalist principles and a critical adherence to the European Modern Movement [Dellapiana et al. 2020]. At the same time, industrial design took its first steps towards an autonomous identity, thanks in part to the work of companies such as Olivetti, which was able to synthesise aesthetics and industrial production into an integrated vision of design culture [Sparke 1986]. The post-war period represented

a season of radical renewal: Italian design gradually gained international visibility, thanks to an innovative tension that combined formal research, visual communication and attention to new lifestyles. The birth of *Made in Italy* found a catalyst in significant events such as the Milan Triennale and in specialist publications such as *Domus*, both centres for disseminating an idea of elegant, cultured and accessible modernity [Ghianda 2024; Pansera 1993]. In this scenario, the figure of Gio Ponti stands out, capable of working across architecture, design, applied arts and editorial graphics. His language combines traditional craftsmanship, technological innovation, classical memory, and modernist sensibility in an original and distinctive synthesis.

Projects such as the Pirelli Tower (1956–1960) marked a turning point in Italian architecture, introducing a new model of light and transparent verticality [Palandri 2019], while his work in product design, from Richard-Ginori ceramics (fig. 2) to furniture for Molteni&C. (fig. 3), reveals a constant search for balance between function and ornamentation.

Ponti’s graphic work reflects a conception of design as a cultural expression rather than a purely technical one. Through his editorship of *Domus*, Ponti promoted the idea of design as a device for thinking, a tool for planning and a means of visual narration [Rossi, Buratti 2016]. Architectural design, in its sketches and graphic elaborations, takes on an analytical and compositional function: it not only represents space, but invents, interprets and transforms it [De Caro 2022]. This approach is ideally aligned with the theories of Ernesto Nathan Rogers, for whom architecture is “the expression of an idea”, of a profound cultural vision and not just a technical solution [Visentin, 2009, p. 2]. Even in object design, Ponti goes beyond superficial decoration to integrate symbolic and constructive motifs into the very structure of the design, as demonstrated by his work for Richard-Ginori and the furniture he designed for Cassina and Molteni&C.

The dynamism of its lines distinguishes Ponti’s graphic design, the narrative use of signs and the integration of figurative elements and modular structures. In the covers of *Domus*, in ceramics and architectural sketches, lines do not simply define contours, but construct visual rhythms, spatial tensions and perceptual emotions. This conception of the line as a narrative element fits perfectly into the tradition of ‘narrative graphics’ that characterises the best European design of the 20th century [Ruggiero 2020]. Colour, an essential element in Ponti’s poetics, is not limited to a decorative function but takes on an expressive and symbolic

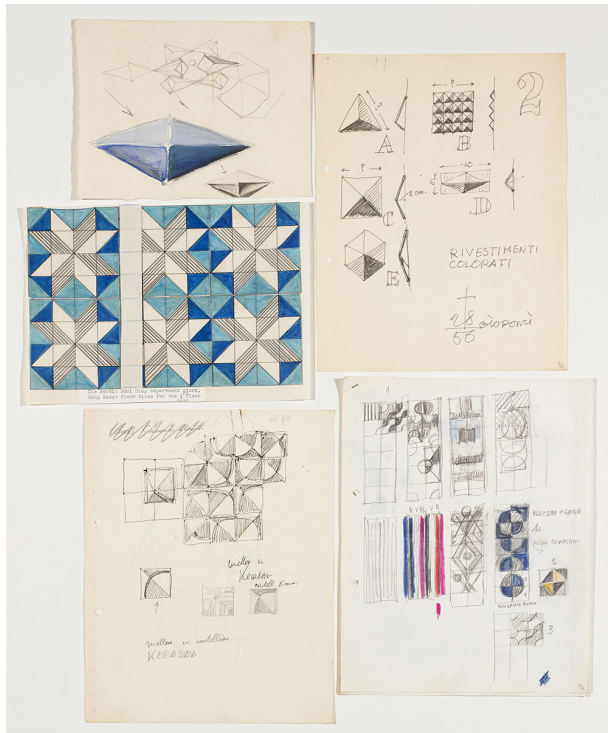


Fig. 1. Study of lines, shapes and colours for a ceramic covering in Hong Kong, 1978 (<www.arsvalue.com>).



Fig. 2. Cup and Vase from the Stuoia 1923 line, Gio Ponti, Ginori 1735 (<www.ginori1735.com>).

role. The colour combinations, often bold and experimental, amplify the communicative power of the compositions, creating visual atmospheres capable of evoking emotions and profound meanings [Ghianda 2020; Ponti 1952]. Modularity, present in both graphic compositions and architectural projects, recalls the principles of systemic design: repetitive geometric patterns generate order, rhythm and variability within surfaces, anticipating much of contemporary research on pattern design and parametric design. Analysing Ponti's graphic language means grasping the depth of an expressive approach to design that goes beyond mere technical function to become cultural construction, narrative invention and universal code. As demonstrated by recent digital reinterpretations of his work, Ponti's style is still an active model today, capable of dialoguing with emerging practices in graphic design, immersive communication and parametric design. Gio Ponti's vibrant legacy confirms the value of drawing as a constantly evolving design language capable of crossing eras, technologies, and imaginations while maintaining its extraordinary innovative power.

Geometry, rhythm and proportion in his drawings

Gio Ponti's graphic work is characterised by a rigorous and refined attention to geometry, rhythm and proportion, which are the true structuring principles of his design poetics. In Ponti, geometry is not limited to an exercise in formal order: it is transformed into an autonomous visual language, capable of condensing a complex stratification of spatial, narrative and emotional meanings into a few strokes. Every line, every module and every proportional relationship in his designs is not the result of mere decoration, but the tangible expression of a profound design philosophy in which form and idea are inextricably intertwined. Colour in Ponti's graphic and architectural designs follows two main lines. It is often used to suggest textures, materials and surfaces, created through dense and modulated graphic symbols. The use of texture in his sketches not only enriches the compositions visually but also becomes a method of communicating the sensory qualities of the objects and environments designed (fig. 4). These configurations are not simply decorations, but authentic graphic architectures capable of conferring dynamism and visual depth to objects [Ghianda 2020; Scalzo 2020].

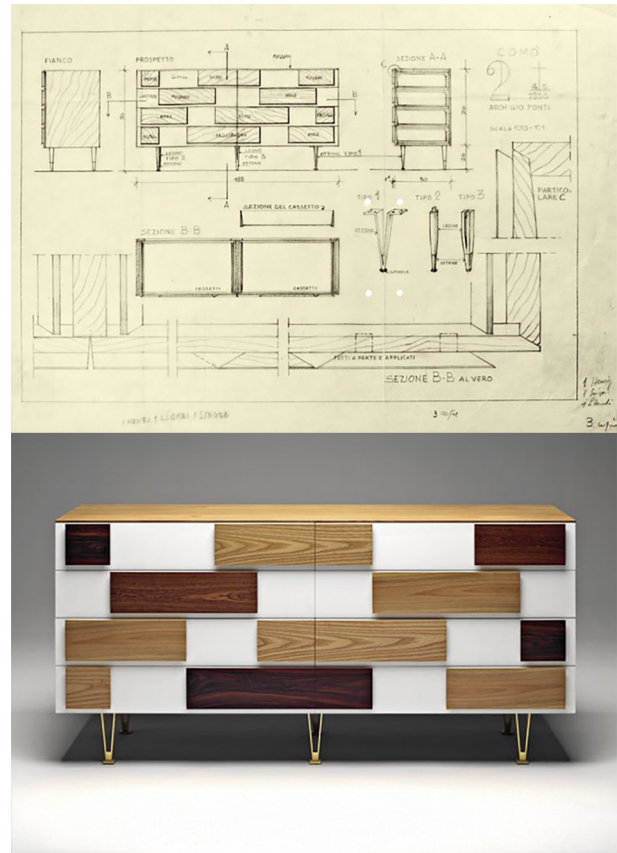


Fig. 3. Chest of drawers, study and technical drawing by Gio Ponti (Domus, 1952 - Gio Ponti Archives). Below, the reissue. D.655.1 Cassettone, Molteni&C., 2023 (<moltenimuseum.com>).

Rhythm, understood as the dynamic articulation of compositional elements, is another fundamental principle of Ponti's language. In his covers for *Domus*, as in his architectural sketches, rhythm emerges from the modular repetition of geometric shapes, the orchestrated variation of solids and voids, and the tension between linearity and curve. This approach recalls Futurist influences and the modernist conception of space as a dynamic field of visual forces [Rossi 2016; De Caro 2022]. As for proportion, Ponti drew on the classical rules of the golden section and Renaissance theories on the harmony of parts. However, his interpretation was never philological or academic: he freely reworked the proportional canons, inventing visual relationships capable of generating balance without rigidity, harmony without staticity. The interiors of Casa Ponti in Via Dezza in Milan (1956-57) and the furniture designed for Molteni&C testify to this skill in constructing fluid and dynamic proportions.

In Ponti's graphic design, the line is emancipated from its mere delimiting function to become a narrator of rhythm and structure. The design sketches, characterised by rapid, fluid and often overlapping strokes, do not simply describe shapes, but construct visual paths, suggest spatial articulations and evoke materials and atmospheres. This expressive use of the line is part of a tradition which, as Maria Elisabetta Ruggiero [Ruggiero 2020] observes, considers the graphic sign as a narrative device, not just a technical representation. Colour also plays a constructive and symbolic role in Ponti's language. Far from being mere ornamentation, colour articulates surfaces, defines visual rhythms and introduces emotional meanings. In his graphic designs, Ponti adopts unusual and bold colour palettes, anticipating much of contemporary research on the emotional function of colour in visual communication [Ponti 1952; Rossi 2016]. The adoption of repeated geometric modules, the alternation between order and variation, the narrative use of line and the significance of colour configure Ponti's design as a systemic language *ante litteram*. This approach anticipates many contemporary practices in parametric design, pattern-based design and generative art, which today interpret graphic design as the dynamic construction of formal and semantic relationships [Calvano 2022]. In this sense, Ponti's graphics should not be read solely as historical evidence of a modernist aesthetic, but as a dynamic archetype still capable of inspiring new modes of visual design. His lesson, based on integrating geometry, rhythm and proportion in a flexible

and poetic syntax, represents a methodological heritage of extraordinary relevance for contemporary design.

Theories and techniques of visual language transformation

The evolution of visual language in design and architecture has always followed a transformation process dependent on cultural, technological and aesthetic factors. In the case of Gio Ponti, the transformation of graphic codes resulted from a constant tension between experimentation and the search for expressive synthesis. The contemporary reinterpretation of his work raises important questions regarding transferring his style to new contexts and media. The concept of transformation in graphic design is not limited to simple reproduction. However, it refers to a process of translation in which the original symbols are adapted, modified and, in some cases, radically reworked to interact with the existing visual language. The transformation of visual language occurs through a series of different processes. One of the most important is abstraction, which reduces an image to its essential elements, eliminating unnecessary details and emphasising formal structures. Abstraction is a recurring feature of Ponti's graphic work, who, even in the early stages of design, tended to simplify forms to improve legibility and compositional coherence. Another process is variation, which recalibrates graphic elements by altering their scale, colour and spatial arrangement. This method, also used in Richard Ginori's decorative designs and on the covers of *Domus*, allows new visual solutions to be found while maintaining stylistic consistency. Reduction is another principle of transformation in which elements are removed to intensify the visual impact of an image. In Ponti's work, the reduction of detail was often used to express archetypes of reality. In his interior designs, for example, essential lines define spaces without excessive decoration. Combining these processes makes his graphic language suitable for contemporary reinterpretation, especially in the context of digital graphics and new visual representations. Digital technology has radically changed how historical graphic works are analysed, transformed and reproduced. Digitisation has made it possible to rework Gio Ponti's designs with tools that increase the possibilities for variation and adaptation, while remaining faithful to the essential elements of his aesthetic. For example, using vector graphics software allows his compositions to be deconstructed and reconfigured, emphasising the modular aspect of his visual language and making it adaptable to



Fig. 4. Initial sketches and colour tests for the flooring of the Hotel Parco dei Principi in Sorrento, Gio Ponti, 1962 (<artemest.com>).



Fig. 5 Cathedral of Taranto (1964–1970) (<ilgiornaledellarchitettura.com>).

contemporary media such as digital design and interactive animation. Digital formatting techniques allow us to explore the fluidity of Ponti's graphic signs, revealing a dynamic dimension that moves away from the static nature of traditional printing. The reinterpretation of Ponti's decorative motifs through augmented reality and 3D printing opens up a new scenario in which his designs are no longer confined to two-dimensional surfaces but can be explored in immersive and interactive spaces. Digital technology also introduces a parametric approach to graphic design, allowing algorithms to reinterpret Ponti's visual codes according to contemporary logic, creating variations in form and colour. This process is particularly evident in recent reissues of furniture and design objects, in which graphic signs are recalibrated

according to the aesthetic and functional requirements of the contemporary world. The digital reinterpretation of Ponti's language is not only a faithful reproduction of his works, but also a creative act that extends the possibilities of his vision to new contexts. Contemporary design is no longer based solely on preserving historical memory but is constantly evolving thanks to new media and technologies. This approach keeps Ponti's visual legacy alive and makes it accessible to a new generation of designers and users. By analysing the processes of abstraction, reduction and transformation in Gio Ponti's graphic language, a design system based on visual integration and diversity of form emerges. Abstraction manifests itself in reducing images to their basic structures, eliminating unnecessary details and increasing the

purity of line and composition. This method is particularly evident in his decorative motifs, where figurative elements are transformed into geometric symbols through gradual stylisation. Reduction is a fundamental principle of his aesthetic, applied to both object design and editorial graphics. In his designs for Molteni&C, for example, he eliminates superfluous details to emphasise the symbolic character of the form and make it immediately recognisable as an elegant and simple piece of furniture. Graphic variations are expressed through changes in form and colour, solutions that respond to specific design contexts. On the cover of *Domus*, Ponti uses a variable compositional scheme, experimenting with different combinations of graphic elements to adapt to the themes covered in the magazine. This dynamic approach demonstrates Ponti's ability to constantly update his language without losing stylistic consistency [Rossi, Buratti 2016]. The transformation process of his visual language is not limited to two-dimensional graphics but also concerns his architectural design. The Cathedral of Taranto (fig. 5), with its façade characterised by geometric motifs that create a rhythmic and harmonious effect, is an emblematic example of how graphic ideas are applied to three-dimensional structures [Palandri 2019].

Application of graphic mutation techniques

The concept of graphic mutation in contemporary design represents a crucial junction between historical memory and design innovation. With its distinctive use of line, colour and modularity, Gio Ponti's work lends itself particularly well to processes of transformation, reinterpretation and adaptation, becoming a living matrix for constructing new visual languages. These processes have found fertile ground in the educational and experimental fields. In particular, the academic experience gained in the Graphic Design course I coordinate as part of the three-year degree programme in Design at the University of Florence has provided an exemplary laboratory for critically exploring Ponti's visual legacy. Through a method based on formal analysis, linguistic synthesis, and creative reinterpretation, students approached Ponti's language not as a model to imitate but as a code to be deconstructed and recomposed into new expressive configurations. Adopting advanced digital techniques made it possible to deconstruct Ponti's signs, emphasising their dynamism, flexibility and modular potential. The teaching experience was structured

as a journey of conscious transformation of graphic language: not a simple stylistic variation, but a genuine design methodology aimed at redefining the identity of a visual code through successive stages of abstraction, reduction, combination and reinvention. The students' work highlighted different strategies for transforming Ponti's signs. In particular, work was done on the modular superimposition of graphic elements, redefining the rhythmic structure of the original compositions; on the variation of dimensional scales, to amplify the sense of spatiality and dynamism; on chromatic experimentation, through the adoption of contemporary palettes and unusual combinations; and finally, on the construction of new digital patterns, reinterpreting historical ceramic motifs in a systematic way that can be adapted to different media (figs. 6, 7).

Particularly significant were the experiments in typography, where Ponti's fluid, narrative style was reworked into dynamic, hybrid layouts capable of translating the original expressive qualities into visual languages suited to the new contexts of digital communication. This graphic transformation highlighted Ponti's potential as an open archetype, capable of generating new visual languages beyond simple formal references to embrace autonomous and innovative research practices. One of the most fascinating aspects of the workshop was the ability to transform Ponti's two-dimensional compositions into immersive visual environments. The use of digital tools –augmented reality, projection mapping, graphic animation– has made it possible to expand his patterns into three-dimensional space, giving rise to multisensory experiences that go beyond the limits of the surface to become habitable spaces of visual narration. The transition from traditional graphics to motion design and mixed reality (augmented and virtual reality) has shown how Ponti's language, while rooted in modernist culture, possesses an extraordinary ability to adapt to the emerging languages of contemporary design [Calvano 2022; Ruggiero 2020]. In particular, some experiments have explored the application of Pontian signs to flexible brand identity systems built on principles of dynamic modularity: visual identities capable of changing and adapting to different contexts without losing stylistic coherence, in line with the latest models of reactive and adaptive visual communication. This teaching experience has highlighted how graphic mutation is not just a formal exercise, but a conscious design act, capable of redefining established codes of expression and producing new modes of visual meaning. Gio Ponti's legacy is evident in his ability to influence

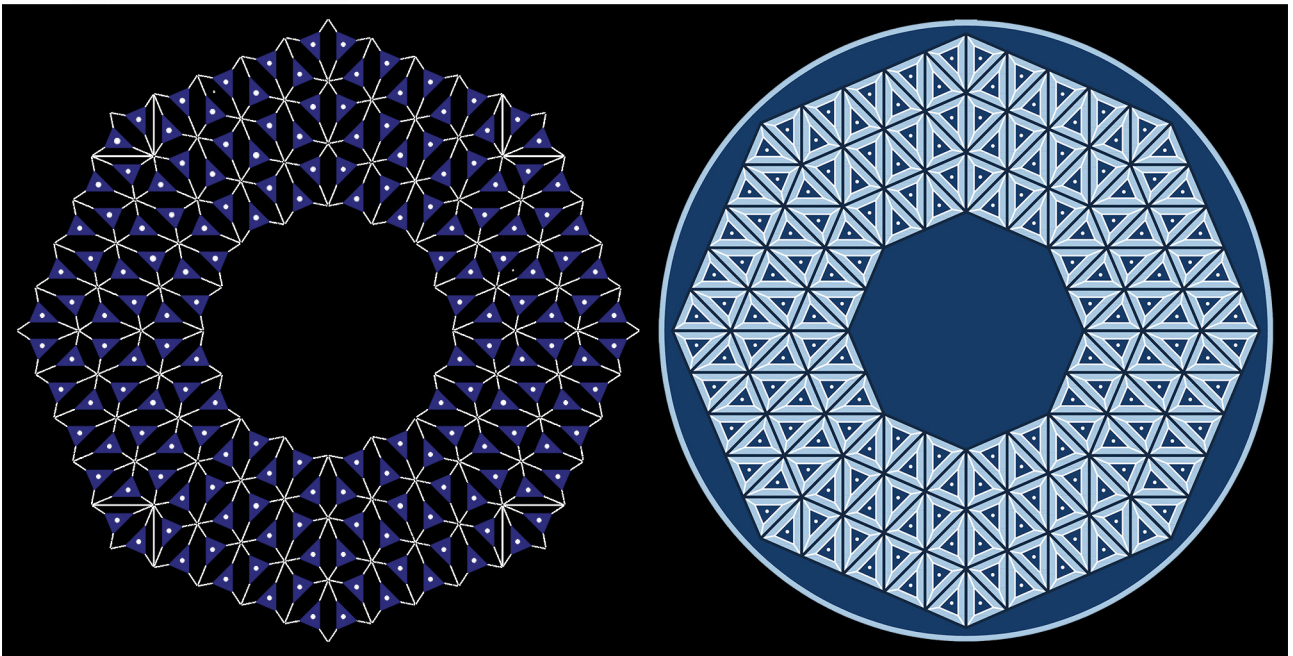
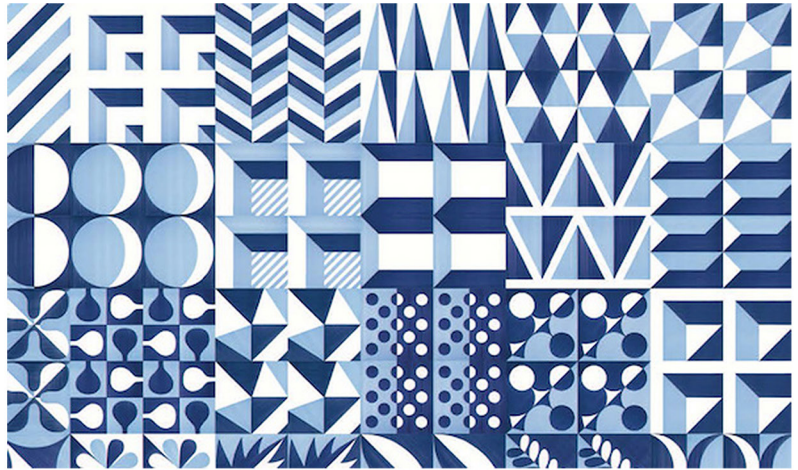


Fig. 6. Design inspiration, technical drawing and final design, Sara Fanelli, 2024.



Fig. 7. Design inspiration, technical drawing and final design, Leonardo Barbensi, 2024.

contemporary design and his extraordinary aptitude for transformation, critical reinterpretation and future projection. Academic research and experimentation have confirmed that his visual language, far from being crystallised in the past, is a living, constantly evolving material capable of generating new imaginaries and suggesting innovative paths in the field of visual communication. An analysis of the results highlights how Pontian design, with its interweaving of modularity, colour, rhythm and geometry, continues to be an inexhaustible source of inspiration for emerging languages in graphic design, experiential branding, immersive reality and interactive visual design.

Conclusions

The analysis of graphic mutation applied to Gio Ponti's work has highlighted the extraordinary vitality and relevance of his visual language, which is capable of transcending temporal boundaries and adapting to the needs of contemporary communication. Far from being a static repertoire, Ponti's graphic code is a living, dynamic material, constantly susceptible to transformation, reinterpretation and innovation. Through the methodological approach adopted –based on iconographic analysis, semantic abstraction and design reinterpretation– a vision of Ponti has emerged not only as a creator of forms, but as an inventor of open expressive systems capable of generating new visual configurations based on structural principles of modularity, rhythm, proportion and symbolic meaning. The educational experimentation confirmed that his aesthetic,

while rooted in Italian modernist culture, is perfectly capable of dialoging with the emerging languages of parametric design, motion design, augmented reality and immersive communication, suggesting new evolution paths for contemporary graphic design. The value of Ponti's legacy lies precisely in this design infrastructure: a network of principles and visual devices which, when critically reinterpreted, allow us to go beyond the concept of mere historical reproduction and embrace a dimension of active research and creative mutation. For Ponti, design was not just a representative tool but an act of thought: a form of visual narration capable of crossing materials, media, and technologies while maintaining its evocative and expressive power. Today, more than ever, this concept is a fundamental lesson for contemporary visual design, which is called upon to confront the fluidity of digital media, the hybridisation of languages and the need to build dynamic and adaptable visual systems. Analysing Ponti's graphic language means recognising an extraordinary foreshadowing of contemporary design practices: a continuous tension between memory and innovation, structure and freedom, and compositional rigour and poetic imagination. Therefore, Gio Ponti's legacy is not just a heritage to be preserved: it is a living laboratory of design possibilities, an open horizon that invites contemporary designers to reinterpret, transform and reinvent, keeping alive the creative tension that underlies every authentic act of design. As Ponti himself said: "Everything in the world should be colourful" [Ponti 1952] – an invitation not only to contemplate the beauty of colour, but to build new visual worlds capable of exciting, questioning and innovating.

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Ambiguous Representations: Drawing and Its Potential Misinterpretations

Felice Romano

Abstract

Drawing, understood as a language, is inherently ambiguous: every mark can be misinterpreted, reinterpreted, or manipulated. Starting from Paul Ricoeur's reflection on the link between interpretation and the possibility of misunderstanding, this essay investigates architectural drawing as a non-neutral device, shaped by cultural conventions, biases, and social contexts. Through the analysis of historical examples –from the accusations of espionage against Aleksandr Alekhine, triggered by the misunderstanding of chess score sheets, to the controversial reception of Frank Lloyd Wright's Masieri Memorial project– it highlights how drawing can become a tool for ideological misinterpretation. A close reading of Jean-Jacques Lequeu's drawings further reveals how seemingly geometric inaccuracies disclose a more complex rhetorical and symbolic intention. The article proposes a classification of ambiguities into four categories: technical, epistemic, rhetorical, and perceptual. The latter is illustrated through the phenomenon of multistable images (Kippbilder), which underline the inherent instability of human perception. In conclusion, the essay argues that the ambiguity of drawing, far from being a mere source of error, constitutes a vital element of its creative and hermeneutic potential, encouraging a more critical and conscious reading of architectural representation.

Keywords: architectural drawing, misunderstanding, graphic ambiguity, Jean-Jacques Lequeu, F.L. Wright.

Introduction

"There is hermeneutics where there is misunderstanding".
[Ricoeur 1981, p. 83].

Paul Ricoeur's assertion opens up a crucial consideration involving every form of language: wherever meaning can be misunderstood, interpretation takes root.

If drawing is a language, as semiotic tradition invites us to consider, then drawing is always a challenge: the line seeks its meaning, and the act of tracing it interrogates the world, aiming to define reality –or the idea of it, shaped through signs– by extracting significant elements; and within this perpetual process of 'artificial signification', lie both the opportunities and the criticalities that any idiom inherently carries. Thus, the 'graphic language' is never neutral either and,

in its ongoing aspiration towards iconicity, it lives through interpretive ambiguities dependent on cultural conventions, social contexts, and sometimes, educational biases. In architectural drawing, these ambiguities manifest both in the act of design and in that of communication, leaving space for subjective interpretations and misunderstandings that can indeed generate misreadings, but may also enrich the creative process.

Acknowledging that the multidisciplinary nature of the theme would require a much broader scope, this paper aims to highlight the intrinsic 'fragility' of the graphic sign –linked precisely to its polysemic nature– which risks at times becoming a communicative 'trap', but at the same time –or so it is believed– can serve as fertile ground

for research and experimentation, related to issues of drawing, representation, and the polysemic character of any activity of image reading.

Within the field of architecture, representation is the privileged tool to communicate, design, and interpret built space. Plans, sections, and modern digital elaborations are mediums that fulfill the task of translating three-dimensional reality (or the multiplicity of dimensions conceived by the mind) into two-dimensional forms.

While on the one hand, architectural drawing aims to reduce ambiguity by making the design intent as clear as possible, on the other hand, it often fails (or sometimes refuses) to eliminate areas of uncertainty, which can generate 'special effects' or illusory perceptions.

The history of art and architecture abounds with examples that critically and consciously exploit visual ambiguities, from Giovanni Battista Piranesi's *Carceri* –impossible spaces challenging perspectival logic– to Andrea Pozzo's baroque illusions, and to the 'multistable' deceptions of M.C. Escher (fig. 1). In all these cases, ambiguity does not lead to 'error' but constitutes an intrinsic component of visual experimentation. When encountering architecture, ambiguity may open new horizons for the interpretation and understanding of space.

For practical reasons, an attempt will be made to classify the ambiguities, so as to frame more organically the examples discussed later. Obviously, one must consider both cognitive and socio-cultural aspects to highlight how the nature of misunderstanding is far from being merely a source of error and instead constitutes fertile ground for exploring the complexities of graphic language capable of triggering hermeneutical processes.

One could first identify a type of ambiguity within specialist contexts, which we might refer to with the term 'technical ambiguity'.

This arises from the use of symbols, graphic conventions, or interpretive codes comprehensible only to insiders or to those with specific training, such as diagrams of electrical or mechanical systems, which are immediately legible to specialized technicians, but may appear indecipherable and ambiguous to an external observer lacking specific technical knowledge.

This form of ambiguity, well-illustrated by Nelson Goodman in *Languages of Art* [1968], emphasizes that ambiguity does not necessarily stem from the form of the sign itself, but rather from the absence of a shared and commonly understood interpretative code. The limit of



Fig. 1. M.C. Escher, *Belvedere*, 1958. lithograph, 46.2 × 29.5 cm.

image translation thus lies in the polymorphic essence of the interpretant, so broad as to be “suitable for any and no use” [Eco 2021, p. 125], a characteristic common to every category. This is inevitable, as drawing always –though not unequivocally– means communicating, and, as we know, “every communication always involves ‘making concessions’ to the notions held by the recipient” [Gombrich 1959, p. 278].

A second type, which we might explicitly associate with ‘abuses of knowledge’, can be called ‘catachrestic ambiguity’. This refers to ambiguities stemming from historical, cultural, or ideological biases that condition the interpretative process independently of the intrinsic qualities of the drawing itself. Here, the drawing becomes a ‘victim’ of prejudiced, uninformed, or instrumental readings. When the observer (or the collective) projects fears, ideological resistance, or partisanship onto the graphic sign, the result is a misinterpretation that effectively severs the graphic work from the author’s original intentions.

A last category concerns rhetorical or intentional ambiguity, deliberately employed by the author of the drawing for expressive, symbolic, or persuasive purposes. This form of ambiguity frequently emerges in architectural treatises and general drawing literature, where deliberately enigmatic and allegorical elements foster multiple interpretative readings. For instance, in the style of Athanasius Kircher’s *Mundus Subterraneus* [1665], esoteric symbols, mythological figures, and ambiguous geometric schemes are combined to stimulate interpretations on multiple levels. In this case, ‘visual ambiguity’ overlaps with ‘communicative strategy’, becoming a medium to convey meanings that go beyond immediate description [Summers 2003].

A third category –assuming this tentative classification to be acceptable– could be described as perceptual-illusionistic ambiguity. In such cases, ambiguity resides in the graphic configuration itself, which induces the observer to perceive multiple and often contradictory visual experiences. These visual ambiguities are clearly manifested in Renaissance and Baroque perspectival illusions, such as the architectural *trompe-l’œil* by Giulio Romano, or in the famous anamorphoses by Hans Holbein, where an image appears completely different depending on the viewer’s position.

This hypothetical categorization, which is hoped to be useful for reading the perceptual dynamics of the

subsequent cases, should not be understood as a rigid separation: the different categories represent complementary dimensions of a single interpretative process.

The interpretative key offered by Walter Benjamin [1920] becomes particularly useful to understand that every form of representation –graphic, linguistic, or artistic– inevitably preserves an essential portion of ambiguity and untranslatability. Such ambiguity constitutes a potential for continuous reinterpretation and resignification, endowing the act of drawing with an inexhaustible and vital interpretative richness over time.

Spies, monsters, and the coercion of the sign: two case studies

An emblematic example –concerning the first two categories previously outlined– of the ambiguous and, at times, ‘coercive’ power of the graphic sign is offered by a curious episode linked to the history of chess: the Meisterturnier [1] held in Mannheim in 1914, which was abruptly interrupted by the outbreak of the First World War. The future fourth world champion, Aleksandr Alekhine, saw his prospects seriously endangered at the time, due to misinterpreted signs. Indeed, after spending a night in detention –because of a photograph portraying him in a school uniform mistaken for military attire– Alekhine and other Russian players registered for the tournament were authorized to move temporarily to Baden-Baden while awaiting repatriation. However, during the journey, the attention of a railway inspector was drawn to the incomprehensible signs and diagrams filling the pockets of the group of passengers: chess score sheets, which, to those unfamiliar with the ‘noble game’, appeared too much like encrypted spy communications. Immediately, the train was diverted to Rastatt, under the pretext of a transfer, where the local military authorities, already alerted, awaited the group of chess players.

“As soon as we stepped off the carriage, we were surrounded by so many soldiers that it seemed almost an entire company, all heavily armed, and we were arrested. In the station depot, they meticulously searched us and our belongings, and with a sense of triumph, they discovered the game score sheets, which the zealous bloodhounds mistook for evident coded messages meant for espionage communication” [2], recounts

Fedor Bogatyrčuk, another chess player from the same unfortunate group, all victims of misinterpretation.

It seems implausible that none of the authorities understood the true nature of the materials; yet, likely in the interest of preserving the reputation of the military corps – “to save face” [Kasparov 2003, p. 428] – and given the ‘overwhelming’ evidence committed to paper, the ‘investigations’ nonetheless led to the arrest of all players. For Alekhine, released after a few weeks along with a few others, the incident added another episode to his already legendary biography. However, not everyone’s story [3] had a happy ending.

The sheets wrongly interpreted from the game forms activated the cognitive biases that process graphic-textual language, whether consciously or not, placing the power of the sign in the uncomfortable position of being simultaneously both ‘victim and perpetrator’ of erroneous interpretation. This clearly illustrates that critical threshold where the links between hermeneutics and the true form [4] of reality are severed by ideologies and prejudices inherent to the socio-cultural context.

If, as Pareyson reminds us, “undoubtedly, interpretation is knowledge in fact, for human beings, there is no knowledge except as interpretation [...] to interpret is to grasp, to capture, to seize, to penetrate” [Pareyson 1974, p. 180], it is equally true that the power, sometimes ‘coercive’, of drawing is such that it can upend even the most favored destiny.

A similar hermeneutical system of formative prejudices brings us to Venice in the 1950s, specifically in 1951, when the young architect Angelo Masieri, accompanied by his wife Savina Rizzi, met Frank Lloyd Wright, who had been invited to the *Serenissima* to receive an honorary degree from the Istituto Universitario di Architettura. On that occasion, the couple from Udine proposed that the master design their Venetian residence, on a triangular lot facing the Grand Canal and the Rio Novo. The vicissitudes surrounding the Memorial project [5] are well known and studied; however, of particular interest here is the central role that certain drawings played in determining the fate of the building’s realization. Specifically, a perspective rendering (fig. 2) – which may have been deliberately ‘inaccurate’ to emphasize the building’s importance – depicted the new structure as being as tall as the adjacent Palazzo Balbi, whereas, as it has been demonstrated [Sdegno 2011], its roof would not even have surpassed the noble floor of the Renaissance

palace. Thus, the drawing provided the Venetian public with further fuel to inflame an already lively controversy. The dissemination of the project’s graphics shifted the dispute into the Italian press, which almost daily attacked the memorial, considering the project inappropriate and scandalous.

The controversy was further fueled by a series of inaccurate descriptions, photomontages, and falsified drawings that continued to reinterpret Wright’s idea in a variety of styles, such that “shameless criticism arose everywhere” regarding the compositional aspect of the structure, its lack of dialogue with the context, and even the inadequacy of the proposed materials.

One particularly emblematic caption appeared anonymously in the weekly *Candido*, beneath Wright’s now infamous drawing: “This is the famous ‘monster house’ that the American architect Wright would like to build in Venice: a kind of compromise between a bunker, a pharaonic mausoleum, and the summer residence of a Californian merchant. To better understand the situation, it should also be noted that the principal building materials would be crystal, stainless steel, and Verona stone, and that the structure would rise only a few meters from Ca’ Foscari, dominating a key stretch of the Grand Canal. The worst part is that the city authorities, extremely sensitive to the honor of hosting Wright’s architectural hallucinations, seem willing to authorize its construction” [6].

It seems obvious that the diffusion of perspective merely acted as an amplifier in an already tense situation; once again, the paranoid delirium of the sign triumphed over reason.

As demonstrated [7], Wright’s project was significantly more modest in scale; yet the memorial was never built. Once again, the ‘coercive’ power of a graphic sign, amplified by a polemical context, proved decisive in transforming a visionary idea into a public scandal.

The misinterpretation of graphic works, in both cases, is inevitably tied to the role played by contextual and situational factors – both of historical-ideological and physical-social nature – which can deeply affect the perception of the subject by the interpreter. These are the same cognitive biases that often lead to judgment errors, constituting real ‘thought shortcuts’ from which rapid, or ‘convenient’, beliefs and decisions are derived. In the analyzed examples, the triggering mechanism is common and relates to the transition in the ownership

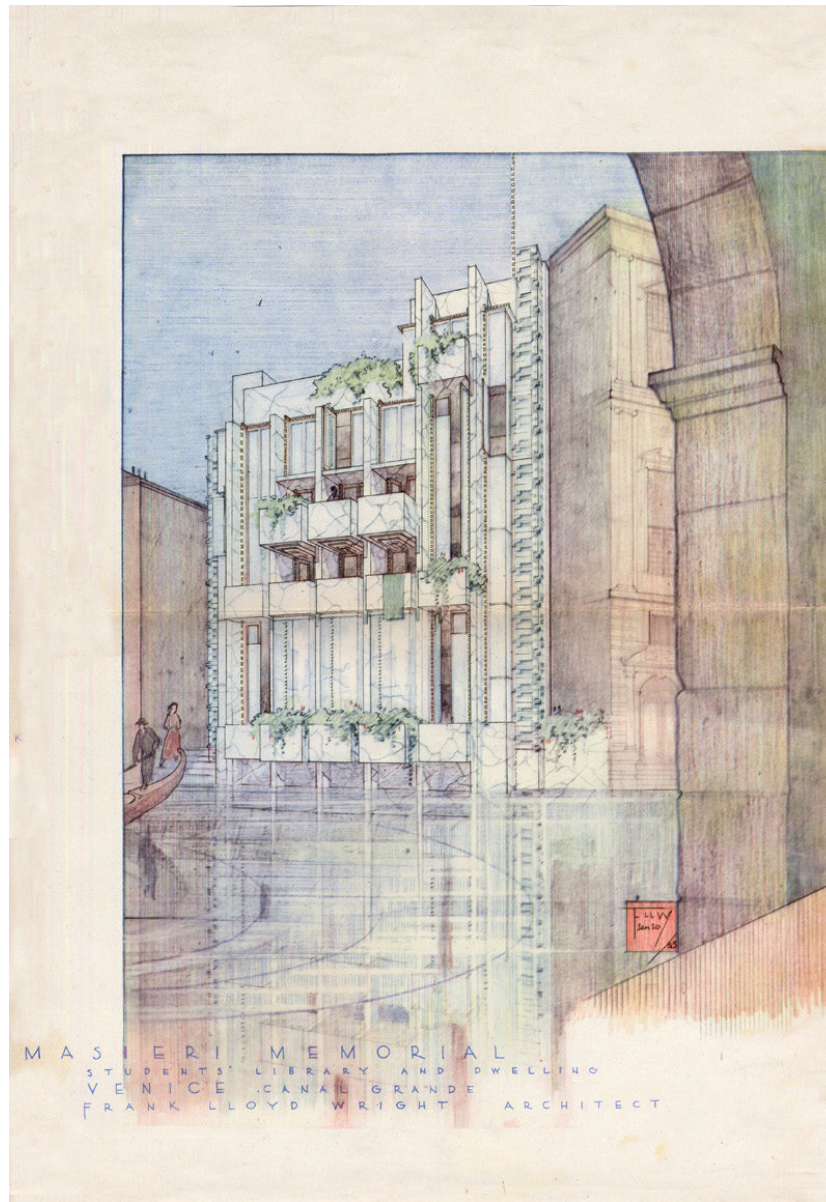


Fig. 2. F.L.I. Wright, Perspective of the Masieri Memorial, Venice 1953 (The Frank Lloyd Wright Foundation).

of the represented object: both the soldiers' searches for the chess players and the premature dissemination of Wright's drawings by the press highlight this fracture. The swift transition from the merely instrumental and private nature of the elaborations –as are all design drawings and chess notations (fig.3)– to their extraction "from their practical (heuristic) framework and their paratexts" into "an entirely public domain" [Gay 2020, p. 66] becomes apparent.

The episodes of misunderstanding outlined above demonstrate how drawing effectively triggers cognitive biases and 'thought shortcuts' [8], which prompt hasty judgments.

The so-called framing effect reveals how the frame in which a problem is presented can strongly influence the way we evaluate it.

An architectural prospectus, a competition panel, or a specialized notation thus becomes a genuine 'interpretive trap' if the observer lacks the necessary tools to decode the language or conversely, if they approach it with pre-formed prejudices. This dynamic can lead to 'convenient', rapid, but potentially fallacious choices.

Kippbilder: ambiguity, reversibility, and multi-stability

Even broader, yet more readily delineable, is the category related to visual perception, understood not as a mere faithful transposition of sensory experience, but rather as a phenomenon "derived from the cognitive functions of the mind, namely from the sensory perception of the external world" [Arnheim 1954, p. 176]. It thus constitutes a dynamic process, one that may lead to misunderstanding and to unstable interpretations.

Pertaining to this typology are the so-called 'Kippbilder', or multistable or reversible images, in which the same graphic figure, observed without any material change, triggers sudden shifts from one perceptual configuration to another.

This effect arises from the way our brain selects, connects, and interprets visual stimuli, often leading to mistaken evaluations that highlight the subtle boundary between perception and misinterpretation (fig. 4).

In these images, the shift between different 'readings' is sometimes triggered by contours that, as in the famous Rubin vase (fig. 5), can be seen simultaneously as a vase or as two human profiles. Other times, the recall of familiar forms intervenes. For example, when the same

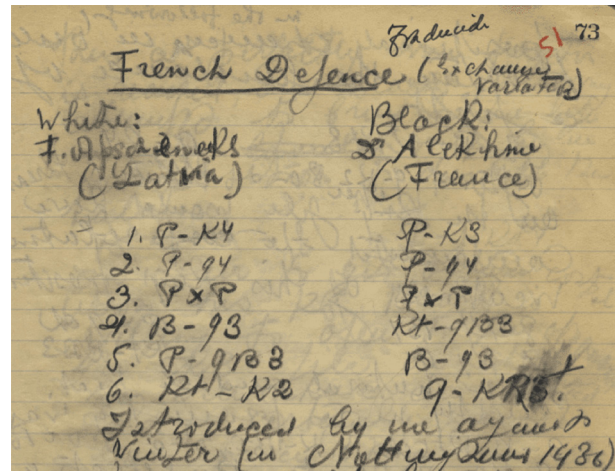


Fig. 3. A. Alekhine, Commentary on the game against Latvian master Fricis Aspaeniks, played during the eighth round of the Chess Olympiad in Buenos Aires, 9 September 1939.

line is perceived either as a rabbit's snout or as a duck's beak (fig. 6). These representations reveal our tendency to recognize faces and bodies from minimal clues; it is enough to think of how, in an otherwise innocuous landscape, the traits of a face may suddenly appear once discovered, leaving us suspended between observing a human silhouette or a twisted tree.

Such ambiguities demonstrate how mental processes can deceive us or lead us into alternative interpretations, emphasizing the kind of 'misinterpretation' to which we are constantly exposed, even in everyday life. The phenomenon also emerges on the perspectival level: for instance, when a cube drawn with transparent lines abruptly inverts its depth direction, causing our perception to oscillate between two opposing spatial configurations. It constitutes an error of reading, but at the same time it serves as evidence of a formidable creative potential with which we engage, stimulating the active function of seeing, wherein the brain strives to extract a unified sense from uncertain traces.

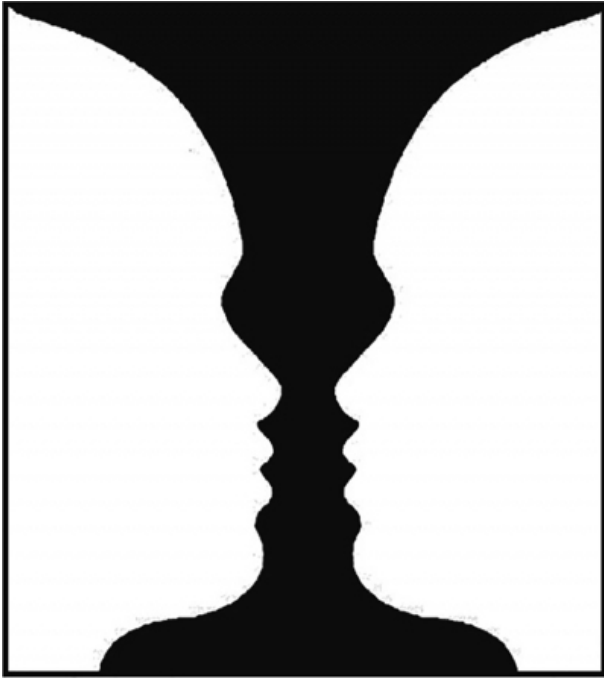
Researchers have sought to explain this perceptual multi-stability both as the result of physiological processes –where the neurons responsible for one 'solution' become exhausted, favoring the alternative one– and because of cognitive factors involving memory, selective attention, and prior knowledge [9]. Experimental evidence, however, suggests an intricate interplay between the two levels: low-level neural circuits work in tandem with higher-order cognitive evaluations, and in some cases, voluntary attempts to cling to one of the two interpretations fail, as it takes very little for perception to 'flip' to the opposite reading.

This mechanism highlights how the mind is predisposed to filling informational gaps and to invent ever-new interpretations. Such occurrences happen not only when confronted with deceptive drawings but also in real-life situations where the lack of a decisive clue can generate misunderstandings or even illusions of reality.

Indeed, *Kippbilder* reminds us that every act of perception is potentially exposed to misunderstanding. The certainty that what we see corresponds unequivocally to what exists can vanish, with a mere shift in perspective or concentration. Nonetheless, while most everyday experiences provide a sufficiently clear context to prevent dangerous reversals of meaning, when faced with an ambiguous stimulus, our sensitivity to detail transforms into fertile ground for misunderstandings,



Fig. 4. W. E. Hill, *My Wife and My Mother-in-Law*, Puck, November 6, 1915.



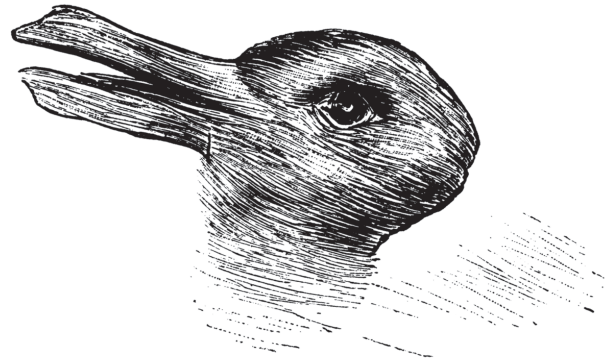
double meanings, and rival interpretations, in a fascinating intertwining of perceptual science and the narrative of how –and to what extent– the mind can deceive itself.

Duality of shadow: a single drawing

Within the undoubtedly vast and inexhaustible context of the fourth category of ambiguity –the ‘rhetorical-intentional’– the following example is proposed: a fragment of a broader study currently being conducted by the present author, dedicated to the intense eighteenth-century debate on the issues of shadow in architectural representation. The example is based on a ‘close’ analysis [10] of a drawing by Jean-Jacques Lequeu (fig. 7).

The drawing constitutes the second frontispiece of his most famous and studied work, *Architecture Civile* [1777–1825], and it presents itself as an exhaustive compendium on the theory of shadows, seemingly useful to be

Welche Thiere gleichen ein-
ander am meisten?



Hasen und Enten

Fig. 5. E. Rubin, Rubin's vase, 1915 ca.

Fig. 6. J. Jastrow, Duck-rabbit illusion, *Fliegende Blätter*, 23 October 1892.

shown to students of art and architecture schools.

Within a rectangular frame, it contains an additional octagonal border that delimits a sort of imaginary plafond, animated solely by a luminous sphere, set against a clear sky devoid of figures. The atmosphere –sacred, much like that of certain representations of the *Assumption*– is entirely devoid of human presence [11] and remains suspended in an unreal space. The central sphere is the only source of light and is conceived as both ‘one and multiple’ at the same time: it could be ‘the sun, the moon, a torch, or a pyre’ [Lequeu 1777–1825, pl. 2], influencing, depending on its dimension, the shadows of five solids arranged around the edges of the composition. In the marginal note, it is specified that all the shadows in the work are generated ‘by a ray of light falling at 45 degrees on their horizontal or vertical faces’ [Lequeu, *ibidem*]. On paper, therefore, the author appears to follow a coherent and methodical approach, combined with an extraordinary ability to graphically render the density of the atmosphere and the materiality of surfaces.

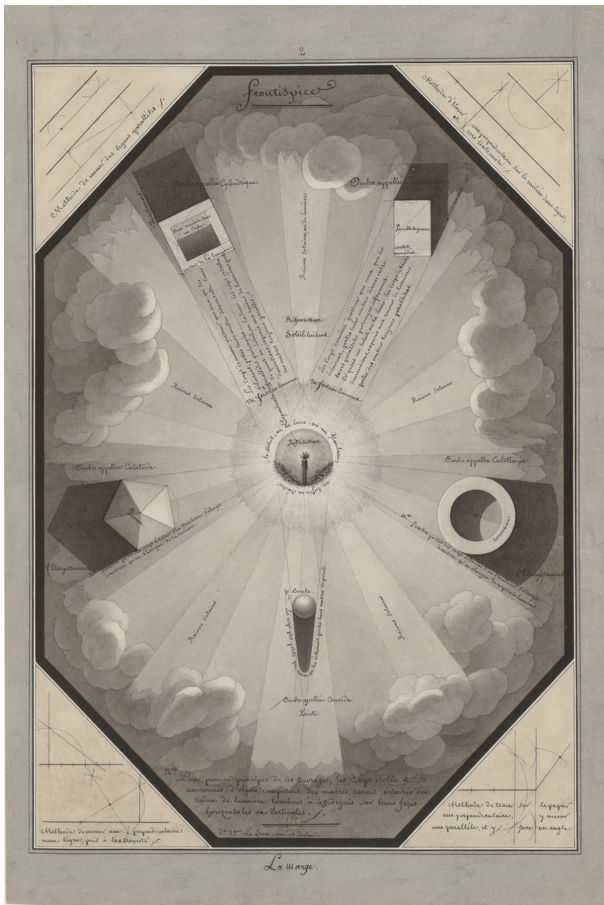


Fig. 7. J.-J. Lequeu, *Frontispiece of the Architecture Civile* [Lequeu 1777-1825, pl. 2], undated. Pencil, pen, monochromatic ink wash, and watercolor, 51.5 × 34.5 cm (BnF, Est Réserve FOL-HA-80 (2)).

Yet, upon closer observation, the image reveals itself to be full of geometric inconsistencies.

It is precisely in this tension between theoretical rigor and practical errors –between didactic clarity and potential interpretative misunderstandings– that the communicative strength of Lequeu's drawing resides.

The skillful use of *lavis* and the compositional balance mask, even to the attentive eye, every construction defect, highlighting how drawing, as a language, is never completely univocal.

Unlike his more famous colleague Étienne-Louis Boullée, who experimented with colossal architectures dramatized by stark contrasts of black and white to explore the behavior of light at different times of day, Lequeu's light remains unchanging.

However, it always appears surreal, with colour serving as a “carrier of the range of sensations that architecture aims to express” [Boeri 2018, p. 86], and where the different consistencies of materials and the atmospheric mass concentration are always perceptible.

Much like an inverted compass rose, from the center of the illuminated sphere propagate “solar rays or rays of light, reflections of the shining sun” [Lequeu 1777-1825, pl. 2], which, refracting through the density of the surrounding air –represented by clouds shaded according to their orientation– divide the interior of the octagon into twenty-two irregular sections, filled with alternating washes of the same gray-brown tone. Lequeu continuously draws from a vast repertoire of calembours, numerical and symbolic references, embedding an elaborate metaphorical apparatus into his plates. Many studies have explored these aspects [12], highlighting how the architect from Rouen often alludes to mystical and philosophical conceptions, ranging from Gnosticism to the Kabbalah.

In particular, the number twenty-two –the irregular segmentation of the luminous rays– recalls the forces responsible for the creation of the universe in various religious and philosophical traditions; twenty-two is a palindromic number, and its square (484) retains this same property. The presence of five solids also refers to the ‘number of individuality and human will’ [Trinajstić 1993, p. 228.], while the central octagon, a symbol of cosmic balance, serves as a conceptual container for these multiple allegories.

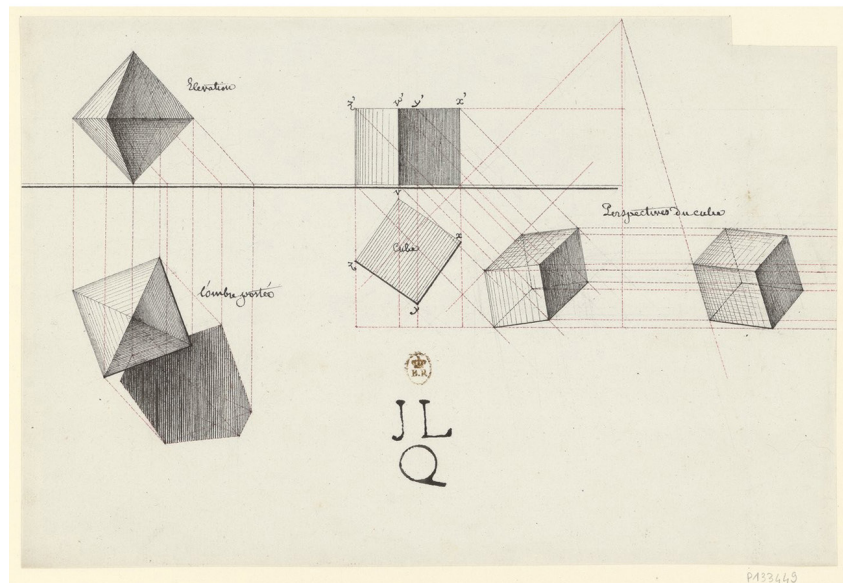
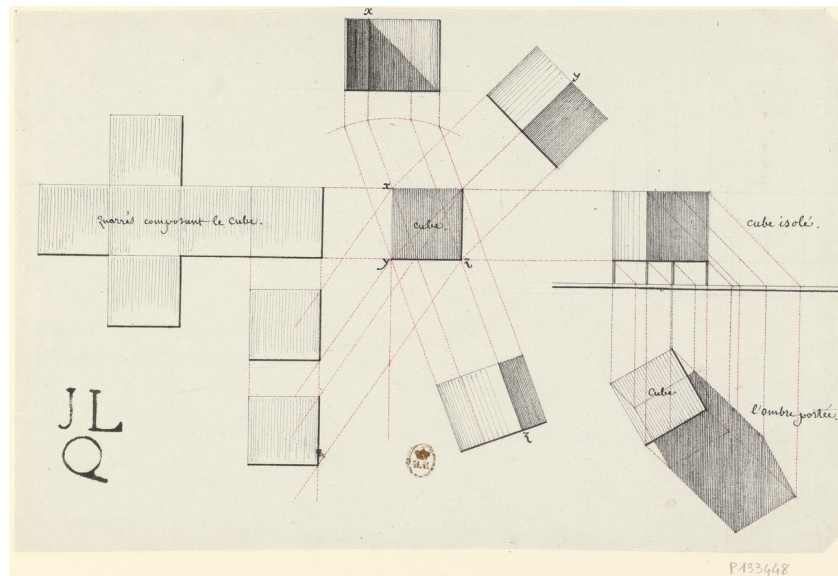
Similarly, in other plates by Lequeu –such as the *Hall of States of the Palais National* or plate 33 of *Architecture Civile*– numerical-linguistic references intertwine with



Fig.8, J.-J. Lequeu, *Ordre symbolique* [sic], du Temple de Mémoire d'un Palais National, Paris 1789. Pencil, pen, monochromatic ink wash, and watercolor, 46,8 x 31 cm (BnF, Est Réserve HA-80 (B, 6)).

deliberately ambiguous representations: for instance, the Ionic order transformed into a 'courtier's wig' (fig. 8) or the figure 100 ('*cent-sang-sangue*') alluding to the Passion of Christ and the author's own personal biography [13]. Within this conceptualization of 'unlimited semiosis', it appears that no choice manifests randomly. The luminous rays strike five solids (the number of individuality and human will), enclosed within the octagonal space (cosmic balance), leading to further reflections. As Franca Trubiano [1995] has emphasized in her study on the 'orthography' of the Rouen draughtsman, the Latin derivation of the term *fascéau*, from *fascis*, perfectly fits this symbolic framework. Among others: the bundles of twigs, wood, and straw traditionally carried by the Virgin; or the *fascés lictoriæ* of Ancient Rome – a bundle of rods tied around an axe, carried by lictors as a symbol of authority over life and death – which, as it is well known, was later adopted by the French Revolution as a "proper symbol of aspiration to national unity and freedom" [De Turris 2006, p. 17].

The connection is, in fact, not implausible. The fasces motif appears in Lequeu's *Ornements d'Italie* plates – of unmistakable Piranesian inspiration – held outside the donation to the Bibliothèque Nationale, and also within *Architecture Civile*: as an ornament surmounting “one of the two monuments to be erected at the center of the Star of the astonishing Royal Road”; in the dedicatory epigraph – in a language that seems unknown – placed atop the grand “triumphal arch erected in honor of the brave patriots”; and again as a decoration flanking the staircase of the “tribune for speeches in the round hall of the marronniers” [Lequeu 1777-1825, p. 80], highlighting the uncompromising attitude toward those harboring hostile sentiments toward the republic. To avoid falling into enthusiastic and misleading associations between the traits and the shape of certain elements drawn in the form of bundles, George Hersey's reflections prove particularly useful. In his study on the language of classical architecture [Hersey 1998], he links the symbolic-practical meaning of these decorative elements to the shadows cast by architectural orders. Specifically, to the *rabdoi* (ῥάβδοις), the *striae* (flutings), whose etymology refers to magic rods, spear shafts, Hermes' caduceus, or the vertical folds of a Greek chiton, but whose practical purpose was to cast shadow along the columns. Similarly, the lateral frames of doorways or windows, also called ‘*fascia*’, serve to frame openings by defining the shadow



Figs. 9-10 J.-J. Lequeu; Quarres composant le cube, L'ombre portée (in alto), Perspectives du cube (in basso), s.d., Bibliothèque Nationale de France FOL-IA-36.

profile between solids and voids, as does the flat fascia managing the length of the architrave –and analogously for other moldings such as the scotia– the symbolic apparatus of individual elements thus leads back to the alternation of light and shadow, intrinsic to the very etymology of the term *fasceau*.

On the margins of the plate, outside the octagonal space, Lequeu illustrates the 'indispensable constructions' for creating shadows: systems for drawing parallel lines, perpendiculars, and angles. This attempt to confer a scientific and methodological aura, typical of an era when geometry was imposing itself as the principal discipline, nevertheless clashes with the numerous inconsistencies that emerge when analyzing the central composition.

Using traditional drawing tools –or even through simple close observation– one discovers that the hollow solids (the cube and the cylindrical crown) show poorly proportioned shadows, as if the light source were simultaneously shifting within the same volume. Even more glaring are the errors in the projection of the spheres and the pyramid's shadows, where the basic rules of projective geometry are not respected.

These inaccuracies are not due to a lack of knowledge: elsewhere, Lequeu demonstrates his ability to correctly construct the shadows of simple solids; see, for example, certain geometric exercises from the Lequeu bequest (figs. 9-10). Thus, the presence of such evident flaws, precisely in the frontispiece of a work that is intended, at least in part, as a didactic text on light behavior, appears even more striking.

Lequeu's geometric inconsistencies can be contextualized within the Parisian society of the late eighteenth century, a society brimming with ferment and controversy: interest in the 'new science of geometry' coexisted with revolutionary aspirations, the symbolic legacy of Antiquity, and Enlightenment experimentation on perception and sensitivity. In his attempts to gain recognition, Lequeu draws from various bibliographic and figurative sources: from *Ornements d'Italie* to the plates of Troili, to Alain Manesson Mallet's *La Géométrie* [14] (fig. 11), and, more distantly, to Leonardo da Vinci.

In the frontispiece, the Rouen architect seems to intend to condense both the scientific dimension of shadow (the marginal constructions and Euclidean-derived perspective) and its symbolic and mystical dimension (the luminous sphere, the numerical references, the meticulous chiaroscuro). The result is a drawing in perfect



Fig. 11. A. Manesson Mallet, *Des Elemens de Géométrie*, Chantilly du costé du Canal et de la Blouse [Manesson Mallet 1702, *La Géométrie pratique*, tome 1, p. 241, pl. 98].

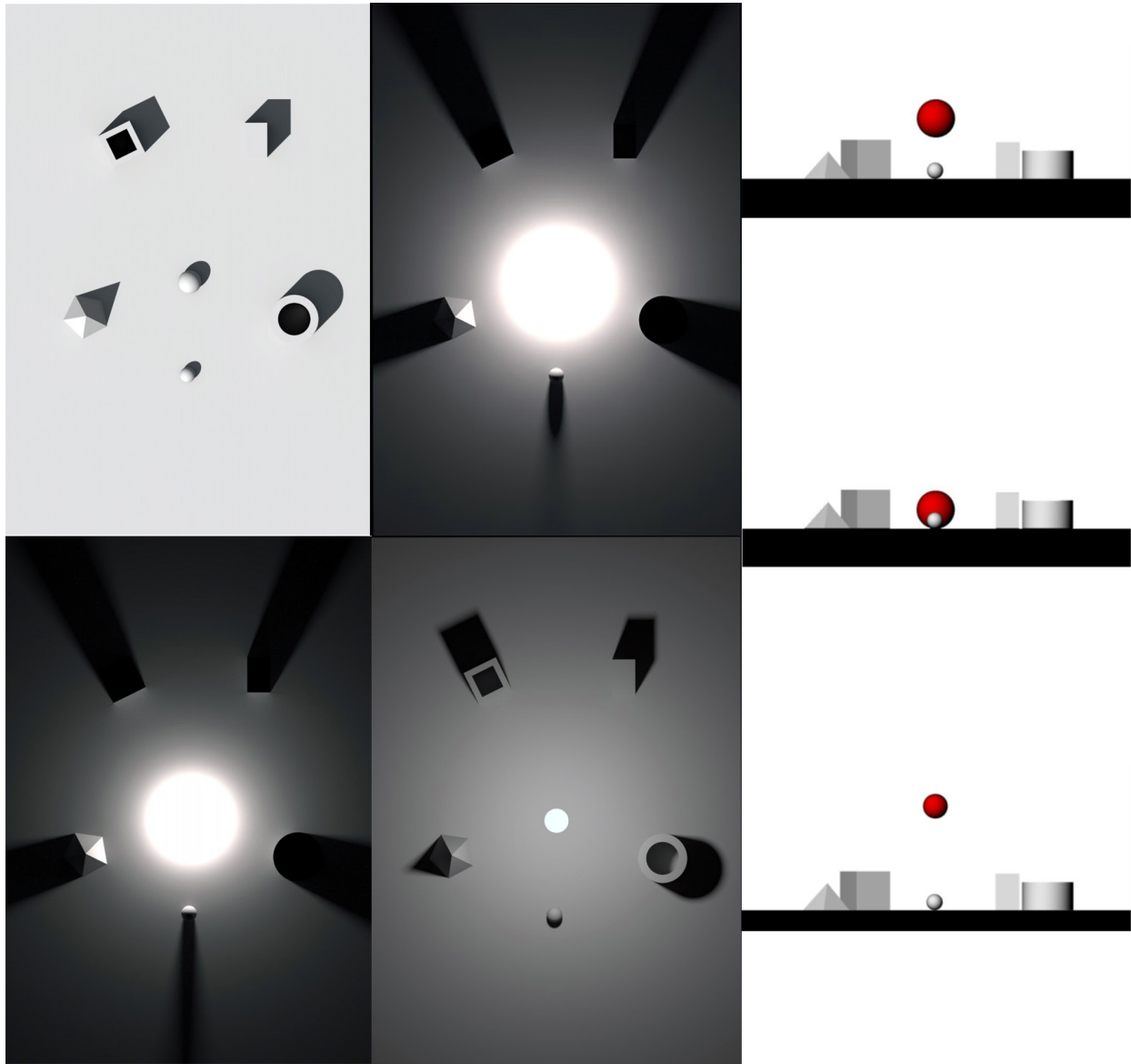


Fig. 12. Redrawing of the Frontispiece and lighting tests in a virtual environment, illuminated, from left to right, respectively: (1) by sunlight positioned at 45° , (2) by artificial light placed on the plane, (3) by artificial light positioned at a height equal to twice the sphere's diameter, and at a height equal to five times the sphere's diameter (elab. by Felice Romano).

equilibrium between a 'pure vision' of the world and the desire to elevate the tools of representation as indispensable means to solve the dilemmas of modernity. Yet without a close analysis, the gap between the aspiration to exactness and the actual error becomes a source of inevitable misunderstanding.

The image stands as a powerful example of how drawing can serve as a complex language, where the didactic and symbolic dimensions intertwine until they become confused. Far from considering the flagrant construction errors as mere oversights, it is more productive to interpret them as part of an expressive system in which the author 'stages' both the ostentation of geometric competence and his own mystical and allegorical inclination. Seen from afar, the plate appears as a model of precision and rationality, consistent with eighteenth-century faith in reason and the science of perspective. But, through a 'closer' analysis with the tools of graphic surveying, all the contradictions of an image emerge which, despite the rigid octagonal frame and marginal geometric constructions, reveals itself as deliberately 'shifted', rich in symbolic anachronisms and debatable interpretative choices. Some tests, carried out with software simulating artificial light sources (fig. 12), further reinforced these initial intuitions. By positioning the light source at different heights, it becomes evident that in some cases—for instance, the crown—it is possible to approximate Lequeu's shadow rendering, whereas for solids like the pyramid and the small sphere, achieving such correspondence is impossible, due to the aforementioned issues regarding the flawed foundational construction.

Considering that the author's intention seems to have been to 'simulate', on a single sheet, all the different lighting conditions, this shortcoming becomes less forgivable. Thus, architectural drawing reaffirms itself as a language where misunderstanding is always lurking, and where the skill of an author like Lequeu perhaps lies precisely in playing with such ambiguity. The eighteenth-century shadow, ultimately, is not solely a matter of geometric 'exactness', but also a rhetorical instrument of fascination, capable of conveying hidden truths and deliberately blurring the boundaries between science and art, rationality and imagination. It offers a lesson that, even today, invites us to view architectural drawing as an irreducibly complex medium, where analysis and interpretation merge into a practice of continuous shifts in meaning.

Conclusions: the dinosaur is still there

"When he/she/it woke, the dinosaur was still there".
[Monterroso 2013, p. 62]

These few words, made famous by Augusto Monterroso, are enough to evoke an entire universe of interpretations. Who is the protagonist? In what context did they fall asleep? Why do they awaken next to a dinosaur? Or perhaps, is it the dinosaur itself that dreamt? The text does not clarify, leaving us with an extraordinarily brief story that nonetheless has the potential to contain infinite meanings. A kind of 'open text', whose enigmatic character constitutes the foundation of its lasting fascination.

Monterroso's very short sentence emblemizes the theme of interpretative ambiguity: eight words [15] that may allude to a dream, a political parable, a temporal paradox, or an ecological warning.

Similarly, drawing—especially in the architectural and design fields—can never be considered 'definitive' or univocal: every drawing, as we have summarily explored, contains an interpretive component that can both stimulate creativity and foster errors in reading. If, as previously stated, "to interpret is to grasp, to capture, to seize, to penetrate" [Pareyson 1954, p. 180], it becomes essential to cultivate a critical awareness, both for those who produce drawings and for those who interpret them.

In architectural practice, this means that the drafter must provide an explanatory framework (reference scales, notes, design purposes, constraints, stages of definition) to prevent major misunderstandings; conversely, the observer must exercise a minimum of 'critical distance' before drawing hasty conclusions: asking themselves for what purpose and at what project stage the drawing was created, which 'visual alphabet' was adopted, and to what context it belongs.

Architecture, by its very nature, oscillates between idea and concrete construction, and drawing acts as the medium between these two poles. Yet, like every form of translation, it is subject to choices, omissions, and multiple interpretations. Ambiguity is not merely a risk to be avoided but a structural element that can also serve as a bearer of new visions.

In an era dominated by 'automatically generated' images, where artificial intelligence can produce architectural

visualizations in mere moments from simple textual prompts, the role of the interpreter (architect, designer, critic, user) becomes even more crucial. Synthetic outputs are not free from conventions and schemes; rather, they may accumulate additional biases, generating new potential misunderstandings.

As demonstrated by the story of the chess players arrested for their 'coded messages' and the events surrounding Wright's Venetian project, visual and textual languages can generate unpredictable meanings. Cultural and social context exerts a decisive pressure on interpretation, which can either 'arrest' meaning or open it toward new ideas.

The metaphorical 'dinosaur' of misunderstanding is always present. The power of representation –surviving

from hand-drawn sketches to digital elaborations– demands to be understood, discussed, and, if necessary, challenged. It is an endless game, where every sign may acquire, lose, or shift its meaning depending on who traces it and who reads it.

Thus, interpretation becomes a matter of 'continuing the game', with the awareness that every project drawing, every sketch, every render harbors within itself both a creative power and a potentially explosive force. And it is precisely this dialectic –between understanding and misunderstanding– that makes drawing (and architecture itself) a living, open, and generative process, in which error –or ambiguity– becomes a n opportunity to push the boundaries of knowledge even further.

Notes

[1] Masters'Tournament.

[2] Transcribed in Kasparov 2003, p. 427.

[3] For further details, see Kasparov 2003; Gillam 2014.

[4] Or rather, '*formatività*' (formative character), as conceived by the Piedmontese philosopher Luigi Pareyson in his *Aesthetics. Theory of Formativity* (1954): that "certain doing which, while doing, invents the way of doing" [Pareyson 1954, p. 181].

[5] This is how the building's intended use changed after the car accident of June 28, 1952, in which Angelo Masieri tragically lost his life. Masieri's widow proposed that the American master design a residence for the student community, to be donated by the family in his memory. See: Ainsworth 2005; Diéz Medina 2004; Sdegno 2011.

[6] The quoted caption is found in Guareschi, Minardi 1953, no. 50, p. 3.

[7] See the digital reconstructions in Sdegno 2011.

[8] These terms are a reference to the 'Prospect Theory', which

was developed by Israeli psychologists Daniel Kahneman and Amos Tversky in 1979.

[9] See: Gregory 1997; Gombrich 1964.

[10] As close as the virtual rooms of the Gallica database may seem, where most of Lequeu's legacy is digitized in high resolution.

[11] It is worth noting that no 'living beings' are depicted in the plates of *Architecture Civile*, except for a couple of lovers portrayed in the act of sexual intercourse at the entrance of the *Garden of Delights*, Lequeu, A.C. Plate 72, fig. 172.

[12] For a comprehensive bibliography, see Romano 2021.

[13] On these aspects, see Duboř 1986.

[14] Found in Lequeu's library [Szambien 1990], but also clearly erroneous [Mallet 1702, p. 241].

[15] Seven words in its original version: "*Cuando despertó, el dinosaurio todavía estaba allí*".

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Project

Thinking Images. Linguistic Hybridizations in Ideational Design

Enrica Bistagnino

The relationship between drawing and language is a theme widely frequented by the theory and critical history of drawing discipline as well as by the disciplines that are adjacent to it or that refer to it: I am thinking of the disciplines of design and those of the artistic sphere, I am thinking of the history of art, representation, graphics, I am thinking of semiotics, philosophy, etc. It is an ancient relationship that, from time to time, reveals similarities, points of contact, overlaps.

It is a reflection that, simplifying the reasoning, tends to bring the elements of the verbal into the visual sphere, interweaving the linguistic-semiotic scaffold with the methods and terms proper to the analysis and formation of the image. It follows that it is a complex process, sometimes not very linear. There are at least two reasons for this: the first is the fact that the visual often consists of expressiveness and aspects not always fully referable to the model of textuality; the second is the vastness of the theoretical, methodological and operational visions of the discipline of representation, which in turn are declined with respect to a wide variety of spheres, purposes, themes, mediums.

In this scenario, therefore, there are implemented forms, functions and 'dimensions' of drawing (drawing of real and thought space, drawing at the territorial, object and communication scales, figurative and abstract drawing) that entail as many possible morphological, syntactic, semantic specificities etc. This implies that, although recognizing a reciprocal tension between the plane of the word and that of the image, the multiple expressions of the theoretical corpus and

operational praxis of representation contribute to tracing a linguistic statute that, in part, maintains inalienable traits of specificity and autonomy.

In this context, it seems useful, therefore, to touch on some of the main topics of design theory and experimentation with reference, in particular, to its relationship with design. Drawing, therefore, as the expression of a formative language that translates themes and processes of the verbal linguistic code onto the visual plane; drawing as conformative medium of ideas and for the project development. On the other hand, these are two contiguous planes. Defining a visual 'alphabet' (morphemes and graphemes), using gaps and adopting signs (paragraphemes) to organize the components of the representation in the form of 'hypotaxis' or 'parataxis', exploiting the semantic value of image elements (icons, indicia and symbols), adopting possible rhetorical strategies, and, of course, selecting methods, techniques and tools of representation are just some of the choices that anyone approaching the language of drawing must define and systematize in a coherent manner.

An idea of drawing, therefore, subtending a project image based on a visual language; an image that, in turn, collaborates with the project *stricto sensu* and orients it, thus attesting to its role as thought-form, or meta-language. In other words, the project configuration, insofar as it is expressed in the production of the image, is naturally affected by the characteristics of the visual language adopted in the representation.

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

Moreover, the matter has been known since the Renaissance. Leon Battista Alberti's term "*lineamenta*" enucleates the intimate and substantial relationship between design and project. An indeterminate term that cannot be translated into a single expression (drawing/project) unless its meaning is altered, which, from time to time and in relation to the context of use, takes on important and precise shades of meaning [1].

In fact, drawing, interpreted as the 'textualisation' of the creative language, once the overall idea has been generated, on the one hand, through a succession of representations, allows its various aspects to be fixed and deepened, and on the other, as language itself, determines significant reflections precisely in the way of thinking about the project. Similarly to what happens in written language, in which "the logical-semantic order underlying the writing, the linearity implicit in the relationship between antecedent and consequent, between premise and conclusion make themselves felt in the practice of speaking" [Maldonado 2005, p. 53], in drawing (in particular in the sketch), the necessary and progressive ordering process that underlies its execution, induces a clarification and coordination of the numerous project variables, thus participating in a decisive way in structuring the elaborative process and outlining its contents.

In this regard, straining the reasoning a little, we can identify two emblematic modes of representation that, precisely in expressing different theoretical visions, further explicate the value of drawing in the formation of the project.

I am referring to the systematic and taxonomic modes traceable in certain project representations of a diagrammatic nature and to the intuitive and poetic modes inherent in the heuristic dimension of much of the ideational design. In this sense, I recall, by way of example, Gui Bonsiepe's morphograms, signs that reflect an analytical project methodology largely matured in the theoretical experience of the Hochschule für Gestaltung in Ulm, and the graphic narratives of Alvaro Siza that express, instead, a sensitive, empirical, decidedly personal project research.

In Bonsiepe we note the reticulation of the object of study into meaningful sections, the identification of classes of formal variants, the use of principles, operations and geometric elements as reference parameters for the possible configurations of the individual parts, the adoption of functional and ergonomic criteria to make project choices [2]. An analytical approach that transpires, therefore, in the organization of the image through schematic representations, in the use of orthogonal projections, in the technical and instrumental

choices, in the iconic saturation (the drawn elements detail the real datum); on the whole, an approach that recalls, precisely, the regulatory value proper to writing.

In Siza, the personal use of signs encourages reflection on solutions that come from experience, through a flow of images. The lines free "from the orthopedics of instrumental drawing" [Scolari 1982, p. 82], represents forms from history and memory, precious references to develop ideas. As he himself writes "drawing proceeds from hypotheses, criticism and, consequently, responses to criticism [...]. Only in this way is it possible to reach a refinement, in realization, that goes as far as poetry" [Siza 1998, p. 127-129].

But there are, of course, also other forms of experimentation where representation interprets the relationship with verbal language in a particularly interesting way. I am thinking of the peculiarities of two original theoretical-methodological lines, developed in the 1960s, where the conceptual and sign intersections of verbal language with visual language, on the one hand, reaffirm the role of drawing as a medium for theoretical research on paradigmatic and primary forms, and, on the other, attest to the metaphorical value and communicative power generated by linguistic hybridizations. I refer to the concept of morphemes and the paragraphematic signs used to develop non-figurative languages. As far as the morpheme is concerned, I recall, first of all, the definition proposed in the linguistic sphere: "a formal element that gives appearance and functionality to words and roots, defining their grammatical category and syntactic function" [3]; extending the reflection to a more general level, "the smallest signifying unit of a linguistic complex and therefore the matrix of every conceptual value of a language" [4]. Thus, in the disciplinary field of drawing, the morpheme can be considered a primary element of the representational system and, therefore, a formative element of visual language. This valence of the idea of morpheme takes on different conceptual and expressive nuances from its earliest experimentation.

By way of example, I propose, albeit without any pretension to exhaustiveness, the fundamental theoretical-visual research of Franco Purini and Alberto Seassaro. The first indicates a morpheme as "a primary compositional principle, that is, not divisible into parts and elements [...], a generative cell of a complex form [...]. Thinking about a morpheme is the creative act in which imagination and logic come together at the highest level, resulting in a synthesis that precedes grammar and syntax" [Purini 2014, p. 149]. It is, therefore, a concept that encompasses, in a few primary signs, a vast potential of formal declinations. Points, lines and

surfaces, organized in delimited configurations and carrying different levels of complexity, make up the 72 morphemes that, collected in a synoptic table, seem to describe patterns that can be used in constitutive processes of form.

They are linguistic units functional to productive imagination, understood as a mediation between thought and its sensitive expression. They make possible an imaginative process that, precisely insofar as it is freed from the mimetic approach of design representation, frees us from the pre-conceptions intrinsic to saturated and definitive images, fosters an understanding of what is beyond the appearance of things, ultimately enhancing the formative action of ideas. In Alberto Seassaro's theoretical reflection, the morpheme idea is developed in the third dimension, through models, and this passage seems to entail a significant conceptual shift. If, in fact, the two-dimensional morpheme is a formal signifying unit at the end of the conformative process of which it is an element of origin, the three-dimensional morpheme is instead both process and outcome at the same time, as it is generated in the formative action itself.

In other words, in Seassaro's vision, morphemes are a sort of middle way between the commonly understood representation (that is abstract projection of spatial concepts) and the concrete realization, regardless of the scale (from that of the object to that of the architecture and the territory), of three-dimensional articulations; their value is, therefore, "to act as forerunners of a more complex and wide-ranging operation –no longer only morphemic but syntagmatic– which, after having availed itself of the 'metalanguage' of which these models are the repositories, leads to a global linguistic operation within the universe of architectural discourse" [5] and, more generally, of three-dimensional elements project. In this vision, morphemes "stimulate and enhance the sense of form and the form-structure relationship even through operations limited in size and in the use of materials" [6].

In this scenario, therefore, it is important to continue reflecting on the relationship between visual language and the content it expresses, in order to verify the relations which, simplifying greatly, may be of dependence or interdependence. If one assumes representation as that which forms project thought, otherwise constrained in an unresolvable nebulousity, then a knot to be unravelled arises: the formulation of a theory of visual language on the basis of which to define the criteria for developing the conformative discourse, which also takes into account different points of observation (functional, formal, structural, etc.).

Parallel to these theoretical researches, equally significant experiments were developed in the radical culture, which, also resorting to the adoption of signs outside the visual language, proposed renewed thinking on drawing and project. In particular, by way of example, I recall the paragraphmatic signs [7] introduced by Archizoom in the configuration of No-Stop City (1969). Signs that produce drawings without design, that represent cities without architecture; they are elaborations that outline "an infinite but not definitive world: unlimited but with limits of development; monological but ungovernable; without borders but lacking a global image. [...] A world made up of many worlds; opaque, polluted, where everything merges and expands [...]. An infinite world whose space is filled by the bodies of seven billion people" [Branzi 2011, p. 30].

These are visual metaphors to represent the intuition of the 'change of state' of society, from material to immaterial, and to evoke the explosion of information flows.

These are codes, those used by Archizoom, that go well beyond those normed by common representational practice, and that take on exceptional power to think and critically 'write' the project. The unusual semantic shift in representation, where traditional iconic signs are replaced with non-figurative symbols, organized in modular textures, and texture is the bearer; in fact, of a renewed theoretical dimension that is implemented in a sort of image-manifesto.

In conclusion, in the examples mentioned here, representations appear as living objects that, in relation to the specificities of the cultural spheres, take on different qualities orienting, from time to time, disciplinary visions, proposing new values, criteria and methodologies. This is related to the fact that the image, as language, is intrinsically dynamic and in a biunivocal relationship with the evolutionary context that feeds it and that it itself contributes to modifying.

In this continuous updating, the introduction of generative artificial intelligence applications represents an important push towards profound change.

As far back as the experiments in generative graphics conducted in the early Sixties at the University of Stuttgart by George Ness, a disciple of Max Bense, image processing algorithms introduced the possibility of writing the visual in a non-visual language and formulating possible variants. A change in image processing is proposed that is somewhat prodromal to the processes of today's generative artificial intelligence. In fact, a radically new working perspective is realized; to produce a visual work does not mean to realize it, that is to elaborate a particular image, but it means to

think about it, to construct it in one's head before describing, in an appropriate way, to the machine what one wishes to be done. Thinking an image means, therefore, thinking a possibility of realization. A process analogous, in fact, to that which takes place with generative artificial intelligence. This is an area in which, among other things, the linguistic component, related to the selection of the vocabulary and syntax to be used in the programming and utilization phase, is fundamental, since the text-to-image method exploits a neural network that learns through word-image association, that is, it relies on textual input to generate unlimited possibilities of representations. It is therefore important to define various parameters that can intervene in the training of the generative model and contribute determining its outcomes, that is, to extend, diversify but also orientate the representational potential. The more diversity is included in the textual and

visual datasets provided to artificial intelligences, the lower is the risk of dominant thinking, cultural bias etc.

We are therefore in an area where disciplinary languages, which are closely interrelated, not only have the task of forming useful representations, but also the responsibility of developing ethical, democratic and transcultural images.

In general, it can be deduced that the centrality acknowledged in the 20th century to visual representation in philosophical speculation and mass-media production, as well as, of course, in research, design and development, is now, in the third millennium, evolving further towards experimentation and scenarios that are still unforeseeable, further attesting to what has been proposed by certain anthropological theories according to which the distinguishing feature of man with respect to other species consists, even before language, in the capacity to represent [Hacking 1983].

Notes

[1] For more details see Bistagnino 2010, p. 25.

[2] For further information see Bonsiepe 1975, pp. 174-197.

[3] "The m. can be isolated, such as prepositions and conjunctions, or joined to the root, such as affixes, desinences, qualitative or quantitative alternations. In the terminology of US linguistics, morpheme is any utterance segment endowed with meaning" (trans. by the author): <<https://www.treccani.it/enciclopedia/morfema/>> (accessed 2025, June 1).

[4] Description taken from *I morfemi di Seassaro*, text by Gillo Dorfles for the poster of the exhibition on Morphemes by Alberto Seassaro, Modern Art Agency, Naples, from 24 January 1968. Available at <<https://designphilology.polimi.it/percorsi/39?id=655>> (accessed 2025, June 23).

[5] Text by Gillo Dorfles taken from the poster of the exhibition on Morphemes by Alberto Seassaro, see note 4.

[6] Text by Gillo Dorfles taken from the poster of the exhibition on Morphemes by Alberto Seassaro, see note 4.

[7] "We call paragraphemic signs (an expression coined by Arrigo Castellani [...]) all the features and graphic devices that combine with one or more letters of the alphabet, or mark their shape, to express a distinctive or functional value. Paragraph signs complement the meaning of graphemes but, unlike the latter, have no correspondence in phonetic units of the language. They serve to provide instructions to the reader on a syntactic and textual level, and their origin and diffusion is attributed to the need to facilitate reading and copying operations" (trans. by the author): <[https://www.treccani.it/enciclopedia/segni-paragrafematici_\(Enciclopedia-dell'italiano\)/](https://www.treccani.it/enciclopedia/segni-paragrafematici_(Enciclopedia-dell'italiano)/>)> (accessed 2025, June 1).

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Representation Systems and Theoretical Design Frameworks

Maria Pompeiana Iarossi, Cecilia Santacroce

Abstract

This contribution, developed within the broader context of a reflection on the role of drawing in the conceptual phase of the design process, analyzes how the adoption of a specific analogical projective representation system aligns with adherence to a particular theoretical orientation in composition.

As a mediator between the design concept and its gradual final configuration, drawing becomes an expression of design intent. It is an essential tool for the designer, who can explore examples and solutions drawn from historical tradition and the reference context, reinterpreting and enriching them with new potential and meaning. Drawing is not a neutral tool, but is always linked to the architectural culture that produces it, shaping design choices. This highlights the non-neutrality of representation as a form of language, linked both to the cultural attribution of meaning to the graphic sign anchored in a specific historical moment and to the ways in which the author employs it to convey a design intention. Today, technological evolution has led to the proliferation of a wide range of digital tools capable of influencing design practice itself. The research to which this contribution refers has shown how digital technologies can restore a central role to drawing in the conceptual phase of design, offering designers innovative tools to explore new creative possibilities.

Keywords: drawing, projective systems, language representation, design intent, compositional theories.

Introduction

According to the theory of design as an exercise in hermeneutics formulated by Renato De Fusco [De Fusco 1990], the design process is characterized in its initial stage as a moment of intuition, defined as the 'auroral' phase, in which the process of formal invention begins. At this stage, the designer, recalling all past design examples that have provided solutions to problems similar to the one at hand, engages in a series of cognitive, interpretative, and manipulative processes of reality, which culminate in the intuitive act of making and shaping defined formal choices. In this process, drawing plays a fundamental role, serving as a cognitive tool for understanding the existing reality and its potential for transformation, thus fostering the development of design thinking.

The compositional process, therefore, takes shape as a fundamentally cognitive activity [Monestiroli 1999], insofar as it reinterprets previously known and internalized formal solutions, filtered through the designer's formal conception. These same solutions are re-experienced and recalibrated in relation both to the external reality, represented by the context and/or specific constraints, and to the memory of architecture as the concrete material of their work. Drawing, when applied to the design process, thus enables critical reflection on the existing reality and brings to light its inherent potential for transformation, in order to uncover meanings within it that can anticipate a possible future configuration [Monestiroli 1999].

This dialectical and unified relationship between representation and design thinking has been widely acknowledged not only by Ernesto Nathan Rogers, who affirmed that the intrinsic nature of drawing lies both in its representational function and in its ability to express, through its symbols, the thought underlying the architectural project [Rogers 1933], but also later by other scholars, who suggested that, precisely through its connection with the design process, drawing can become a conceptual space of architecture and a theoretical model that, “through elaborations entirely internal to the language of two or three-dimensional representation, can be transformed into built matter” [De Rubertis 1994, p. 155]. When drawing takes shape as a manifesto of the designer’s intentionality – assuming the role of a conceptual program, an indispensable tool for managing form within the design process, as well as a means of investigation and expression through which to explore the heritage of models and solutions handed down by history, reinterpreting and enriching them with new potential and meanings– it can no longer be regarded as a neutral element. On the contrary, in the designer’s gesture and in the way it is employed to formulate a critical judgment on reality, drawing reveals itself to be deeply rooted in the culture that produced it, exerting a decisive influence on design choices. Roberto De Rubertis, in *Il disegno dell’architettura*, emphasizes that representation is never neutral, but rather constitutes a form of language, closely connected both to the cultural meaning attributed to the graphic sign in a specific historical moment, and to the ways in which the author of the drawing uses it to express a precise design intent [1]. Given these premises, and assuming that drawing manifests itself not only through the practice of still-life drawing but also through its theoretical corpus, codified in projective representation systems, it can be hypothesized that the adoption of a particular system of representation, in reference to the specific geometric device that governs it, constitutes the manifestation of a precise design intent. Therefore, each time, the design is nothing but a dialogue that the author establishes with the representation itself [2].

Representation as the language of the architectural project. Orthogonal projections as the rational foundation of composition

In the formal genesis of certain architectures, the adoption of a specific analogical projective representation system

constitutes a manifestation of the possible approaches and methodologies for manipulation by the designer.

The idea of architectural composition as a scientific response to a construction problem widespread in 19th-century France emphasizes a functionalist approach to architecture. Prominent figures such as Jean-Nicolas-Louis Durand [Werner 1986] based their architectural composition lectures at the *École Polytechnique* on the assumption that it should occur through the re-composition in plan of elements that typologically constituted the vocabulary of possible architectural forms, the latter cataloged and represented according to the method of orthogonal projections, and then collected in *Recueil et parallèle des édifices de tout genre, anciens et modernes* (fig. 1).

Following the wave of French positivism by Auguste Comte, for whom the scientific method is the only valid means of understanding the world and solving problems, the influence of the *École Polytechnique* is based on the belief that the teaching of architecture can be assimilated to that of the exact sciences and technical disciplines, whose transmission must be carried out with scientific rigor, ensured by the use of Gaspard Monge’s descriptive geometry. This approach abandons the three-dimensional representation of architecture in favor of its composition and representation in plan, and only later in section and elevations [Werner 1986].

Durand taught at the *École* until 1833, compiling his teaching principles into important volumes published between 1809 and 1825, including *Partie graphique*, *Précis des leçons*, and *Nouveau précis des leçons*, the latter being the result of the compilation of works carried out in his architecture courses. The compositional method he taught is based on a limited number of architectural forms, whose relationship is regulated by a module that varies in shape and proportion depending on the type of building to be designed (fig. 2).

Since architecture is intrinsically geared towards utility, a rigorous classification of its elements becomes essential in order to optimize the reorganization of its parts. Architectural elements are therefore cataloged according to a formal and functional principle, constituting a true vocabulary from which to draw during the compositional phase.

Durand’s method is therefore based on orthogonal projections, with buildings conceived starting from the plan drawing: “The elevation is deduced from the plans

according to certain rules, and the section results from the first two. The three representations must align on the same sheet, on the same axis, at the same scale of proportion" [Werner 1986, p. 133].

This approach implies that architectural design originates from its plan distribution, based on orthogonal projections on the horizontal plane. From this projection, all other design documents are then reconstructed, in which the altimetric compositions are a rigorously scientific consequence of the plan distribution, paving the way

for an objective, rational architectural approach. For this reason, in Durand's architecture course, students practiced composition by drawing on graph paper, which not only helped identify the starting module, its related planimetric proportions, and symmetries, but also allowed for planimetric composition exercises starting from elementary shapes –such as the square, rectangle, and circle– as highlighted in the 1802 plate that illustrates a set of buildings resulting from the divisions of the square, parallelogram, and their combinations with the circle (fig. 3).

Fig. 1. Plate 19 of the *Nouveau Précis* from 1813 showing the possible plan configurations of buildings based on the possible recombinations of their parts [Durand 1813].

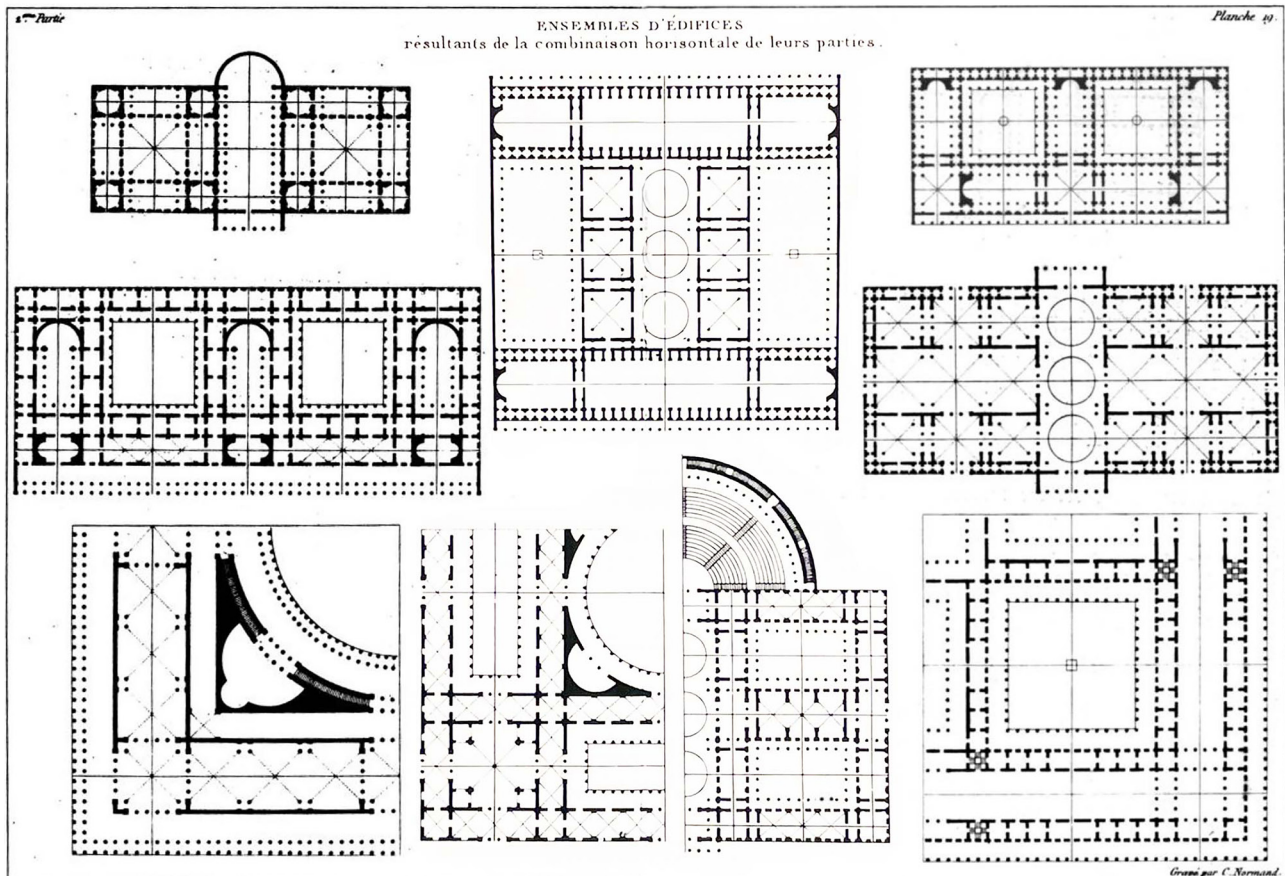


Fig. 2. Plate 3 of the *Partie Graphique* from 1821 with the planimetric grid defines the modules of the rooms [Durand 1821].

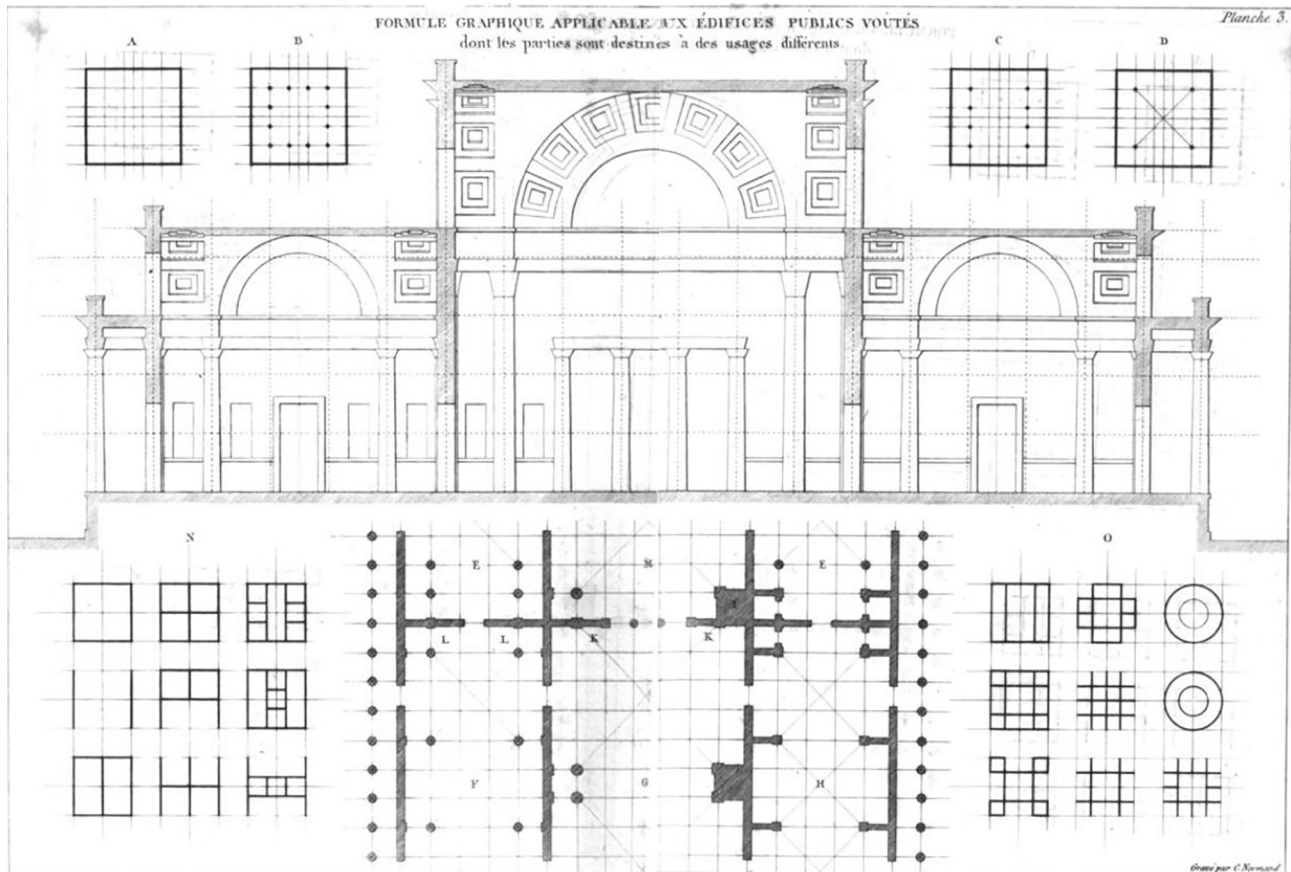
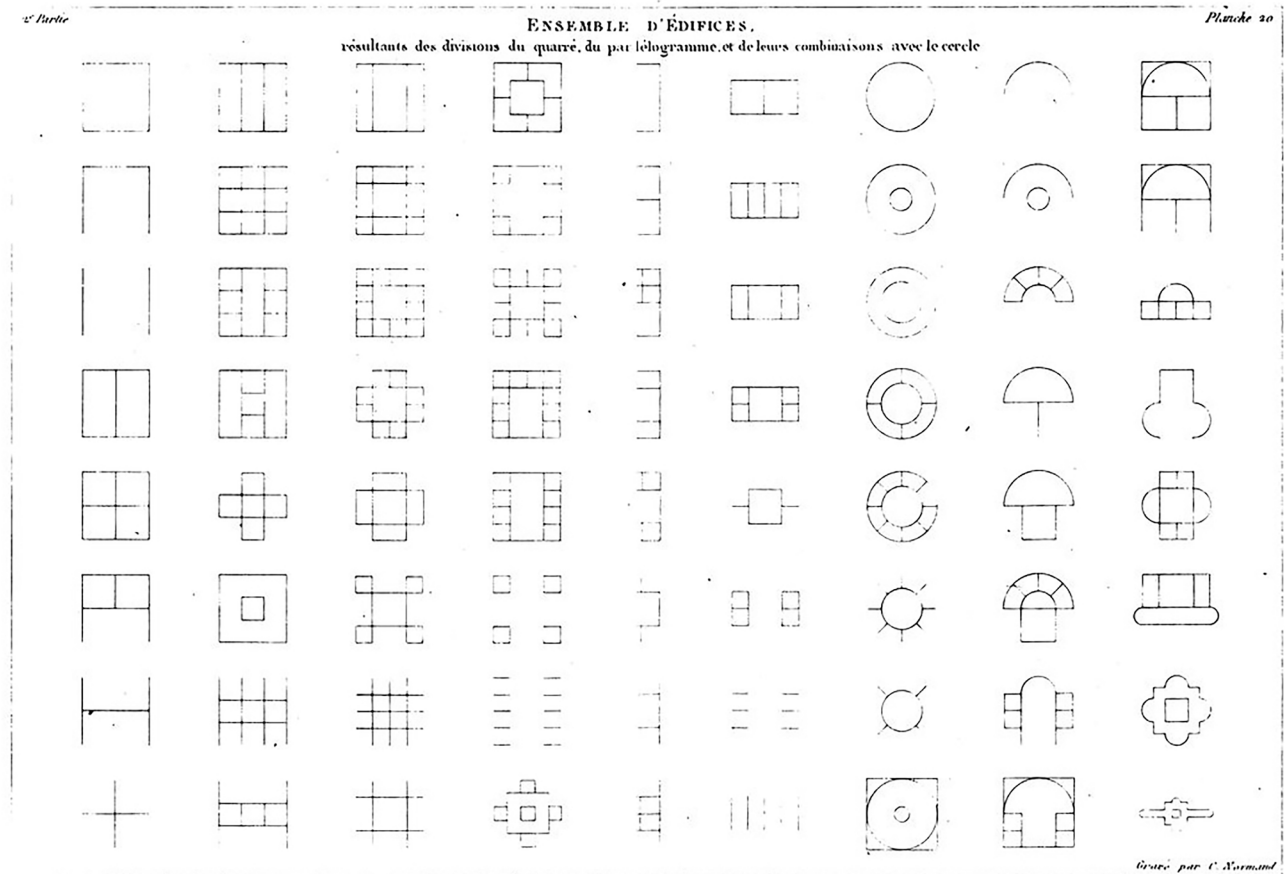


Fig. 3. Plate 20 of the *Précis des Leçons* from 1809 explaining the design method based on exercises in planimetric composition starting from simple forms [Durand 1809].



Axonometric projections for the simultaneous visual experience of constructive relationships

While orthogonal projection suggests a conception of the architectural project starting from its plan distribution, the adoption of axonometric projection in the Constructivist movement and the 20th-century avant-gardes, on the other hand, reflects a conception of architecture free from preconceived morphological and linguistic configurations. The volumetric values and the instances of simplification expressed through the method of axonometric projections reflect a growing critique of past orders and styles. Architectural compositions thus detach from the concepts of frontality, symmetry, and axisity, in favor of a simultaneity of visual experience.

Axonometry as a symbolic form reaches its full expression when, following the Neoplasticist movement of De Stijl, Theo Van Doesburg and Cornelis Van Eesteren in 1932 present axonometric drawings of architectural projects at the Parisian gallery Effort Modern (fig. 4).

The use of the axonometric plane as the sole projection plane—capable of synthesizing a comprehensive, and thus simultaneous, view of the artifacts—reflects a growing interest in figurative abstraction, where architectural compositions are no longer bound by the concepts of symmetry and axially, but embrace the multiplicity of ways of experiencing them: “Already now we can see the beginning of an architecture conceived on a space-functional basis, which is drawn according to the axonometric method. This method of representation allows simultaneous reading of all the elements of the house in their exact relationships, even from top to bottom, that is without any perspective vanishing points. It is evident that the entire project must also be developed axonometrically, from the foundations to the roof” [Van Doesburg 1929, p. 305; Giordano 2002, pp. 246-248].

Van Doesburg’s theory for the new architecture, expressed in *Grundbegriffe der Neuen Gestaltenden Kunst* published in 1919 and 1925, is based on the concept of ‘rebellion against styles’ and the consequent theory of the harmony and universality of the arts, which in the architectural field is expressed through the reduction of architecture to its volumetric and spatial values, and thus to pure plasticity. According to Van Doesburg, compared to music, theater, and literature, painting and architecture are the arts that enjoy the greatest expressive freedom because they can easily aspire to universality. This concept of universality is

based on the belief that shaping means finding a balance between the basic components that constitute the art itself, whose opposition gives voice to the aesthetic experience of the artist. If the artist, then, makes use of the specific means of the art to find a plastic balance, the work of art itself will become a metaphor for the universe, thus acquiring a harmonic and universal character: “All arts have the same content. The aesthetic experience is expressed in relationships. These relationships manifest themselves within the pure means of expression of each form of art [...]. The architect expresses his aesthetic experience through the relationship between planes and masses with interior spaces and external space. ‘Giving shape’ essentially means: balancing the positive and the negative to achieve a precise harmonic unity” [Van Straaten 1993, p. 8].

Therefore, in architecture, this universality and harmony can be achieved if it aims for pure plasticity, reducing itself to its essential geometric-volumetric elements.

Referring to his design for a fountain for the city of Leuwarden (1917-18) as a pure example of spatial plasticity, Van Doesburg states that “A valid example of spatial plasticity [...] must give the impression that all sides emerged simultaneously. In this way, so to speak, the annoying distinction between ‘front,’ ‘back,’ and ‘side’ disappears. Only in this way can the viewer, moving around the work, perceive a logical development of space and volumes” [Petersen 1918, p. 72].

This plasticity is clearly expressible if architecture is conceived and represented through the use of axonometric projection systems. By providing the three-dimensional image of an object without subjecting it to volumetric-spatial deformations—which are characteristic of perspective representation—axonometry, as a form of cylindrical projection, conveys the idea of architecture as an object observable from different viewpoints, without predefined modes of experience or prefiguration, allowing the viewer to “[...] freely choose their positions and thus experience the countless and changing ways in which the object exists” [Magnago Lampugnani 1982, p. 12].

By rejecting the concepts of axially and frontality in architecture and promoting an architecture that places its plastic character at the core of the composition, Van Doesburg envisions a new architecture of the future that seeks to achieve harmony between space and time: “Unlike frontal architecture, in which everything is concentrated on the façade, the architecture of the future will develop a richness of dimensions that we can barely imagine today.

The modern architect will no longer be satisfied with the two-dimensional idea of the façade; the new task of the modern architect will be to conquer three-dimensional space. This will only be possible if he feel and think simultaneously about the problems of space and time" [Van Straaten 1993, p. 31]. This spatial-temporal harmony is understood as the appropriate relationship between designed spaces and their use, the right spatial balance that allows the activities of life and dwelling to unfold according to their own rhythms.

For this reason, the new architecture had to be elementary and grounded in the foundational concepts of use, mass, plane, time, space, light, color, and material, all of which were to be endowed with a plastic quality. In this regard, the axonometric system of representation enables a level of abstraction of architectural elements that allows for the delineation of lines, surfaces, and volumes, recognized by Van Doesburg as the basic components of architecture [3] (fig. 5).

Specific axonometric studies conducted by Van Doesburg demonstrate how the architectural idea is conceived precisely from an axonometric vision of space and architectural elements, subjected to a process of deconstruction into vertical and horizontal planes, filled with solid tones of blue, red, yellow, grey, white, and black, adhering to the theory of the universality of the arts, in which painting and architecture merge. These axonometric experiments, referred to as "counter-constructions" or "color constructions in the fourth dimension of space-time" [Van Straaten 1993, p. 10], aim to transfigure architecture into its basic elements, reduced to a juxtaposition of colored planes, in order to decipher their reciprocal relationships and spatial configurations.

Emblematic are the *analyses de l'architecture* supporting the design of the *Maison particulière* of 1923 (fig. 6), collected by Van Straaten in a monographic volume [Van Straaten 1993, pp. 118-127]. These studies clearly reveal the structural scheme of load-bearing and supported elements, reduced to lines and planes, while the use of color illustrates the space-time dimension of the architecture and the spatial configuration of the interior.

The compositional approach based on axonometric projection developed by Van Doesburg laid the groundwork for the deconstructive processes also explored by Peter Eisenman in his experimental house projects designed between 1968 and 1975: House I (1968), House II (1970), House III (1971), House IV (1971), House VI (1975), and House X (1975).

Fig. 4. Drawings of the *Maison particulière* and the *Maison d'artiste* from 1923, in which axonometry becomes a manifesto of the simultaneity of the visual experience of architecture [Van Straaten 1993, pp. 110-131].

Fig. 5. Studies on the opposition between passive and active in painting, sculpture, and architecture [Van Straaten 1993, pp. 99, 100].

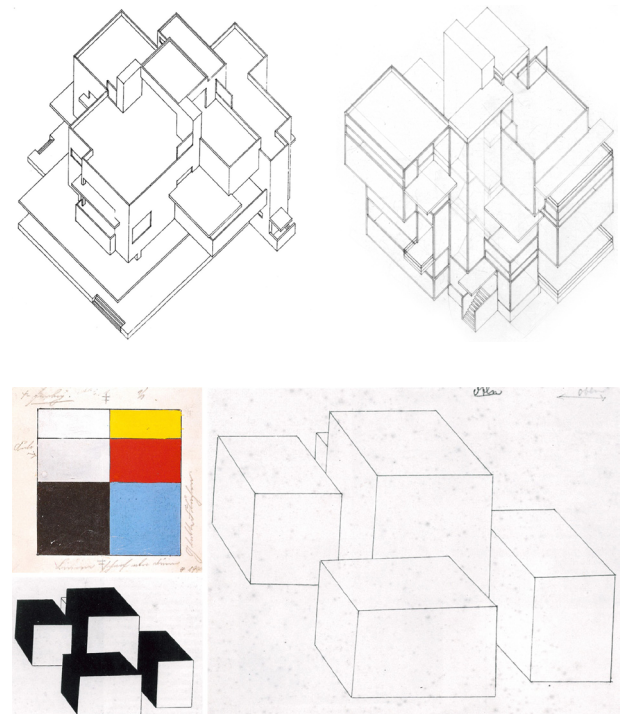


Fig. 6. Van Doesburg's exercises in counter-constructions on the search for universality in architecture [Van Straaten 1993, pp. 119, 120, 125].

Fig. 7. Eisenman's deconstruction exercises for the design of House I from 1968 <<https://eisenmanarchitects.com/Residential/>>.

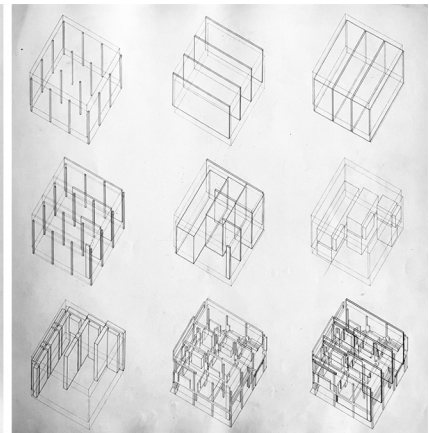
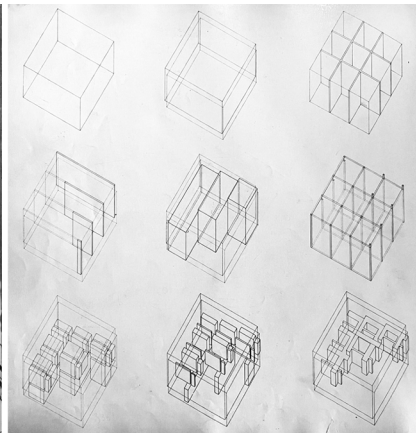
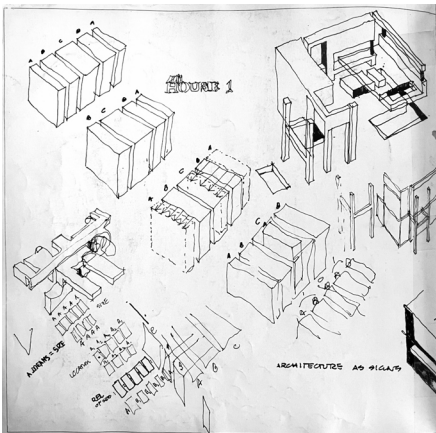
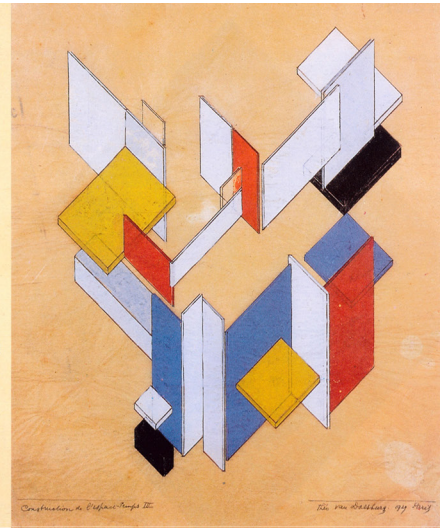
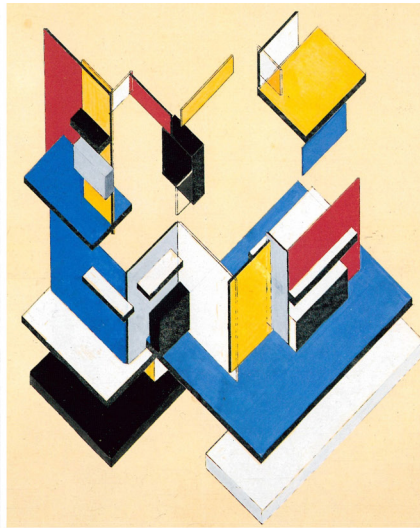
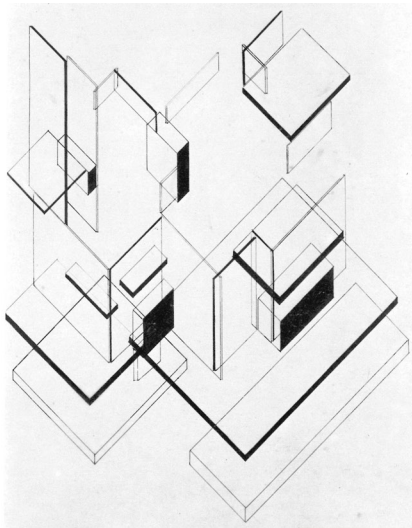
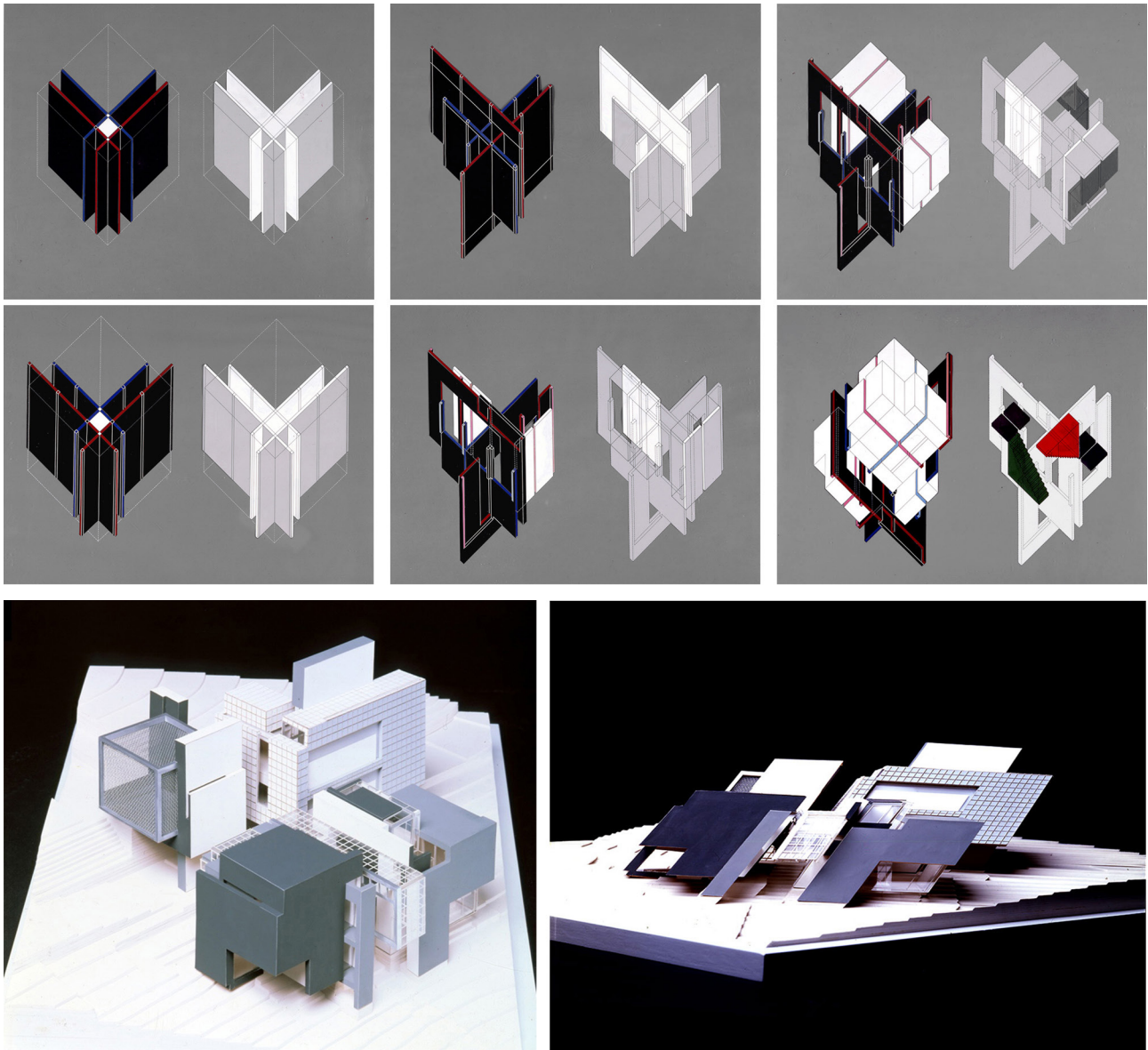


Fig. 8. Diagrammatic sketches by Eisenman with color opposition of the design for House VI from 1975 and axonometric model of House X from 1975
<<https://eisenmanarchitects.com/Residential>>.



With the aim of exploring new compositional possibilities based on the principle of deconstruction, these projects follow a process that takes into account the potential geometric transformations to which the autonomous system of the house can be subjected. Once again, the traditional conception of architectural design is overturned in favor of a compositional approach grounded in the search for new topological connections, where geometric decompositions enact a deliberate dissolution of hierarchies between inside and outside, structure and function.

Starting from axonometric diagrams, Eisenman works through processes of decomposition and fragmentation of the initial volume (fig. 7), revealing mechanisms of deconstruction and recomposition, fragmentation, disassembly, and displacement. The application of color allows for a juxtaposition of the various elements of the building, which remain independent yet interconnected [Galafaro 1999, p. 14]. Finally, the physical model allows for the control of the project's evolution in terms of its spatial and formal definition.

Of particular interest is the model created for House X in 1975, a model that aims to simulate an axonometric representation of the building (fig. 8).

This persistent use of axonometry, even in the models, aligns with Eisenman's theories, according to which designing using the axonometric method allows for direct manipulation of spatiality, applying control between internal and external spaces.

The diagrammatic models and the physical model, used alternatively throughout all stages of the project, function as tools for theoretical reflection, whose interconnection and mutual influence not only allow for controlling the formal evolutionary stage of the project but also enable the exploration of new figurative possibilities for the design.

In this process of research and analysis of possible complex systems of spatial configuration, digital three-dimensional models will later allow Eisenman to further explore this spatial theme, in line with the theory that architecture can no longer be conceived from a perspective view simulating visual perception, but rather from its spatial component, first defined in its general volumes and then deepened in the relationships between its elements.

Following this line is the project of the Virtual House from 1997, whose diagrammatic schemes are conceived from virtual elaborations developed through early digital modeling software such as Form Z and CATIA [4]. While analogical schemes allowed for formulating assumptions about the

spatial relationship between elements, now digital diagrams become more complex, incorporating the temporal factor, and thus movement, into their process of analysis, which influences the search and formal definition of architecture [Galafaro 1999, p. 54]. In this new process of reflection on architecture, Eisenman believes that it is no longer possible to think of architecture in terms of the combination of its constructional elements –walls, windows, columns– but rather it is necessary to conceptually rework the way spatial definition is approached, seeking a language that, through new digital tools, allows for the exploration of forms of continuity, where interior and exterior merge into a single unity. In the Virtual House, this folding process is generated starting from the nine initial cubes that define the diagrammatic scheme, which, subjected to vector deformations, create new spatial conditions and new formal expressions (fig. 9). This approach paves the way for a different conception of architecture, expanding the possibilities for manipulating form through a play of transformations and parametric relationships –dimensional, geometric, and logical– of the elements.

This methodology will be reiterated and further explored in *Palladio Virtuel* [Eisenman 2015], which takes some of Palladio's well-known villas as its starting point.

The perspective projection as a medium for a new relationship between architecture and nature

A different compositional approach is based on the perceptual verification of places as if they truly existed, where the adoption of the perspective representation system emerges as a privileged tool, capable of fostering a compositional approach in which architecture is closely related to the context in which it is situated. In this relationship, two main tendencies can be observed: on one hand, a search that places the project in relation to the landscape; on the other, a tendency that seeks the definition of the urban identity of the place through the dialogue between architectural elements and the natural landscape.

The first line of compositional research is reflected in the experiences of the pensionnaires during their travels in Italy in the 18th and 19th centuries. The relationship between architecture and landscape that emerges in the perspective representations of architects such as Karl Friedrich Schinkel and Leo von Klenze helped form a design aesthetic in which the context becomes an integral part of the architectural

composition, a principle that influenced neoclassical architecture and, later, 19th-century urban thought. The perspective representation is adopted to analyze the interaction between architectural works and their natural or urban context, revealing a critical perspective that seeks to integrate the two elements, rather than oppose them, in order to rediscover a sort of natural character of architecture, similar to that of classical antiquity.

On the other hand, the use of perspective as a design tool allows for relating the elements that make up architecture with the natural landscape, thereby constructing, through their mutual dialogue, the language of the urban landscape.

An example of this is Mies van der Rohe's use of perspective collage, which creates representations that articulate spatial depth through the overlapping of planes

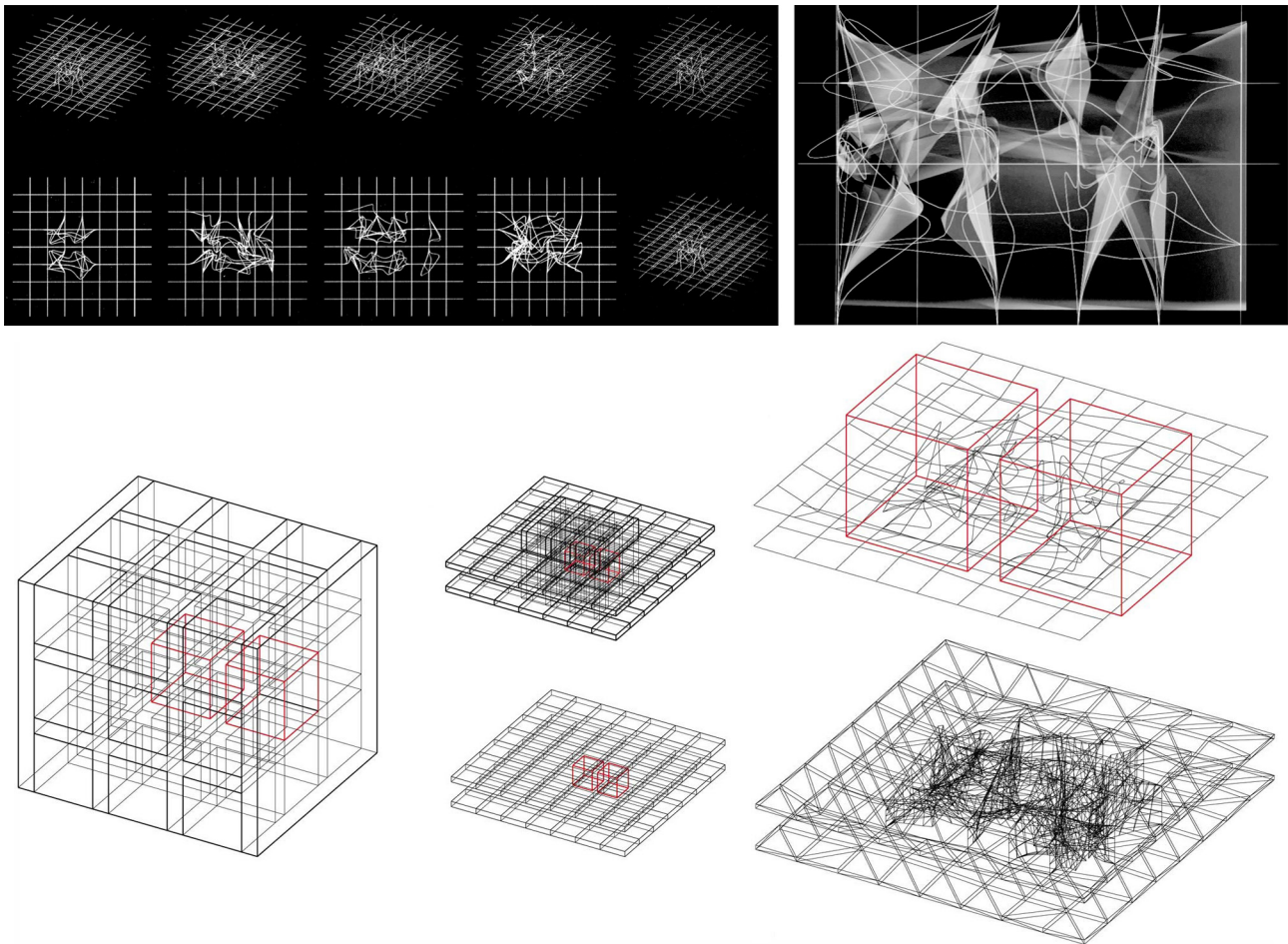


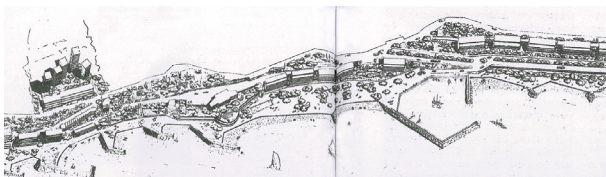
Fig. 9. Conceptual diagrams and drawings by Eisenman of the Virtual House from 1997 <<https://eisenmanarchitects.com/Residential/>>.

[Shields 2014, p. 73]. This method recalls the 17th-century perspective scenery, where architectural elements and the surrounding context are composed in a succession of levels, with the visual layering of fragments generating multiple layers of interpretation, thus strengthening the relationship between architecture and context [5]. The collages related to the 1937 Resor House project clearly illustrate this compositional strategy: the perspective representation, evoked by a photographic image of the mountainous landscape, becomes the central element around which the architectural space is articulated. Architecture is reduced to a system of lines and planes that, like a crystalline structure, define a spatial void, in contrast to the physicality of the natural context. The dialogue established between the architectural object and the landscape raises reflections on the construction of a unified urban language, where perspective representation is not only a tool of depiction but also a method for exploring a new language.

A similar reflection also emerges in the perspectives created by Luigi Carlo Daneri for two different projects:

Fig. 10. The perspective view of the INA-Casa Bernabò Brea neighborhood in Genoa by Danero [Boeri 2024, pp. 76, 77] is part of the designer's search for a solution that integrates the residences with the Ligurian landscape.

Fig. 11. Danero's perspective for the tourist complex of Capo Pino [Boeri 2024, pp. 54, 55] is conceived as a tool for the search for identity in relation to the Sanremo seaside landscape.



the INA-Casa Bernabò Brea district in Genoa from 1954 [6] [Boeri 2024, pp. 73-84], and the seaside and tourist complex of Capo Pino in Sanremo from 1957-60 [Boeri 2024].

The first project is part of the vast INA-Casa public housing plan established to address the post-war housing crisis and promote economic recovery. Daneri's project represents a "concrete experiment in the cohesion between territory and architecture, the first attempt at constructing the landscape" [Boeri 2024, p. 78]. It is a truly experimental project, where the architectural language, while adopting the principles of prefabrication, attempts to find cohesion with the configuration of the Ligurian territory, aiming to build an urban language "tailored to both man and the environment" [Gentili Tedeschi 1954, p. 49]. The perspectives created by Daneri for the district, preserved in the L. C. Daneri archive (fig. 10), highlight this search for the coexistence of the buildings with the Ligurian landscape, drawing inspiration from the construction of the streets of Genoa and the terraced layout of typical hillside houses.

In this case, the perspective representation emerges as a design criterion to consolidate the dialogue between the built environment and the landscape, verifying the dynamic experience of the places thus configured.

In the project for the seaside center in Sanremo, the bird's-eye perspective (fig. 11), which shows the configuration of the project on a territorial scale, is used as a tool for the search for an urban identity. Engaging in the debate surrounding the protection of the territory in relation to the massive urbanization phenomena triggered by the post-war housing needs [Boeri 2024], Daneri's design proposal evokes the small Ligurian villas arranged in terraces overlooking the coast, adapting this typology typical of the historic city and the anthropized landscape on a larger scale.

Conclusions

The analysis conducted on the project drawings has shown how, each time, the preference given to a specific analog system of projective representation has been configured as a declaration of adherence to a defined architectural theory paradigm, due to the close correspondence established between design choices and the adopted representation systems.

Drawing, in its various forms, thus effectively emerges as both a language and a theoretical foundation for architectural practice, as expressed by Margherita De Simone, who highlights that “in the design process, or rather in the act of design as a formative will, there are drawings that, in addition to clearly expressing the meaning of what is depicted, contain an emerging theoretical significance” [De Simone 1990, p. 160].

However, this extraordinary power inherent in traditional drawing, with its theoretical apparatus, seems today to be obliterated and overshadowed by the operational efficiency and communicative effectiveness that new digital systems are able to deploy.

Setting aside the more trivially communicative uses of digital technology (sometimes even with a blatantly seductive attitude), it now seems taken for granted, and even outdated, to consider the objective performance advantages (in terms of speed of execution and modification of graphic works) that, in past decades, made vector-based representation systems so successful. After all, these systems were conceived within the tradition of projection based on rigidly Euclidean principles, still reliant on the protagonism of the line drawn by hand, a line replaced in AutoCAD by the canonical straight line passing through two points.

Credits

The authorship of paragraphs *Introduction* and *Conclusions* is to be ascribed to Maria Pompeiana Iarossi, while the authorship of *Representation as the language of the architectural project*, *Orthogonal projections as the rational foundation of composition*, *Axonometric*

The real revolution, capable of truly acting as a booster for contemporary design thinking, can instead only be induced by the widespread adoption and development of BIM systems, where a wall is no longer a pair of lines, but rather an object placed and oriented in space, which in the project must establish a defined syntactic relationship with the other elements of the structure.

This vocation to govern the architectural syntax was already foreshadowed in the axonometric projection and suggested by William Farish's urgency to provide an adequate geometric-theoretical foundation for the graphic representations accompanying the assembly and maintenance instructions for mechanical systems, the true engines of the English industrial revolution. Therefore, in a sense, axonometry should be reconsidered as a kind of 'pre-BIM'.

In a broader view of the problem of contemporary representation, therefore, only by rediscovering the deeper conceptual connection between old and new systems of representation –without digging trenches between the past and the present, between the analog and the digital– can the project and its representation regain that essential unity between *les choses et les mots pour les dire*, which is characteristic of every evolved human language.

projections for the simultaneous visual experience of constructive relationships and *The perspective projection as a medium for a new relationship between architecture and nature* is to be ascribed to Cecilia Santacroce.

Notes

[1] In this regard, De Rubertis states: “Every representation stands as a new reality and a direct object of knowledge. Within it are present both the values of the represented reality and those introduced by the author of the depiction, bound in a semantic structure that is the outcome of the relationship (between the drafter and the subject)”: De Rubertis 1994, pp. 120, 121.

[2] “The means of representation [...] indicates and is part of the design intention, since on the one hand it is not the representation of a given thing, but of the design conversation that we establish with the representation itself as a matter that challenges and suggests to us”: Gregotti 1975, pp. 21, 22.

[3] The three drawings published by Theo van Doesburg concerning the dichotomy between active/passive, positive/negative, in painting, sculpture, and architecture are published in Van Straaten 1993, pp. 99, 100. These drawings were published in various Russian and German magazi-

nes between 1922 and 1923. In painting, the opposition was expressed through rectangular surfaces of different colors, while in sculpture the fundamental elements were space, time, plane, line, and volume, visualized through five parallelepipeds with black, grey, and white faces. In the architectural field, on the other hand, the essential principles included mass, space, time, line, and plane, represented through axonometry as five volumes outlined only by their contours.

[4] The CATIA application, developed since 1977 for the mechanical design of airplanes, originated as a CAD/CAE/CAM platform for structural analysis and verification. The software Form Z, following CATIA and developed starting in 1989, is an application for surface and solid modeling through Boolean mathematical operations applied to NURB surfaces and meshes. Pioneers in the active adoption of these tools for design were Peter Eisenman, who developed through the Form Z software the concept of folding and deconstruction in architecture, and Frank Gehry, who

adopted CATIA as a device with which to translate and redefine the soft forms of his architectures.

[5] "The importance of Mies's drawing-photographs lies in the manner in which differing means of signification are used to challenge the

symbolic and spatial meanings of a project relative to its context": Hoffman 1994, p. 105.

[6] Project carried out between 1950 and 1954 in collaboration with Giulio Zappa and Luciano Grossi Bianchi.

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The Manual Graphic Language as a Propaedeutic and Research Tool. The Drawing of Construction Details as a Singular Case Study

Antonio Estepa Rubio, Jesús Estepa Rubio

Abstract

In this paper, we present a study on the value and relevance of mastering manual graphic language as an essential tool for the development of educational and research processes, especially in contexts related to the performance of technical and creative skills at advanced levels of critical thinking.

In contemporary times, where digital resources have reached a notable level of sophistication, manual drawing continues to hold a significant place due to, among other characteristics, its expressive immediacy in fostering perception, participation, spatial understanding, and creativity.

The design of construction details, as a singular case study, demonstrates that technical drawing remains an irreplaceable universal platform for professions with technical and creative roots. Therefore, the propaedeutic training of architects, engineers, and designers is more necessary today than ever.

The preview capabilities provided by digital tools, including BIM, are fundamental for contemporary professional practice. However, learning to build and manufacture requires rigorous prior training. Drawing, as a scenario where errors are reversible, allows one to anticipate problems that may arise during the execution phases.

Keywords: graphic language, propaedeutic, research, construction detail, creativity.

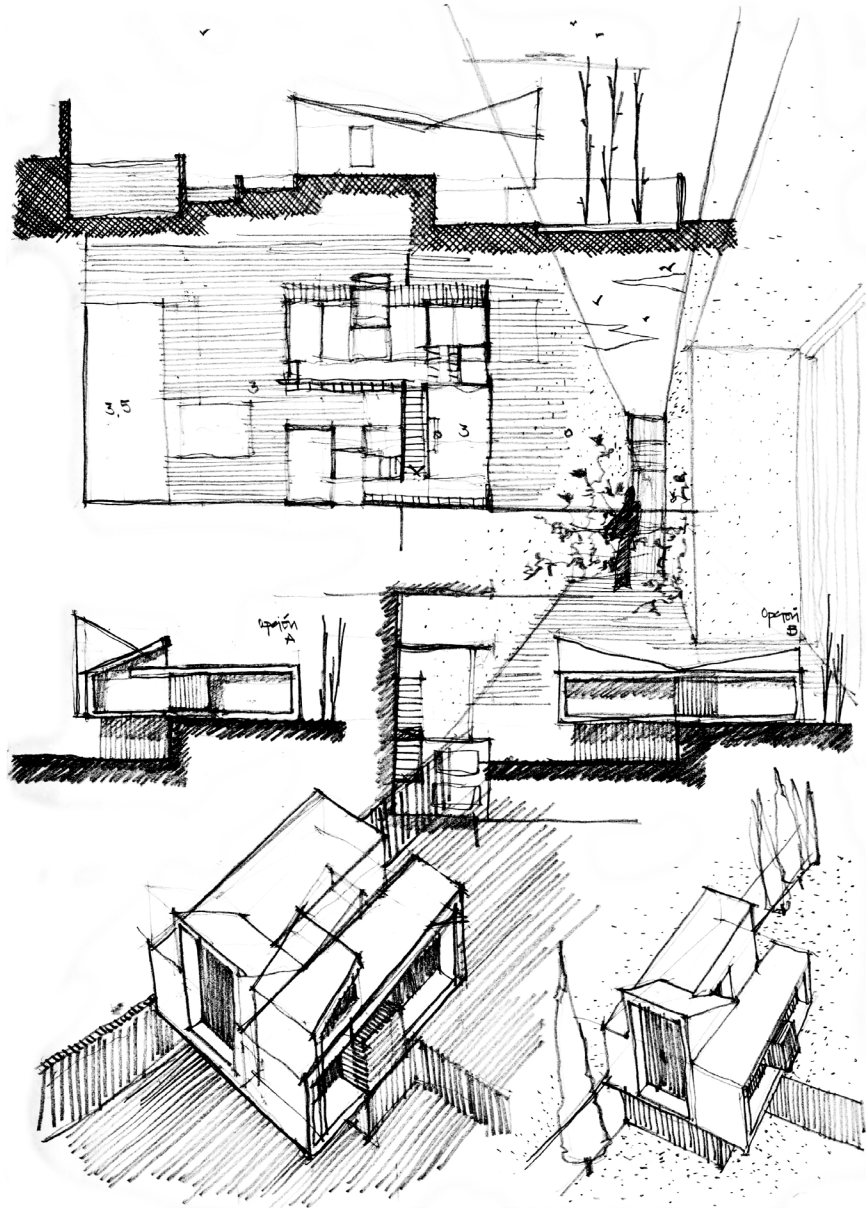
Graphic expression as a tool for thought and as a linguistic code for the practice of technical and creative professions

Discursive thinking refers to the ability to reason and express oneself coherently and organizedly in a dialectical exposition or conversation. It is characterized by being a skill derived from the creative intelligence characteristic of human beings [Marina 1994] to organize ideas and arguments clearly and logically, as well as allowing us to understand and respond to the ideas of other interlocutors effectively. This type of thinking involves the ability to use language effectively to communicate with others, whether orally or in writing. It implies the capacity to structure ideas and arguments in a complex yet coherent manner, as well as the ability to establish connections between different related topics or ideas.

Discursive thinking, as an exploratory process inherited from modern thought and art [Argán 1996], is related to the ability to ask critical questions and formulate solid arguments from an intelligible and rational standpoint. Discursive thinkers are often good at critically analyzing information, identifying problems, and formulating practical solutions.

Drawing, understood as a method of discursive interaction, is a highly useful tool for shaping thought and/or structuring communication derived from our intentions [Martín López, Durán López 2020, pp. 38, 39]. In many cases, drawing allows people to visually represent their mental elaborations and ideas (fig. 1), which undoubtedly helps to better understand and more effectively remember what they are trying to convey.

Fig. 1. Discursive graphic iteration in the gestation process of the architectural project (graphic elaboration by the authors).



Additionally, drawing can be a creative and therapeutic tool since, by drawing, people can process their emotions and thoughts in a non-verbal and artistic manner, which can help relieve stress and find new solutions to complex problems [Raposo Grau 2006, pp. 115, 116].

It can also be a fundamental tool for structuring collaboration and communication within a team. By drawing together, team members can share and discuss their ideas visually, which can help them reach agreements and make decisions more effectively.

The ability to process thought visually is always a versatile and valuable strategy for training the intellect, modelling communication, and facilitating collaboration among individuals. By allowing people to represent and share their ideas visually, it can help them better understand and solve problems more effectively.

Drawing and language are two distinct but equally important forms of exchange in the field of communication and representation [De Llano Cabado 1994, p. 26]. Both can be used to express ideas, emotions, and concepts.

Drawing is based on a narrative logic [Chías Navarro 2017, pp. 27, 28] that allows people to represent their thoughts and ideas concretely and tangibly through the intellectual stimulation of the sense of sight, capable of overcoming any intercultural barrier. Unlike language, which is verbal and abstract, drawing is more easily understandable and accessible to those who do not have a deep knowledge of a specific language [Bini 2017, pp. 24, 25].

However, language, whether oral or written, manifests as a more complex and flexible form of communication that allows people to express abstract ideas precisely. Language can also be used to describe and analyse drawing, providing a level of detail and depth that cannot be achieved solely by using drawing. Therefore, it can be concluded that language and drawing form a highly valuable communicative set for the performance of creative, technical, and executive activities.

Architectural graphic expression in its technical and executive aspect: from sketching to drawing construction details

Drawing is a form of representation that uses lines, shapes, and shadows to create an image on a flat surface, such as paper or canvas [Ching 2006]. Since ancient times [Pérez-Gómez 2017, pp. 17, 18], drawing has been used as a form of visual communication and artistic expression

Fig. 2. Axonometry of a vault in the Monastery of Iviron on Mount Athos (Greece) [Choisy 1883, Plate XII]. Source: National Library of France

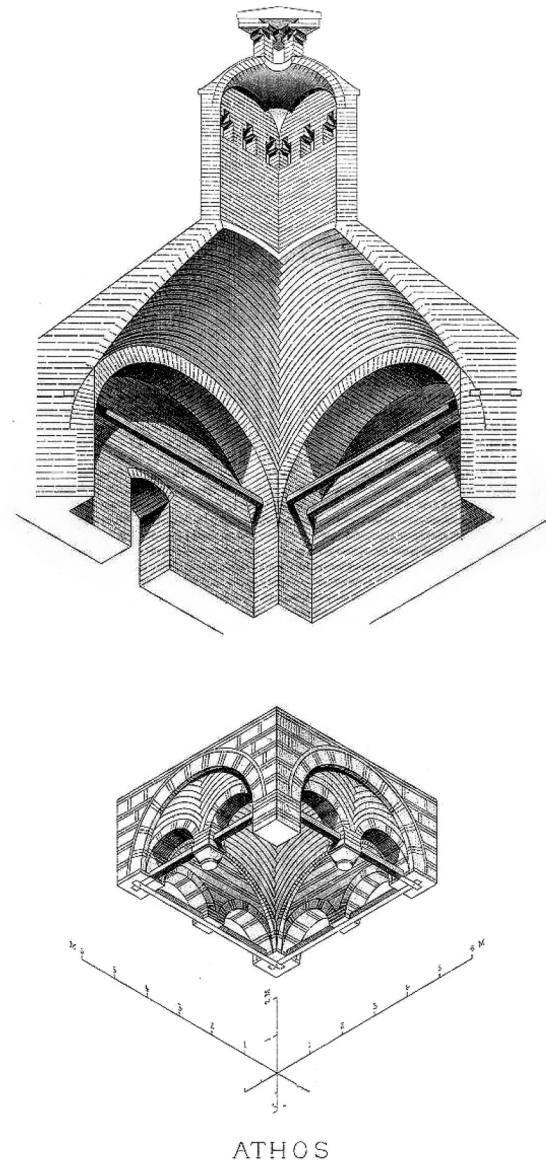
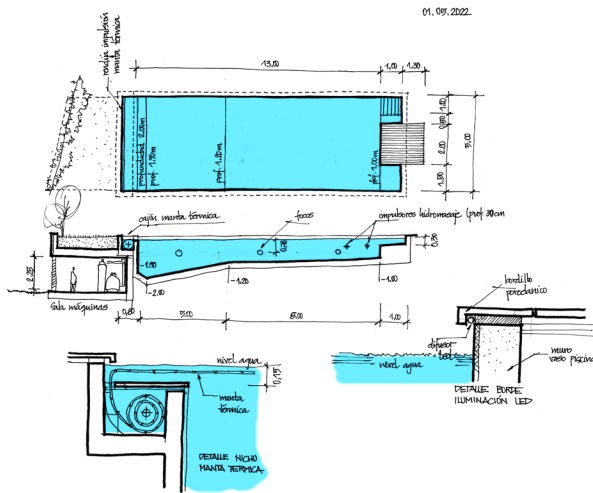


Fig. 3. Example of hand-drawn plans and sections for resolving the execution of a swimming pool (graphic elaboration by the authors).



in the field of Architecture. Thus, masters like Auguste Choisy (fig. 2), among others, have passed down a mode of graphic communication that has allowed, over the years, the development of a unique and highly recognizable way of drawing architecture; in Choisy's case, particularly sensitive to construction-related issues.

Drawing can be a creative and relaxing activity, and it can also be used as a tool to solve problems and improve cognitive skills. Additionally, drawing can be a form of personal and artistic expression, allowing authors to express their emotions, ideas, and visions [Seguí de la Riva, Burgaleta Mezo, Peña Pereda 1986, pp. 5-7].

Graphic-plastic expression and architecture are two fields that are closely related [Baldellou Santolaria 1998]. Graphic expression is a fundamental tool for representing professional ideas and concepts; thus, architects and designers use different graphic representation techniques to communicate their intentions to colleagues, clients, and, in executive phases, to interact with builders.

The exploration of ideas through sketches and drawings based on intuition is also an essential practice in the architectural design process [Melis 2023, pp. 34-36]. Architects and designers use freehand or digital drawings to explore

different design options and evaluate the functionality and aesthetics of their projects [Montiel Zacarías 2020, pp. 18, 19]. Architectural Graphic Expression can be categorized as a set of disciplines involving the visual representation of architectural ideas and their communication through drawings, sketches, models, and other visual means, even to represent territory and large scale [Salerno 2019]. This training is essential in the practice of architecture, as it allows for precise instructions to the various agents and entities with whom they must interact to carry out their professional work.

Graphic expression systematically works on several conceptual elements of radical importance for the subsequent practice of the profession, including perspective, scale, proportion, light and shadow, colour, texture, and composition [Viñas Limonchi 2024, pp. 3-5]. These elements are fundamental for creating precise and effective architectural drawings that can clearly and concisely convey the architect's vision, especially when responding to specific problems or resolving conflicts.

There are several types of architectural drawings used in the field of Architectural Graphic Expression; among them, one stands out for its significance and universality: planimetric representation, whose basic foundation lies, as we know, in the development of plans, sections, elevations, perspectives, and, of course, construction details (fig. 3). Each of these types of drawings, typically linked to the development of different technical production phases, has a specific purpose and is used to communicate different aspects [Uría Iglesias 1998, pp. 58-60], both in the preliminary planning phase and in the subsequent implementation phase.

Propaedeutic training in the learning of Architecture and Design

Propaedeutic training is based on a series of pedagogical and theoretical principles aimed at preparing students to assimilate advanced training and, in the case of architecture, to subsequently perform extensive and complex professional practice.

Therefore, one of the most relevant pedagogical approaches for learning any discipline of a creative nature has always been systematic training based on the effective simulation of project development; this allows for a focus on active learning through the execution of practical cases as close as possible to those that occur in reality [Raposo

Fig. 4. Detail drawing to explain on-site how to resolve water drainage at the edge of a terrace (graphic elaboration by the authors).

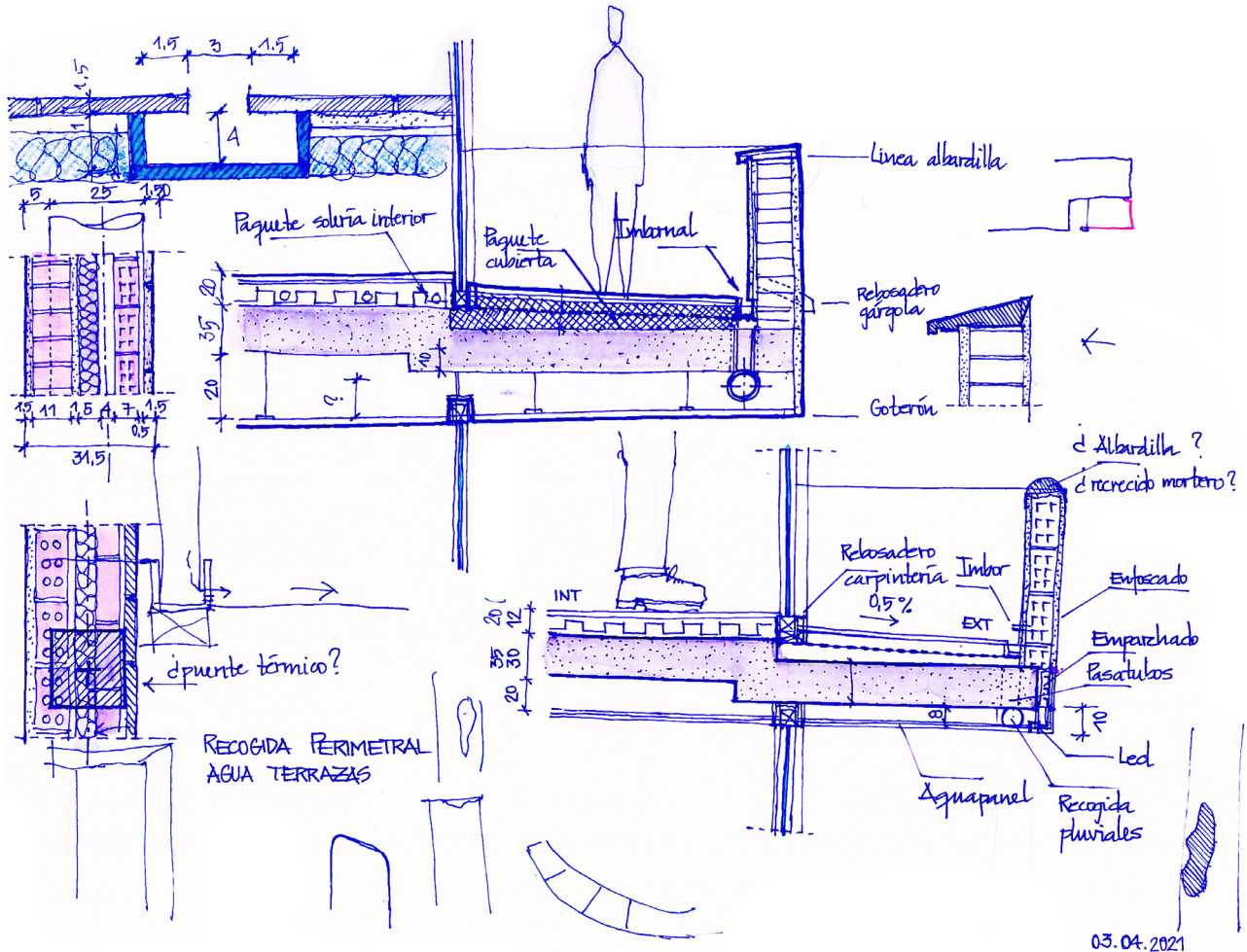
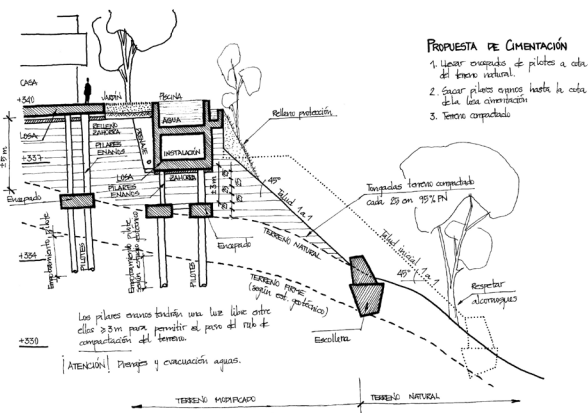
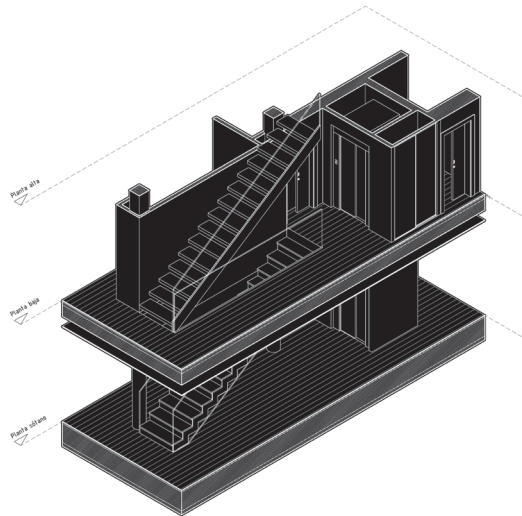


Fig. 5. Sectioned axonometry of the development of a staircase modelled with BIM (graphic elaboration by the authors).

Fig. 6. Detail drawing to explain on-site how to execute the foundation and soil retention (graphic elaboration by the authors).



Grau 2006, pp. 106, 107]. Thus, students apply theoretical knowledge in real or simulated situations, facilitating their understanding and retention of concepts analyzed from theory [Suter Warnholtz 2020, p. 33].

In architectural training, simulation-based learning allows students to develop design skills and spatial mastery where multiple convergent situations must be combined, as this is an interdisciplinary professional activity that combines elements of art, science, technology, and humanities.

Accordingly, it is easy to understand that propaedeutic training must reflect this integration, providing a solid foundation in various areas of knowledge. The juxtaposition of disciplines fosters a holistic understanding of the built environment and prepares students to tackle complex problems from multiple approaches.

For all these reasons, critical thinking is essential for architectural practice, as it allows professionals to evaluate and analyse information objectively and make informed decisions. Propaedeutic training should include activities and exercises that stimulate critical thinking, propositional analysis, and, above all, decision-making from leadership positions.

That is why the practice of architecture requires training in both technical and creative skills; thus, propaedeutic training must balance the development of cognitive competencies, such as logical reasoning and problem-solving, with the promotion of creativity and innovation.

Theoretical foundations provide a solid basis for the propaedeutic training of architects, ensuring that students acquire the necessary competencies to continue their education and subsequently practice the profession competently and ethically.

Within the area of Architectural Graphic Expression, it is worth notably mentioning one of the propaedeutic subjects that, over the years, has served as a springboard for advanced learning of mechanisms that help architects control space, namely, Descriptive Geometry.

Descriptive Geometry, systematized in its current form by Gaspard Monge [Gentil Baldrich 2021, pp. 1207-1209], is a mathematical discipline focused on representing three-dimensional objects on a two-dimensional plane using projective graphic techniques. This science has historically been very important in the fields of engineering, architecture, and industrial design, which is why it has always been part of the curricula of all those careers that deal with manipulating the physical environment, space, and the occupation of objects within it [Bergamo 2022, pp. 112-114].

Precision and attention to detail are fundamental in graphic expression to ensure the effective communication of architectural ideas and the rigorous construction of our works (fig. 4). Therefore, architectural drawings must synthesize and explain, in the best possible way, the spatial distribution of the project, its exterior and interior appearance, construction decisions, and spatial relationships between the different areas of the ensemble.

Thus, propaedeutic initiation into transversal knowledge is essential for the specific knowledge of the discipline to take root as it should. In the context of architecture and design, the integration of disciplines such as history, theory, mathematics, and applied sciences allows professionals to develop a holistic understanding of the built environment. This transversal foundation not only enriches their technical knowledge but also fosters a broader and more critical perspective, essential for addressing the most complex challenges of professional life.

Excellence in digital drawing: CAD and BIM representations through manual graphic discourse

The BIM (Building Information Modeling) methodology allows for efficient and sustainable management of construction and infrastructure projects, improving design quality and informed decision-making. While the CAD (Computer-Aided Design) methodology focuses on creating precise drawings, BIM focuses on collaboration, coordination, and information analysis in all design phases, using a technological and digital role where all project information is contained and programmed [Del Giudice 2018, pp. 122, 123].

On the other hand, it is worth remembering that freehand drawing has historically been a key tool in the conceptualization and communication of architectural ideas; however, with the definitive implementation of contemporary digital technologies that allow the creation of digital twins (fig. 5) with an impressive level of precision, the relevance and necessity of maintaining this traditional skill for professional tasks in our discipline might seem questionable [Borin et al. 2020, pp. 139, 140]. Nevertheless, it is increasingly evident that freehand drawing remains a crucial skill that facilitates the effective handling of digital graphic tools and enhances creativity and precision in the design, ideation, and proposition of architectural solutions of any kind and level (fig. 6).

Manual graphic skills foster a direct connection between the mind and the hand, facilitating the quick and spontaneous

Fig. 7. Construction details of timber frame structures. Drawings by Antonio Cámara [Cámara 1949, p. 86]. Source: Official College of Architects of Madrid.

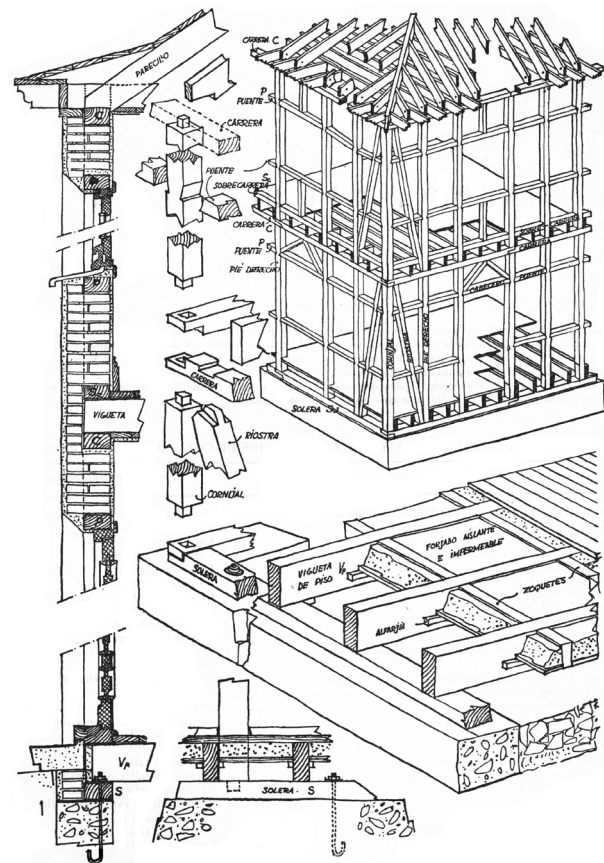
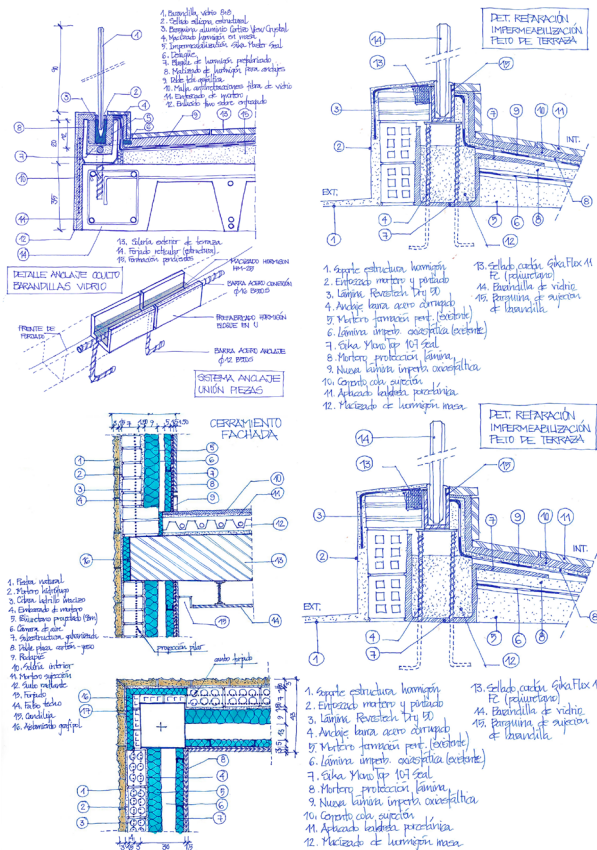


Fig. 8. Construction details of joints and connections on-site (graphic elaboration by the authors).



expression of ideas through conceptual diagrams or basic three-dimensional approximations [Figueroa Rodr  guez 2023, pp. 52-54]. Unlike digital tools, which may impose certain technical limitations, freehand drawing offers a creative freedom that is irreplaceable for initiating and structuring decisions in the early stages of design [Graves 1979, p. 32].

Moreover, it can be said without fear of contradiction that freehand drawing serves as a solid foundation for learning and handling digital graphic tools. Architects who master freehand drawing can transfer their observation and representation skills to digital platforms more easily. For example, the ability to quickly visualize and sketch concepts by hand can accelerate the modelling process in BIM and CAD, allowing for a smoother transition between conceptual design and the final technical documentation used for implementation.

Digital tools, such as BIM and CAD, offer significant advantages in terms of precision, efficiency, and collaboration; however, they require a clear understanding of design principles and the ability to think spatially and constructively. It goes without saying that freehand drawing helps develop these competencies, providing a solid foundation upon which more advanced digital skills can be built. In other words, it is quite likely that individuals with good manual graphic expression skills will handle and use digital graphic tools better than those who lack this foundational knowledge.

Additionally, freehand drawing can enhance communication and collaboration in multidisciplinary teams, especially when many agents need to intervene simultaneously on-site. Quick sketches and freehand annotations facilitate discussion, idea exchange, and understanding in executive design or construction management meetings, allowing for a clearer and faster comprehension of proposed concepts. This principle is particularly valuable in collaborative environments where visual communication is key to the project's success [Graves 1979, pp. 35, 36].

Freehand drawing remains an essential skill in the training and practice of architects and designers, complementing and enriching the use of digital graphic tools such as BIM and CAD. The combination of traditional and digital skills allows professionals to approach architectural design with greater creativity, precision, and efficiency. Therefore, it is crucial that educational programs continue to emphasize the importance of freehand drawing as a substantial propaedeutic competence for the training of architects and designers.

The drawing of construction details as a support for mastering construction

Despite technology having changed the way construction projects are carried out, hand-drawing construction details remains important in many cases. Hand-drawn sketches and conceptual diagrams [Puebla Pons, Martínez López 2010, pp. 101-103], often made spontaneously on-site, are very useful for communicating manufacturing processes and determining specific characteristics that can be difficult to convey on a computer screen.

Technical drawing is a form of expression that has always been used to communicate detailed information about how construction processes should be managed and executed (fig. 7). Technical drawings are especially important for construction companies to understand exactly what needs to be done and how tasks should be planned to ensure the material execution of the work aligns with the project's specifications.

Accordingly, developing a set of detailed plans is essential for various trades to understand precisely what is required to construct each unit of work accurately and appropriately. However, we must not fall into the error of thinking that a project document is sufficient to resolve all the problems and conflicts that will arise on-site. In this sense, as it is always necessary to follow up on-site to complete the information in the project's graphic documentation, being able to draw well freehand ensures rapid agility to address and solve any gaps due to the possible lack of graphic information in the execution project.

Additionally, these details are important for budgeting and selecting the most suitable materials and executive systems, which translates into control over the timing and processes of construction and, consequently, parallel cost control during construction. Therefore, in the architectural design process, construction details are always drawn to evaluate different sections where the main construction joints and connections can be studied. It is important that the drawings are precise and detailed so that builders can easily understand how to make connections, joints, or intersections, avoiding errors that could jeopardize any part of the process.

Drawings must be clear and precise so that everyone can understand and follow the instructions correctly. Currently, the drawing of construction details is largely done with digital tools such as CAD and BIM. These tools allow for the creation of precise and detailed drawings, facilitating

Fig. 9. Construction details of floor and roof solutions (graphic elaboration by the authors).

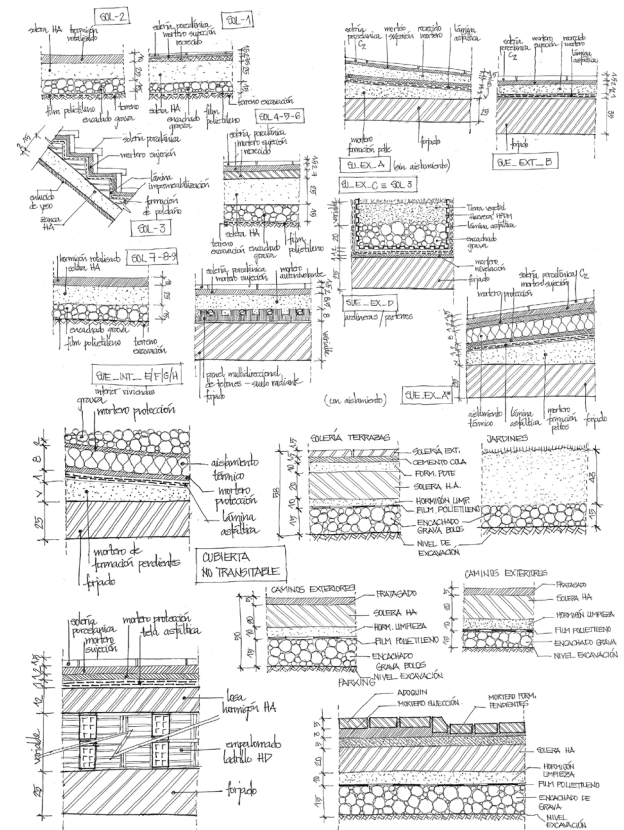
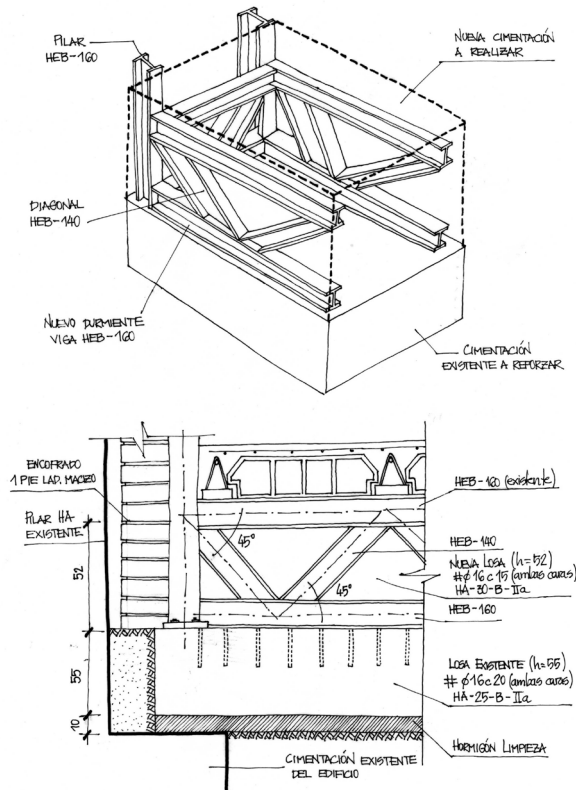


Fig. 10. Construction detail of structural reinforcement (graphic elaboration by the authors).



the management and exchange of information among the different agents involved in the various production phases. However, it is important to highlight that, despite the advantages of digital tools, the ability to draw by hand remains a valuable skill for architects and designers, as it allows for the quick exploration of different solutions and the intuitive and personalized communication of ideas.

Drawing on-site is one of the most valuable skills for an architect or engineer working in construction today (fig. 8). The ability to observe construction systems and record construction details in real-time is fundamental for decision-making and problem-solving on-site, being a differentiating factor that clearly marks the level of excellence among professionals responsible for directing and coordinating building works.

On-site drawing allows construction professionals to capture critical situations in real-time and provide precise and useful information to design and construction teams. Therefore, drawings made on-site help improve the quality of the work and reduce costs associated with subsequent changes and corrections.

In parallel, drawings of construction details that complement the graphic material in the official project documentation allow contractors to visualize the design and better understand the executive requirements.

On-site drawing also helps professionals anticipate problems and avoid errors during task execution (fig. 9). By recording precise details and measurements, site supervisors can identify potential issues before they become major and costly conflicts, enabling early correction and preventing project delays. On-site drawings can also be useful for construction documentation and inspection (fig. 10), and are used to verify the work of contractors and ensure compliance with design requirements. They are also very useful for documenting any changes in design and planning. This improves project efficiency, reduces construction duration, and ensures work quality, which translates into cost control and avoids conflicts arising from poor execution.

Conclusions

In conclusion, it is worth reiterating that manual graphic language, specifically freehand drawing, remains an indispensable tool in the training and practice of contemporary architects and designers. Despite technological advancements and the widespread adoption of digital tools such as

BIM and CAD, manual drawing maintains its relevance for several key reasons.

Firstly, freehand drawing fosters a deep and direct understanding of forms, proportions, and spaces, which is essential in the early stages of design, where creative freedom and the ability to express ideas quickly and spontaneously are crucial. Manual drawing allows designers to explore concepts without the technical limitations sometimes imposed by digital tools.

Additionally, freehand drawing serves as a solid foundation for learning and handling digital graphic tools. Architects who master manual drawing can transfer their observation and representation skills to digital platforms more easily. This smooth transition is particularly evident in the case of drawing construction details, where precision and clarity are fundamental. Manual sketches of construction details allow site supervisors to visualize and effectively solve executive problems before translating them into reality.

Manual graphic language also enhances communication and collaboration in multidisciplinary teams, as quick sketches and freehand annotations facilitate discussion and idea exchange in design meetings, allowing for a clearer and faster understanding of proposed concepts.

In terms of research, freehand drawing allows for a freer and more creative exploration of ideas, which can lead to unique innovations and solutions. The ability to experiment and iterate quickly through manual sketches is a significant advantage in the investigative process.

To conclude, we emphasize our belief that manual graphic language remains an essential propaedeutic and investigative tool for performing advanced technical and creative tasks in contemporary times. In the case of drawing construction details, it is important to note that mastering freehand drawing serves to complement and enrich the use of digital tools, improving precision, creativity, and efficiency in professional practice.

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Perspective and Spatial Illusion as Language and Technique in Urban Art of JR

Alessandra Coppola

Abstract

Street Art, as the set of artistic and performative practices within the urban space, represents one of the most significant artistic movements of modernity. Through visual imagery, Street Art invites viewers to reconsider the reality surrounding them, engaging them in a process of reinterpretation of the lived and traversed space. In this context, illusory representations, with their ability to alter perception through ephemeral spatial suggestions, offer fertile ground for experimentation by street artists. The artistic production of the Paris-based urban artist Jean René, widely known as JR, is emblematic in this regard. This study focuses on the exploration of trompe l'œil and anamorphosis as visual languages and techniques within JR's artistic practice. The aim of the research is to analyze how figurative techniques of Renaissance origin are interpreted in his urban artworks, to make explicit the complex relationship between stylistic choices and the communicative purposes of the artistic project. Through an in-depth examination of selected works, the research intends to show how the perspective construction of illusory space, reinterpreted through photography and new media, is today a visual and symbolic language capable of conveying unprecedented visions and representations of contemporary urban space.

Keywords: street art, JR, illusory perspectives, trompe l'œil, anamorphosis.

Introduction

Emerging between the late 1960s and early 1970s as an illegal phenomenon of urban space reclamation, Street Art has evolved over time, adopting diverse forms, styles, techniques, and objectives that, in their complexity, overlay signs and meanings onto the architecture of the city. Most street artists begin with a profound identification and empathy with the city: they are driven to make a statement *within* and *through* the urban environment [Irvine 2012]. From this perspective, Street Art can be understood as a practice of rewriting urban space through images that, in their 'figurative' dimension [Bredekamp 2015], play a fundamental role in shaping the lived experience. Within this context, artists employ visual language to express ideas, emotions, and

reflections, taking the city itself as the stage for their work to reach the public in forms and through modalities more direct and unexpected than those typically found in museums or galleries. As observed by Di Luggo and Zerlenga, this practice demonstrates how "drawing, in its broadest sense, becomes a vast horizon of subjects to explore and affirms itself as a universal expressive force and, at the same time, a creative engine for storytelling through visual imagery" [Di Luggo, Zerlenga 2020, p. 10]. Like any language, that of street art possesses its own grammar and syntax, in which the themes depicted, the colors, shapes, and techniques chosen by the artist mediate specific meanings and engage viewers in different ways. Illusory representations, due to their ability to alter

perception through ephemeral spatial suggestions, offer a rich field of experimentation for artists [Attademo 2020]. They construct illusory artworks on every type of surface, employing in a contemporary key "*Lo inganno degl'occhi*" [Accolti 1625] of linear conical perspective, to induce in the spectator "a perception of depth that 'breaks through' the wall structure, expanding the space hosting them to the limits of the gaze" [Migliari 2014, p. 1]. Through the figurative techniques of *trompe l'œil* and anamorphosis, artists recreate illusory scenarios that involve the urban observer in both the recognition of the image in its true form and in the dual awareness of the reality of the image and the spatial illusion that plays on distortion and manipulation of visual perception. Anamorphosis, described as a "*La Perspective curieuse ou Magie artificielle*" [Niceron 1638], is used by street artists to produce artworks that can only be correctly interpreted from a specific point of view. It is primarily employed to define illusory spatialities on horizontal planes, such as streets or squares, or on fragmented surfaces that only cohere when the viewer aligns his gaze with the projection point of the geometric construction [Pagliano 2024]. *Trompe l'œil* artworks, on the other hand, are typically created on vertical urban surfaces: the physiological vision acquires depth through the superimposition of the plane of representation that dematerializes the fixity of the support. Historically employed by artists from the 16th century onwards to expand the spatiality of architectural interiors, such as churches and noble palaces, this technique finds contemporary application on blind facades of ordinary buildings, endowing them with both depth and motion through spatial configurations. The illusionistic effects realized by the artists in the urban context reveal, on the one hand, an awareness, at least empirical, of the laws of central perspective and the complex mechanisms of visual perception, and on the other hand, show how the sign system of Renaissance origin is declined in the light of contemporary communicative and artistic needs. Within this framework, the work of JR, the well-known French urban artist, stands out as a particularly interesting case. His evocative and monumental images are representations of architecture, illusory perspectives that are as realistic as they are visionary, whose aesthetic and expressive sophistication captures observers with a sense of wonder and surprise. In his installations, perspective, reinterpreted through modern digital drawing tools and new media [McLuhan



Fig. 1. JR, 2001. *Expo2Rue Sur les toit*. Paris. (Photo © JR).

Fig. 2. JR, 2007. *28 Millimètres, Face 2 Face*, Separation wall, security fence, Israeli side, Abu Dis, Jerusalem. (Photo © JR).

2015], assumes new forms, dimensions, and purposes. This evolution is inscribed within the tradition of a consolidated and extensively tested representational method and artistic language, allowing it to be read between continuity and innovation.

JR's urban art

JR, the pseudonym of Jean René, was born in France in 1983 to a family of Tunisian origin and grew up in Montfermeil, a suburb of Paris. He is also known as the '*photographeur*', a term that highlights the distinctive use of photography and black-and-white photo collages in his urban artworks. His artistic career began in 2001, when he started photographing writers at work on the rooftops and in the subways of Paris (fig. 1). Today, JR is one of the most internationally recognized urban artists. His fame and recognition are supported by numerous exhibitions and public commissions from cultural institutions and venues. As the artist himself has remarked, his projects reveal "a gentle blending between works created in full legality and others conceived in complete illegality" [Galansino 2021, p. 16]; an approach that situates a large part of his practice within the broader realm of public art. His works are temporary installations that always start and act as mediators of a reflection on the context, understood in the dual sense of *site*, a physical, urban, and territorial framework, and *place*, as a construct embedded with historical, social, and cultural meanings. Community participation and engagement are central to JR's artistic vision. He stands out for his approach to art as a practice capable of generating new relationships and opportunities, as "an activity consisting of producing relationships with the world through signs, forms, gestures or objects" [Bourriaud 2010, p. 11]. This not only amplifies the impact of his installations but also fosters a strong sense of collective belonging and identity, encouraging dialogue and critical reflection. In this sense, his work exemplifies a particular understanding of the *site-specific* dimension of public art, which, as art historian Deutsche defines it is a discourse that "combines ideas on art, architecture and urbanism, on the one hand, with the city's theories of social and public space on the other" [Deutsche 1996 p. 11]. JR primarily employs two figurative approaches in his work: photographic portraits [1] (fig. 2) and photo-collages of

illusory spatial constructions (fig. 3). Both approaches are characterized using black and white, which, as argued by Barthes in his essay on photography, privileges symbolic and conceptual representation while simultaneously revealing the ephemeral nature of the image [Barthes 1980]. In his illusory representations, JR, as a "modern quadraturist" [Galansino 2021, p.13], uses the figurative techniques of *trompe l'œil* and anamorphosis to create "marvelous experiences" whose effects captivate observers by "giving shape to mutable images" [Della Porta 1611, XX]. In his works, in fact, perspective is used as an expedient to impress the viewer with his own ability to create something that resembles reality, rather than reproduce it. Superimposed on urban scenes, building facades, monuments and landscape segments, his works reveal hidden or forgotten narratives, or introduce new ones, inviting viewers to look beyond the familiar and actively interact with the artwork and its context. The viewer's level of involvement is such that they are encouraged to take up a specific position in space, creating a dialogue between the artist, the artwork, and the viewer through perceptual cues and physical interaction. The viewing experience of these installations is not limited to achieving the 'perfect view', but is enriched by the infinite range of 'imperfect views' that the viewers are encouraged to explore [Pagliano 2016, pp. 37-38]. The technique of photo-collage, which JR consistently uses in these works, enhances the ambiguity of the illusory space. On one hand, like a painting, it appears as a 'manual' result of deliberate spatial control, based on knowledge of perspective and the study of shadows that seamlessly link different elements of the artwork. On the other hand, through the composition of photographic fragments, the collage appears less "artificial and imaginary" than an architectural drawing and more "true and credible, like a photograph" [Marra 2012, p. 65]. This duality allows JR to play with public perception, crafting artworks that challenge the boundary between reality and illusion (fig. 4). Beginning with his first installation at the Louvre Museum in 2016, JR initiated a focused exploration of perspective space. Through the analysis of key artworks created in urban contexts of strong symbolic significance, this article highlights how the perspectival construction of represented space is continually adapted to serve the communicative aims of the artistic project.

JR's Anamorphosis at the Louvre

JR created two monumental installations at the Louvre Museum in Paris, both centered around the iconic glass Pyramid designed by architect I.M. Pei in 1989, an emblematic structure symbolizing the dialogue between ancient and modern architecture, and now a globally recognized symbol of the city. Invited by the museum in 2016, JR produced an installation on the northwest facade of the Pyramid. This artwork consisted of a photographic collage in anamorphosis, designed to create a visual illusion that effectively made the Pyramid disappear (fig. 4). The piece restructured and expanded the perception of the Sully Wing facade, located behind the modern structure, highlighting the full architectural profile of the historical building. The anamorphic technique enabled JR to distort a photographic collage of the hidden portion of the Sully Wing onto the inclined surface of the Pyramid, making it visually coherent only when viewed from a specific vantage point, coinciding in this case with the actual observer's eye (fig. 5). Through the alignment of points in real space with those in the image, the viewer perceives the continuity between architectural elements such as arches, openings, and string courses. Notably, the alignment of the lateral turrets of the building's central block, rising above the image, amplifies the illusion of a unified visual plane. This allows visitors approaching from the Place du Carrousel to experience the same space in a different temporal dimension. The reflection on the passage of time and the reverence for the past evokes Hubert Robert's imaginary view of the *Grand Gallery of the Louvre in Ruins* (1796) (fig. 6), a visionary view depicting the Grand Gallery in a ruined atmosphere during its construction. At the same time, JR, by making the Pyramid disappear, emphasizes the void as the presence of an absence [Catalan 2021]. As the artist stated in an interview, "we should make it [the Pyramid] disappear so that people can rediscover the pleasure of seeing it reappear" [Galansino 2021, p. 18]. Indeed, the Pyramid becomes the visual focus of the entire experience: the viewer is induced to find the privileged vantage point, moving around it in search of visual deception.

In 2019, JR returned to the Louvre to commemorate the 30th anniversary of the glass Pyramid's construction. This time, the artist developed an installation across the horizontal plane of the Cour Napoléon, incorporating



Fig. 3. JR, 2023. *Retour à la Caverne, Acte I*, 6 September 2023, h 08:20. Palais Garnier, Opéra de Paris. (Photo © JR).



Fig. 4. JR, 2016. *JR au Louvre, La Pyramide*, 12 June 2016, h 05:55. Pyramide, architecte I.M. Pei, Musée du Louvre, Paris, France. (Photo © JR).

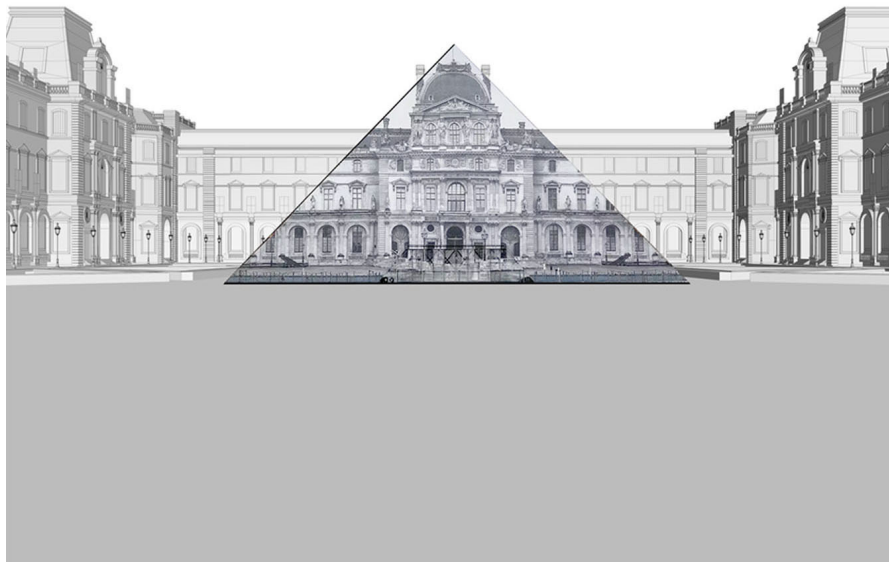
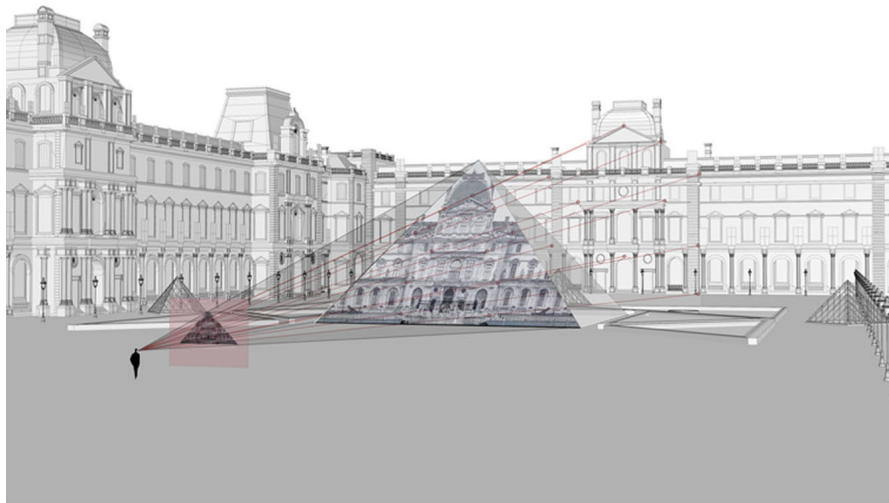


Fig. 5. Top: three-dimensional reconstruction of the anamorphic process used to distort the image into its true form on the inclined surface of the Pyramid. Bottom: three-dimensional reconstruction of the view from the projection center. (Graphic elaboration by the author).



Fig. 6. Hubert Robert, 1796. *Vue imaginaire de la Grande Galerie du Louvre en ruines*. Oil on canvas. © 2007 GrandPalaisRmn (musée du Louvre) / Jean-Gilles Berizzi.

Fig. 7. JR, 2019. *JR at the Louvre Museum & The secret of the Great Pyramid*, Louvre Museum, Paris, 2019. (Photo © JR).

benches and the smaller satellite pyramids present in the square. The installation, *The Secret of the Grand Pyramid* (fig. 7), stands as JR's largest participatory photographic collage, involving around 400 volunteers who helped cut and paste over 2,000 sheets of paper. Again, employing the technique of anamorphosis [2], JR extended the illusion below the pavement of the courtyard, creating an evocative, cavernous, and rocky spatiality from which the Pyramid now appeared to emerge. The image, distorted along the horizontal surface, remained incomprehensible to viewers moving within the square. The anamorphic viewpoint was positioned at the center of the Sully Wing facade, precisely at the height of the parapet of the top floor of the building. During the creation process, a camera was installed at this strategic point to capture the image from the exact angle needed to reveal the anamorphic effect. Two large screens placed in the square broadcasted this perspective in real time, progressively revealing the image as it was constructed. In this case, the ideal viewer of the geometric construction didn't coincide with the real observer's location. This mechanism actively engaged viewers, encouraging them to contrast their subjective, physiological perception of the creative space with the elevated viewpoint that revealed the image in its true form. In this installation, the camera assumed the geometric and symbolic role of the projection center; the observer's eye, translating the artistic experience into a mediated, technological dimension that reinterprets perspectival language and expands its physical and expressive potential.

JR's *Trompe l'œil* Series and the 'Rip in the Monument'

With his first anamorphic installation at the Louvre, JR initiated an in-depth artistic exploration of increasingly complex and articulated illusory spatialities. The *Trompe l'œil* series, which has a dedicated section on the artist's official website, gathers these projects [3]. In 2021, JR carried out two notable interventions in Italy, unveiling the architectural interiors of two prestigious historical buildings through perspective: *La Ferita* on the facade of Palazzo Strozzi in Florence (fig. 8) and *Punto di Fuga* at Palazzo Farnese in Rome (fig. 9). In these artworks, the illusionistic representation originates from a rip, a simulated material rupture in the architectural support, revealing the depth of the depicted space behind



Fig. 8. JR, 2021. *La Ferita*, 19 March 2021, h 06:34, Palazzo Strozzi, Florence, Italy. (Photo © JR).

Fig. 9. JR, 2021. *Punto di Fuga*, 23 July 2021, h 05:50, Rome, Italy. (Photo © JR).



the facade. These rips, constructed using perspective, assume diverse shapes, in continuity with the design and features of the facades they inhabit, establishing an ambiguous *limen* between real and represented space. This enhances the realism of the illusion and deceives the observer's eye. Despite their variations, the rips share an irregular profile that evokes a sense of collapse and ruin. This choice bestows the artworks with an aura of decay, suggesting a narrative of transformation and vulnerability that stands in stark contrast to the monumentality of the buildings on which they are installed. In keeping with the originally irreverent and subversive spirit of street art, this contrast invites the viewer to deconstruct both the image and the conventional imaginary associated with the monument. *La Ferita*, created in Florence in spring 2021, presents an enormous gash on the main facade of Palazzo Strozzi, ideal model of a Renaissance noble residence. Commissioned by the Fondazione Palazzo Strozzi, the installation reflects on access to culture during the pandemic: "the work speaks to us about a deserted city [...] a metaphorical destruction of the world of culture, the arts and research, a real drama through an ephemeral, illusionistic and powerful image. Palazzo Strozzi thus becomes the spectacular stage for a tear, symbolic but painful, that unites all cultural institutions in Italy and elsewhere: museums, libraries, cinemas and theatres forced to keep their doors closed. It is therefore not only a site-specific but also a time-specific artwork" [Galansino 2021, p. 12].

The anamorphic artwork on the main facade reveals several interior spaces of the palace: the colonnade of the courtyard, an exhibition room on the *piano nobile*, and a room of the National Institute of Renaissance Studies' library. The composition is enriched with iconic pieces of art of Florentine heritage, such as Botticelli's *Primavera* and *The Birth of Venus*, housed in the Uffizi, and Giambologna's *Rape of the Sabine Women*, located in the Loggia dei Lanzi. The view, coherent and plausible at first glance, reveals a palimpsest of architectural environments and artistic references displaced across space and time. This superposition of reality and imagination recalls the tradition of the 18th-century *capriccio*: "a pictorial invention that creates an imaginary or analogous reality by combining existing buildings or spaces with imagined ones, displacing or reorganizing their placement and composition within

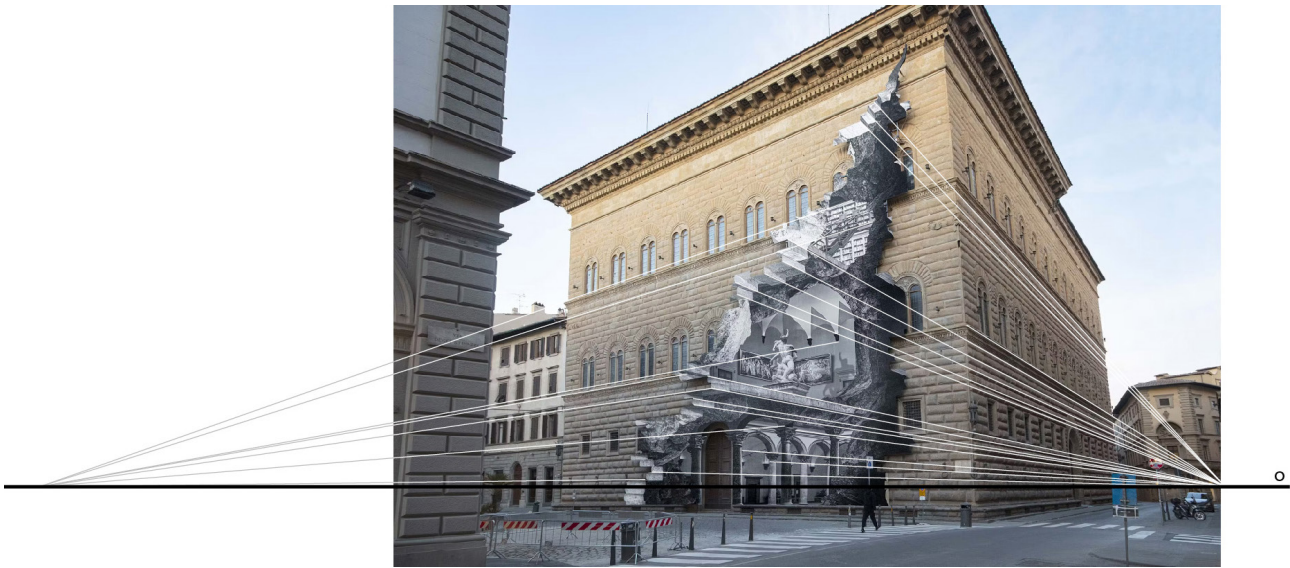


Fig. 10. Perspective analysis with identification of the horizon line in JR's *La Ferita*. (Graphic elaboration by the author).

evocative visions" [Steil 2013, p. LIII]. The installation was constructed using approximately 80 printed aluminum panels mounted on a metal scaffolding structure affixed to the building's facade. Starting from a photograph of the artwork, which captures the privileged viewpoint of illusionistic construction, the perspective analysis reveals a visual coherence between the vanishing lines of the perspective section and those of the actual building that share the same direction (fig. 10). The vanishing points lie on a single horizon line, situated approximately 180 centimeters above ground level, measured at the level of the ashlar stone on the facade. This position of the horizon line is consistent with the height of the observer's eye; a relationship further highlighted by the presence of a person in the photograph: the horizon line passes exactly at the eye level of this figure. From a frontal view, the image appears distorted, revealing the illusory spatiality only when the observer adopts the correct viewpoint of the geometric construction, which is notably off-center relative to the facade (fig. 11). This choice is probably influenced by the limited space in front of the main facade, which

would not allow a complete view of the building except from a sharp angle of observation. The 'corner scene' thus becomes the privileged view of the perspective construction: the diagonal lines of the composition give dynamism to the image, encouraging the observer's eye to actively explore the scene.

La Nascita, created in Rome in the summer of the same year, is a *trompe l'œil* in central perspective, positioned on the main facade of Palazzo Farnese. The project is part of the initiative *Palazzo Farnese: Open for Works*, promoted by the French Embassy, which is hosted in the palace itself. The project arose from the need to cover the restoration site of the building's facade and roof, transforming the temporary closure into an opportunity for artistic enhancement. The intervention employs the same visual language as the previous installation in Florence; the perspective reveals the interior spaces of the palace, such as the vestibule with its columns and decorated barrel vault, the courtyard, and the *Sala dei Fasti*. Additionally, the artwork features the statue of the *Ercole Farnese*, which, although it was once hosted in the palace, is currently preserved at the

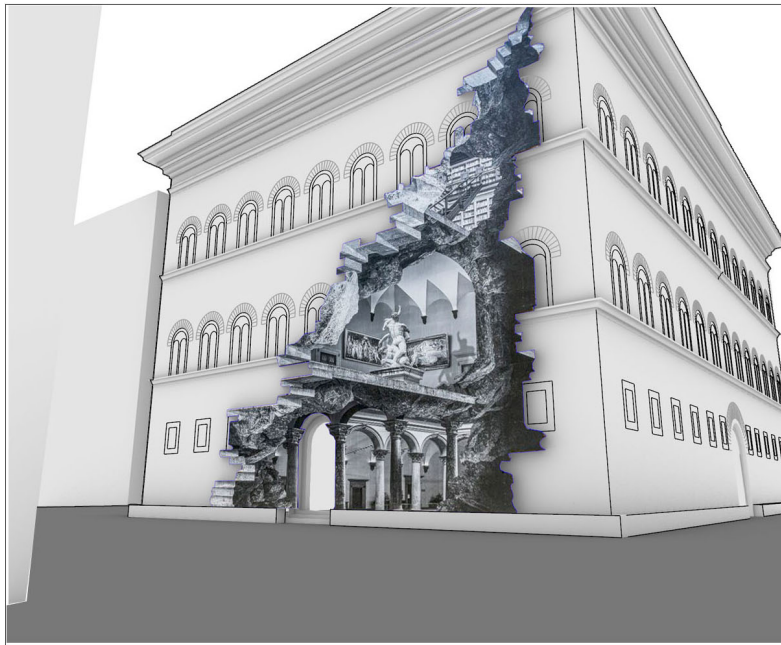
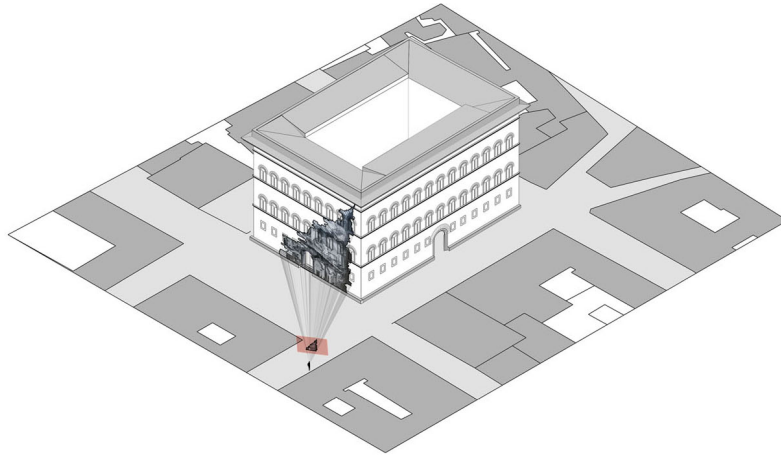


Fig. 11. Top: three-dimensional reconstruction of JR's anamorphosis at Palazzo Strozzi, showing the projection center in relation to the urban surroundings. Bottom: three-dimensional reconstruction of the view from the projection center. (Graphic elaboration by the author).



Fig. 12. Perspective analysis with identification of the horizon line and the vanishing points of the lines orthogonal to the picture plane in JR's *Punto di Fuga*. (Graphic elaboration by the author).

National Archaeological Museum (MANN) in Naples. Starting with the photographic image of the artwork, it is possible to observe that the perspectival construction is articulated, in this case, into three segments of central perspective, each with its own vanishing point for the lines orthogonal to the picture plane, located near the main doorway of the Palazzo (fig. 12). The vanishing points all lie on the same horizon line which, as shown in the perspective reconstruction by Francesca Porfiri and Luca James Senatore, is positioned at a height of approximately 160 centimeters from the ground, thus, once again, corresponding to the viewer's eye level [Porfiri, Senatore 2021]. While the perspectival construction in the previous intervention appears rigorous, in this case the deviations adopted by the artist, namely the decision to displace the vanishing points of the lines orthogonal to the picture plane at different positions along the horizon line, can be interpreted as "expedients that depart from the strictness of a unified viewpoint in order to make the visual experience of the simulated space less rigid, and thus more natural" [Rossi 2014, p. 322]. These choices serve the overall spectacular effect and enhance the viewer's experience, showcasing JR's command of the technique and his ability to adapt it in service of the desired illusionistic effect.

Credits and Acknowledgments

Special thanks to the artist JR for granting permission to include photographic reproductions of his artistic projects in this article. *All JR images are the property of JR. All rights reserved.*

Notes

[1] For an in-depth of JR's photographic portraits see Eckhard 2015.

[2] For the realization of the artwork, JR collaborated with the Paris-based creative studio SUPERBIEN, which was commissioned to develop the three-dimensional anamorphic projection of the image onto the physical structure. The process involved creating a digital ren-

Conclusions

In JR's artistic practice, perspective becomes a *medium* for re-signifying the narrative of the urban space. His ephemeral and temporary installations, through the creation of illusory spatialities, invite the viewer-interpreter to explore hidden stories and imaginative visions, evoking wonder and surprise. The projects examined reveal how he adapts perspectival language each time to tell different stories, shaped by the specificity of the context and the expressive aims of each intervention. In these artworks, the interaction and mimesis between real space and figurative space, supported by modern digital drawing tools, emphasize the illusory character of the representation, which takes on dimensions, forms, and purposes unique to contemporary. With its ability to direct and capture the observer's gaze, in these artworks perspective becomes an open and accessible language through which the artist communicates not only with experts and art enthusiasts, but also with everyday urban viewers, engaging them in a perceptual game that cannot go unnoticed. In conclusion, JR's artistic practice demonstrates how perspective, through the techniques of *trompe l'œil* and anamorphosis, is reinterpreted within the context of urban art, generating visual and illusionistic experiences that, in their temporal brevity, inscribe new layers of meaning onto the discourse of the city [Barthes 1967].

dering of the Cour Napoléon and constructing a 3D model, necessary to determine the printing parameters for each square meter of the ground intervention. ("https://www.superbien.studio/projects/jr-the-secret-of-the-great-pyramid, last access 20.06.2025).

[3] For an in-depth of JR's 'Trompe l'œil' artworks see: <https://www.jr-art.net/project-list/trompes-loeil> (accessed 12 February 2025).

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The Drawing of Objects with a High Aesthetic Function. Bruno Munari's Travel Sculptures, a Restless Lexicon

Valentina Castagnolo, Anna Christiana Maiorano

Abstract

The present contribution describes the research work to catalogue and study that system of objects, multiples and mass-produced, to which Munari gave the name Travel Sculptures, which he created from 1958 onwards in a constant and tireless search for a balance between form and meaning, between utility and aesthetic function, between art and design. In the taxonomic reading of the master's production and above all through the decoding operations performed by the drawing, the sculptures appear to be objects that revolutionise the way of looking at things: based on the 'co-presence of variants', what is observed is not a single subjective and definitive image, but a multitude of images in continuous variation; not a single form but a series of forms in movement. Through the operations of interpretation of the approximately 40 sculptures, traced through research in the multi-source literature, which shows their strong critical historical impact, they have been redesigned and decoded through an actual survey carried out on the images collected and catalogued according to chronological criteria, referring to material, size, etc. As will be seen, the design of the artefacts is crossed by the multiple dynamics of observation and use, by the relationship with space, by the action of opening and closing, by the discontinuity of the material, by light and shadows, by movement and stillness, restoring a particular language that is never monotonous, at times ambiguous and discordant, variegated, that in the graphic sign seeks its state of stillness.

Keywords: travel sculpture, survey, drawing, design, Munari

Introduction

In order to investigate the relationship, not always linear and evident, that is established between the Munari object, the design of its form and the communication of meaning, the approach to the themes of drawing as language, passes through the study of certain documents and events that, in addition to framing the master's production in the cultural context in which he worked, contain reflections on the genealogy of his ideas and all those components that made their explication possible.

Approaching the rich repertoire of artefacts that Bruno Munari created after his futurist experience meant entering a constantly expanding universe, populated

by dense objects and 'restless works', as Umberto Eco defines them in his essay presenting the exhibition *Arte programmata. Kinetic art, multiplied works, open work*, promoted by Munari and Giorgio Soavi and inaugurated on 15 May 1962 at the Olivetti shop in the Galleria Vittorio Emanuele in Milan.

Eco's essay, entitled *La forma dell'ordine*, is an important passage to compose some characters of Munari's figure and trace the principles that supported his research expressed through the production of a multitude of objects 'in balance' between utility and aesthetic function, between art and design, between form and meaning.

Fig. 1. *Travel sculptures*, 1958. The photograph is accompanied by the text of Munari's presentation of the exhibition. The image is taken from <<https://corraini.com/it/codice-ovvio.html>> (accessed 12 June 2025).



Le sculture da viaggio sono oggetti a funzione estetica. Nella valigia normalmente mettiamo oggetti a funzione pratica, ci preoccupiamo di avere il necessario per la pulizia personale e gli indumenti di ricambio, mettiamo il sapone personale, il rasoio, camicie e mutande; mettiamo anche oggetti di collegamento col nostro mondo affettivo: le foto delle persone care. Qualcuno cura anche l'estetica degli indumenti, li sceglie secondo accordi di colore: questa cravatta o questa maglia con questi calzonni. Ben pochi si preoccupano di mettere nella valigia qualcosa che mantenga il collegamento col proprio mondo culturale. Si sa, molti non hanno un mondo culturale, ad altri dà addirittura fastidio, qualcuno crede che sia un altro pianeta.

Le camere d'albergo hanno un aspetto piuttosto anonimo, non si può pretendere, d'altra parte, che abbiano un qualche sia pur minimo riferimento con una certa estetica. Possiamo dire che devono essere anonime proprio perché devono ospitare gente di ogni tipo. In queste camere non si sa veramente dove posare gli occhi nel momento in cui stiamo per spegnere la luce. Io guardo la finestra, Giovanni guarda San Giovanni, Maria guarda l'interruttore perché di solito prende in mano il pomolo della sedia per spegnere la luce.

Se ci fosse un oggetto, leggero e poco ingombrante, un oggetto da portare con sé, che avesse una funzione puramente estetica (visto che per le funzioni pratiche ci siamo già occupati), potrebbe fare da collegamento col nostro mondo estetico culturale moderno. Come a casa nostra.

S'intende che si parla qui di estetica dei nostri tempi, poiché pensiamo a un viaggiatore moderno che non va in diligenza ma in jet. Un viaggiatore giovane di fuori e anche di dentro. Un tipo che appartiene a una cultura internazionale, non un analfabeta culturale. E siccome una persona non è completa se non cura tutte le parti di se stessa, non solo l'apparenza ma anche la sostanza, ecco che nasce da un certo punto, quasi chiamato dalle esigenze vitali più complesse, la «scultura da viaggio».

Codice ovvio

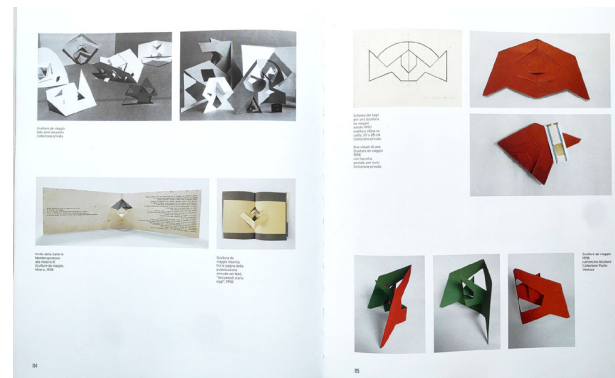
The essay was published in the 1962 *Almanacco Letterario Bompiani* [Eco 1961], which came out in November 1961 and was dedicated to "Applicazioni dei calcolatori elettronici alle scienze morali e alla letteratura". The volume, whose graphic design was conceived and edited by Munari himself, can be considered the first reflection dedicated to the aesthetic and artistic possibilities of the computer's organization of culture. The essays and illustrations in the volume attempt to develop a comprehensive discourse on the aesthetic and intellectual changes brought about by the advent of computers, addressing the ways in which they could transform developments in creativity. In his essay, Eco introduces the formula 'programmed art' and establishes terms and canons of this neo-avant-garde [Bartorelli 2017, p. 11]: a multiplicity of viewpoints and a diverse range of perceptual experiences, generated by a predetermined principle or operation.

The exhibition project has as its catalyst the complex figure of Bruno Munari and sees the involvement of personalities grouped in collectives [1], who were to become protagonists of Italian and international culture in the following decades. The exhibition makes it possible to trace an important moment in the relationship between art, culture and industry in 1960s Italy, as well as representing an exemplary case study of the virtuous union between artistic avant-garde and industrial research. The works on show are radically new experimental objects that, in their kinetic impulse and the materials chosen, embrace experimentation and go beyond established boundaries: they are no longer painting or sculpture, available for the enjoyment of all. They are 'hybrid' objects, born at the intersection of different disciplines, with an essentially aesthetic function, as Munari himself defines them, that revolutionise the way of looking at things. Like the 'cybernetic perturbation' that envelops the spectator and forces him to interact, to move, to change references and points of view. In this visual quest, Munari, like many figures alongside him, adopts a technical or conventional graphic language with a certain reluctance. Rather, the graphic sign decodes the gesture that sets the work in motion and the artistic experience that functions through the transmission of information that is as exact as possible [Munari 2009, p. 72], even if never unambiguous.

In the Munari landscape, one no longer finds the reassuring coordinates indicating above and below, left and right, orienting the observer; no longer one message, but the possibility of many co-present messages. This is what

Fig. 2. Photographs and drawings of travel sculptures [Meneguzzo, Roffi 2024, pp. 114-115].

Fig. 3. Photographs of travel sculptures [Meneguzzo, Roffi 2024, pp. 116-117].



happens when one enters this “finite and unlimited curved space. And now try to avert your gaze, to rest it on a single detail. You will no longer succeed. The observer of the Renaissance perspective was a good cyclops who rested his one eye on the slit of a magic box in which he saw the world from the only possible point of view. Munari’s man is forced to have a thousand eyes, on his nose, on the nape of his neck, on his shoulders, on his fingers, on his bottom. And he revolts restlessly in a world that storms him with stimuli that assail him from all sides. Through the programmatic wisdom of the exact sciences he discovers himself a restless inhabitant of an expanding universe. I am not saying it is a good story. It is history” [Eco 1961, pp. 186, 187].

Travel sculptures, instructions for use

It is complex to isolate the history of travel sculptures and to trace a genealogy of Munari’s ideas referring exclusively to these artefacts. This is emphasised by Dellapiana in the essay in the exhibition catalogue *Bruno Munari tutto* [Meneguzzo, Roffi 2024], in which he provides some insights into the master’s production through key words, or rather key objects, including travel sculptures, as a physical trace to unveil the paths Munari travelled. But “there are so many paths, each seemingly linear in its results, but the picture is almost impossible to compose, time is short, positioning in a complicated context: one would have to talk about all kinds of sophisticated experimentation, from painting to sculpture, music, literature, obviously graphics and design, and then psychology, cybernetics” [Dellapiana 2024, pp. 44, 45]. As well as his ‘fellow travellers... too many. Futurists, kinetics, concretists, Colombo, Eco, Soavi, Berio, Mari, Cage, Tinguely... how to reconcile this pinwheel of crowned heads from the best of the intellectual class with the repeated recommendations for simplicity?’ [Dellapiana 2024, pp. 44, 45]. For Munari, simplicity is realised by recalling the Cartesian method, but with continual reminders of a hermeneutic approach, through which his paths can be seen not as simple, nor linear, but rather as the outcome of contaminations, in some cases even counter-intuitive, but on the basis of simple design gestures.

Sampling, contouring, folding, splicing, these are the gestures that substantiate Munari’s work (the project) as the result of a unified thought, through which sculptures are reinterpreted by thinking of them as a system of objects and opportunities offered to experiment with simplicity.

The first travel sculptures were created in the early 1950s as foldable, transportable sculptures, made of cardboard and, as Munari says, given as gifts or sent as greeting cards. The presentation that Munari sketches on the occasion of the exhibition of his travel sculptures in 1958 is a narrative between art and poetry implemented through a discursive strategy that prepares the observer to accept the works as ‘urgent’ objects (fig. 1). Even from the choice of name, the ironic but never bitter acceptance of the transience of things is manifested, where the artefact becomes the symbol of the demythologisation of art. The materiality closely linked to the idea and image of a sculpture, the plasticity of form, the topological issues, the occupation of space, come into conflict, in a lively confrontation, with the lightness and provisionality of these objects. But it is precisely in the renunciation of the utilitarian dimension that the indispensable condition for the unfolding of the aesthetic fact arises.

“These travel sculptures have the function of creating in an anonymous hotel room or in an environment where one is hosted a reference point where the eye finds a link with the world of one’s own culture” [2]. In *Codice ovvio* edited by Fossati and reissued by Corraini in 2017, Munari’s texts are quoted which, on several occasions, appear to be real instructions for use, not mere descriptions in order to mediate the meaning or visual content of the object. “Travel sculptures are objects with an aesthetic function. In the suitcase we normally put objects with a practical function, we take care to have the necessities for personal cleanliness and spare clothing. [...] Very few bother to put something in the suitcase that maintains the connection with their cultural world. [...] If there was an object, light and unobtrusive, an object to carry with you, that had a purely aesthetic function, it could act as a link to our modern cultural aesthetic world. Like at home. It is understood that we speak here of the aesthetics of our times, as we think of a modern traveller who does not go by stagecoach but by jet. A guy who belongs to an international culture and not a cultural illiterate. And since a person is not complete if he does not take care of all parts of himself, not only the appearance but also the substance, here is where the travel sculpture was born from a certain point, almost called by the most complex vital needs” [Munari 2017, pp. 60, 61]. His instructions for use are true stories, short, light and, still, simple, capable of creating a special atmosphere, an emotional-perceptive state in which the sculptures appear as the only possible objects capable of satisfying the most

Fig. 4. Basic format of the cataloguing sheet containing the drawings of the sculpture n. 4: diagram of development on the plane, folded, orthogonal projections, axonometric view (drawing by the authors).

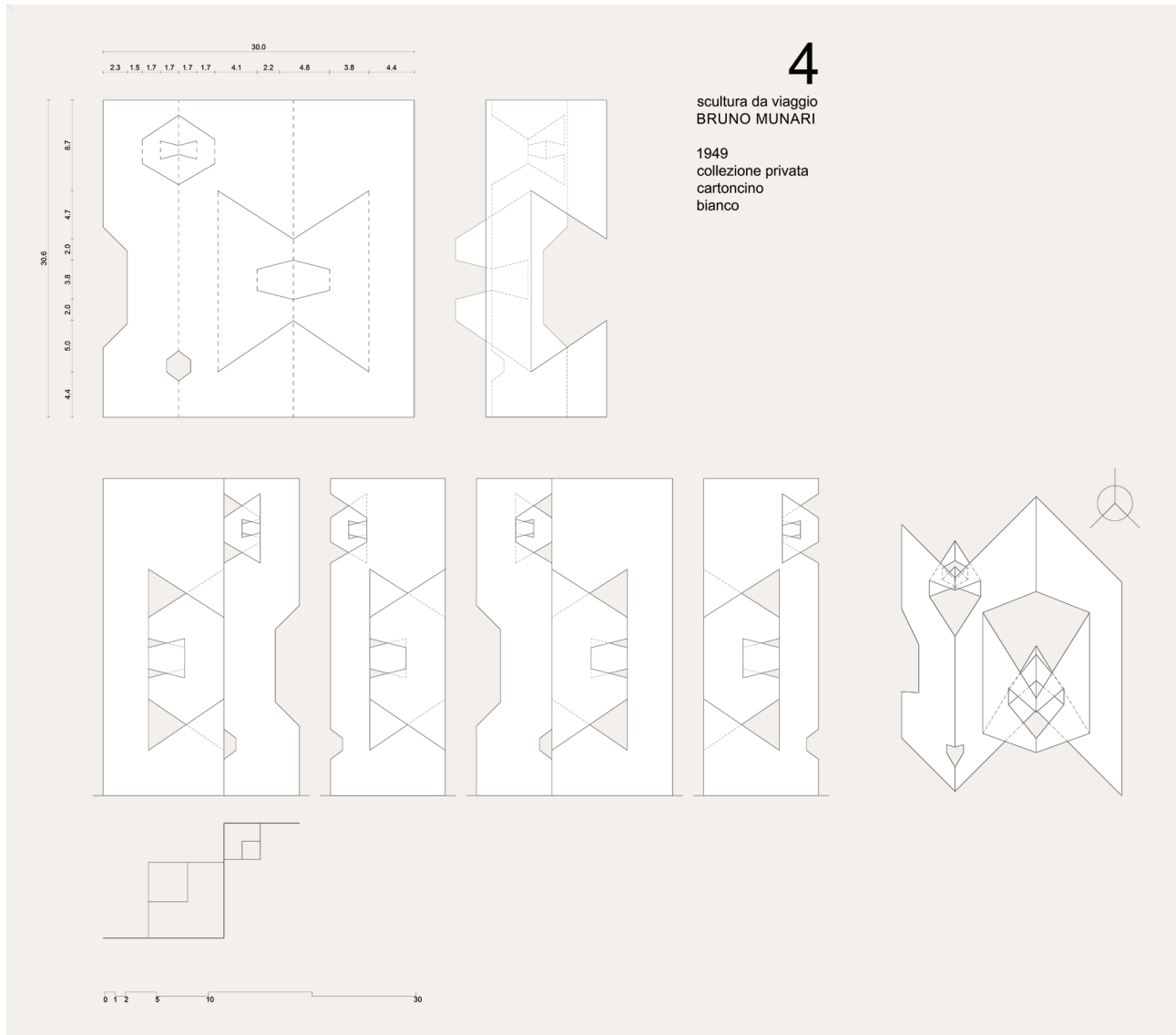
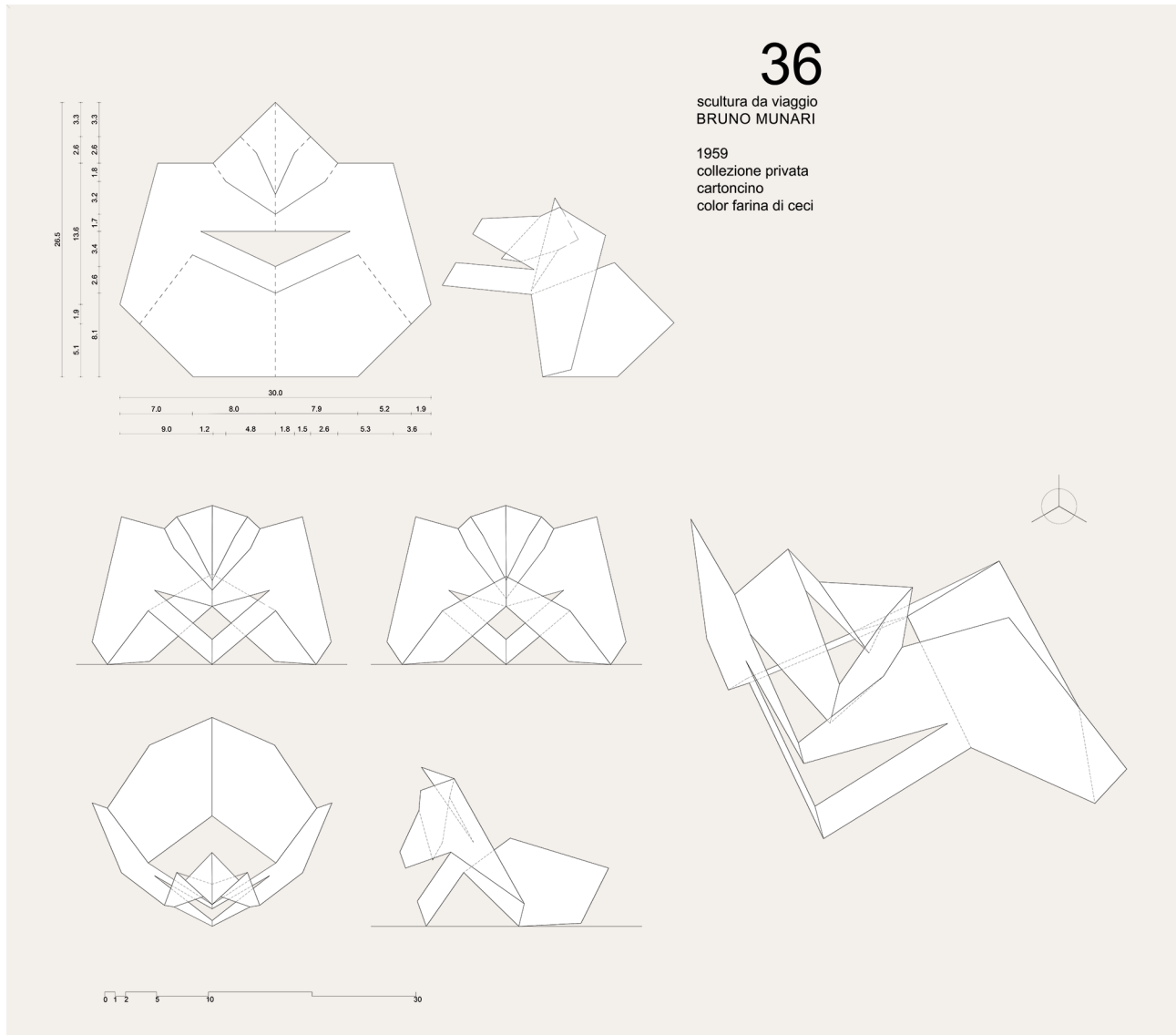
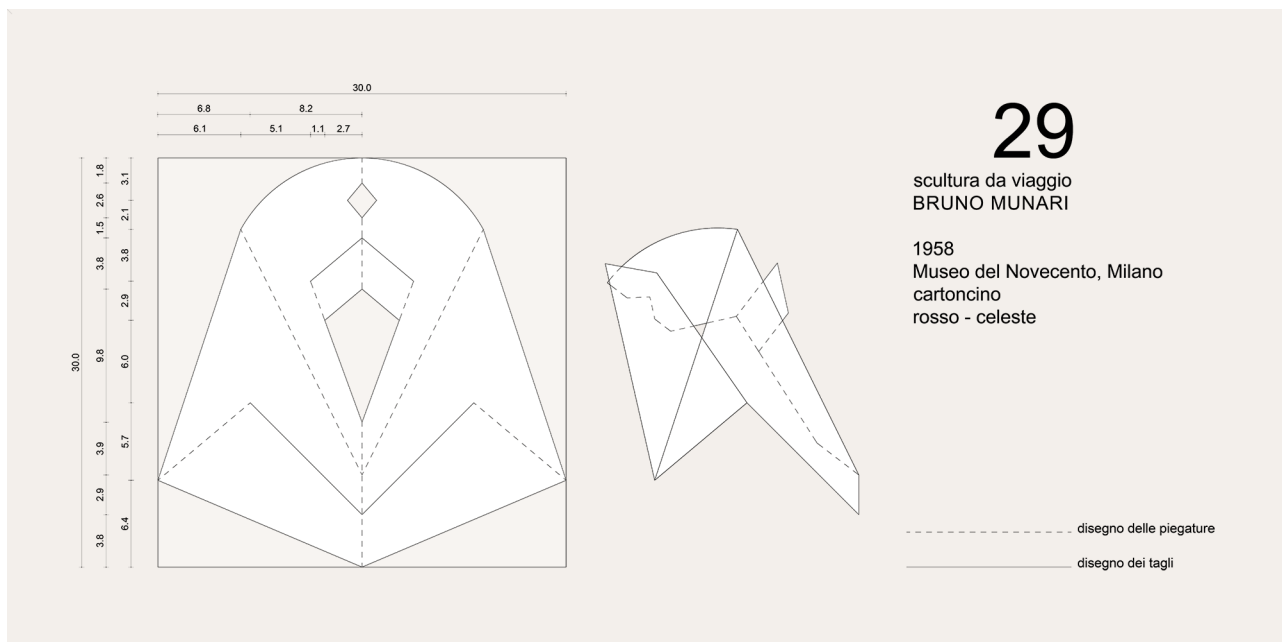


Fig. 5. Basic format of the cataloguing sheet containing the drawings of the sculpture n. 36: development diagram on the plane, folded, orthogonal projections, axonometric view (drawing by the authors).





29

scultura da viaggio
BRUNO MUNARI1958
Museo del Novecento, Milano
cartoncino
rosso - celeste----- disegno delle piegature
———— disegno dei tagli

Fig. 6. Graphic nomenclature and detail of the development drawing on the plane of the sculpture n. 29 (drawing by the authors).

intimate needs of the user, whom Munari skilfully guides through his gestures.

“The sculpture is presented folded in an envelope. You open the envelope and take out the sculpture. To open the sculpture, you simply take the left side with your left hand and the right side with your right hand (the left side is usually on the left and the right is on the right, otherwise you mean that you are holding the sculpture upside down, i.e. the right is on the left and the left is on the other side. If you take the right side with your left hand and the left with your right hand, you will be embarrassed to open the object although this is not that complicated). Sit down and don't worry. Open the window. Turn on the light as evening has now come. By chance your eye falls on the illustration that is together with the sculpture. Suddenly everything is clear: Place the sculpture on a horizontal plane (on inclined planes it slides) and before you switch off the light, observe how it illuminates the various projecting or recessed parts, the solid and the hollow parts, turn it a little by lightly

pushing the right side with the middle finger of your left hand, there, that's better. Turn it the other way, it changes its appearance, your thoughts from practical will slowly become aesthetic (the speed depends on you), you will no longer wonder 'cusa l'è chel rob ki' and you will fall asleep happily. Good night” [Munari 2017, pp. 60-65].

Workflow

The process of gathering the material from which to formulate project hypotheses for the cataloguing of the works brought to light certain difficulties linked not so much to the retrieval of resources, information and data, nor of the sources, which were in fact numerous and rich. They were confronted with a real need: to redesign and reproduce them. Of the sculptures, the iconographic material consists mainly of photographs; the photograph, i.e. a perspective view, is the only visual format on which to

make design hypotheses. Munari's drawings for the rarely present sculptures are essential representations, drawn in pen and pencil on paper where the grid that quantifies and measures proportions, alignments and configuration possibilities shines through. They are construction diagrams in which the remarkable points of the figure that regulate the movement of and between the parts are highlighted (fig. 2). They are drawings that contain directions to do something and, like all the devices Munari designs, to learn how to do something, while using, studying, observing, contemplating.

And as one investigates the rules of construction, one notices the work ethic of the master; the absolute lack of waste of material as well as energy, everything is of disarming simplicity.

Therefore, one of the objectives of the research was to construct the graphic apparatus, visual codes and language to decode the structure of the individual works. A space where they can be placed side by side, compared, matched, without this proximity altering the uniqueness and meanings of each one, but rather favouring the reading. A work recalculated and adapted case by case so as not to break that delicate balance between presence and absence that is generated when drawing [3] [Purini 2007, pp. 34, 35]. A space where the different methods of representation through which this precious heritage can be read can be compared.

With the aim of reconstructing the travel sculptures and interpreting the repertoire of forms and languages of Munari's work, the first operation was to detect

Fig. 7. Narrative-descriptive space of the archive of Munari's travel sculptures. Extract of the graphic table comparing the different methods of representation (drawing by the authors).

Fig. 8. A possible taxonomy of language from the top views of travel sculptures (drawing by the authors).

Sviluppo sul piano ripiegata										
Proiezioni ortogonali										
Vista frontale / laterale										
Vista dall'alto										
Vista assometrica										
	1	2	3	4	5	6	7	8	9	10

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

proportions, measurements, possible configurations from the available photographic images and documents. An initial analysis and cataloguing phase made it possible to define a nomenclature referring to the individual artefacts and the operations connected to spatial configuration, construction, as well as to hypothesise the geometric forms of the composition on the plane. The survey from the image, a kind of visual redrawing of the object, is connected to the interpretative study of the method Munari applies to conceive and construct sculptures. The survey of the artefact and the drawing are developed in the light of the study of the process of conception, design and construction of the artefacts starting precisely from Munari's intentions, apparently spontaneous and improvised, but rather planned in every aspect.

By internalising the questions of method [4] [Munari 2009, p. 359], the design sequences, the instructions that Munari himself establishes in the verification drawing of the artefact (fig. 3), he favoured that complex of technical-practical activities and critical interpretation of the survey of (and from) the images. A system of interpretative graphic representations is thus generated, sketches that, like elementary writings (level I eidotypes), outline the spatial arrangement of the sculptures in different ways.

What emerges is the geography of the cuts and curves, the projections and recesses, the relative directions and proportions, the angles between the surfaces and with the support plane and the hierarchy of the structure in general. The direct comparison with some models of travel

sculptures in Carter's pop-up book [Carter 2019] guided the first operations of restitution of the basic format from which Munari presumably started to construct the artefacts. Access to this material was a preliminary phase of fundamental importance. There are approximately ten models reconstructed in the book, each belonging to different moments of Munari's production and reconstructed by Carter on a reduced scale. The measurements and surveys, both of the development on the plane and in space, were possible thanks to the reading device of the Carter volume cited, published not by chance by Corraini. The book, which has educational purposes, in addition to celebrating the art of the master, allows to establish the nomenclature that supports the construction of cardboard models. On the basis of these models, the apparatus of graphic instructions, two-dimensional and three-dimensional, for the creation of the individual sculptures is defined. At this point the workflow develops through a second phase of survey of the constructed artifact that 'fixes' its spatial configuration and allows a graphic restitution of the data that reaches the codified system of the drawing.

This drawing has a prescriptive character [Anceschi 1992, p. 70] and questions, through traditional representation devices, how many and which images to produce. Drawing, as a practice that fulfills the role of decoding and restitution of forms, measurements and meanings, finds itself, especially in this cultural context, obliged to respect, in the graphic language adopted for this purpose, the principles that generated the work; in particular to illustrate its variability, its complexity, adopting a language capable of expressing the movement and the tension towards a new possible configuration.

In the interaction between sculpture, space and the user, the aesthetic function of the artifact itself is determined: observing, moving around, lifting, opening and closing, folding, transporting, placing, playing, illuminating, framing etc. When the observation point or ways of using it change, the work is transfigured, while always remaining the same, in a continuous and reciprocal exchange of information, solicitations and stimuli. In constructing the iconographic apparatus of the travel sculptures, the objective of the research, it was therefore necessary to change the research paradigm, accommodate the movements, the variations, recalculate the observation distance from the object, vary the spatial coordinates of the point of view of the representation and finally generate a visualisation space for the artifacts. This system of objects was

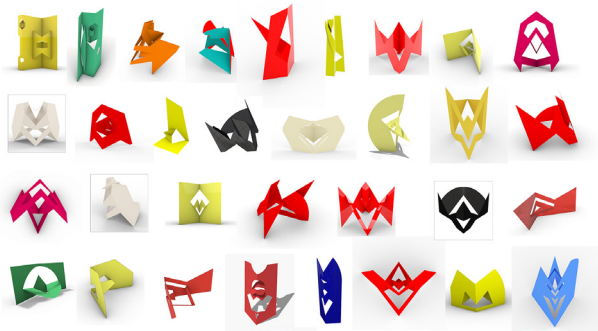


Fig. 9. A (incomplete) taxonomy that compares the coexistence of variations in the design and composition actions of travel sculptures (drawing by authors).

subsequently transferred to a virtual space [Maldonado 2007, p. 78] built ad hoc (a kind of database) which, starting from the single card, is divided into different categories of analysis, interpretation and representation. The taxonomic organization of sculpture materials follows the different interests and aims of research moving from one format to another, from one model to another, from one point of view to an infinite place.

The visualization in taxonomies, as well as being a necessity for study, represents a challenge, that is the possibility of submitting these objects, which Munari wants free to move in space, to be communicated in a static mode and through the graphic sign. With the risk of disrupting the system of meanings and languages, the risk of altering the balance between one sculpture and another in subtle differences and the measure of complexity.

Layout and taxonomy of graphic production

The cataloging of the works and the true reading of the morphological and morphometric data are organized on the basis of the file format defined by the free schema structure of the archive that collects and systematizes the materials on the sculptures. The basic format of the sheet contains, in addition to information on the dating of the work, its placement in collections, material, reference bibliography, photographic images and (possible) written notes of the author, the development drawing on the plane with indications of cuts and folds (figs. 4, 5). This is a drawing that defines the layout of the project, i.e. the main device that displays and in order the instructions for the work of building the artifact. The cutting and bending operations are defined by a coded graphic language that, through the sign, declares its function within the project. In the card, the design of the artifact in its development on the plane, in order to interpret the author's intentions regarding the possibilities of use of the sculpture, that is to be closed on itself, is flanked by another design that sees the sculpture folded (fig. 6).

To draw the sculpture of travel in its spatial configuration defined by the operations of survey, it was necessary to rethink a visual format suitable for showing the complexity of the work and those values and meanings that interpret the intentionality of Munari's project. A space –narrative-descriptive– of the project capable of incorporating the variability of form and ways of use, as well as the lightness,

Fig. 10. Basic format of the cataloguing sheet containing the three-dimensional model built in cad environment of the sculpture n. 36 (drawing of the authors).

Fig. 11. Basic format of the cataloguing sheet containing the three-dimensional model built in cad environment of the sculpture n. 4 (drawing of the authors).

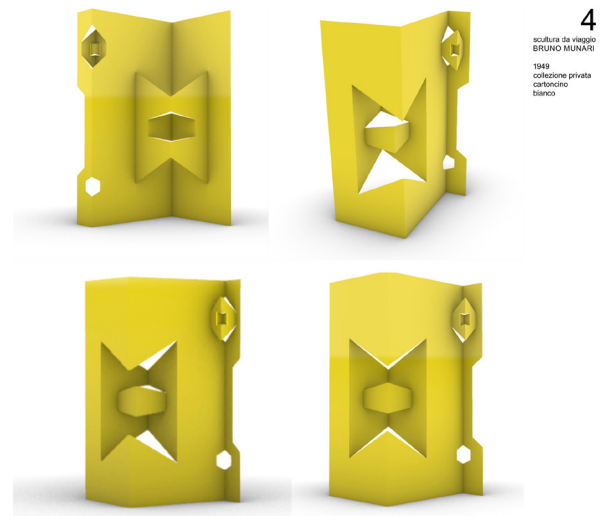
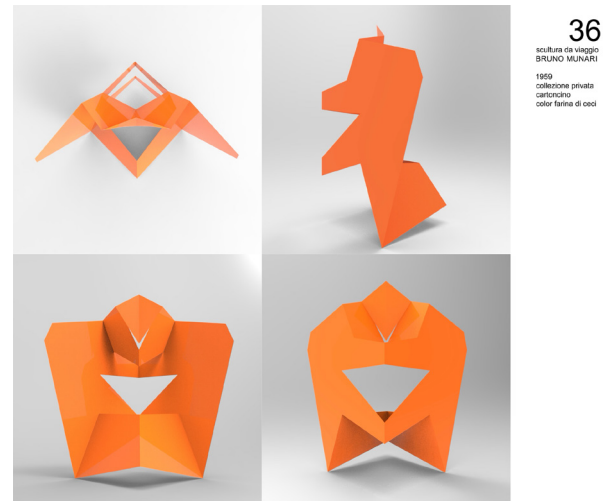


Fig. 12. Photograph of the models/prototypes in coloured cardboard according to the original indications (photo by the authors).



continuity and integrity of the development surface, the instability and fragility of the material.

And if the drawings in orthogonal projection (fig. 7) can appear as a result of a very precise (visual) choice which blocks the sculpture in a given spatial configuration, they really offer a starting point for a more complex, deeper analysis. From these (conventional) drawings, the path is traced for subsequent drawings, for more advanced representations (from orthogonal projections to isometric axonometry and perspective) and for constructing transverse images, visual compositions that can compare the individual artifacts with each other in different projective modes, in a landscape of forms, figures, minimal signs that graphically translate the direct experience of the system of objects (fig. 8).

The process of constructing the three-dimensional digital model of the sculptures represented a very important phase of study because, besides enriching the iconographic apparatus with an instrument of knowledge and production of images, it also addressed a question of method. The realization of the three-dimensional model starts from the placement, in a cad environment, of the geometrical entities engaged by Munari: mainly surfaces, and then lines and points. The 3D model is developed by reproducing the significant design actions, from the cutout on the surfaces to the folds, varying parameters and values to entities, in order to facilitate the possibility of assuming different configurations, even slightly.

And this is how the drawing of the same object expands into multiple drawings through minute differences: angles, distances, decentralizations, combinations in accordance with the rules of topology and Euclidean geometry in order to rediscover the expressive possibilities of continuous movement (figs. 9-11).

Conclusions

Munari's research on travel sculptures, which is not considered to be concluded at all, is part of a broader project of knowledge considering the circularity of the discipline of drawing that questions the communicative dynamics of a coded language. The study of the system of defined objects with an aesthetic function and the problem of representation opens up new models. Parallel to the cataloging of Munari's sculptures, an experiment was started on another set of objects, profoundly different and born in

a different historical-cultural context, the Morphemes by Michele Reginaldi. This group of more than 100 works was also submitted to the morphological interpretation, often the result of a spontaneous gesture, through the relief from the image and the construction of the graphic apparatus.

Credits

Introduction was written by A.C. Maiorano; *Travel sculptures, instructions for use* was written by V. Castagnolo; *Workflow* was written by A.C. Maiorano;

On the project model for cataloguing travel sculptures, an alternative visual format has been developed for these new objects, which nevertheless offers a taxonomic reading of the system and allows to visualize the expressive possibilities of the graphic language adopted.

Layout and taxonomy of graphic production was written by A.C. Maiorano; *Conclusions* was written by V. Castagnolo and A.C. Maiorano.

Notes

[1] As Group N explains in a letter to Munari of 12 January 1962: "We consider the title 'programmed art' the most appropriate to define our experiments. For most of our works it will be necessary to specify that the programmer of the work is the same viewer who chooses a vision rather than another or determines indeterminate variations by capturing the object in the movement of his view». Group T also understood its work in a similar way, emphasizing the freedom of interaction and interpretation that these works give to the viewer; «the interaction between two dynamic processes, that of the work and that of the perception of the spectator, could increase the communicative potential of visual art; and in a way more consistent with the concept of a reality that is not fixed and immutable, but in continuous mutation" [Meloni, 2006, p. 23]. (Alicata, M. (2022). Olivetti ispira i giovani. Le ragioni della mostra Arte Programmata. Arte cinetica, opere moltiplicate, opera aperta, Milano 1962. Piano B. *Arti E Culture Visive*, 7(2), 1-21. <<https://doi.org/10.6092/issn.2531-9876/16340>> (accessed 9 May 2025).

[2] Bruno Munari, text for the invitation to the exhibition *Travel Sculptures* at the Galleria Montenapoleone, Milano 17-30 giugno 1958.

[3] The absolute priority of the thought-form of design, however, does not seem to consist so much in the possibility that it offers of anticipating the outcome of a constructive undertaking, as much in its being a propitiatory and dedicatory event centered on the ambiguity of the image. The simulacrum of a future building is, in fact, both an absence and a presence. is an absence because it testifies to the remoteness and diversity of the real object of which it is a virtual projection; it is a presence because it itself is a real object that refers back to itself [Purini 2008, p. 34].

[4] see chapter under title *Un metodo di progettazione* present in the volume *Design e comunicazione visiva* in which Munari, through a graphic schematization from the enunciation of the problem to the prototype, addresses the delicate process of design of the designer.

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Micro Relation Decodes: Movement, Boundaries and Materiality in Drawing

Şebnem Çakaloğlu

Abstract

This research explores how drawing and tracing have evolved into critical tools in scientific and political discourse. Tracing, once seen as mere reproduction, now involves transferring conditions, engaging with past events, and addressing urgent issues –particularly within forensic aesthetics. The study questions the epistemological status of traces, framing them as ontologically significant in both artistic and technical production. Drawing is approached as a performative act that reveals unsensed or unconscious micro-events. It extends beyond the body.

The research aims to conceptualize how tracing and drawing converge through the re-visualization of invisible. The political agency of drawing and its dialogical potential between abstraction and grounded realities. Simultaneously, it considers the aesthetic and technical dimensions of drawing as a dynamic, non-standard process. Tracing is redefined as performative –through choreography, erasure and evolving imagery– opening new paths for engaging space, perception and meaning.

Keywords: tracing, micro relation, topography, drawing, performance

Introduction

According to the dictionary, drawing is the art or technique of producing images on a surface, usually paper, by making marks, typically with ink, graphite, chalk, charcoal, or crayon. Drawing involves tracing something [Hutter 2025]. However, as Jacques Derrida discusses in his groundbreaking project, drawing is not only about the physical, sensed world; it also involves a transformative process between the eye and the hand [Derrida 1990]. This transformation represents traces of the mind, which harbor various forms of becoming. Today, drawing extends beyond the body's territory, expanding its scope through scientific roles and contributing to political discourse. Tracing, in this context, changes the way we understand it. It is not merely about copying; it involves transferring something from one state or condition to another. The function of traces provides solutions to critical problems and addresses the questions

raised within epistemological frameworks, particularly those concerning forensic aesthetics. Traces in drawing are not only expanded to include memory but also serve as mechanisms for reflecting and addressing past events. When rereading a drawing, the basic act of tracing extends beyond its initial function, acquiring new layers of meaning. Drawing appears to oscillate between objectivity and instrumentality [Milani, Schoonderbeek 2010]. Tracing ephemeral lines allows us to perceive natural processes, giving material form to what was once immaterial [Bacon 2024]. This mode of understanding introduces a figural approach to drawing, one that enables a deeper engagement with the physical world and aids in navigating the complexities of imagery and interpretation. In this context, tracing becomes akin to a forensic method –functionalizing marks and reproducing them within the

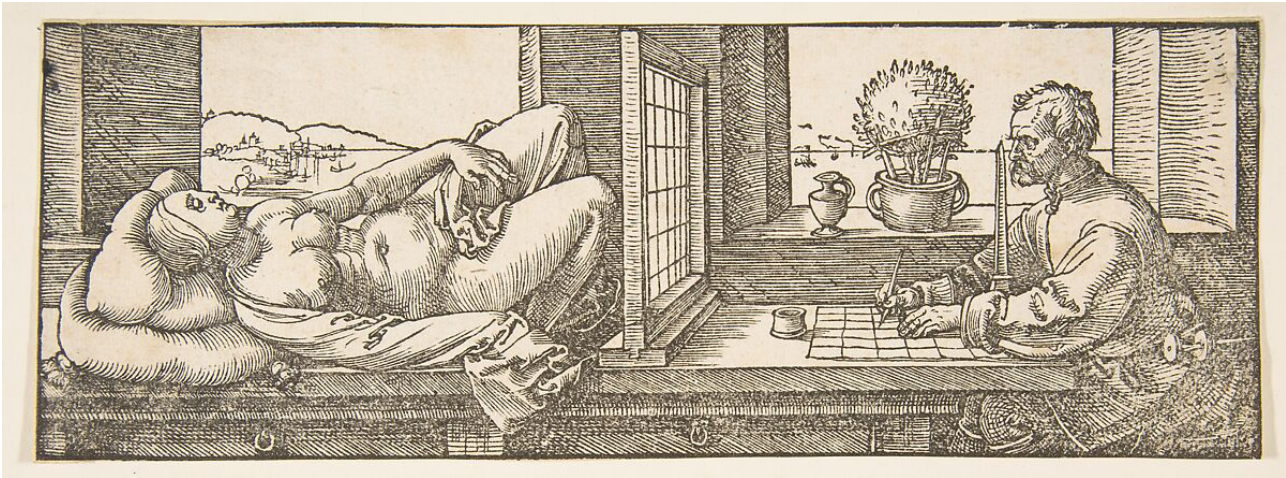


Fig. 1. Albert Durer, *Draftsman drawing a reclining nude*, c. 1527, woodcut. <<https://www.metmuseum.org/art/collection/search/366555>> (accessed 26 June 2025).

drawing environment as clues to past events, allowing for the investigation of hidden realities. Tracing, then, emerges as a tactical means of approaching truth.

Drawing serves not just as a medium for art but as a tool in various fields –data visualization, immersive technologies, mapping, scientific charts and more. Drawing can take place on a vast array of surfaces: paper, walls, sand, skin, screens and even in the sky or on water. It occurs in diverse settings, from artist studios to laboratories, archaeological sites and even in the streets and homes [Taylor 2020]. The extreme functioning of drawing amplifies the complexity of the image and the perception of it as a politics of everyday life. This evolving understanding of drawing is becoming not just a representation but an active participant in shaping concepts and benchmarks in both art and society.

Throughout the twentieth century, the core principles of drawing –essentially the trace of an action on a surface– have been tested, expanded and deconstructed, as artists explored new forms of drawing through performance, land art and soundscapes. Dexter identifies today, drawing takes on various forms, such as lines in sand, footprints in snow, or vapor trails in the sky [Dexter 2005]. Drawing serves as a means of perception, making the invisible visible by capturing anthropogenic traces and recording

micro-scale surface changes. It reveals unique continuities, linking seemingly independent transformations. Considering this, tracing/drawing not only runs parallel to traditional practices but also expands the ecological dimension of drawing, redefining the relationship between anthropogenic objects and subjects while broadening the graphic and abstract concept of drawing.

Viewing drawing through the act of tracing is not merely a material process; it also holds the potential to perform chaotic instances and reunite fragmented clues into newly investigated realities. By focusing on micro-relational aspects, this research highlights the continuity of traces, engaging both material and abstract dimensions within the experimental space of installation. This conceptual shift also redefines how tools are selected and used –allowing materials and their symbolic meanings to construct their own mythologies. Through this, the image is completed not solely through technique but through the perceptual rhythm between eye and mind, situated within a spatial framework. Conceptualizes drawing through tracing by making the invisible spatially perceptible and performative. It reconsiders drawing as a medium that captures moments of compression –intense, layered instants– thereby revisiting its role beyond representation. The study explores how tools and equipment become entangled in the production

of alternative realities, where drawing is no longer confined to figures on paper but emerges as a practice, a performance and an installation. It highlights drawing's ability to challenge controlled imagery and authoritative narratives. As a research method, the first part brings together drawing and trace through their shared proximity in reading, positioning them as witnesses to what is narrated. To enable this witnessing, the research constructs a stage that establishes the superstructural correspondences of the underlying meanings emerging from what is narrated. This stage, in turn, becomes a site of witnessing through the unfolding of the topic being discussed. In this context, the stage becomes a setting where, consequently, the ontology of the unique relationship that defines modern drawing practices is revisited and witnessing as a methodology introduces a new dialogic approach to the act of drawing itself.

This paper oscillates between literary interpretation and the act of practice, drawing from multiple perspectives conceptualized within the domains of drawing and tracing. The research initially expands the field of drawing by exploring its integrated relationship with the notion of trace. In the second part, it seeks to establish this perspective as both a methodological and instrumental framework, positioning witnessing as a central theoretical approach. The first section engages with the depth of the relationship between drawing practices and tracing, framing it as a form of witnessing. The second section addresses drawing's technical expansion as a site of compulsory witnessing, proposing a transformation in the conventional understanding of drawing materials and processes. These transformations reconfigure the conception of drawing through spatial and practical outcomes, offering a renewed dialogue between materiality, representation, and practice.

Conceptualizing drawing

Drawing is not primarily about space; rather, it is about capturing the fleeting nature of time. In Durer's drawing table construction, the grid is positioned perpendicularly to the ground, acting as a filter that captures surrounding movement (fig. 1). This serves as a mechanical system that preserves the traces of 'time' on the surface of the paper. Drawing equipment creates a unique experience of time. Grid is flattening the distance between viewer and viewing. The references and depth between things as defining time in physics is transferred on the grid.

Libeskind's drawing practice creates a constructive grammar by incorporating architectural mechanization, which leads to the formation of a unique language specific to his style (fig. 2). His approach views drawing not only as a way of exploring future possibilities but also as a way to recover and challenge a particular history. For him, a drawing is far more than just lines or the shadow of an object—it disrupts conventional ideas and moves beyond mere representation. "As much a prospective unfolding of future possibilities as it is a recovery of a particular history to whose intentions it testifies and whose limits it always challenges. In any case, a drawing is more than the shadow of an object, more than a pile of lines, more than a resignation to the inertia of convention" [Libeskind 2001, p. 84].

Whether deliberate or unintentional, every crack and scratch that materials exhibit as we interact with objects tells a story [Robbins et al. 2015]. In the 2010 online exhibition, drawing emerged as a space where performances—embodying physical actions reflective of elegant material tensions—were both frozen and transformed into new impressions. Notably, Lucio Fontana's *Spatial Concept* series, developed through environmental traces, demonstrated how a line can act as a trace of trauma and more (fig. 3) [Whitfield, Fontana, Gallery 1999]. This exhibition opens up numerous pathways for rethinking drawing, presenting it as a domain with its own ecology—a physical entity imbued with atmosphere and logic, where all these interrelated elements come together in a harmonious whole.

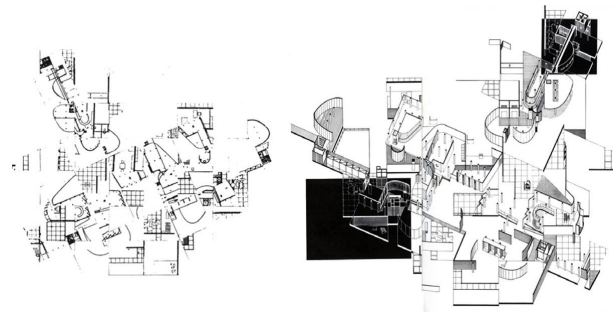


Fig. 2. Daniel Libeskind, *Collage Rebus 3*, 1967, paper. Fracturing and displacement of forms [Lucarelli 2015].

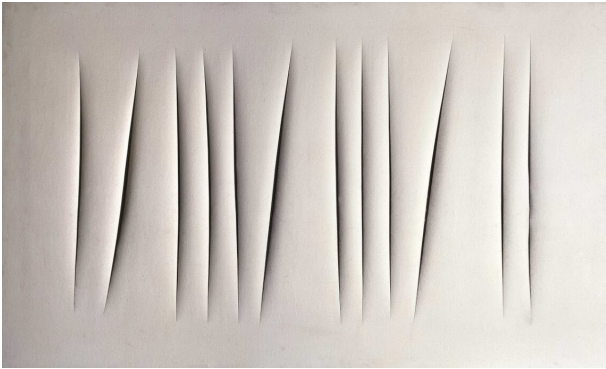


Fig. 3. Lucio Fontana, *Spatial Concept, Waiting A Dive into the infinite*, 1960, canvas and cuts. <<https://www.singularart.com/blog/en/2024/04/02/spatial-concept-waiting-by-lucio-fontana/>> (accessed 2 February 2025).

Expandable territory of conventional drawing which is investigated by the traces play a role in continuously reproducing the image in each new perspective. Similarly, the seismograph, by moving away from conventional spatial awareness, produces psychograms emerging from a hallucinatory void (fig. 4). These psychograms evoke André Breton's concepts of "psychic automatism" or "pictorial emanations" –spontaneous images that are freely released from the unconscious [Einstein 2019, p. 216] [1]. The incredible power of unconscious drawing, or psychograms, lies in their endless capacity for expression. This type of drawing transcends conceptual frameworks of space, venturing beyond the boundaries of architecturally crafted environments. It explores areas defined by accident and the uncanny –those spaces not shaped within the design of modern architecture.

In these spaces, traces and the body act as unique recorders of sensory experiences and atmospheres –often those marked by danger, excitement and uncanny elements. The trace transforms into a body, automating itself through the random imagery that arises. Micro-relational cartographies in drawing reconsider trauma and violence in the context of both the aesthetic nature of drawing and its role as a political witness, capturing the immaterialized concepts and imagery of the physical environment that emerges under the evolving image regimes of the post-war era. The developed aesthetic is not solely concerned

with the image itself; these cartographies of traces focus more on the ideas, events and identities that lie behind them. The Metzger creation of public demonstration's set up is acid and plastic membrane, based on the process of tracing on the surface of plastic and its presence on the public area. It changes the way of interpretation of border and limits (fig. 5).

The role of tracing as more than just a representational tool, positioning it as an active agent in both understanding and shaping reality. Rather than being a mere recollection of a moment, these traces also reflect the tensions experienced through the compression of space and time, as shaped by destructive events. These traces hold the potential to expand, offering a free and fair-minded



Fig. 4. Oscar Dominguez, *Untitled*, 1936, gouache on paper (Khan Academy) [Cramer, Grant 2025].

ground for engagement. This is reflected in the Surrealists' techniques always developing the pressure force onto the canvas and creating accidental traces by using the form of material and tool. Max Earnest's *paysages* mostly occurred the tracing technique which is called *decalcomania* and developing a very unique meaning (fig. 6).

Drawing involves activities like tracing, layering and cutting etc. where the mark left on the surface often hides the process behind it. It has been referred to as a 'trace fossil' by Halperin [McKenzie 2015; Sawdon, Marshall 2012]. These accidental, overexposed traces give rise to new particles, turning the act of witnessing into an anonymous and unpredictable investigation. Drawing here is not simply a protocol designed for universal contexts; instead, it creates its own language, one shaped by micro-responsive relationships and an open structure that challenges traditional assumptions.

Staging event as tracing

In this section research paper presents the process between drawing and tracing in the stage. This part of the research consists of multiple media. These are stage real presentation spatial and planimetric development of area, other superimposed representation in order to reflect the atmosphere of the process, the video production for movement and changing contour for following the traces. The process of this experience is creating the research witnessing and these all practice is transformed into as for setting witnessing to previous narration about the relation. Traces are kind and organize the writing about things and this new experience of the environment over the hazardous micro event is more about the new appearances creating a journey inside a flatten surface. In this respect, flattening is inside harboring also a technical tool, a way of observing is referencing each other. Then the figures are although a certain object or *paysage* this flattening form as distance paved the way constructing this in between eye and mind. Below this research thinking about this event and micro relation through practice in order to restructure conceptually drawing the environment over several steps. At this stage, the motion of materials and matter at a micro-scale presence on the surface fosters both an investigative eye and an investigative drawing practice. The materialized drawing/tracing exercise involves the transformation of a liquefied material as it shifts between dry and wet states, facilitated by a brush and the material filling



Fig. 5. Gustav Metzger, *Re-creation of the First Public Demonstration of Auto-Destructive Art*, 1960. Presented by the Artist in 2006. Image credit © Gustav Metzger. <<https://www.tate.org.uk/art/artworks/metzger-recreation-of-first-public-demonstration-of-auto-destructive-art-t12156>> (accessed 26 June 2025).

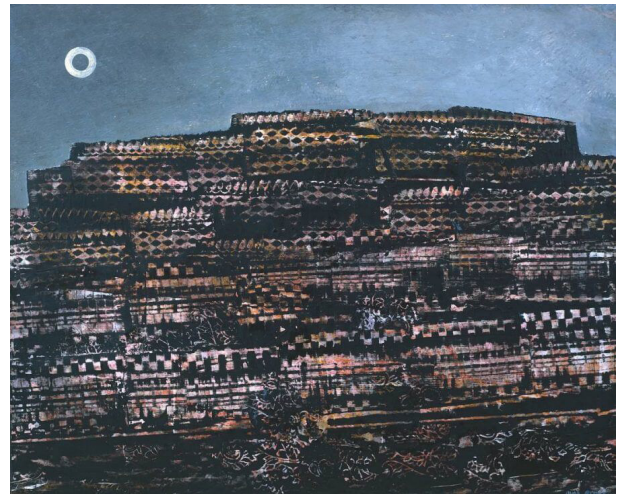


Fig. 6. Max Ernst, *The Entire City*, 1934, oil on paper laid on canvas. Image credit © Copyright www.Max-Ernst.com. <<https://www.max-ernst.com/the-entire-city.jsp>> (accessed 2 February 2025).

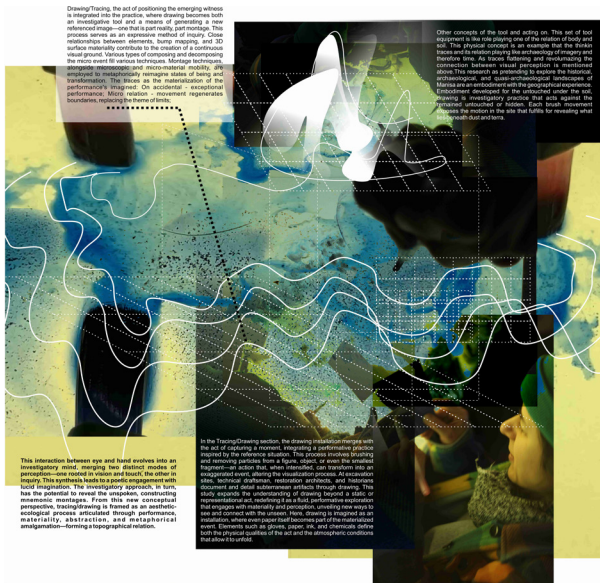


Fig. 7. Practice for witnessing micro relation [2]. Collage by author. <<https://www.youtube.com/watch?v=GTdQOxdwO9Q>> (accessed 2 April 2025).

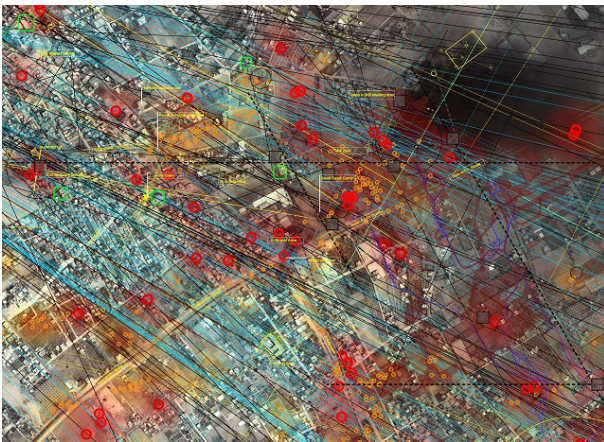


Fig. 8. A composite image by Forensic Architecture and Amnesty International regarding Rafiah on August 1, 2014. <<https://ceasefiremagazine.co.uk/arts-culture-exhibition-forensic-architecture-cloud-studies-whitworth-gallery/>> (accessed 26 June 2025).

inside. This process mimics the act of brushing away material, creating traces during the performance. The materials crystallize, forming a heterogeneous mixture that directs the eye to follow the traces as particles, moved by the force of the brush. At certain points, the material settles into a final form, yet it is once again displaced by the introduction of another substance (Sparagum, a chemical used to remove ink from the mold), continuing the cycle of transformation. In this part of the research, the designed drawing set is both explained and performed by the author as a tracing machine, producing images without causal relations and vocalizing the drawing/tracing act. This process aims to establish a new ecological regime, positioning tracing as a consequential system of relations.

The entire practice of tracing, performed as drawing, creates a highly imagery-rich moving picture. This process reflects a state of becoming, but ultimately, when the Sparagum vaporizes, the traces freeze on the surface. The memory of this practice begins with the displacement of the surface cover and culminates in a spatial condition where the material naturally stabilizes itself, leaving a contour and, most notably, a trace. What the video recording and its montage demonstrate is the endless displacement through the materialization of drawing, forming an ecological model in itself (fig. 7).

Tracing as event

These conceptualizations are given below left a question about the drawing/traces unity because it is not only figurational consequences. How does tracing/drawing engage with hidden dynamics and potentialities, transcending aesthetic and eye-centered perceptions? The avant-garde definition also related to creating traces on the thing hazard made realized itself through the appearances of trauma. Such as dirt, garbage and other ruination appeared as romantic encounters that is because creating new adventure points unconsciousness.

Generating layering of movement as a time

Drawing and its time relation is becoming an entangled relation. The developed tool for drawing is transforming the recreating not only figure of the seen but also lost thing. When drawing is offering distance, relation is extreme, happening in the lost dimension as time and rapid destruction is kind of an investigating setup. Therefore, traces are



Fig. 9. Jananne Al-Ani, *Timelines* (film still), 2022, Panoramic Video Installation. Image source Film and Video Umbrella [FVU 2022]. <<https://www.fvu.co.uk/projects/timelines>> (accessed 2 February 2025).

decomposed through thinking about its occurrences and presentation over forensic gaze. Below the forensic architecture groups work is presented as a composite image. This is a representation of ephemeral movement on the site that causes an unexpected physical deformation in a certain area (fig. 8).

Analogies and its potential occurrences for a new context

In her work, Jananne Al-Ani [Al-Ani 2024] illustrates how the visible depressions of a surface in close-up photography act as witness marks, drawing connections between the object's space and the image within the object. This narrative explores the scales of visualization, particularly landforms, and their context independent of the landscape (*paysage*) (fig. 9). The witnessing of traces that comes from its functional attitude in the forensic side become decomposing itself for the reimagining of the situation or happening beyond. To reach topography as Al-Ani's work is not a solely phantasmatic image it makes the topography as a tool transform its geographical meaning into metaphysical and connection with the *paysage*.

An intersection of spatial data converges into spatial representations, much like Al-Ani's concept of a 'timeline'. In her work, Al-Ani presents a collection of objects that possess tangible physical references, using sectional, planimetric and scenographic representations. This synthesis of objects, physical space, land and atmospheric events parallels the creation of new realms –planetary systems of objects– within our spatial environment. In this sense, it extends far beyond traditional representation. It becomes propositional, visionary, imaginative and performative. A reciprocal dialogue gives rise to a space of convergence and articulation, allowing the two realms to intersect and become intertwined.

Generating clues

Becoming many, image material traces are dynamic data that shape the material, and these traces blur the boundary between the object and its representation. They continuously reproduce images, marking a critical point for the perception of the environment. The environment is in constant change, with traces materializing time and becoming the present form of things. According to Roberto Matta, traces as clues enable us to think about appearances in a highly creative way. He defines this state as a kind of "*mathématique sensible*" [Lash 2009, p. 268] (fig. 10).

Drawing transforms into a trace of an event in which the separation between things disappears, and they converge like a map that has merged with the very object it represents.

In forensic gaze, one political issue is the reason for looking at these traces. It more spatially occurred in the ruined areas establishing their own distinct methods of information processing aesthetic is becoming a writing about space and time. This endless desire for reorganization symbols both the danger and the power of disorder, as noted by Mary Douglas. The power of disorder arises from the infinite possibilities and high potential for patterning contained within its contents. Thus, "disorder disrupts the pattern, but also provides the very material for the pattern itself" [Douglas 2007, p. 104]. The image, therefore, is not just a cartographic past but also holds the capacity for patterning.

Emerges as a material process itself

Tolon's works, in their way of making sense of loss through traces unexpectedly occurred on the painting, present an experience of a deep awareness of the forces overlooked

in the ordinary course of daily life [Ceylan 2022]. Traces that exist as a flatten record of objects serve as time necessary for illuminating an event. In destruction, the symbolism of crumbling and turning to dust leads us into situations that unfold within one another. Destruction, when viewed through a different experiential lens, presents itself as a spectacle, a departure from past forms of vision. There is an architecture of destruction that occurs not only externally but also internally, where disintegration and the process of becoming dust take place [Küçük 2023]. Particles as an unfolding body that exposes itself moves inward from external spatial relations to create a new interaction between the body and space.

Schuppli uses the term "extreme image" to understand anthropogenic matter, where there is not only a reorganization of geological layers but also the emergence of aesthetics within this realm [Schuppli 2020]. Traces physical experience in its backside appear on the representation table makes environmental boundaries even any physical forms that are constituted place of embodiment. Traces, even micro relation, give back to reimagined topographies as macro scale connection. This scale full embodiment fulfilled by the traces technically acts as anonymous witnesses to interventions in the object, particularly those that record a non-presence or absence.

Conclusion

By extending the concept of tracing beyond traditional practices, this research conceptualizes tracing as a performative setting. It reflects on the very existence of drawing as a dynamic process. While drawing is often understood as the act of marking a surface, it also embodies a transformative interaction between the eye and the hand –a space where traces of thought materialize into different forms of becoming. This research deepens that understanding by framing drawing as both a political and technical act, and by situating tracing within a broader analogy of geographical representation –drawing as a topographical map that makes visible what is otherwise tacit.

In the space between reality and censorship, the dark path of drawing and tracing reveals itself through the work of professionals who transition from trace to drawing

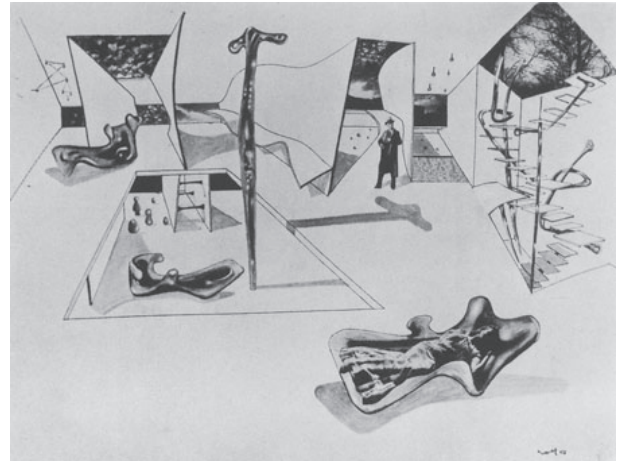


Fig. 10. *Mathématique Sensible. Architecture de Temps Model of an Apartment Unit [3]* [Matta 1938, p. 43].



Fig. 11. View from Canan Tolon's exhibition called *Tedbir* in Arter - Looking at the image of destroyed painting. <<https://www.worldgazetesanat.com/new-group-exhibition-from-the-arter-collection-precaution-has-opened-at-arter/>>. (accessed 2 February 2025).

and vice versa, challenging traditional production methods. This ephemeral time, in turn, holds the potential to develop a new epistemological understanding of delineation. Ceylan explores the concept of 'loss' through traces' dialogues and monologues. In addition, Al-Ani reflects this dialogue through land topography as a form of narration. Previous heading also conceptualizes trace/drawing relation feed from the trace itself in order to narrate something and transform them into events. In this regard, traces become the narrator and it changes the way the narration of the environment on the flattened surface.

Ultimately, the making of micro-relations has an active relation with the image. Tracing is thus reimagined as a performative act that includes choreography, erasure, and the continuous transformation of imagery. By analyzing how traces function in installations, tools, and materials, they contribute to meaning-making. The dynamic interplay between objects this conceptualized drawing engages both physical and abstract phenomena in various forms. Within this framework, rethinking and restructuring the drawing environment allows us to perform time and space, rather than merely depict them. This perspective expands the act of drawing beyond figural representation, transforming it into a spatial and temporal practice. Representation –traditionally understood as the projection of what is seen onto another

surface– is now reinterpreted through a forward-looking vision shaped by traces.

The nature of the traces is given as flattening the distances through various cases to investigate the aesthetics of the sign. The case studies are subjected to go in-depth this nature of traces through various forms that create a fraction in the representational theory. On the other hand, this also constitutes the political reflection of creating an image. They all are issued the not only figurative aspect but also the event behind which is conceptualized as distancing the things. To discuss the drawing in terms of tracing context is expanding the nature of the figure that appears.

All things considered, this research contributes a new example to the case studies by questioning drawing not as an abstract practice, but as a materially and conceptually grounded act. Additionally, the technical outcomes of the research establish a thoughtful link to the conceptualization of drawing. It involves assembling various forms of image production through an installation-like, dynamic visual structure. As a result, the work evokes an experienced –yet lost or forgotten– landscape of drawing, deepening the understanding of drawing within this conceptual framework. This final composition also introduces new modifications and a sense of unity around the subject. Through this practice-based exploration, the work restructures both the narrative and structural dimensions of drawing.

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this study and for sharing his knowledge of printing technologies and materials. Additionally, I am deeply grateful to architect Emel Feratlar for sharing her valuable experience, which inspired me to imagine what is expected from a drawing in 2024.

Notes

[1] Moreover, considering the meaning of the psychogram, as Einstein stated, *écriture spontanée* ("environmental writing") is a record of undirected psychic processes, incorporating the traumatic memory of the 20th century [Einstein 2019, p. 271].

[2] For the full performance, please visit the video link: <<https://www.youtube.com/watch?v=GTdQOxdwO9Q>> (accessed 2 April 2025).

tube.com/watch?v=GTdQOxdwO9Q> (accessed 2 April 2025).

[3] The space is designed to cultivate an awareness of the vertical human experience. Various planes and railing-free staircases allow for a sense of control over the void. The Ionic-style column carries a psychological dimension. These all-object experiments are referencing their impression and traces on the memory [Matta 1938].

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Experiences

To Anyone with Eyes in Their Head

Elena Ippoliti

The illusion of perfect communication

A professor is delivering a lecture in a university classroom. It is an 'intermediate' lecture for an 'intermediate' year of study. The students are already familiar with the academic path, the subject matter –having learned most of the technical terminology– and with the professor himself. Though the lesson is technical in nature, it does not introduce particularly advanced content.

The communicative situation appears clear. It is a traditional lecture format with no disruptive noise, lighting, or other disturbances. Both professor and students share the same native language.

All the elements for effective communication are seemingly present: an expert sender (the professor), a well-prepared audience (students with a solid foundation),

content that is not overly complex, and a well-established communication channel (a frontal lecture). One would thus expect the transmission of the message to occur smoothly and the content to be received by the students as the professor intended. However, experience shows that even in apparently structured and favorable contexts, communication can be partial, distorted, or ineffective.

This reminds us that communication is both complex and fragile. It does not resolve itself in the passive transmission of information, but rather in the negotiation of meaning. This negotiation depends on many factors: cognitive and emotional context, level of attention, motivation, prior knowledge, and more. Even before that,

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

communication presupposes the existence of a shared medium between sender and receiver: language. For the content to be truly 'shared', the language must be internalized by both parties.

Simplified, language is a communication system aimed at establishing interactive relationships within a socio-cultural group. This system is based on the adoption and sharing of a common code—a set of signs and rules—for encoding and decoding messages. This theoretically ensures a correlation between the plane of expression (signifier) and the plane of content (signified) in communication.

The assumption of substantial homogeneity is a feature common to all theories of language and all methods of linguistic analysis, ideally assuming that both speaker and listener use the same code to formulate and understand discourse [Rosiello 1979, p. 335].

But in practice, even when the code is supposedly shared and established, communication is always subject to ambiguity. Every act of communication involves subjective interpretation, both when constructing the statement and when reconstructing the message, based on one's experiences and prior knowledge. This results in an inevitable misalignment between the sender's code and the receiver's [1] (fig. 1).

Ambiguity is an intrinsic feature of all languages that involve human interaction, as these do not presuppose univocal associations between sign and meaning [2]. This also applies to natural language, which is subject to lexical, functional, morphological, syntactic ambiguities etc., as well as ambiguity in the sound-to-meaning projection [Aissen, Hankamer 1977]. Ambiguity is a direct consequence of the linguistic system's complexity: "If the sentences of a natural language were simple sequences of words without syntagmatic structure, there would be no ambiguity" [Aissen, Hankamer 1977, p. 16]. It is precisely this complexity that makes language so rich and nuanced. For certain types of discourse, ambiguity is even a structuring element—as in persuasive, poetic, or playful language. Conversely, "if every ambiguity, disturbance, or deviation were eliminated, there would probably be no choice: voice would be lost; the surprises of art, as well as the wonders of riddles and puns, would come to an end" [Baratta 1979, p. 334].

The illusion of perfect communication is thus confronted by the dual nature of language: on one hand, a tool for clarity and precision; on the other, a vehicle



Fig. 1. The ambiguity of verbal communication brilliantly demonstrated by the surreal dialogue between Totò and Hon. Trombetta (Antonio De Curtis and Mario Castellani) in the film *Totò a colori* (Steno 1952).

for expressive depth and extension. In this dialectic, understanding is always the result of negotiation between codes, contexts, and subjectivities, whether it's a verbal (natural) language or a polysemic one such as the visual language.

Telling (almost) nothing

What happens to sense when the form of the narrative changes? To reflect on this question, Raymond Queneau's work *Exercises in Style* is exemplary [3].

In the *Introduction* to the 1963 edition [4], Queneau recounts how the idea came to him in the 1930s while attending a performance of *The Art of Fugue* by Johann Sebastian Bach [5] with his friend Michel Leiris. He was struck by how a seemingly simple musical theme could generate infinite variations through the contrapuntal technique of the canon [6]. Inspired by Bach's work, Queneau—novelist, poet, essayist, journalist, translator, and mathematics enthusiast—decided to "do something similar on a literary level" [Queneau 1963, p. 9]. Not to showcase linguistic virtuosity, but with the intention of renewing French language, observing that there were by then "two distinct languages": one, that of the 15th century, poorly taught in schools, and the other, the spoken language (neo-French) [Queneau 1965, p. 66].

He therefore equipped himself with a very short story, or rather a 'non-story' –*Notations* [7]–, and then established a set of rules, keeping “an eye out also for the pleasure of the ear” [Eco 2002, p. 229] [8]. With these sole ingredients, he embarked on an exploration of the French language through 98 exercises of intralinguistic rewriting [Jakobson 1959, p. 233] [9], i.e., 98 stylistic variations, but always remaining within the linguistic constraints –historical and cultural– of the French language. An exploratory research through language, animated by a generative and combinatorial logic [10]. A game for which Quenau “laid down the rules as he went about playing it, splendidly, in 1947” [Eco 2002, p. 238], inviting the reader to play their own match in discovering the rules underlying the *Exercises* [11].

As said, the story is always the same, yet each *Exercise* represents a *unicum* and offers a distinct narrative perspective. So, what changed in the 98 rewritings of *Notations*? The style, demonstrating that style itself partakes in the production of sense. Not a mere formal virtuosity, but a theoretical demonstration in action: sense does not lie in the story, but in the form of its enunciation. A ‘simple’ lesson on language.

Queneau’s experiment inspired other authors, even in different expressive fields, such as comics.

A first significant experiment applied to graphic narrative is due to Stefano Disegni and Massimo Caviglia. Again, a ‘non-story’ –a man looks at a watch, waits for a woman who is late, then she finally arrives and they kiss– repeated over 103 strips. Each strip reinterprets the same event (he, she, and love), rigorously maintaining the same narrative development –introduction, development, twist, conclusion– and almost unchanged authorial graphic signs.

However, each variation changes the narrative register, essentially shifting the tone –romantic, surreal, ironic, dream-like, abstract, etc.– and consequently adapting rhythm and stroke. Thus, the narrative moves seamlessly from a romantic strip –with soft lines and syrupy dialogues– to a cinematic one –with close-ups, visual cuts, camera movements– introducing an endless procession of the most varied post-punk inhabitants of an urban condition: the Chav (*il Tamarro*), the Thug (*il Cattivo*), the Nose picker (*lo Scaccolone*), the Giant, the two Viruses, the Distracted, the Fool, the Zen, the Limpet (*la Cozza*), and so on.

A second experiment is Matt Madden’s *99 Ways to Tell a Story* [12]. Again, it starts from a ‘non-story’ (this time

visualized in the template of a page): two characters in an apartment engaged in daily activities, a brief exchange of lines. Then, like Queneau, Madden attempts to challenge the limits of the comic language by proposing the same ‘non-story’ through 98 variations. He alters handwriting, signs, colors; genre (photo-comic, manga, horror, etc.); the point of view from which the story is narrated (first one character, then the other; a subjective shot, from outside the apartment etc.); the time sequence (a time that expands to a life story, a time meticulously described in thirty frames, a time that dissolves into a geographical map, a time compressed into three panels, a time diluted in a single image, and more).

The experiences of Disegni & Caviglia and Madden show that intralinguistic translation –or more precisely, rewriting– is also possible in the visual domain, provided one ‘plays’ while respecting the rules underlying the language of the aesthetic text put into play, in this case that of comics.

Strict adherence to a specific set of norms has ensured the recognizability of styles and the coherence of the narrative in a ‘time’ –demonstrating the causality of the chain of narrated events– and in a ‘space’ –equipped with characteristics to make it identifiable and recognizable. These are summative formative modes that, while progressing through “combinations of figural fragments”, ultimately lead to a “unitary *gestalt*” where “the result is something absolutely unitary, indistinguishable, inseparable” [Anceschi 1992, p. 57].

More broadly, in the experiments by Queneau, Disegni & Caviglia, and Madden, we are essentially witnessing a demystification of narrative. They show that meaning does not depend on the story (or ‘non-story’) –that is, the content– but rather on the discourse, and even more so on the manner, the process by which it is produced, that is, on the form of enunciation. In all these experiments, the authors operated on signs and rules –that is, on the code– through systematic variation, each within the specific framework of their linguistic system: French –therefore producing a verbal text– or comics –thus producing an aesthetic text.

And in an aesthetic text, that is, a text that offers an experience through images, the form of enunciation is even more compelling, as it defines the “aesthetic contract” established between author and reader and determines what the reader should consider relevant and what not [Barbieri 1992, p. 256].

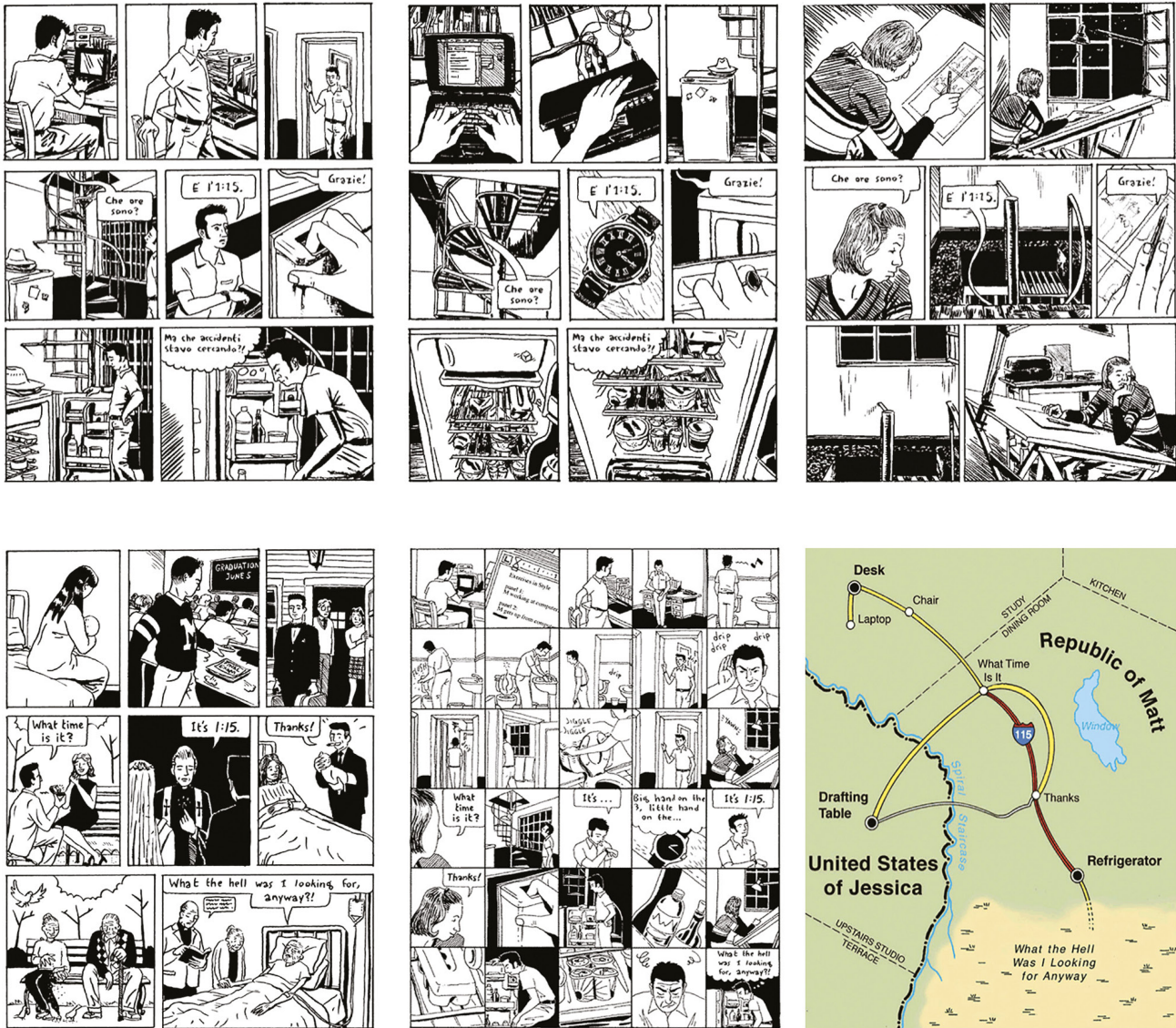


Fig. 2, 3. Some of Madden's style exercises. While the paranarrative elements remain constant, the point of view from which the story is told varies (fig. 2) or the time of the story varies (fig. 3) [Madden 2005, pp. 3, 7, 9, 95, 141, 63].

What has been argued so far is enough to demonstrate that the visual language possesses a structure and a code sufficient to be considered an autonomous communication system – that is, a language. Or not yet?

How do you recognize a dog? Or on the aspiration for a perfect language

It is with Roland Barthes' famous 1964 essay on the analysis of the Panzani advertisement – a photograph prominently displaying a mesh shopping bag, half open on a table, overflowing with Panzani products, mainly spaghetti packs, surrounded by tomatoes, peppers, onions, etc. (fig. 4) – that visual semiotics is considered to have been born [Barthes 1964]. For the first time, thanks to Barthes, images become an autonomous object of research: systems of signification are examined, and the critical analysis of the visual language structure is addressed.

However, for Barthes himself, it is only in the words of the headline *Pâtes Tomato Sauce, à l'italienne de luxe* that one finds the code that allows the image's ambiguity to be limited and that therefore guides its interpretation: because the image, by itself, is 'a message without a code'. It is the verbal text – title, caption, brand – that limits the "floating of meaning", playing the essential role of "anchoring" the conveyed meaning [Barthes 1964, p. 40].

On closer inspection, albeit simplifying greatly, the image is once again treated based on the meanings it conveys through its relationship with the referent, that is, only as an icon. According to this perspective, "the interpreter must fill a 'code gap' by appealing to a potentially boundless encyclopedia" [Eco 1997, p. 48]. Interpretative ambiguity can therefore be resolved by verbal language which, being able to stabilize meaning "by forcing the object into a system of discrete units, it drastically reduces this interpretative oscillation" [Eco 1984, p. 109].

Thus, by remaining confined within the domain of representational realism – that is, the relationship with the referent – the question arises whether we can truly speak of language in the visual domain, given that "images, in themselves, are just pictures, and pictures do not correspond to anything: we have them correspond to something" [Marconi 2021, p. 12].

Fig. 4. The Panzani advertisement image analyzed by Roland Barthes in his 1964 essay [Barthes 1964, s.n.p.].



Once again, the issue is the problematic relationship between image and word, between the concreteness of the icon and the abstraction of the concept, the disjunction between visual and verbal languages, and the consequent subordination of the former to the latter, a condition considered by some to be necessary to limit the ambiguity of the former, given its polysemic nature [13].

A fundamentally irresolvable question because it is indeterminate. Indeed, it is possible to affirm that “that a concept’s application conditions cannot be implemented by an image, because every image is exceeded in generality by the corresponding concept” [Marconi 2021, p. 12]; but, conversely, it is also possible to “demonstrate that the image exceeds the concept” [Ferraris 2021, p. 16] because “a given image is valid for a whole class” of objects but is also a sign of an idea, that is, a symbol of an abstract idea [Ferraris 2021, p. 16]. On one hand, the ontological primacy of verbal language is affirmed, whereby being manifests itself always and only in (verbal) language and signs are expressions of consciousness; on the other hand, being is said to manifest itself as form, as sensible or intelligible presence, where every sign, by itself and originally, refers to something else that precedes and grounds both consciousness and language.

It is the ‘dog’ problem already raised by Immanuel Kant: we cannot know things in themselves, but only our representations of them. “The concept of a dog signifies a rule according to which my imagination can delineate the figure of a four-footed animal in a general manner, without being restricted to any specific representation given to me by experience or to any concrete image that I can picture” [Kant 2005, p. 383].

But what happens when we are faced with something for which we have no (visible) experience and the rule and image break down? And so, “how can you recognize a dog (any dog, therefore a dog in general) if you have never seen one?” [Eco, Ferraris, Marconi 2021, p. 11]. How do consciousness and language function in the face of something new, like what happened to European explorers when they encountered the platypus in Australia? [Eco 1997].

Probably similar to what happened to Albrecht Dürer, who managed to depict, in his famous 1515 engraving, a rhinoceros –an animal he had never seen and until then unknown in Europe– based solely on a



Fig. 5. Preparatory study by Albrecht Dürer for the famous 1515 woodcut depicting a rhinoceros. Pen and brown ink on paper (27.4 × 42 cm).

textual description [14] (fig. 5). He probably succeeded by working simultaneously through formal comparisons and conceptual contiguities, drawing on vicarious experiences and descriptions.

Returning, then, to the dog: how is it that we are able to construct a mental schema of ‘dog’ that allows us to distinguish a Labrador from a Greyhound? [Eco 2021, p. 30] (figs. 6, 7).

We probably can only proceed by both ostension and definition, just as Dürer did: even though he had never seen a rhinoceros, he managed to imagine and represent it, giving it form through that combinatory process of memories and emotions that is intrinsic to the nature of images, which “associate with one another, not because they previously occurred together, nor because we perceive relationships of similarity, but because they share a common affective tone” [Vygotsky 2010, p. 3]. Through this combinatory mechanism, Dürer not only represents the rhinoceros (with errors and inaccuracies, of course), but also gives form to the entire imaginary that had developed around the appearance of this exotic animal.

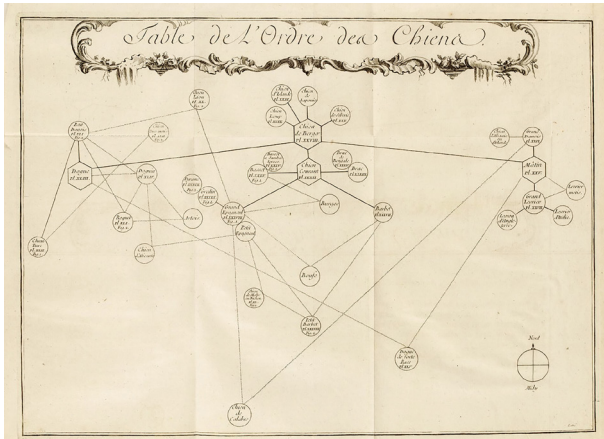
Just beyond the fence enclosing us in the mistaken assumption that there always exists a relationship linking object/word/representation, as René Magritte already taught us, we discover that ‘the pipe is not a pipe’ (fig. 8). Overturning “the affirmative discourse on which



Fig. 6. Mimetic representation. Plates XXV-XXXIV, XXXVIII and XLIII-XLV from the chapter describing the dog in Leclerc Buffon [Leclerc Buffon 1755].

Fig. 7. Logical-conceptual representation. *The Table de l'Ordre des Chiens* from *Lederc Buffon* [Lederc Buffon 1755, between p. 228 and p. 229].

Fig. 8. Between image and word: the disjunction of visual and verbal languages. Banksy, *This is a Pipe*, 2011.



the comfort of resemblance rested" [Foucault 1980, p. 53], in a depiction it is always necessary to distinguish between visible and invisible, between resemblance which pertains to thought— and similitude — which pertains to aspects of the visible world [Magritte 2005, pp. 122, 123]. Thus, in Magritte's paintings, verbal language often functions as a misleading clue and "something exactly like an egg is called *l'acacia*, a shoe *la lune*, a bowler hat *la neige*, a candle *le plafond*" [Foucault 1980, p. 35] (fig. 9).

More broadly, all the figurative arts of the twentieth century have moved toward the interweaving of languages [15] and toward the dismantling of the equivalence "between the fact of resemblance and the affirmation of a representative bond" [Foucault 1980, p. 34]. The new abstract-plastic expressiveness affirms the artist's freedom from the constraint of mimetic representation, giving rise to non-figurative compositions. Geometric shapes, colors, letters of the alphabet, and punctuation marks etc., are combined to propose a new reality no less significant than the supposed natural objectivity.

Visual configurations from which sense effects derive not by virtue of the mimetic relations that are established with reality, but by "making their way to the brain through the eyes" [Lisitskij-Küppers 1992, 352], through perceptual analysis that first isolates a 'field' from the indistinct, then investigates textures, shapes, colors; then examines positions, directions, occupancies, and then evaluates distribution, balance, hierarchy, dynamism, tension, etc. (fig. 10).

However, even after having gone beyond the narrow confines of referential illusion, we cannot ignore how a combination of geometric forms, even when intentionally abstract and devoid of mimetic references, evokes in us an experience of 'figure'. That is, we are led to recognize something, to search within those marks for an order—a sense—that we trace by examining the composition, the arrangement of elements in the 'field', their mutual positions, spatial relationships among individual elements and groups of elements, associating what appears homogeneous and distinguishing what seems dissimilar, linking and unlinking etc.

As Massironi teaches, we can thus recognize a face in the tracing of four identical segments, but only if certain rules are respected: a placement according to specific spatial relations and a distance between the segments within a given interval [Massironi 2002, p. 44]. Under

Fig. 9. Between image and word: the disjunction of visual and verbal languages. René Magritte, *La clef des songes*, 1930.



these conditions, we will recognize the schematic representation of a face –that is, we will perceive the four identical segments as an organized whole endowed with sense, a figuration (fig. 11).

It is the double nature of the image, characterized by an ontological oscillation between abstraction and sensory experience, between concept and percept. On one hand, the image is impossible to place “like other entities such as trees, chairs, mountains, animals, and people”; on the other hand, in being a copy –“an image of itself as an image of something”– it expresses the overflow of the very principle of reality [Desideri 2015, p. 3]. So then? It’s the beauty of the image! And there’s nothing we can do about it! [16].

Thinking without knowing: the experience of beauty

Let us imagine observing *The Ascent of Jesus Christ to Calvary*, attributed to the final phase of Hieronymus Bosch’s production and today housed in the Museum voor Schone Kunsten in Ghent (thus to be distinguished from another work of the same title kept in the Kunsthistorisches Museum in Vienna). In the painting, an oil on panel of nearly square shape, the entire scene takes place in a single foreground, almost completely hiding the dense darkness barely visible in the background, which deprives the representation of any contextual reference. In the foreground, the grotesque and unsettling faces of a deformed humanity crowd tightly around Christ and his cross: evil gazes and diabolical sneers, toothless snarling mouths, crooked and hooked noses. It is a work of art that stages the ugly and therefore would seem to contradict the sensitive experience of beauty, which underlies aesthetics and art.

Where is the beauty in this artwork, in this image? It is certainly not in the features of the faces of the humanity portrayed by Bosch. For already from the observation –or rather, the experience– of the pre-Lombrosian anatomy of these faces, we would recognize the deformed, a re-cognition that emerges by comparison: because in those disproportionate, altered, counterfeit faces, we identify, by contrast, what is ‘in-form’, ‘without’ form – in short, the de-formed. We recognize in them ugliness because, as Plato taught, the essence of beauty is the embodiment of measure, commensurability, and distribution according to rules and

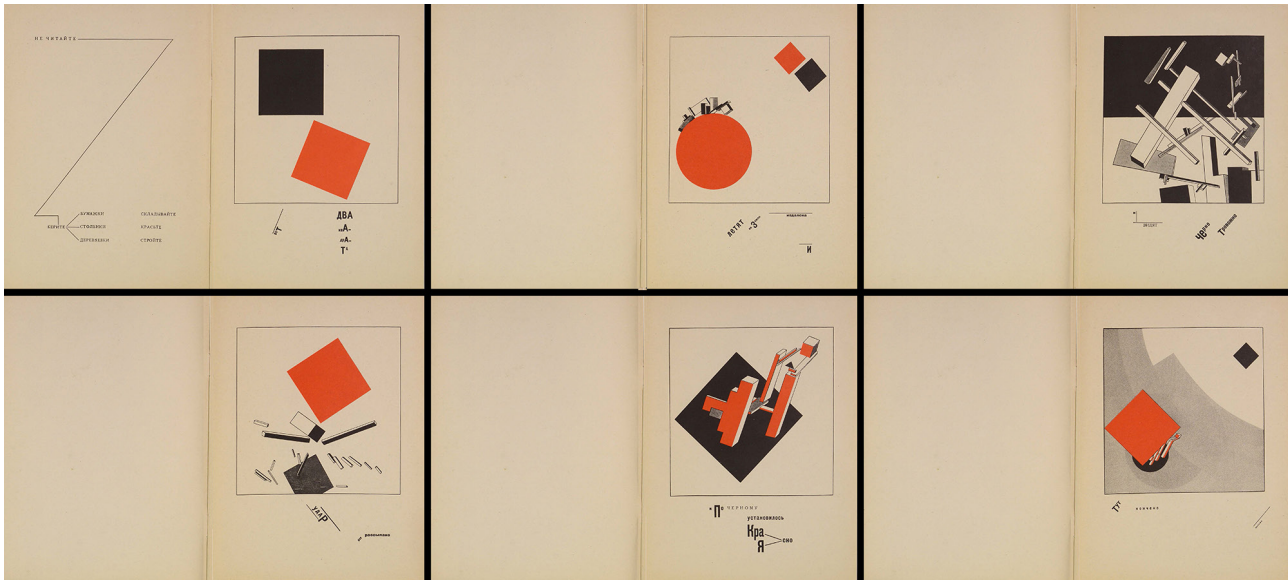


Fig. 10. Basic geometric shapes and chromatic and compositional contrasts suggest a sequence of actions: telling a story without words [Lissitzky 1922].

relationships, while, conversely, the essence of ugliness is the lack of measure.

But the process underlying the experience of an image, and therefore also the process that guides aesthetic appreciation and ultimately leads to the formulation of an aesthetic judgment, does not settle for so little, does not stop at such a preliminary analysis. This kind of process is in fact much more complex –or rather, refined– advancing through perceptual analysis, emotional reaction, cognitive analysis, and attribution of meaning [Mastandrea 2011].

Thus, from the very first stage, of the colors, textures, lines etc., present in the image, we analyze how they are distributed and organized in the pictorial space, their mutual relationships, and their relationships with the field – in other words, the composition.

In this way, we will notice that the formless and deformed crowd surrounding Christ and his cross, as well as Christ and the cross itself, are arranged within the pictorial space 'with measure', according to rules –in this case, simple rules of elementary geometry: the diagonal from left to right– highlighted by the bare cross –and

the diagonal from right to left– underscored by the axis of the positive faces, the good thief and Veronica –that intersect in the face of Christ, the geometric center of the composition. Or in the four corners of the panel, where are positioned, from top left proceeding clockwise, the recognizable faces of those who were with Christ at Calvary: Simon of Cyrene, the good thief, the bad thief, and Veronica with the Shroud (fig. 12).

Therefore, it is in the composition, in the spatial arrangement of the elements, that we are able to appreciate beauty: because, even without wanting it, we derive pleasure from tracing in the image the logic of a rule-based arrangement –an organization, that is, an order, and thus a sense [17].

In the composition we will find –without knowing [18] we were looking for it– the structure of sense of the image. Well before assigning it a meaning derived from the interpretation of what is represented in the image (that is, the analysis of its content), an 'instinct' will push us, through perceptual analysis, to an active exploration of the image to understand it purely in visual terms. Among the redundancy of signals that our gaze can

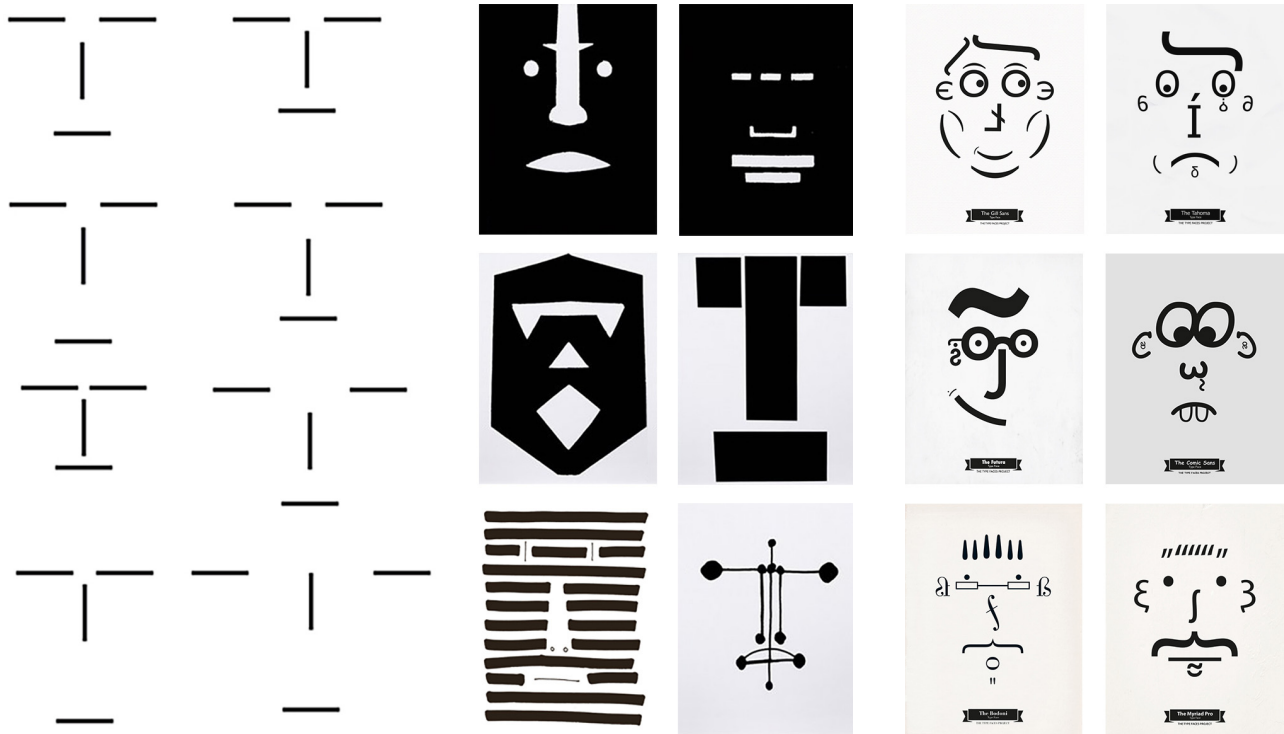


Fig. 11. Faces. Left: variation in arrangement [Massironi 2002]. Center: variation in signs [Munari 1992]. Right: variation in font [Pinto 2011].

capture, for our brain to make sense of that image, a perceptual support will guide us in selecting and understanding, identifying a rule-based arrangement, an organization, an order [Casale 2023].

We will recognize beauty in the order we are able to find in a set of elements, in that rule capable of transforming an incoherent cluster into a coherent collection, because this is the specific nature of beauty, and also its very motivation.

There is, therefore, a natural predisposition to recognize beauty in structures of order, which science explains as foundational to the interpretation of the organization of the natural world. As in chaos theory, which demonstrates the beauty of mathematical writings able to recognize an organization that governs disorder—that is, able to endow chaotic systems with well-defined and at the same time variable structures of order.

So far, the appreciation of Bosch's painting has moved within the confined context of finding sense in what our gaze has captured—an act of recognition/interpretation of the expressive level of the image that still belongs entirely to its visual properties, and is therefore still unrelated to assigning a meaning to the artwork in cultural terms.

Then, only then—and again without wanting to—from the signs, forms, figures, and composition, from the 'coherent units' we have distinguished in the image, we will derive a complex of emotions and reflections to which we will attribute meanings that go beyond what is 'objectively' represented there.

Faced with this image—which does not demand an active response to a visual stimulus from the outside (i.e. a utilitarian response such as crossing the street without being hit by a car)—we will enter a state of contemplative meditation and from it derive, as a reward mechanism, a feeling of pleasure, with an intensity that varies depending on who we are and what we know, that is, on our experience, personality, and knowledge.

From the deformed humanity depicted by Hieronymus Bosch, most of us viewers will likely derive emotions, more or less intense, leading to reflections—also more or less intense—on human wickedness (because, no more and no less than in Plato's time, even today in the de-formed, in the formless, we recognize the ugly, and associate the ugly with the wicked). Some will further derive meaning in relation to the episode of Christ's passion; others will draw emotions and reflections from

comparing this ascent to Calvary with other works on the same subject, between Bosch's visionary style expressive of Northern European culture and the vastly different Italian Humanism, and so on.

A set of emotions and reflections, affective and cognitive meanings, that—especially when visual experience qualifies as an aesthetic experience—are related not only to the properties of the aesthetic object (bottom-up aesthetics) but also to the characteristics of the subject/viewer (top-down aesthetics), that is, they are undoubtedly influenced by socio-cultural factors [Consoli 2017].

It is a refined process always underlying the experience of an image, which is always an aesthetic experience, and which, as already stated, advances through perceptual analysis, emotional reaction, cognitive analysis, and—only lastly—attribution of meaning. A process in which aesthetic appreciation depends both on the properties of the object and on the characteristics of the perceiver/viewer. A process structured in different moments that not only integrate but also influence one another, as taught by the recent and numerous experimental studies in cognitive science devoted to perception and aesthetic evaluation, confirming what was already intuited at least since *Gestalt* theories [Consoli 2017, p. 69]: the stable and dynamic mechanisms of the intelligence of perception, and more broadly of visual intelligence, in the aesthetic experience—that is, in the experience of the 'beautiful' [Zeki, Lamb 1994].

It therefore seems necessary to reaffirm the aesthetic value of a configuration, of an aesthetics of visual forms—that is, of an intrinsic beauty (or ugliness) of images—and hence the need to reassert the original mission of those dealing with Drawing: to understand, and educate in understanding, in order to govern images, which are essential nourishment for our mind and body.

To contribute to the formation of that specific intelligence which is proper to visual thinking (Arnheim 1974)—a type of thinking that unfolds in its writing, for it is in this figuration that thought takes shape and is formulated. But also a type of thinking that must be nurtured, as it is built up over time through progressive deposits and archival of visual memories [Cervellini 2012].

Therefore, to reaffirm—and certainly renew—the practices of the discipline as essential for both 'making' and 'using' images encompassing under the same heading images, imagination, and the imaginary, and holding

Fig. 12. *The plane of expression. Geometric-compositional analysis of The Ascent of Jesus Christ to Calvary, Hieronymus Bosch, 1515-1516.*



together, in the context of the social and cultural specific, plural and singular, form and matter, production and reception, image and gaze [19].

A mission that is essential today more than ever, in a historical moment characterized by the overproduction of images [20], where such an excess of redundancy—as with all cognitive process—can turn data into noise rather than information, making us increasingly unable to distinguish and select, that is, to choose. And at the same time, we also know that such exposure to the noise generated by this whirlwind of visual experiences contributes to developing 'familiarity' (one of the elements at the base of cognitive analysis and meaning attribution) with the noise itself, and, who knows, perhaps, sooner or later, it will make us unable to distinguish the little faces of an emoticon from the solemn faces of the Arnolfini spouses [Voltolini 2016, pp. 2, 3].

Credits

The title is borrowed from a famous quote by Viktor Šklovskij (1893-1984), one of the leading exponents of Russian formalism: "To anyone with eyes in their head it is perfectly clear that art does not strive for synthesis but for

decomposition, for it does not march to the beat of music, but is rather a dance and a stroll perceived – or better yet, a movement created solely so that we might feel it" [Šklovskij 1966, p. 43].

Notes

[1] On this point, we should recall the linguistic variety unique to an individual speaker defined by the term *idiolect*, meaning "each individual's use of language, their personal language or 'style', regardless of the group or community to which the individual belongs" [Marchese 1991, p. 140].

[2] In artificial languages, typical of science, ambiguity is reduced in favor of logical coherence to ensure univocality and rigor. In natural languages, ambiguity is instead tolerated and sometimes sought for expressive, persuasive, or poetic purposes.

[3] Compared to the previous example (the university lecture), the content of communication here is virtually null.

[4] Published by Gallimard in 1947, an updated edition was released in 1963 accompanied by figurative 'style exercises' –typographic, painted, drawn, sculpted etc.

[5] *The Art of Fugue* is recognized as one of the most complex and articulated works ever written and is universally considered one of the highest achievements of contrapuntal polyphony in the entire history of music.

[6] In a simple canon, the melody is repeated by another voice shortly after its initial statement (as in the popular *Frère Jacques*); in a perpetual canon, it restarts in the next key, continuing endlessly; in a retrograde canon, finally, once the melody reaches its end, it resumes, but this time in reverse, allowing it to begin again, and so on.

[7] In short, the plot is: during rush hour on a bus, one 'guy' notices a second 'guy' who starts arguing with a third 'guy', accusing him of pushing him on purpose; two hours later, the first 'guy' sees the second again in front of a train station with a friend as they talk about a misplaced button.

[8] In the introduction, Eco returns to the question: "In any case, Queneau has opted not only for grammatical variation on the musical theme but also for a variation in the listening conditions" [Eco 2002, p. 233].

[9] "Three means of interpreting a verbal sign can be distinguished. This can be translated into other signs in the same language, another language, or another, non-verbal symbol of symbols. These three types of translation must be classified differently: 1. Intra-linguistic translation, or rewriting, is an interpretation of verbal signs by means of other signs in the same language. 2. Inter-linguistic translation, or actual translation, is an interpretation of verbal signs by means of another language. 3. Inter-semiotic translation, or transmutation, is an interpretation of verbal signs by means of signs in non-verbal sign systems" [Jakobson 1959, p. 233].

[10] Among Raymond Queneau's passions was also mathematics, as mentioned; he was even a member of the Académie Goncourt.

[11] "the reader [...] soon realizes that there is little to make sense of [...] and, so, just sits back and admires the skill of the author. This admiration entails understanding the rule but Queneau trusts his readers to find it for themselves and, no doubt, contemplated this element of puzzle in the game" [Eco 2002, p. 225].

[12] The reference to Raymond Queneau is made explicit by the author in the *Preface* [Madden 2005, p. 1].

[13] In fact, "Ambiguity is an inherent property of natural language; there is no natural language that is free from ambiguity in its meaning-to-sound projection" [Aissen, Hankamer 1977, p. 16].

[14] On June 3, 1515, printer Valentin Fernandes attended a public spectacle in Lisbon featuring a fight between a rhinoceros, sent as a gift from India, and an elephant. Fernandes sent a letter to a friend in Nuremberg describing the marvels of this extraordinary animal. This was likely one of Dürer's sources.

[15] For example, Paul Klee said: "writing and image, writing and depicting, are fundamentally one and the same" [Klee 2011, p. 17].

[16] The phrase is clearly an adaptation of the famous line "That's the press, baby! And there's nothing you can do about it!" spoken by Humphrey Bogart in the film *Deadline – U.S.A.* directed by Richard Brooks in 1952.

[18] By its nature, representation is primarily a topical device: by assigning a position, giving it "a meaningful place", it confers order, because "knowledge without a place seems to be evanescent" [Anceschi 1992, p. 103].

[17] "All perceiving is also thinking, all reasoning is also intuition, all observation is also invention" [Arnheim 1974, p. 5].

[19] This approach to images has for many years represented a broad field of convergence for different disciplines which, with their own methods and specificities, engage in dialogue across disciplinary boundaries to hold together the components of visual experience: images, devices (from traditional optics to visual media), and the gazes directed at images [Cometa 2020].

[20] Some data on image overproduction: regarding daily photos taken, estimates indicate around 4.38 billion in 2023 and 5.3 billion in 2024. Archived photos on hard drives and other formats in 2023 are estimated to be around 9 trillion (considering only

so-called 'unique' images), while including backups the figure approaches 16 trillion. For AI-generated images: since the launch of 'text-to-image' models through August 2023, over 15 billion; dur-

ing 2022-2023, about 34 million per day. Finally, 90% of all digital images (including video, AI, photos, scans) were produced in the last two years.

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Rhetorical Imagery between Word and Sign. Olivetti Advertising and Communication

Michela Rossi, Sara Conte, Greta Millino

Abstract

Technological evolution has always diversified communication tools by introducing new media and languages. Digitalization demands an adaptation of codes to the immediacy required by contemporary channels, focusing attention on the word–image relationship. The acceleration of the digital transition requires a revision of communication modes, as multimedia channels interact synergistically with the sensory system, making it necessary to reconsider how words and images work together.

The rhetorical principles codified for verbal language also apply to visual communication, as demonstrated by advertising, considered the “soul of commerce” due to its effectiveness in engaging the audience. The verbo-visual rhetoric of modern advertising renews the art of communication by creatively combining ethos, pathos, and logos in a narrative that appeals to emotion.

In particular, Olivetti’s commercial communication channels went beyond mere product promotion. They created a syntactic–semantic ecosystem that remains relevant even in the digital era. Alongside other forms of commercial communication, advertising in general, and Olivetti’s communication in particular, serve as a reference point for updating languages in the digital age. This is especially valuable for activities operating in the virtual space as a privileged place of communication, especially in the commercial domain.

Keywords: visual rhetoric, rhetorical figures, advertising graphics, Olivetti

Introduction

Communication is a fundamental activity in relationships between individuals. Each sensory channel corresponds to specific languages, with different modes of reception, purposes, and content, which can generally be grouped into three main types: information (content), expression (feelings), and reasoning (ideas). These are linked respectively to *ethos*, *pathos*, and *logos*, the rhetorical categories of classical verbal communication, developed long before the theorization of visual communication.

Art stimulates the senses, often in a synesthetic way, but the transmission of complex messages primarily engages

the dominant human senses: hearing and sight, which correspond to speech and drawing. Verbal and visual language are the main tools of intellectual, scientific, and technical communication because they support reasoning within the domain of *logos*. The Latin term means ‘word’ or ‘discourse’, but the Greek word λόγος also implied ‘relation’, ‘proportion’, and ‘measure’ concepts we associate with formal reasoning in geometry [1]. This etymological connection highlights the semantic proximity between graphic and verbal languages, the latter being considered ‘natural’ as it is the primary form of human communication [Barthes 1964].

Words and images, language codes and verbo-visual rhetoric

The relationship between verbal and visual language integrates opposing components. The former employs expressions that require lexical knowledge; the latter consists of intuitive, immediate iconic elements that impact the emotional sphere. Images trigger direct reactions of acceptance or rejection, while words engage the rational part of the intellect. Yet discourse can generate mental imagery that acts on emotion, making it more effective.

Visual communication takes advantage of mechanisms that combine the completeness of language with the immediacy of drawing, conveying messages through compositions of words and images that often follow the structure of rhetorical figures, originally theorized as ornaments that enhance the persuasiveness of discourse by stimulating imagination, the capacity to produce mental images. The interaction between verbal and (mental) image thus blends two antithetical yet complementary languages, enhancing communicative effectiveness.

The form–word relationship marks the origins of phonetic writing, which developed from ideograms, then iconic and/or onomatopoeic signs linked to spoken words like *m*, reminiscent of sea waves, or *s*, which mimics both the form and the hiss of a snake. The graphic quality of language finds its peak in calligraphy (i.e., beautiful writing) and calligrams, which emphasize the visual beauty of writing shaped into recognizable forms. The *carmina figurata* of the Hellenistic and Latin worlds were used in Islam to sidestep the iconoclastic prohibition through surahs shaped like animals, before becoming a disruptive element in the graphico-literary compositions of Marinetti and the drawings of Apollinaire (fig. 1).

The link between these two codes is intrinsic to Futurismo, which left a lasting mark on visual communication by revolutionizing advertising, celebrated as a poetic form fully aligned with modernity: “Noi futuristi siamo stati i primi nel mondo a glorificare il canto dei motori, le lucentezze metalliche, le vertigini della velocità, la macchina, il grattacielo, il sole elettrico e con la poesia e con la pittura... Alla luna, che nessuno ha poi mai avvicinato (chissà come dev'essere cattiva!) io preferisco la lampadina elettrica della mia camera da letto e, ad un tramonto, il falò di un mucchio di libri passatisti.” [Depero 1933] (fig. 2).

While advertising already existed, it took the discreet form of printed ads, decorative signs, and commercial

logos. The Futuristi revolutionized it: they were among the first to recognize the effectiveness of visual communication and the persuasive power of images, elevating it to an art form: “l'arte dell'avvenire sarà prepotentemente pubblicitaria” [Depero 1931].

The use of visual language for commercial graphics highlights a strong awareness of the rhetorical potential of images in emotional engagement and in promoting industrial products: “Esaltare un prodotto industriale o commerciale con lo stesso stato d'animo con cui si esaltano gli occhi di una donna (che sono poi meno dolci.... delle caramelle Venchi) vuol dire raggiungere un lirismo d'alta potenzialità. E perché la mia Beatrice non debba essere una Isotta Fraschini?” [Depero 1931].

The *Numero Unico futurista Campari* [Depero 1931] combines playful text –co-created with poet G. Gerbino and musician F. Casavola– and striking graphic inventions with a provocative manifesto defining the advertising artist: “vi sono celebrità passatiste che scrivono, compongono e dipingono opere per esaltare ditte ed industrie con un senso di palese opportunismo e assoluta mancanza di sincerità artistica. Difatti le loro immagini mitologiche, il lirismo medioevale, lo stile pregno di tradizione è di urtante dissonanza con i nuovi prodotti che intendono esaltare. Le vittorie alate, i volatili pennuti, gli allori funebri, i centauri antidiluviani e tutti i soggetti settecenteschi, sono inutili e goffamente ridicoli per glorificare velocità, macchine e prodotti moderni [...]. Benché io dipinga giornalmente quadri di libera ispirazione, con eguale armonia di stile, con lo stesso amore, con non minore entusiasmo e cura, esalto con la mia fantasia prodotti industriali nostri” [Villari 2009, p. 11].

By exploiting the emotional force of images, the *cartelli lanciatori*, a phrase coined by Farfa (Vittorio Osvaldo Tommasini), emerged as street posters the Futuristi claimed to have revived as a new art form, experimenting with the fusion of the arts. By transforming advertising into art, Futurismo elevated visual communication to graphic art, laying the foundations for verbo-visual rhetoric, later theorized by the Bauhaus and the Ulm School, which underlined its psychological roots in direct relation to commercial communication [Bistagnino 2018]. A shared aim unites advertising and rhetoric: where there is choice, persuasion is needed [Bonsiepe 1966]. The market renews rhetorical tools [Groupe Mu 1970]. Advertising adopts rhetorical principles to strengthen persuasive power; the fusion of words and images confirms the rhetorical essence of

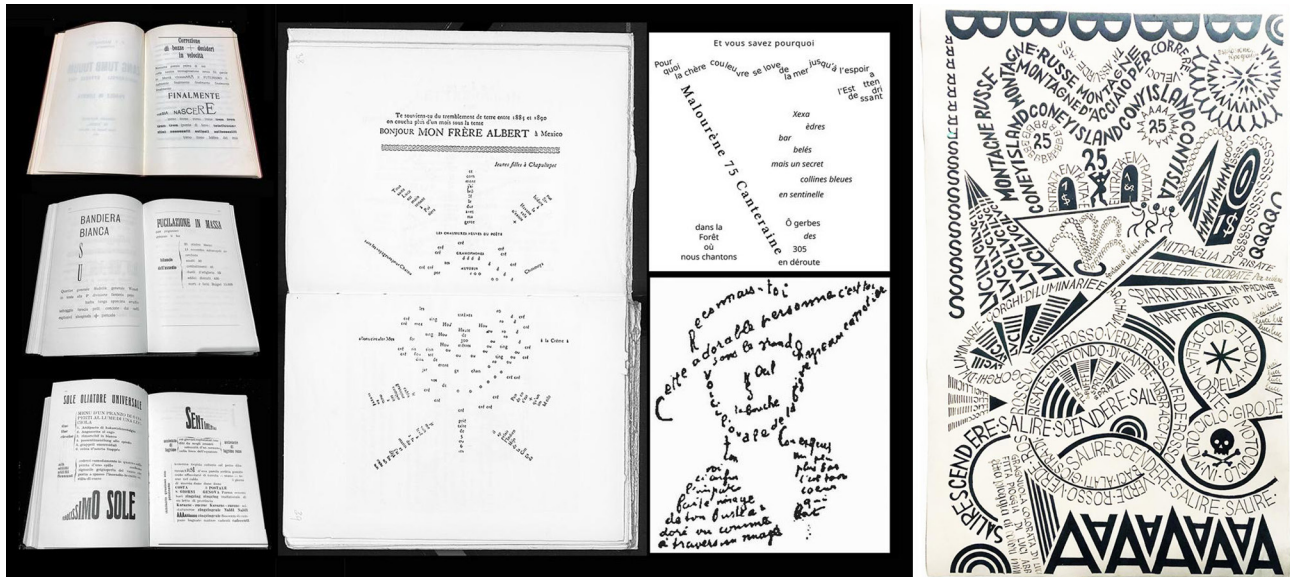


Fig. 1. Pages from Zum Tang Bum Bum (Filippo Tommaso Marinetti 2010) and calligrammi (Apollinaire); Fortunato Depero, Lunapark, drawing exhibited at Mart (2021, photo by the authors).

glorie, prodotti e arte del passato e del presente.
stile futurista - precursori - plagiari

ANSALDO - FIAT - MARCHETTI - CAPRONI
- ITALA - LANCIA - ISOTTA FRASCHINI -
ALFA ROMEO - BIANCHI ecc. non sono can-

Tarte del passato, è bene ripeterlo per la milionesima volta, servi ad esaltare il passato; lo stile classico ed arcaico del passato, servi per glorificare la vita di allora—
lo splendore nostro, le glorie nostre, gli uomini nostri, i prodotti nostri, hanno bisogno di un'arte nuova altrettanto splendente, altrettanto meccanica e veloce, esaltatrice della dinamica, della pratica, della luce, delle materie nostre—
anche l'arte deve marciare di pari passo all'industria, alla scienza, alla politica, alla moda del tempo, glorificandole—
tale arte glorificatrice venne iniziata dal futurismo e dall'arte pubblicitaria—

W GLI ARTISTI CREATORI
GLI INDUSTRIALI
E I PRODUTTORI

un solo industriale è più utile all'arte moderna
ed alla nazione che 100 critici, che 1000 inutili
esecutivi.

i futuristi furono i primi pittori, poeti ed architetti che esaltarono con la loro arte l'opera moderna -
dipinsero automobili in velocità -
dipinsero lampade scoppianti di luce -
dipinsero locomotive sballanti e ciclisti veloci -
i futuristi stilizzarono le loro composizioni con uno stile violentemente colorato; con una plastica riassuntiva e geometrica moltiplicarono e scomposero i ritmi degli oggetti e dei paesaggi per accrescere la dinamicità e per rendere effi-

per esempio: all'esposizione mondiale d'arte de-

anche le vicine della maggior via di lusso del mondo, cioè della quinta *avenue* di new-york. sono la prima e la più grande opera di architettura costruttiva dinamica e collettiva: il "decentralismo" espresso con i più vari materiali: legumi, metalli, panni, velluti, seta, cartonnage, papi, dolciumi, sugari, vetri, scatole, stoffe, stoffe di fiori, paesaggi di crevette, foreste, e monumenti di matite, tralci di cappelli, borchie e villaggi di parafumi, cavalcate di generi alimentari - sono plastici in argentea e ora, sui quali siiedono, e si stanno in piedi, impellicciati, manichini di ebanoo con perle e collane lussuose - la piuma colorata di librerie che collano futuristicamente - anche gli sfondi di queste vetrine superbe ed incommensurabili sono dipinti con uno stile nettamente dinamico - sono alberi, sono nuvole, sono marine astratte:

полностью, а не по частям.



0 0 0

Rhetorical figures, effective in enriching prose and poetry, disarm skepticism toward commercial content. Their graphic transposition preserves recognizable forms even in the absence of verbal text, although the latter helps reduce interpretative ambiguity. The visual version distills both the immediacy of the image and the reasoning behind it. Rhetorical devices invite non-canonical connections, sparking playful engagement and adding interest to the message or product [Rossi et al. 2022]. Commercial rhetoric merges creativity and technique into effective formulas that integrate word and image through the sensory channels activated by 20th century media. Drawing was soon accompanied by photography, and then by sound and cinematic motion. The 20th century witnessed the rise of advertising graphics through the diversification of visual communication tools and techniques. The current century, marked by digital acceleration, demands faster and more intuitive communication, which requires a reconsideration of the word-image relationship. Digitalization is altering the codes of language through a synesthetic fusion of stimuli conveyed by images, and advertising, the soul of commerce [2], demonstrates the persuasive power of visual communication.

In the early decades of the twentieth century, Olivetti's advertising anticipated communication strategies that are still relevant today. Using visual rhetorical figures constructed from geometric shapes, abstract compositions, or bold photographic images accompanied by incisive slogans, its posters conveyed complex messages that went beyond simple product promotion; they synthesized a cultural, aesthetic, and philosophical vision in an emotional message, situating Olivetti within contemporary cultural movements. The communication campaigns developed over a fairly long period [3] can be read as episodes in a broader narrative reflecting the factory and its values (*ethos*): responsibility for socio-cultural transformation, the relationship between production and territory, the valorisation of history as a cultural foundation for the future, an awareness of art and culture in their many forms, trust in technological progress, and the quality of industrial production are just some of the messages that intellectuals, artists, and designers [4] conveyed through images of products, projects, and buildings.

As early as the 1912 poster commissioned by Camillo Olivetti for the first *M1* typewriter, there is a clear intent to present innovation not as a break with the past, but, through metonymy, to affirm the possibility of realizing

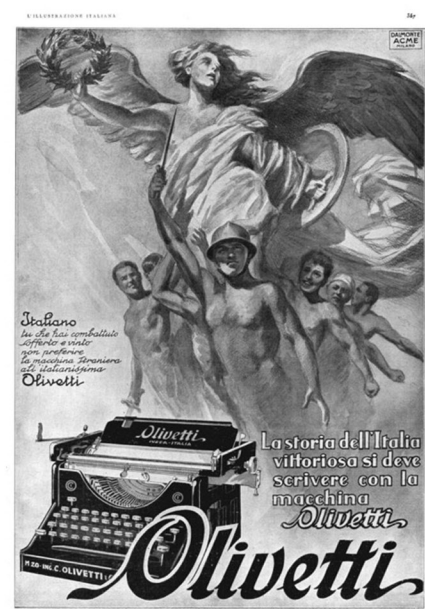


Fig. 3. Manifesto M1 by Teodoro Wolf Ferrari, 1912 (Polano, Santerno, p.12); 1929 advertisements by Dalmonte Acme for the M20 from L'illustrazione italiana.

Fig. 4. 1923 manifesto for the M20 by Manlio and Erminio Pirovano (<<http://www.san.beniculturali.it/web/san/dettaglio-oggetto-digitale?pid=san.di.SAN:IMG-00002911>>); advertisement by F. Gibelli published in L'illustrazione Italiana in 1929, curated by the Olivetti Advertising Office; advertisements in L'illustrazione Italiana, 1929 (AASO).



Fig. 5. Advertisement for the M20 published in L'illustrazione Italiana (1920s); advertising posters designed in 1926 and 1928 by Marcello Dudovich (source: AASO). Poster for the MPI from 1935 by Xanti and advertisements published in L'illustrazione Italiana in the 1930s (source: AASO).

what has already happened: the foundation of a new language [Conte 2016]. The advertising testimonial, Dante Alighieri, father of the Italian language, stands as a guarantor of the typewriter's quality.

Through this improbable meeting, the artist Teodoro Wolf Ferrari narrates the emergence of an event: just as the poet wrote in the vernacular, Olivetti, with a typewriter that combines mechanical clarity, beauty, and practicality, seeks to free the object and its communication from the ornamentation that had prevailed until then [Fiorentino 2014].

Similar in intent and structure are the posters for the M20 which, consistent with the historical context, emphasize Italian identity and product solidity with figures of past literary icons positioned behind the image of the product and texts that exalt nationalism (fig. 3). During this period, advertising also emphasized technical qualities such as reliability, efficiency, ease of use, and technological superiority through synesthetic and hyperbolic visual and literary devices. Manlio Pirovano's 1923 advertisement references the historical avant-garde with the slogan "la Rapidissima" and an image of the typewriter on train tracks, outrunning the train, emphasizing through visual parallelism the speed and modernity of its technology. The composition of the elements, the perspective used, and the diagonal cut of the tracks all accentuate and convey movement and speed as a value (fig. 4).

Beyond technological innovation, Olivetti imagery addressed the social issue of women's emancipation and presence in the workplace. The relevance of the message is reflected in the M20 posters depicting typists at work [5]. The machine is part of their daily lives; the message of efficiency is entrusted to the joyful expressions of the women using it, or to the visual metaphor that elevates it to an almost divine object, admired by a secretary dreaming of a better future (fig. 5).

From the 1930s onward [6], the very concept of the typewriter shifted with the launch of the world's first portable model, offering a product that conveyed meanings of modernity, simplicity, and functionality to a broader and more diverse audience. Olivetti's communication evolved in both technique and message, becoming a means to tell stories, influence and reflect socio-cultural change, and shape how people perceive the world through the dynamism and modernity of technology at the service of humanity.

Images and graphic compositions built from objects belonging to shared culture began to replace slogans, which gradually disappeared, leaving only the product or company name.



Fig. 6. From top: "Una campagna pubblicitaria" collection of posters for Studio 42 artboard no. 16 and 6; "La rosa nel calamaio" (1939) by Nivola and Pintori from an idea by Sinisgalli; ad for the Lexikon 80 E by Pintori from Graphis 1954–55; poster by Nizzoli for the Lexikon (1953); flyer for the Lettera 22 by E. Bonfante (1953); magazine ads for the Lettera 22 from May and September 1954, and a 1950 poster, all by Pintori.

At the same time, the graphics and advertising department expanded its scope beyond posters and brochures to include typefaces, urban planning diagrams, showroom design, and all elements contributing to the construction of the company's image and success [Labò 1957].

Products like the *MP1* and, later, the *Lettera 22* were aimed at a new kind of clientele, designed for domestic spaces or alternative workplaces, reflecting rapid societal changes. The launch of the *MP1* returned to the theme of the female figure, no longer through the surprise and gratitude expressed by secretaries, but through the image of a sophisticated, modern woman wearing a hat, a metaphor for the object's portability. Promotional brochures emphasized its elegance, its compatibility with modern living rooms, or its lightness, making it usable during holidays, on trips, or even at the edge of tennis courts, where a woman is engaged in a live radio broadcast (fig. 5).

Elegance is often emphasised by the juxtaposition of industrial products with works of art or objects, which, emptied of their function, such as the inkwell that becomes a flower stand (fig. 6), convey the message that innovation and beauty have their roots in the past, but are at the service of today's man's needs because "la pubblicità dev'essere diversamente da quella americana, arte" [Vittorini 1939, p.V].

Lightness, portability, and technological simplification were the technical hallmarks of Olivetti products in the 1950s, supported by a graphic style based on the use of flat primary colors. The design of posters expressed motion, sound, and lightness through stylized and immediate imagery: a blue paper airplane carrying a *Lettera 22*, colored lines jumping from key to key simulating the tap of fingers, or a typewriter fitting in a jacket pocket.

The bird designed by Nizzoli for the Lexicon 80, recalling a drawing by Paul Klee with thick black lines echoing the hammers striking the page, seems to fly out of the machine, heralding something new. It symbolizes a colourful machine with innovative forms, emphasized by the three-quarter framing used in the poster, lightweight and easy to use. High technical performance paired with lightness is also the focus of another famous 1955 Pintori poster: in this case, it is a ball bouncing on the keys that visually conveys the idea of a nimble, fast machine with customizable typing, so delicate that even a small ball can activate it (fig. 7).

The relationship with the past and with history returns cyclically in Olivetti advertising, particularly when new technological innovations are introduced. Visual rhetoric

aims to convey a positive image of progress, representing it as a tool to improve human life and validating its origins through concrete references. The Rosetta Stone, the Phai-tos Disc, and symbolic-numeric inscriptions from ancient texts are key milestones in the history of human communication. Used by Pintori as an extended metaphor, they elevate Olivetti products to objects of cultural and historical significance, not mere office tools. Just as writing has always marked the progress of civilization, Olivetti represents the avant-garde of modern communication (fig. 8).

Olivetti's commercial strategy extended well beyond advertising into the design of monobrand retail spaces, which became essential environments for expressing the company's identity. These points of sale were not merely commercial spaces but places capable of conveying the company's philosophy, blending technology, functionality, beauty, and culture [Persico 1935; Fornari, Turrini 2022]. Each store, rigorously designed with attention to the socio-cultural context, became an integral part of brand storytelling, highlighting the innovative character of its products through architecture and design. The adopted solutions, though very different, shared a focus on the interface between customer and product: the shop window. The integration of industrial products and works of art, the periodic transformation of displays anticipated as cultural events, the emphasis on user-product relationships, and the involvement of internationally renowned designers constituted a revolution in marketing. This was a new way of perceiving a brand, associating it with values that went beyond the product itself or its use.

The Olivetti experience embodies a holistic conception of corporate communication, documenting the role of imagery in visual language and underscoring the centrality of advertising in the subtle relationship between evolving languages and the media that convey them.

Advertising and rhetoric: evolution in the digital age – new forms and future perspectives

With the rise of contemporary advertising and the emergence of mass media, the landscape and methods of communication have undergone a significant evolution toward an increasingly visual dimension. Within this context, the interaction between images and words has given rise to an integrated mode of communication, where images, thanks to their immediacy and evocative power, are paired

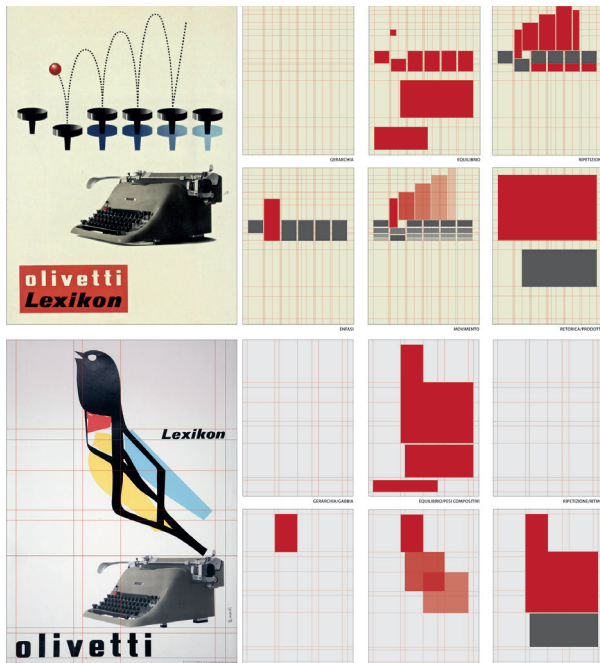


Fig. 7. Analysis of the graphic and verbal/visual structure of the advertisements: Lexikon 80 E by Pintori (1954–55), and the Lexikon poster by Nizzoli (1953) (designed by the author).



Fig. 8. Posters by G. Pintori for the Lexikon 80 (1953), Studio 44 (1952), and Summa 15, a negative-balance calculator (1949–50) (Polano, Santerno 2022, pp. 131, 123, 92); poster for electric machines (1953) (Fiorentino 2014, p. 292). Graphic analysis by the author.



Fig. 9. True Color campaign by Faber Castell (Serviceplan 2010), rhetorical figures associated through color with different semantic spheres.

with verbal language, which provides precision and clarity. This balance between the suggestive force of imagery and the structured nature of language has led to the development of a particularly persuasive form of communication, which has found widespread application in advertising. Within these dynamics, rhetorical figures inherited from classical tradition are reinterpreted to give life to a verbo-visual rhetoric, a form of persuasive communication based on the interplay between words and images. This approach enhances the distinctive strengths of both expressive tools, combining linguistic clarity with the evocative potential of the visual. The verbo-visual rhetoric thus emerges as a complex communicative strategy, in which the synergistic interaction of text and image produces a message more powerful and persuasive than either mode could achieve on its own (fig. 9).

In advertising, visual rhetorical figures play a central role in the construction of meaning. Using such figures, complex concepts can be translated into easily recognizable images, thereby facilitating the audience's understanding of the message. Originally the use of images in communication aimed to overcome illiteracy, serving as distinctive signs for shops or as tools for both sacred and secular storytelling. However, the complexity of contemporary communication has radically transformed the role of images, elevating them to central instruments in a context marked by information saturation. Today's communicators face two interconnected challenges: capturing the attention of an audience overwhelmed by visual stimuli and achieving both emotional and cognitive engagement. Psychological studies have shown that human attention is a limited resource [Kahneman 1973], and in a media environment

saturated with information, competition for this resource has become increasingly intense. Cognitive load theory [Sweller 1988] posits that the human mind can only process a limited amount of information at once. In this context, the image becomes a powerful tool for reducing cognitive load and optimizing message transmission. Visual content, processed in parallel with text and drawing on established mental schemas, facilitates understanding and memory retention, enabling faster and more intuitive information processing. Thanks to their immediacy and their ability to evoke emotional responses, visual elements are especially suited to meet the demands of a society immersed in an overstimulating informational environment. Within this scenario, advertising has adapted by employing visual rhetorical strategies to attract interest and increase the likelihood that a product will be remembered. Rhetorical figures, whether verbal or visual, require active participation from the viewer, who must invest time and cognitive effort to decode the message. This process contains a playful element: the consumer, in solving the 'puzzle' of the advertisement, experiences personal satisfaction, which further reinforces memory of both the product and its message. This mechanism is rooted in a cognitive dynamic whereby a greater investment of mental resources in the decoding process increases the probability that the content will be retained in memory. For these reasons, images continue to serve as essential tools in persuasive communication today, capable of conveying information quickly and recognizably. Verbo-visual rhetoric thus stands as a key paradigm in the study of contemporary communicative dynamics—particularly in the field of advertising, where the effectiveness of a message increasingly depends on the strategic, coherent, and above all innovative balance between visual and verbal elements. The advent of the digital age has marked a crucial evolutionary phase for rhetorical figures, particularly evident in social media environments, where the need for concise and impactful messaging has fostered the emergence of new expressive forms. The brevity imposed by social platforms, combined with the speed at which messages are consumed, has led to a deep transformation in rhetorical techniques, now finding new incarnations in visual tools such as emojis and memes. These forms of condensed visual communication, though structurally simple, are capable of conveying complex and often emotional

	PREZZI COMMOVENTI TUTTI I GIORNI	
	LA NOSTRA FELICITÀ È SEMPRE DI QUALITÀ	
	CONVENIENZA A TUTTE LE ORE, QUESTO È AMORE	
	LA QUALITÀ CHE TI EMOZIONA	
EMOJI	COPY	PARAFRASI VISIVA

Fig. 10. Esselunga campaign (Armando Testa, 2017): following the structure of earlier campaigns, the personification of food products paraphrases emojis, independent of the copy.

meanings. Rooted in the cultural and social context of the present, they represent an evolution of traditional visual rhetorical figures, reinterpreted for a global, fast-paced consumption environment. *Emojis*, for instance, can be considered true rhetorical figures in visual form, used to express emotions and nuances of meaning with a speed that verbal language cannot always achieve (figs. 10, 11). The analysed campaigns further demonstrate that *emojis* often function as complete communication tools, rendering textual elements unnecessary to deliver the message. *Memes* represent an even more complex form of visual rhetoric, as they combine images, text, and cultural context into a play of intertextual references – offering social or satirical commentary in a format that is both synthetic and impactful (fig. 12). However, *memes* carry an inherent constraint: to decode the message effectively and fully grasp its meaning, one must recognize the cultural reference or origin from which the meme derives.

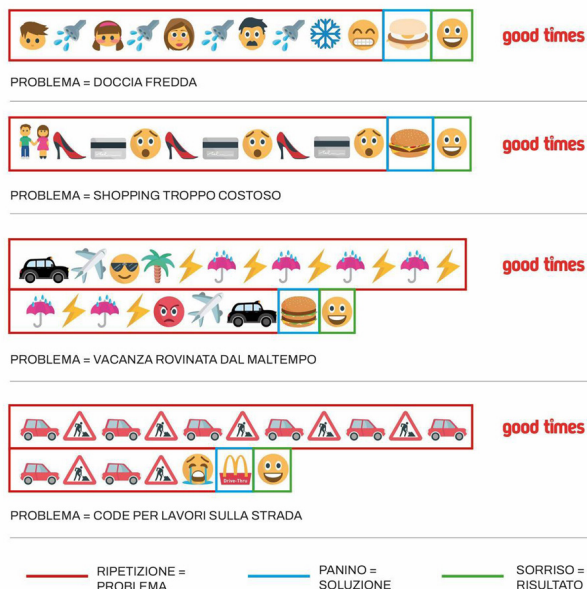


Fig. 11. McDonald's campaign (Leo Burnett, 2015); sequences of ideograms/emojis convey a message whose meaning is decodable independently of the copy.

The speed at which these contents must communicate is crucial in an environment defined by a continuous and fragmented flow of information. For this reason, modern rhetoric in digital contexts relies on highly condensed language and strongly symbolic images to maximize persuasive impact in minimal time.

This strategic use of rhetoric across digital platforms not only echoes classical persuasive techniques but also adapts them to the new cognitive and behavioural dynamics of the digital audience. Rhetorical figures, though rooted in classical tradition, demonstrate an extraordinary capacity to evolve and renew themselves in response to the shifting communicative needs of contemporary society.

In the digital age –and beyond– their role will not only persist but expand, integrating new technologies and expressive forms to continuously strengthen and enrich persuasive language in all its manifestations.



Fig. 12. Barilla campaign for lemon pesto (Milan metro in 2023); the image references a meme from a viral video set in a market in Barletta (2020).

Conclusions

Technological evolution has transformed communication tools, introducing new media that have accelerated the transformation and hybridization of languages. Visual languages, better suited to the speed demanded by new media, which shift primary attention from words to images, have begun to adopt elements typical of digital communication (such as *emoji*) and/or rework social rhetorical forms (like *memes*) within 'metropolitan' advertising formats such as billboards and posters.

Visual codes adapt to the platforms and rhythms of digital communication, requiring verbo-visual message structures to be reconfigured in response to accelerated and increasingly 'private' image consumption. Commercial communication, which originally codified visual language, now enhances the expressiveness of everyday visual practices

through new rhetorical forms. These offer valuable insights for other domains, such as technical communication and scientific dissemination, which can borrow and adapt advertising's engagement strategies.

The same codes can also be used to develop new languages for digital shop windows, potentially integrating multimodal sensory platforms. The commercial communication of the last century, particularly the visual rhetoric seen in the design of Olivetti's store displays around the world, remains a meaningful reference point in understanding the relationship between visual language and contemporary culture.

This research acknowledges the continuing relevance of the static image in print advertising as a foundational model for today's communication channels. These channels can transfer the efficacy of verbo-visual synthesis to other contexts, beginning with the semantic and syntactic 'structure' of the image. The focus is on the visual transposition of classical rhetorical figures, taking cues from advertising's

verbo-visual strategies, which were among the first to apply a scientific approach to the rhetorical use of imagery. The static image of the printed ad serves as a reference for identifying effective communicative formulas that may be applied in cultural, educational, and entertainment contexts, as well as in adapting project representation to the formats of new digital media.

More recent and still-unpublished research into prompt-to-image generative applications underscores the rhetorical weight carried by visual structures in the communicative power of advertising imagery. These experiments suggest a valuable foundation for developing new rhetorical formulas across cultural, didactic, and ludic domains. *Mutatis mutandis*, the gradual adaptation of rhetorical codes, first across different commercial media, and then into digital environments, draws attention to the growing importance of engaging with artificial intelligence tools, which are increasingly shaped by the structures and rules of natural language.

Credits

Although the paper was jointly conceived, Michela Rossi is the author of the section 'Words and Images, Language Codes and Verbo-Visual Rhetoric' and the related images; Sara Conte is the author of the section 'Olivetti Communication: Between Aesthetics, Innovation, and Culture'

and the related images; Greta Millino authored the section 'Advertising and Rhetoric: Evolution in the Digital Age – New Forms and Future Perspectives' and the related images. 'Introduction' and 'Conclusions' were written jointly.

Notes

[1] Enciclopedia Garzanti di Filosofia, 1981, under the corresponding entry.

[2] The statement is attributed to Henry Ford, a major innovator of the twentieth-century industrial production system.

[3] The company's activity spanned from 1908 to 1999, the year in which Olivetti's profile changed significantly in terms of operations, organization, and corporate structure.

[4] In 1928, Servizio Pubblicità (Advertising Department) was introduced, initially directed by Adriano Olivetti and formally established in 1931. This office replaced external agencies and freelance artists who had previously created posters and advertisements. It was initially headed

by Renato Zveteremich, and included designers and intellectuals such as Xanti Schawinsky, Edoardo Persico, Marcello Nizzoli, Luigi Figini, Gino Pollini, Bruno Munari, Luigi Veronesi, Giovanni Pintori, et al.

[5] In the early twentieth century, thanks in part to the introduction of typewriters, the typist profession became one of the few viable paths to economic emancipation for Italian women. In 1923, a Royal Decree introduced typing as a subject in technical schools, and in 1931, it was extended to schools with a commercial focus.

[6] The production shift coincided with Adriano Olivetti's increasing role within the family company, becoming general manager in 1932 and assuming the position of president in 1938.

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Curves and Colors: A Journey into Hundertwasser's Visual Language

Cristiana Bartolomei, Caterina Morganti

Abstract

This paper offers a critical and original reading of Friedensreich Hundertwasser's work, focusing on the continuity between his visual language in painting and architecture. Moving beyond symbolic or stylistic interpretations, the analysis introduces the concept of atmospheric drawing: a perceptual grammar in which color, line, and texture do not merely represent but generate multisensory and affective environments. Hundertwasser's graphic signs—spirals, organic curves, chromatic contrasts—are interpreted as compositional devices that activate emotional responses and structure space, both pictorial and architectural. By comparing specific paintings such as Irinaland over the Balkans with buildings like the Hundertwasserhaus or the Waldspirale, the article demonstrates how drawing operates as a generative process that redefines the relationship between humans, architecture, and nature. The concept of the 'third skin' is reexamined as a sensory interface, mediating the boundaries between interiority and landscape. Finally, the paper proposes the idea of visual ecology as a framework for understanding drawing as a critical and environmental practice. In doing so, it positions Hundertwasser's work as a living laboratory for rethinking the role of drawing, not as a static representation of reality, but as a creative tool for shaping how we perceive, inhabit, and imagine the world.

Keywords: Hundertwasser, visual semiotics, drawing, graphic language, colors.

Introduction

In the context of reflecting on drawing as a language, the work of Friedensreich Hundertwasser represents an exemplary case of how the graphic sign can transcend its mere representational function to become a complex communicative system. This perspective invites us to consider drawing not only as a technical or aesthetic tool, but as a form of visual language capable of conveying profound meanings through an articulated semiotic structure [Derrida 1978]. Hundertwasser, a multifaceted and visionary figure, developed a unique approach to drawing, using it not only to represent forms but to convey philosophical, ecological, and aesthetic values that challenge the conventions of modernity and open new perspectives for dialogue between art, nature, and society. Hundertwasser's work is positioned at

the crossroads of multiple disciplines, spanning from painting and architecture to design [Barak 2017] (fig. 1). At the center of this multifaceted approach, drawing emerges as a unifying element, a visual language capable of connecting signs, symbols, and concepts in a coherent and original expressive system. His visual alphabet is distinguished by the predominant use of spirals, curves, and organic shapes, elements that subvert the rigidity of geometry and refer to a vision of the world as cyclical and ever evolving. These signs are not mere decorative elements, but genuine vehicles of meaning that reveal a deep concern for the dynamics between humanity and nature, inviting a reconsideration of the relationship between the individual, the environment, and the built world.



Fig. 1. F. Hundertwasser, *The 30 Days Fax Painting*, 1992-1994, mixed media, 1510 mm × 1300 mm (collection KunstHausWien, Vienna), and Hundertwasser photograph taken by Gerhard Krömer (Title: Hundertwasser 1985 Gerhard, Format: jpeg, 1973 px x 2067 px, collection Hundertwasser Archiv, Vienna) (composition by the authors).

As an illustrative example, one can refer to the painting *The Houses Are Hanging Underneath the Meadows* (1972), in which spirals proliferate within a dense chromatic field, enriched by tactile textures that evoke a sense of continuous, pulsating movement. The colors, sulfurous yellows, intense greens, and saturated reds, function not merely as expressive tools, but as sensory devices that engage the viewer on a visceral level. The color planes are far from flat; they are animated by tonal variations and juxtapositions that suggest the stratification of matter and the vitality of biological life. These pictorial elements find a clear architectural counterpart in the facade of the *Hundertwasserhaus*, where the undulating surface is accentuated by glossy ceramic cladding and chromatic segmentation that deliberately rejects symmetry.

This article aims to analyze Hundertwasser's work through three main directions: its semiotic, aesthetic, and ecological significance. From a semiotic perspective, we will explore how drawing functions as an organized system of signs, capable of communicating complex meanings through articulated visual grammar. On an aesthetic level, the use of

color and organic forms will be investigated, as they evoke an intense emotional and sensory response, challenging the conventions of rationalist modernity and celebrating the diversity and irregularity of nature.

Finally, the analysis will focus on the ecological dimension of his visual language, highlighting how drawing goes beyond a representational function to offer a critique of urban rationalization and propose a vision of harmony between humanity and the environment. Hundertwasser's drawing reveals itself as an integrated and polysemic language, where semiotics [Eco 1976], aesthetics, and ecology [Domazet, Nadić 2022, pp. 1003-1031] merge to offer an alternative and deeply meaningful vision.

The research has focused on an in-depth analysis of the material preserved at the Hundertwasser Archive in Vienna. This archive constitutes a comprehensive collection of writings, original drawings, and print clippings related to Hundertwasser's work, most of which have been published in collections such as the one curated by Schmied and Fuerst in 2003.

The investigation centered on Hundertwasser's texts and the related press articles, with particular attention to four

recurring themes in his production: ecology, style and architectural process, the active role of residents, and the concept of utopia, often defined by Hundertwasser as 'paradise'.

Hundertwasser and visual language

The visual language of Friedensreich Hundertwasser presents itself as a complex and deeply symbolic system, where drawing plays a central role not only as a form of representation but as a multifaceted and polysemous means of communication. Hundertwasser's visual alphabet, as we've already introduced, is characterized by the prevalence of spirals, curves, and organic shapes, elements that deliberately oppose the rigidity of geometric forms and the coldness of modernist structures [Hundertwasser 1986] (fig. 2). The spiral occupies a central place in his work, representing the continuous flow of life and the cyclical movement of nature. This form, which appears in many of his pieces, becomes an emblematic sign of the connection between the individual and the cosmos, suggesting a process of evolution that embraces both personal growth and universal interdependence.

This reading moves beyond symbolic interpretation to consider the spiral as a spatial operator: not a sign to decode, but a visual engine that expands the pictorial field, generating rhythms, tensions, and directions that guide the viewer's perceptive experience. In this sense, Hundertwasser's use of spirals reveals not only the cosmological intent, but also a proto-architectural logic that anticipates the morphogenetic processes of his built works.

Similarly, the curves and undulating lines evoke the fluidity of water and natural rhythms, emphasizing an aesthetic grounded in respect for and celebration of natural life. Hundertwasser's canvases are self-contained universes, filled with details that interweave and overlap [Restany 2002].

The artist covers every square inch, often starting with humble materials such as packaging paper, and completing the irregular edges with a black background that creates a sharp contrast. It is said that he works from the edges toward the center, in a process that feels almost automatic, but which also reveals great mastery. The images emerging from his paintings are rich with suggestions and hidden meanings. Titles like *The Garden of Happy Dead*, *The Yellow Tear*, *The Escape of the Dalai Lama*, or *The Tower of Babel Pierces the Sun* reveal a deep sensitivity and an acute awareness of the world around him. Hundertwasser



Fig. 2. The theme of the spiral in the architecture and painting of Hundertwasser (elaboration by the authors).

Fig. 3. A comparison between the rigidity that characterizes Bauhaus and the organic forms of Hundertwasser (elaboration by the authors).

describes himself as a “literary and decorative painter” [Hundertwasser 1956], harmoniously combining visual narration with formal beauty. These graphic elements, far from being mere decoration, constitute complex semiotic signs with layered meanings. Using a semiotic approach, we can analyze them according to the dimensions of syntax, semantics, and pragmatics. At the syntactic level, Hundertwasser’s compositions stand out for their fluid, non-linear structure. The signs combine into configurations that evoke the harmony and complexity of nature, rejecting the rigid and standardized rules of modernity [Frascina, Harrison 1983] (fig. 3).

The semantics of his work manifests through the intrinsic symbolic charge of each sign: the spiral represents infinity and renewal, the curves embody dynamism and vitality, while the vibrant colors amplify the symbolic message, conveying emotions and stimulating imagination [Jeong 2018, pp. 159-178]. This visual grammar is not just a formal matter but carries a deep critique of modernist rationality and the detachment of contemporary humans from nature. Hundertwasser uses drawing as a symbolic language to express a worldview in which humanity is an integral part of a living, interconnected ecosystem. His works become a denunciation of alienating urbanization and standardized planning, proposing in their place a model of harmonious coexistence between humanity and the environment. In this context, drawing doesn’t merely represent reality but reinterprets it, offering a new perspective on how art can stimulate ecological awareness and critical reflection on our role in the world. From a semiotic standpoint, Hundertwasser’s drawings represent a dynamic semiotics [Aroni 2023, pp. 277-296], in which every visual element is charged with complex and interconnected meanings. His works demonstrate how the graphic sign can transform into a powerful vehicle for ideas, emotions, and concepts. Through a process of visual coding, Hundertwasser creates a symbolic system that not only communicates but invites the observer to actively participate in the construction of meaning. This participation occurs not only on an intellectual level but also on a sensory and emotional one, making the drawing an immersive and multifaceted experience. The strength of Hundertwasser’s visual language lies in its ability to challenge conventions and propose innovative alternatives. Through the transformation of the graphic sign into a rich and articulated meaning, Hundertwasser redefines the role of drawing, making it a medium capable of addressing contemporary challenges and proposing new avenues for connection between humanity, nature, and culture.

The fluid grammar of drawing

Friedensreich Hundertwasser’s drawing stands out for its ability to break from traditional geometric conventions. His wavy, sinuous lines deliberately avoid rigid straight structures, embracing a natural dynamism that rejects static, artificial forms. Hundertwasser’s visual grammar is not simply decorative but a dynamic, fluid process that evolves organically, much like nature itself. His works result from a design process where classical geometry has no place, replaced by forms that adapt and respond to principles of growth, evolution, and transformation [Hundertwasser 2005]. These forms follow no rigid logic but flow with the natural cycles of life. At first glance, Hundertwasser’s works seem like abstract compositions, a kaleidoscope of colors dominated by squares and spirals. The insistent use of color as a structural element is also evident in works such as *Irinaland over the Balkans* (1969), where the pictorial surfaces are broken down into overlapping chromatic modules that evoke imaginary landscapes and cities. Each color carries a symbolic function: gold represents utopia, blue the vital flow, and an expansive red energy. Green, which dominates the lower portion of the painting, suggests the latent presence of nature, even within structures that appear artificial. Color acts as a constructive element, delineating areas of space not through sharp boundaries, but through layers and transparencies that render the composition unstable and vibrant. The dense, tactile, almost stratified texture of the painting contributes to a sensory perception of the surface. The entire work unfolds as an emotional map, where color, line, and material create an autonomous universe governed by its own visual logic.

Upon closer inspection, these squares reveal windows and rooftops, while circular shapes become streets, rivers, or labyrinths.

Trees, boats, fields, and water also emerge. However, these shapes are not attempts at realistic representation but symbols more akin to childlike drawings or map symbols. Their precise identity is secondary; they represent a deeper search for meaning. Hundertwasser’s true obsession lies not in painting houses or cities but in his love for color and his impulse to create lines and fill blank spaces with vibrant hues.

This fluidity extends into his architecture, where every building is conceived as a living organism, constantly evolving and reflecting the interconnectedness of humanity,

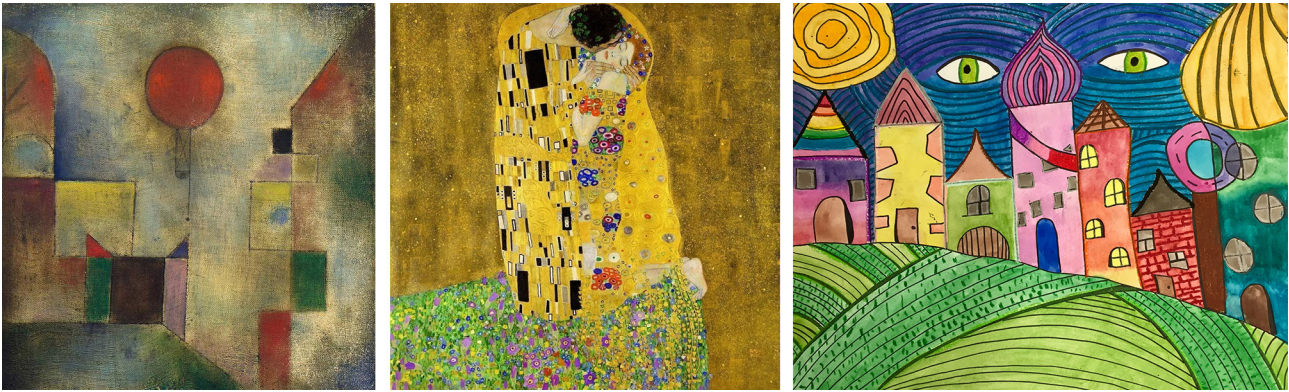


Fig. 4. A comparative analysis of the artistic works of Klee, Klimt, and Hundertwasser (composition by the authors).

nature, and space. The continuity between drawing and architecture does not rely on formal repetition, but on a shared logic of process and transformation. What emerges is a form of diagrammatic thinking, in which the act of drawing becomes a projective gesture: it establishes relationships between forces visual, emotional, material that are then spatially translated into built form.

Hundertwasser's art rejects the static, functionalist visions of modernity, advocating for designs that celebrate spontaneity, naturalness, and unpredictability. His approach is a departure from rationalist architecture, which focused on clean, definable geometric shapes, as seen in the work of Le Corbusier and the Modernist Movement [Heller, Pettit 2004]. Hundertwasser distances himself from this reductionist view, embracing the diversity and unpredictability of forms. His architecture is not meant to reflect a universal ideal of order and functionality but to blend with the landscape, adapt to its features, and foster an empathetic relationship with the environment [Margolin 1989]. Hundertwasser opposes the standardization and rationalization of modern architecture, promoting a visual language that seeks to reintegrate nature and its laws into the design process. Through this, he challenges the notions of beauty, order, and functionality that dominated 20th-century architecture [Nesbitt 1996]. His fluid drawing grammar invites us to rethink the role of art in architecture, urging us to view the world with open, sensitive eyes that are in tune with nature. Hundertwasser's artistic influences are

varied, particularly from the Austrian heritage of decorative motifs and sinuous lines, notably seen in the works of Klimt and Schiele. Klimt's *The Kiss* demonstrates how Hundertwasser absorbed and reworked the curving lines and rhythms of the Secessionist style. The embrace of the figures in Klimt's work, united by a sinuous outline, anticipates the spirals and organic forms in Hundertwasser's later work. Egon Schiele, Klimt's student, also profoundly influenced Hundertwasser, especially with his depictions of cities, where houses with sloping roofs and empty-eyed windows foreshadowed the dreamlike and melancholic atmospheres in Hundertwasser's paintings. However, it is Paul Klee who provided a deeper influence. Klee's work, which balances abstraction and figuration, poetry and geometry, offered Hundertwasser a model to explore his own fantasies and create a pictorial world rich in symbolism [Gombrich 2004]. Klee's organic shapes, sinuous lines, and vibrant colors helped shape Hundertwasser's approach to art, combining technical precision with poetic imagination. Although Hundertwasser acknowledged his debt to these predecessors, he developed a distinctive style of his own. By merging Klimt's technical perfection with Klee's poetic sensibility, Hundertwasser created a unique visual language that blends formal beauty with profound reflection on humanity's relationship with nature. His vibrant colors, organic shapes, and intricate textures invite the viewer into an introspective journey, discovering an inner world full of mystery and fascination (fig. 4).

Drawing and architecture

Since the 1950s, Hundertwasser has passionately dedicated himself to creating architecture that is deeply human and in harmony with nature. This pursuit led him to develop a personal architectural language, which allowed him to intervene in buildings as a true “architectural doctor” [Hundertwasser 1947]. His style is characterized by undulating forms in floors and walls, which contrast with rigid geometry, rooftops transformed into lush gardens, windows of various shapes, and towers and columns that encourage relaxation, evoking a sense of being embraced by nature. Hundertwasser revolutionized the concept of architecture, elevating it from mere function to artistic and social expression [Chiavoni 2017] (fig. 5).

In this sense, the artist anticipates many contemporary reflections on emotional architecture and sensuous dwelling, in line with the theories of Juhani Pallasmaa. His buildings are not merely spaces to inhabit, but environments to be experienced through all the senses—spaces where the variety of materials, the presence of natural light, and the diversity of forms foster a deep, embodied relationship with the surrounding environment.

Through his wise use of color, he gave buildings a ‘third skin’, an organic and dynamic coating that harmoniously integrates them into their environment (fig. 6).

The ‘third skin’ can be understood as a perceptual membrane: a dynamic threshold that filters and modulates light, color, and texture, reconfiguring the boundary between the private and the collective, the natural and the artificial. This notion resonates with contemporary discourses on embodied architecture and sensory space, positioning Hundertwasser as a forerunner of today’s experiential and affective design strategies.

His theory of the ‘third skin’ is based on the idea that buildings, like living beings, should breathe and evolve over time. In this context, color becomes a key tool in creating organic architecture, capable of stimulating the senses and promoting well-being. His works, such as the *Hundertwasserhaus* in Vienna or the *Waldspirale* in Darmstadt [Kraftl 2009, pp. 111–134], exemplify this approach (fig. 7).

In these buildings, the undulating facades, green rooftops, uniquely shaped windows, and flower-filled balconies create an atmosphere where humans and nature coexist in harmony. In the *Waldspirale*, the façade’s texture alternates between smooth and rough surfaces, treated with earth-toned plasters interrupted by glossy ceramic inserts.



Fig. 5. Colors and shapes in Hundertwasser’s architecture (photo by the authors).

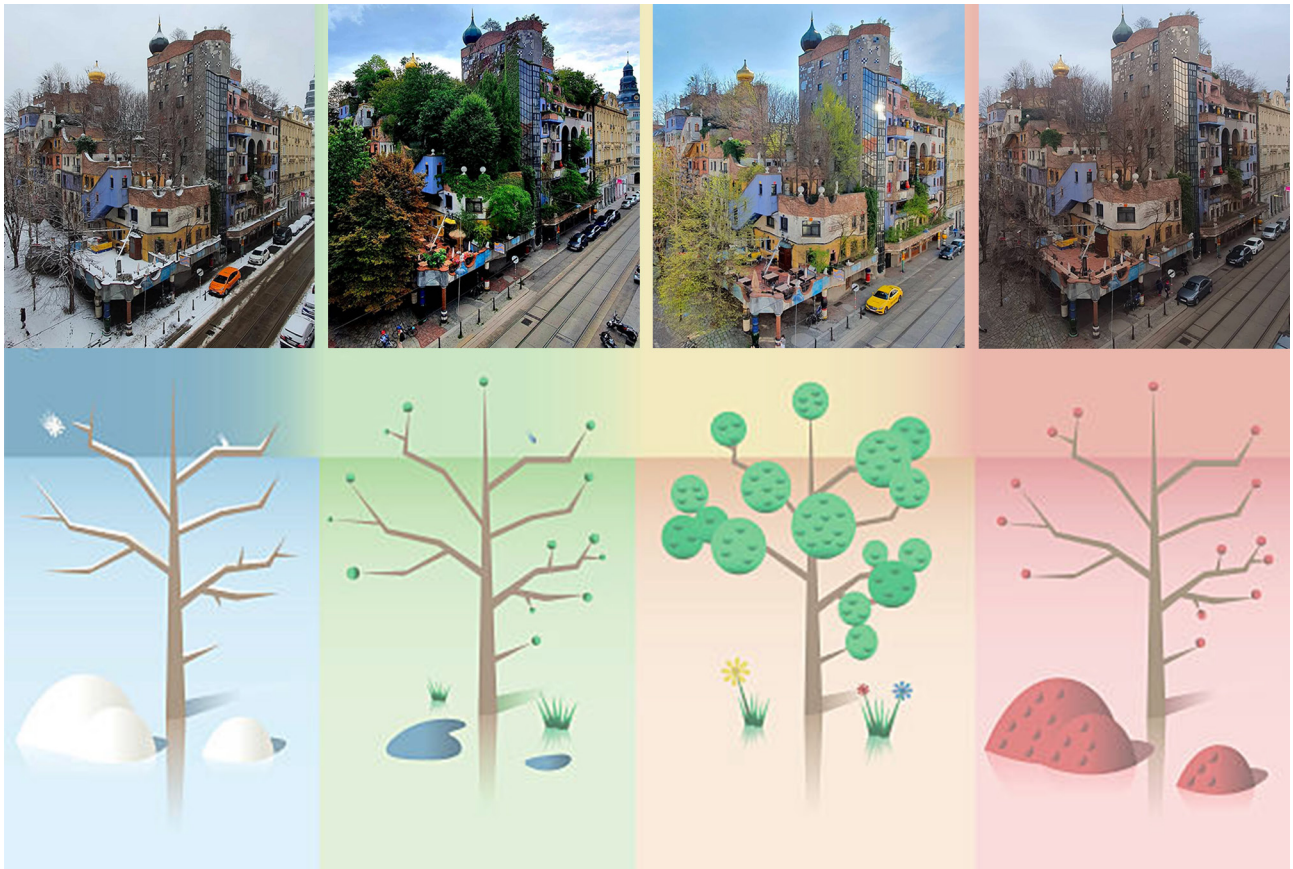
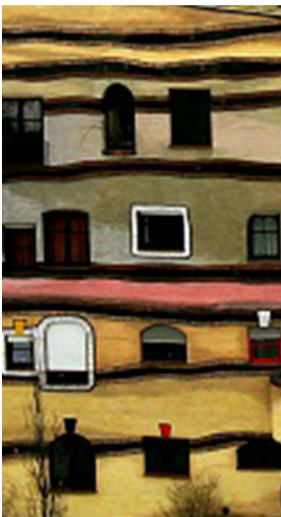
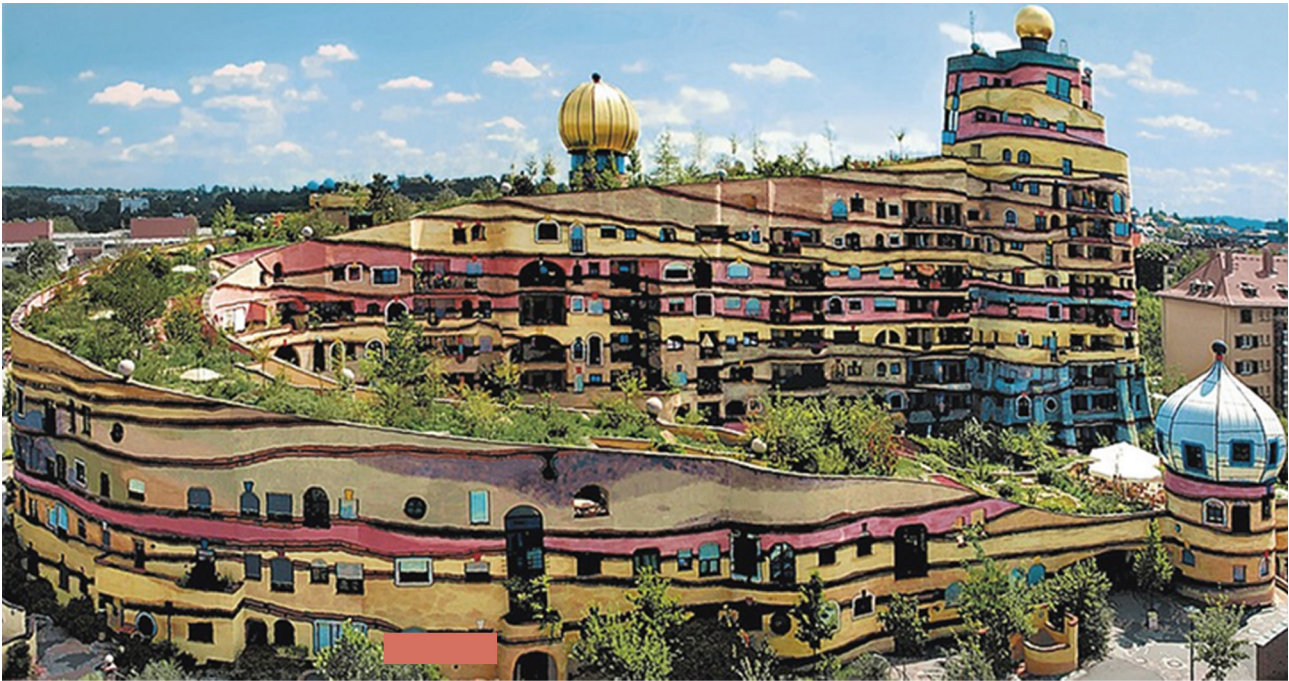


Fig. 6. The theory of the 'third skin': buildings as living beings (elaboration by the authors).



-  Light yellow → Solar Energy: a symbol of vitality and optimism, the light that nourishes life.
-  Ochre → Connection to the earth: a natural color evoking clay, the raw material.
-  Sand beige → Neutrality and breath: a calm background on which nature and art can emerge.
-  Olive green → Integrated vegetation: nature climbing over buildings, a living part of the architecture.
-  Terracotta red → Deep roots: a warm, emotional bond with the soil and tradition.



-  Sand beige → Neutral Base: a harmonious support for more vibrant colors.
-  Warm brown → Living matter: nature as the very fabric of construction.
-  Cream yellow → Diffused light: embracing warmth that fosters well-being.
-  Powder pink → Emotion and delicacy: a visual caress, an opening to feelings.
-  Golden yellow → Spirit and splendor: spirituality shining through matter.

Fig. 7. Color analysis of the Waldspirale in Darmstadt, 2000 (elaboration by the authors).



Fig. 8. The Spittelau Incinerator in Vienna, 1971 (photos by the authors).

These material contrasts create a dynamic, multisensory perception, enhanced by the irregular sequence of openings, niches, and colorful frames. Color, applied as if it were mural painting, does not follow functional logic but acts as an emotional code.

Similarly, the *Kunst Haus Wien*, with its irregular black-and-white checkerboard tiles, glazed ceramic cladding, and the bold yet poetic use of primary colors, illustrates how the architectural surface is conceived as an extension of the painted canvas. Here, texture is not only visual but also tactile: the materials invite touch, exploration, and inhabitation. Architectural experience, therefore, is not built through abstraction, but through sensory immersion. For example, each apartment in the *Hundertwasserhaus* features a personalized facade with unique colors and decorations, highlighting individuality and creativity. The *Waldspirale*, a residential complex in the shape of a spiral, integrates perfectly

into the surrounding forest landscape. In both works, Hundertwasser uses color to evoke a sense of movement, vitality, and connection with nature. Drawing plays a central role in Hundertwasser's architectural vision, as it does not simply represent spaces but forms the foundation for a new way of thinking about architecture [Docci, Ippolito 2010, pp. 26-37]. Unlike traditional practices where drawing is primarily used for functional design, for Hundertwasser, it is a language that conveys a message.

Architectural drawing is the medium through which he expresses a spatial concept that goes beyond utility, extending to the sensory and visual experience of the user. The transition from two-dimensional drawing to spatial design is a key transformation in Hundertwasser's work. When the artist confronts three-dimensionality, his ability to represent the world visually is no longer limited to the surface of a canvas or paper.

Drawing becomes a means of translating two-dimensionality into three-dimensional architectural spaces, with lines and curves evolving into walls, windows, and arches. Hundertwasser's visual language, based on natural and sinuous forms, disrupts the geometric rigidity that dominates conventional architecture.

In his *Mouldiness Manifesto* (originally titled *Verchimmelungsmanifest gegen den Rationalismus in der Architektur*), he boldly criticized the use of straight lines in architecture, calling it a 'symbol of new illiteracy' and 'a reproductive lie'. For Hundertwasser, straight lines were not creative but represented sterile, unimaginative design. His manifesto advocates for a rejection of modern architecture that employs straight lines or circles, even conceptually, arguing that these shapes contribute to 'architectural decay'. For Hundertwasser, the curve was not an arbitrary aesthetic choice but a reflection of natural form, with each element of design conceived to interact harmoniously with the environment.

Hundertwasser's architecture is not about merely designing buildings; it's about creating a spatial experience that visually expresses a philosophy of life. Nature and humanity, in his view, are interconnected, not separate. A striking example of how Hundertwasser's drawing informs his architecture is the Spittelau Incinerator in Vienna (fig. 8).

Although it serves an industrial function, the building is designed as a work of art that reflects the artist's aesthetic philosophy [Peirce 1955]. The Spittelau district heating plant represents a sharp break from the monotony of functionalist architecture. Its form, though cubic, is animated by elements that enrich its visual and tactile perception. The facade, composed of heterogeneous materials such as Corten steel, concrete, and ceramics, creates a play of textures and hues, giving the building a dynamic, ever-changing appearance.

The straight lines and sharp angles typical of rationalist architecture are replaced by curved forms, saddle roofs, and irregular windows, giving the structure an organic, spontaneous character. The vibrant color palette contrasts with the neutrality of the materials, creating a joyful, festive atmosphere. Decorative elements like golden spheres, colorful ceramics, and sculptures further enhance the building's distinct character.

The facade of the incinerator merges Hundertwasser's pictorial language with the practical need to design an industrial building. The curves and vivid colors are not mere decoration but structural elements that redefine the perception of space. The design of the Spittelau Incinerator shows how

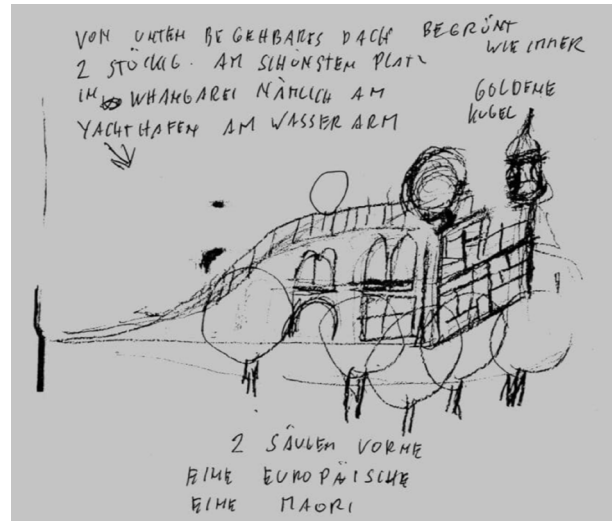


Fig. 9. F. Hundertwasser, original concept sketch for the Hundertwasser Art Centre with Wairau Māori Art Gallery in Whangārei, New Zealand, 1993 (image: courtesy Hundertwasser Non Profit Foundation).

Hundertwasser's visual drawings are essential to his architectural conception. Curves and undulating lines are not just formal choices, they are translated into spatial designs that convey respect for nature and emphasize the relationship between humanity and the environment [Villela 2012]. Spittelau is more than just a waste disposal plant. It is a testament to how visual language can be applied to architecture to generate a spatial experience that goes beyond function, integrating aesthetics, ecology, and symbolism. Rather than hiding or denying the industrial function of the building, Hundertwasser amplifies it through a symbolic aesthetic. The incinerator becomes a manifesto of reconciliation: between pollution and beauty, between the violence of industrialization and the possibility of ecological awareness. This visual transformation re-signifies the function, turning infrastructure into a site of reflection and civic identity. Hundertwasser wove a rich tapestry of symbols into Spittelau's design, each evoking deep, sometimes contradictory meanings. The white and black, referencing the Vienna Secession, symbolize not just elegance but life's inherent contrasts: light and shadow, birth and death. Colorful ceramics, fragments of an industrial and polluted world, are coated

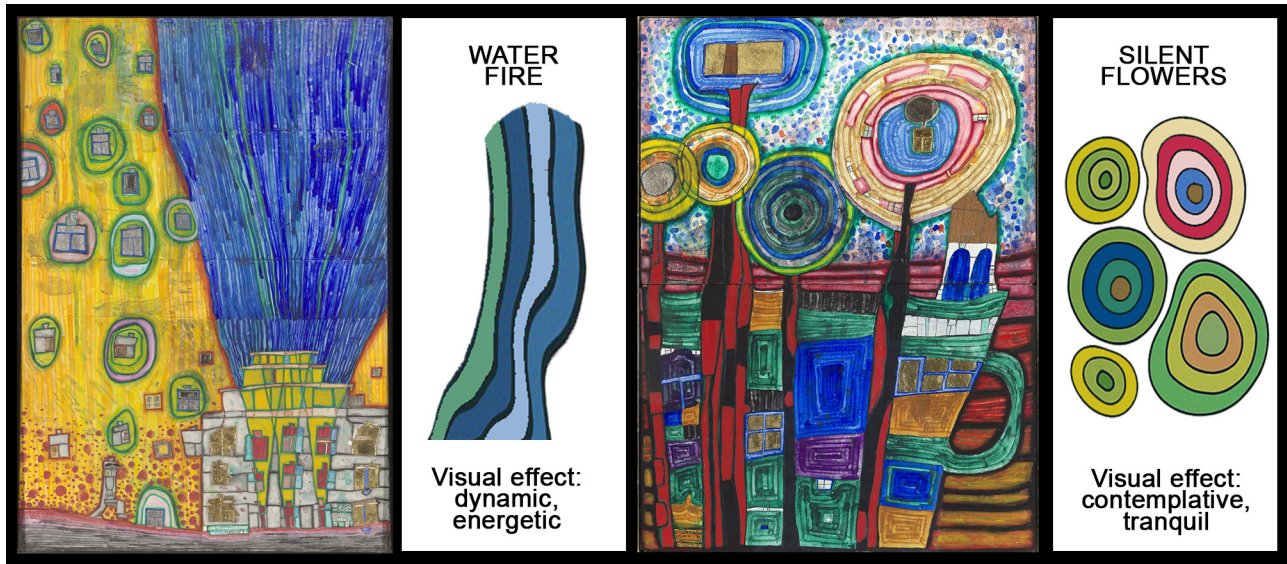


Fig. 10. Analysis of the paintings by Hundertwasser: on the left *Water fire*, 1982-1991; on the right *Silent flowers*, 1989-1991 (elaboration by the authors).

in nuances that suggest the complexity of reality and the importance of recycling.

The windows, like colored eyes, reflect both the richness of life and its fragility. The checkerboard pattern symbolizes the fight against standardization, contrasting with the organic forms and colors that speak to the tension between order and chaos. The blue of the sky, the yellow of fire, the gold of the future: each color carries a message, urging reflection on our relationship with the world and ourselves. Hundertwasser's drawings do more than represent form; they are the foundation of his architectural vision [Fürst 2002].

The transition from two-dimensional drawing to spatial design highlights how Hundertwasser translates his visual ideas into buildings that fulfill not just functional needs but emotional and symbolic ones as well (fig. 9).

Emotional and perceptual implications of drawing

The emotional and perceptual implications of drawing reveal themselves through a sensory and transformative dimension that goes beyond mere visual observation. The

artist draws and paints with brushes and various types of colors-oil, tempera, gouache, or watercolor-on canvas or paper. The only heterogeneous material that he likes to introduce is a touch of silver or gold leaf. Each color, chosen with precision, becomes a vehicle for a specific psychological and emotional response, capable of evoking contrasting sensations or harmonizing the perceptual experience. Colors are the true protagonists of his works: warm, vibrant shades like bright red and intense yellow alternate with deeper, more mysterious hues, such as black and purple. The color combinations are in continuous evolution, creating atmospheres that are sometimes joyful, sometimes melancholic. Particularly recurring is the spiral, a symbol of life and movement, which unfurls against backgrounds of intense colors. The line, as well as the color, plays a fundamental role. Organic shapes, reminiscent of the lines of nature, repeat rhythmically, creating a sense of movement and vitality [Pallasmaa 2012]. Despite the repetition, each work is unique, thanks to the artist's ability to avoid monotony and give each element its own individuality. Warm tones, such as orange and yellow, for example, create an atmosphere of warmth and vitality, stimulating interest and

energy, while cooler colors, like blue and green, induce a sense of tranquility and connection to the natural environment. The viewer is invited to immerse themselves in a fluid and dynamic vision, where each curve suggests movement, a continuous flow, generating a multisensory response that goes beyond sight to embrace touch and movement as well. Hundertwasser's drawing, therefore, does not merely represent a static image, but becomes a vehicle for a multisensory visual experience that transforms the perception of the surrounding world [Stephens, Fürst, Walkup 2020, pp. 53-57]. In this context, drawing operates as a form of atmospheric design: it sets in motion a choreography of signs and colors that affect the viewer's mood, memory, and bodily presence. The space of the drawing is not a window onto the world, but a milieu, a sensorial condition in which perception and emotion are mutually entangled. The fluid shapes, spirals, and curved lines are designed in such a way as to stimulate the imagination, inviting the viewer to enter a sort of visual dance, where each part of the work is in constant relationship with the others. The sense of movement these lines evoke is amplified by the contrast between vibrant colors and soft forms, creating a visual synesthesia that stimulates not only the eye but also the mind and the soul, facilitating a deep connection with the personal emotions of the observer. Drawing becomes an integrated experience that not only visually informs but also fully engages the emotional sphere, creating an experience in which art becomes a sensory medium (fig. 10).

Conclusions

This contribution aims to offer a critical and previously unexplored interpretation of Friedensreich Hundertwasser's work, moving beyond the predominantly descriptive or iconographic readings found in existing literature. While acknowledging the richness of current scholarships, particularly those focusing on the ecological, symbolic, and stylistic aspects of the artist's oeuvre, this study introduces an original perspective: the idea of drawing as an atmospheric language, conceived not merely as a medium of signification, but as a device capable of generating sensory, perceptual, and spatial conditions.

From this standpoint, Hundertwasser's graphic production is interpreted as a field of experiential activation, where color, line, and material collaborate to create affective environments, rather than mere images to be decoded (fig. 11).



Fig. 11. F. Hundertwasser, *Green town*, 1973-1978, mixed media, 970 mm × 1450 mm, Kunst-Haus Wien, Vienna (loan by collection Christian Baha).

The originality of this approach lies in its systematic and critical connection between drawing, painting, and architecture, domains which, in Hundertwasser's practice, are not separate, but form a fluid, coherent, and transformative language. While literature often separates his pictorial and architectural phases, this research demonstrates how the same visual alphabet, spirals, curves, chromatic contrasts, and tactile textures, is articulated both in two and three dimensions, maintaining an expressive continuity that challenges conventional disciplinary boundaries.

Works such as *Irinaland over the Balkans* and *The Houses Are Hanging Underneath the Meadows* (fig. 12) are analyzed here not only for their symbolic value, but also for their generative function, as genuine sensory prototypes that inform the spatial logic of the *Hundertwasserhaus* [1] and the *Waldspirale*.

The contribution also distinguishes itself through a focus on the active role of color and line as architectural tools. Contrary to interpretations that frame them as merely decorative, these elements are understood as part of a design strategy in which visual qualities act as devices for orientation, inclusion, differentiation, and relational engagement. Color, for instance, functions as a perceptual threshold: it defines zones, suggests directions, and evokes emotional states. The curved line, on the other hand, disrupts the functionalist rigidity of modernism and introduces the logic of body, of movement, of living irregularity.

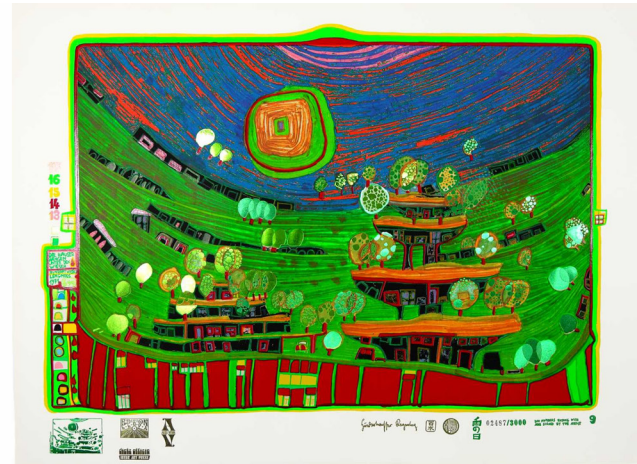


Fig. 12. Paintings by F. Hundertwasser: on the left *Irland over the Balkans*, 1969; on the right *The houses are hanging underneath the meadows*, 1972.

In this sense, the paper proposes a semiotic reading applied not only to Hundertwasser's graphic work but also to architectural space as a communicative and affective environment.

An additional critical element is the reconsideration of the concept of skin, a recurring theme in Hundertwasser's poetics, as an interface between the individual and the environment. It is not merely an ecological or symbolic envelope, but a sensitive, perceptual threshold that embodies the continuity between subjectivity, inhabited space, and nature.

Viewed through this lens, the artist's work can be reinterpreted as a precursor to current discourses on drawing as an immersive, relational, and multisensory language.

Finally, this study introduces a new trajectory for research: that of visual ecology, understood as a field that interre-

lates sign, color, space, and perception. Through this paradigm, Hundertwasser's work emerges as a paradigmatic case for understanding how drawing, far from being a purely representational act, can generate perceptual and ecological worlds, restoring to the discipline of drawing a central role in imagining sustainable and poetically inhabited ways of dwelling.

The critical value of this contribution lies in its ability to rethink Hundertwasser's work beyond stylistic repertoire, exploring it as a visual thought practice that questions how we perceive, construct, and inhabit the world. In this perspective, drawing, in its broadest sense, asserts itself not only as a language of design, but as a critical and generative tool for engaging with the complexities of the contemporary world.

Notes

[1] The *Hundertwasserhaus*, completed in 1986, is a social housing complex that houses 52 apartments. Located about fifteen minutes' walk from the center of Vienna, in a predominantly residential area from the 19th century, it stands in sharp contrast to the surrounding buildings, which were often rebuilt in a modernist style in the mid-20th century. As a social housing building, it is owned and managed by the City of Vienna. To live there, residents must meet the criteria set by the city for public housing allocation. All the apartments are rented and feature different layouts: some are spread over one or two floors, while others are designed

for couples or larger families. Many have terraces with private gardens or balconies, while others provide access to common areas such as terraces, a winter garden, a laundry room, and children's play areas. The building also houses a café and a shop on the ground floor, which welcome the many tourists who visit Vienna each year. Although access inside the *Hundertwasserhaus* is no longer allowed for visitors, it is possible to immerse oneself in Hundertwasser's creative universe by visiting a renovated tire factory across from the building, where installations inspired by his architecture have been created.

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Anatomy of a Prompt: a Semiotic System of Text-to-Image Gen AI

Hoa Vo

Abstract

Text-to-image Generative AI (Gen AI) introduces a novel perspective on the notion of drawing as a language. This study employs Saussure's Semiotic Theory to investigate how architectural and interior design prompts in DiffusionDB (part-000001) function as a semiotic system. The filtered dataset includes 246 architecture-related prompts (APs) and 276 interior design-related prompts (IDPs), validated through random sampling and visual inspection. Among the APs, 98% featured terms like 'architecture' and 'design' with 'building', 'nature', and 'archdaily' appearing in 71-72%. Other prevalent themes included 'city' (59%), 'art', and 'digital' (48%), reflecting a conceptual emphasis on physical structures integrated with environmental and stylistic elements. In contrast, IDPs showed a 100% occurrence of 'style', followed by 'light' (74%) and 'concept' (63%), suggesting a focus on stylistic expression and ambient qualities. The findings indicate that APs center around 'building' as the core term, while IDPs are anchored by 'style'. Notably, ArchDaily and Artstation emerged as linguistic and visual archives, informing the prompt structures. This semiotic analysis reveals that Gen AI users consciously employ architectural vocabulary and artistic techniques, crafting prompts as intentional design compositions that bridge language, imagery, and social meanings in architecture and interior design.

Keywords: drawing, semiotic system, Generative AI, prompt, visual language.

Introduction

A picture is worth a thousand words –this adage encapsulates Massironi's taxonomy of graphic communication. Visual elements— through their defined units, categories, and rules – form the nonverbal language that expresses the complexity of societal meanings [Massironi 2002]. As Mario Trimarchi stated, “I start talking to those things and sometimes they talk back to me, but instead of using words I use drawing” [Trimarchi 2022, p. 23]. Drawing –to architects and designers– is an act of transcribing abstract ideas into tangible entities that evolve, adapt, and convey values, beliefs, and practices that embody the meanings of social interactions [Melis 2023]. Nevertheless, the rise of digital and computational technologies, particularly Artificial Intelligence (AI), has sparked concerns about whether these

tools weaken drawing's role in expressing, negotiating, and building meanings by bypassing the analog, iterative brain-to-hand process [Palestini 2022; Florio 2023]. Has drawing lost its relevance in the post-information era? Not quite. Instead, now is the ideal moment to re-contextualize our perspective on drawing as a language amidst transforming technologies like AI. “Writing is the ability of fixing thoughts in signs” [Leroi-Gourhan 1964 as cited in Papi-dou 2014, p. 23-32]. This notion challenges Massironi's [Massironi 2002] taxonomy of graphic communication by asserting that language is the semiotic foundation that precedes drawing, rather than treating the two as parallel systems. Saussure's [Saussure 2011] Semiotic Theory – aligning with Leroi-Gourhan's insight–also recontextualizes

drawing as an extension of the linguistic system, where the 'signifier' (expression) produces the 'signified' (thought), shaping a cohesive visual sign that embodies and communicates meanings. Thus, the prevalence of drawing remains but its manifestations evolve from visual elements into new expressions, such as the textual tokens of Generative AI (Gen AI).

In fact, Gen AI is not a product introduced by the post-information era to undermine the analog nature of hand-to-brain iteration in drawings. Since 2002, when Massironi's taxonomy of graphic communication became well-known, architects and designers have been experimenting with early-developed generative media to produce distinctive and unforeseen drawings [Soddu 2002]. In other words, units of graphic communication are not static but continuously evolve with societal changes, bringing new practices—like perspectives and technologies—to architects and designers. Yet, the transformative advancements in Gen AI—distinct from traditional analogs—obscures the perception of this technology as a powerful and important drawing medium.

In this paper, I explored drawing through text-to-image Gen AI using Saussure's [Saussure 2011] semiotic lens, focusing on architectural and interior design prompts—revealing how architectural and interior design prompts act as 'signifiers', their generated images as 'signifieds', and how their interaction creates a cohesive visual language. Similarly, Dade-Robertson [Dade-Robertson 2011] positioned 'information' at the core of architecture—or more broadly, the design of the built environment—arguing that digital media expands, rather than hampers, our ability to convey meanings through drawings. However, Saussure's [Saussure 2011] semiotic lens reveals the structure of abstract thinking, as reflected through linguistics, and is thus more helpful in dissecting the nature of Gen AI as a novel drawing medium. With DiffusionDB [Wang et al. 2022], a dataset with 14 million Stable Diffusion prompts from real users, I reframe drawing as a linguistic-semantic act and examine Gen AI as a transformative tool for graphic communication in the post-information era.

A semiotic view of drawing as writing

Through digital and computational tools, architects and designers enter the "techno-biological-cultural coevolution" [Ranzo 2022, pp. 40, 41], gaining the ability to produce

prolific drawings, yet facing confusions to embed such abundance with deliberate meanings. Such a challenge might derive from the lack of "manual dexterity" which architects and designers rely on to express the "writing of the soul"—or their understandings and perspectives of the world they live in [Florio 2023, p. 22]. Put simply, the ease of generating instant depictions of thought can stifle thinking—architects and designers, confronted with vivid images of preliminary ideas, might lose the incentive to explore the unknown and stray from fixation [Boudier et al. 2023]. Yet 'abstract' drawing through digital and computational tools can still develop metaphors, analyze compositions, and negotiate relations between visual elements and thoughts [Amore 2023, pp. 50, 51; Dade-Robertson 2011]. Such drawing maintains a certain degree of abstraction (i.e., diagrams) and leaves room for imagination and reflection, thereby cultivating developed and in-depth meanings. Drawing through text-to-image Gen AI reaches the highest level of abstraction, enabling architects and designers to retrieve a wide array of visual elements—from units (point, line), categories (building, tree), to rules (symmetrical, imbalance)—via textual prompts and a vague anticipation of what the outcome will be [Mancini, Menconero 2023, pp. 57-68]. The inherent randomness of Gen AI [Tørresen 2021] also produces outcomes that loosely align with the textual prompts, leading to iterative rounds of prompt refinement and evolving interpretations in the generated act of drawing. Thus, understanding drawing through text-to-image generative AI is critical for architects and designers to harness a powerful tool that amplifies their thinking.

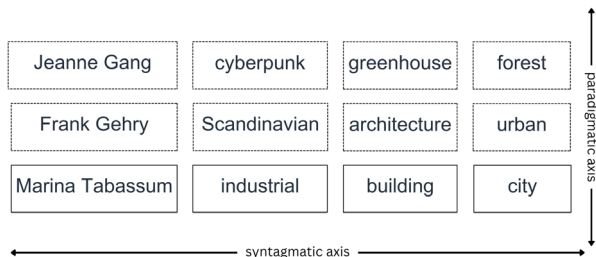
I propose that architects and designers can understand drawing through text-to-image Gen AI via the lens of Saussure's [Saussure 2011] *Semiotic Theory*, one of the most influential theories in linguistics literature. Saussure viewed language as a hierarchy of the 'signifier' (expression), the 'signified' (thought), and 'signs'—structured meanings of social interactions [Stawarska 2015]. For instance, the sound /tri:/ is the signifier of the signified concept of a plant with a trunk, branches, and leaves—forming the word 'tree', a sign with meaning. Yet the 'signifier' does not demonstrate the 'signified' in form, such that the sound /tri:/ does not embody a trunk with branches and leaves and the same 'signified' will have different 'signifiers' across cultures. While Saussure's *Semiotic Theory* published in 1916 [Carson et al. 2005]—with this paper citing its 2011 English translation—its values endure in

the post-information era with the notion of signs expand beyond words to include gestures and images [Chandler 2007; Stawarska 2015]. In the *Semiotic approaches to image-based research* the authors used this semiotic lens to explain how society consumes images, indicating that image production is the posterity of language – an abbreviation of writing [Carson et al. 2005].

In this paper, I applied Saussure's semiotic framework— using the syntagmatic (horizontal) and paradigmatic (vertical) axes [Chandler 2007; Saussure 2011]— to anatomize text-to-image Gen AI prompts. The first axis explains how multiple signifiers combine in sequence, while the second one highlights the range of alternative signifiers. Together, these relationships determine the value of a sign. From this standpoint, I inferred that when drawing with text-to-image Gen AI, architects and designers first translate their ideas into a series of signifiers along the syntagmatic axis. They then evaluate whether the generated images capture their intended meanings; and thus, refine their prompts by experimenting with different signifiers along the paradigmatic axis - either selecting alternatives that better align with their thinking or introducing new ones to inspire fresh interpretations of meanings (fig. 1).

With a background in design research, I am dedicated to exploring drawing as a form of writing through a semiotic lens in the context of architecture and interior design. My goal is to demonstrate that digital and computational tools are essential for architects and interior designers in the post-information era. By dissecting the anatomy of a prompt via its signifiers, I uncovered how textual cues generate a rich tapestry of visual elements, driving continuous cycles of prompt enhancement and meaning making.

Fig. 1. Syntagmatic and paradigmatic axes of text-to-image Gen AI prompts (diagram elaborated by the author based on Chandler 2007, p. 84).



A semiotic analysis of DiffusionDB

Among available datasets on text-to-image Gen AI prompts, DiffusionDB [Wang et al., 2022] is the most relevant for this paper. Stable Diffusion 100k [Turley 2023] and Kazimir [Kazimir 2023] have 100,000 and 50,000 prompts created by real users, respectively. DiffusionDB, using the same Gen AI model as Stable Diffusion 100k, contains 14 million prompts from real users. The diverse topics covered by the prompts enhance the likelihood of capturing text-to-image prompts appealing to architects and interior designers. Additionally, DiffusionDB is available under the CC0 1.0 License, making it a public domain resource for ethical research of secondary data.

To analyze this dataset, I used Visual Studio Code [Microsoft 2023] on a local computer equipped with a 13th Gen Intel(R) Core(TM) i9-13900K processor and an NVIDIA GeForce RTX 4090 graphic card. In this paper, I focused on the DiffusionDB 2M (part-000001) subset of 1,000 prompts. This subset is sufficiently large to gather enough prompts on architecture and interior design, yielding valuable insights while serving as a test bed for the semiotic-analysis protocol. The semiotic-analysis protocol combines qualitative thematic analysis –systematically examining textual data to identify, analyze, and report patterns or themes [Creswell, Clark 2017]– with exploratory data analysis using basic Python libraries like Pandas and NumPy [Foster 2020]. The overall steps included downloading the data subset, filtering text-to-image prompts related to architecture and interior design using keywords and identifying themes via word clouds and co-occurrence networks (fig. 2).

Fig. 2. Tokenizing and normalizing key terms (code snippet elaborated by the author).

```
from collections import defaultdict

# Create word association groups
architecture_associations = defaultdict(list)
interior_design_associations = defaultdict(list)

for tokens in architecture_tokens:
    if 'architecture' in tokens:
        architecture_associations['architecture'].extend(tokens)
    if 'building' in tokens:
        architecture_associations['building'].extend(tokens)

for tokens in interior_design_tokens:
    if 'style' in tokens:
        interior_design_associations['style'].extend(tokens)
    if 'light' in tokens:
        interior_design_associations['light'].extend(tokens)
```

I began by sampling frequent key terms from DiffusionDB 2M (part-000001) – such as ‘architecture’, ‘building’, ‘design’, and ‘nature’ for architecture, and ‘concept’, ‘style’, ‘light’, and ‘artwork’ for interior design. Leveraging WordNet library, I expanded these keywords with synonyms and related terms, then used custom NLTK text-processing algorithms to tokenize the prompts, structuring those linguistic patterns into a collection of prompts. I further extracted corresponding images of the filtered prompts using PIL library to verify that the ‘signifiers’ (textual descriptions) mirror the intended ‘signifieds’ (visual representations). After processing and normalizing key term frequencies, I employed Matplotlib library to visualize word clouds and co-occurrence networks. This approach captured semiotic insights of how dominant themes in textual descriptions (writing) in architecture and interior design defined visual representations (drawing), ultimately establishing a scalable protocol for larger datasets.

Anatomy of a prompt from DiffusionDB

The filtered collection comprised 246 architecture-related prompts (APs) and 276 interior design-related prompts (IDPs), validated through both random sampling and visual inspection. Based on Saussure’s [Saussure 2011] *Semiotic Theory*, these findings illustrated the following elements:

signifiers or the textual prompts that encoded design themes and intentions; signifieds or the AI-generated images that translated those prompts into visual outputs; signs or the interaction of (textual) prompts and (visual) outputs form a cohesive language of drawing that dictated by the dominance of key terms. In terms of architecture, among 246 APs, approximately 98% of the prompts contained themes like ‘architecture’ and ‘design’. Between 71% and 72% of all APs were themes like ‘building’, ‘nature’, and ‘archdaily’. Other prominent themes were ‘city’ – occupied 59%, ‘art’ and ‘digital’ also occurred in 48% of all APs. The word cloud and co-occurrence network for 246 APs (fig. 3) also showed a variety of stylistic or aesthetic influences via terms like ‘cyberpunk’, ‘neon’, and ‘industrial’. Therefore, the APs were more than just simple texts; they were intentional compositions. The real users of Stable Diffusion –the text-to-image Gen AI in DiffusionDB– carefully selected ‘signifiers’, likely drawing from their existing architectural vocabulary, to create desirable ‘signifieds’. A sample prompt for architecture is as follows: “a beautiful detailed painting of city abandoned industrial architecture building tomb nature urbex by jeanne gang, night sky magic realism vaporwave laser otherworldly fisheye at fall sea universe synthwave landscape nature made of glass sunlight thermal vision infrared dramatic lighting, archdaily, wallpaper; highly detailed, trending on artstation” [Wang et al. 2023, p. 4].

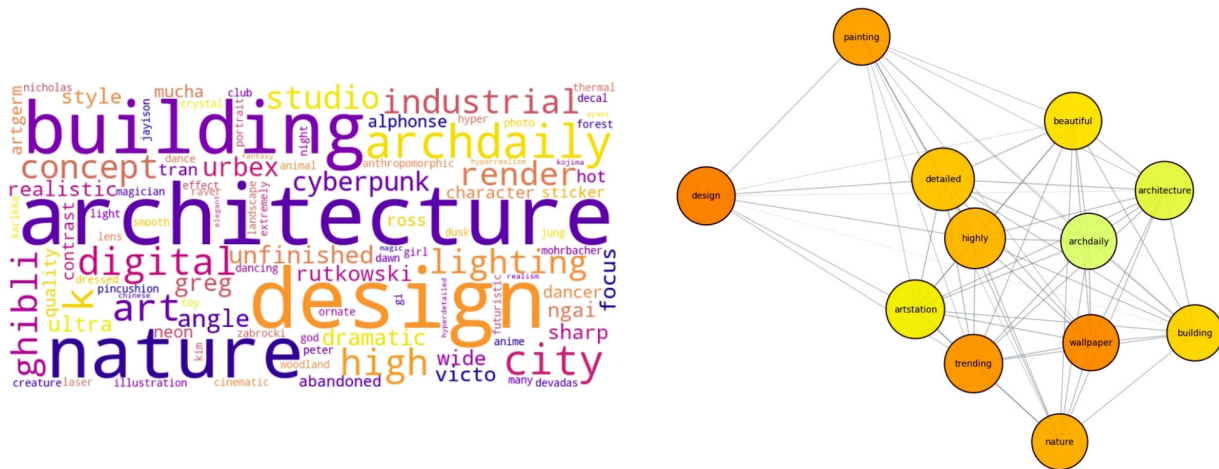


Fig. 3. Word cloud and co-occurrence network for architecture (left: diagram elaborated by the author; right: Deepak’s diagram).

These concurrent patterns revealed that the ‘signs’ of (interior design) drawing via text-to-image Gen AI emphasize stylistic expressions or the underlying social conventions that distinguish styles and concepts from one another. In addition, the IDPs underscored a critical element of interior design: the ambient quality of light. Together, the filtered prompts offer a broad yet narrow view of interior design, focusing primarily on modifying spaces for aesthetic appeal. This perspective overlooks the equally important aspect of functional efficiency, as emphasized by Rengel [Rengel 2023].

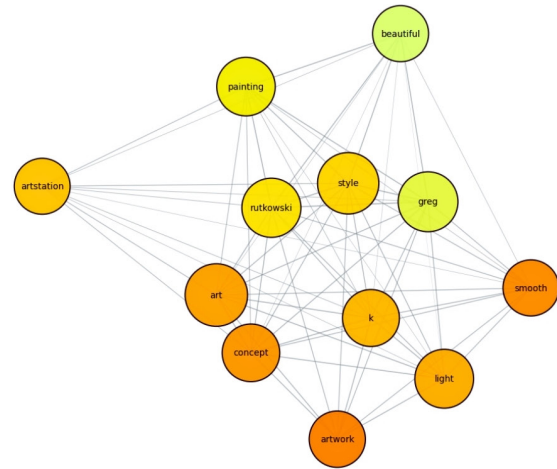




Fig. 5. Sample 'signifieds' for architecture (images retrieved from DiffusionDB 2M part-000001).

Fig. 6. Sample 'signifieds' for interior design (images retrieved from DiffusionDB 2M part-000001).

This observation was evident in the frequent references to Artstation [6]—a well-known platform for artistic projects—within the IDPs, signaling its role as both a vocabulary of signifiers and an archive of signifieds. However, while Artstation offers a myriad of design visualizations, its primary focus is on artistic, digital, and conceptual projects rather than interior design. Therefore, unlike APs, IDPs suggested that the real users might conflate art with interior design (fig. 6). The generated images amplified this mix by depicting dramatic indoor spaces that, although sometimes appearing run-down or abandoned, emphasize sophisticated lighting and artistic techniques reminiscent of oil painting and abstraction.

Overall, across 246 APs and 276 IDPs, I observed two permanent components of the text-to-image Gen AI prompts—'building' and 'style', respectively. Both APs and IDPs shared the same anatomy with a fixed order along the syntagmatic axis, while offering a flexible range of alternatives along the paradigmatic axis (fig. 7). This observation reinforced my proposition on the continuous sequence of drafting and refining text-to-image Gen AI prompts, within the context of architecture and interior design. For instance,

APs anchored by the 'signifier', 'building' while users experimented with alternatives—such as 'organic', 'unfinished', or 'industrial'—to convey their unique envisioned 'signifieds'. Likewise, IDPs based on the 'signifier', 'style', while variations such as 'symmetry', 'cyber', and '(dark/cinematic) light' were introduced to match the intention of individual users in the data subset. This semiotic framework highlights the linguistic underpinnings of Gen AI and its transformative role in bridging language, technology, and communicative graphics.

Semiotic deficits of vernacular architecture and cultural symbolism

Overall, text-to-image Gen AI functions as a nonverbal language, expressing layers of societal meanings. The generated visuals are continuously shaped by, and in turn, influence the written prompts that create them, demonstrating a reciprocal relationship between textual descriptions and visual representations. For instance, the vocabulary in APs and IDPs portrayed accurate but simplistic 'signifieds'

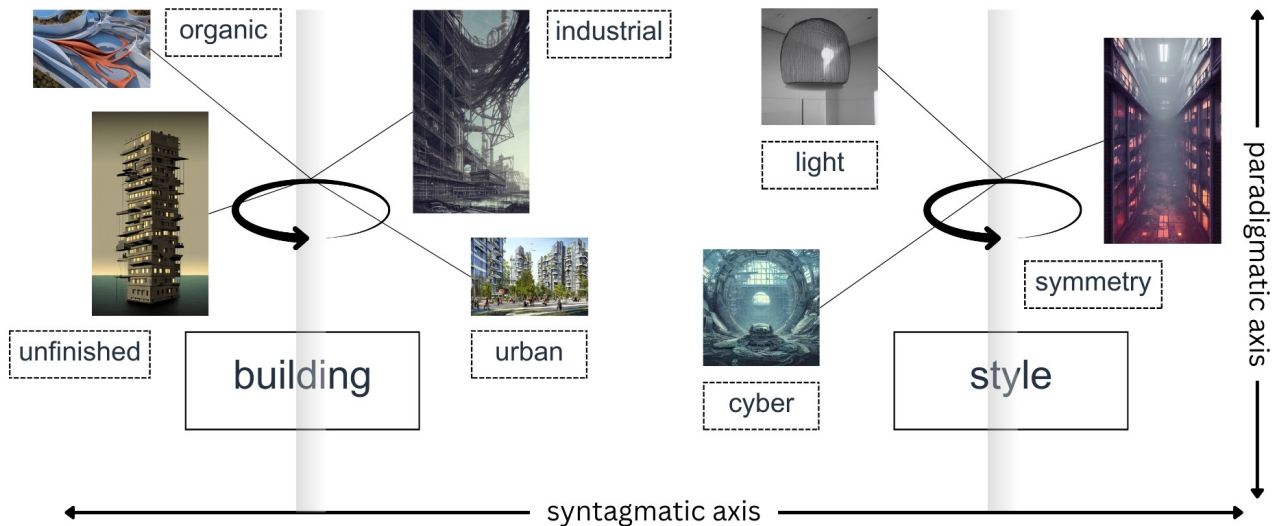


Fig. 7. Anatomy of text-to-image Gen AI prompts for architecture and interior design (diagram elaborated by the author).

of architecture and interior design via the prominent uses of Western-oriented 'signifiers'.

As shown in the semiotic analysis results, real users relied on Western traditions –borrowing from role models in architecture, design, and artistic styles like William Pereira [7], and Camille Pissarro [8]– to facilitate their prompt crafting process. : Furthermore, these role models spanned from William Morris [9] of the Arts and Crafts movement in 1868 to Neri Oxman [10] of the Material Ecology approach in 2006 onward. Yet, most 'signifiers' reflected Western histories, nationalities, and geographies, with non-Western 'signifiers' appearing in a few instances (12%). For example, Japanese architect Shigeru Ban [11], Ghanaian sculptor El Anatsui [12], plus references to locations like Tokyo and Kenya.

While Saussure's [Saussure 2011] Semiotic Theory primarily focuses on the arbitrary relationship between 'signifiers' and 'signifieds', with the former bearing no visual cues of the latter, the vocabulary across APs and IDPs reveals another dimension of this relationship – the quality of the 'signifiers'. Here, I observed 'semiotic deficits' in vernacular architecture and cultural symbolism within the signifiers, thus biasing the 'signifieds'. This observation is inherent to Gen AI but not a deliberate intent. Rather, it is more attributable to technical and practical constraints, particularly the accessibility and composition of training datasets used in Gen AI models like Stable Diffusion. These models often rely on web-sourced data, which tends to disproportionately document Western architecture and interior design [Häusler et al. 2023].

This inherent imbalance in data availability and curation tends to underrepresent vernacular architecture and cultural symbolism, inadvertently amplifying Western role models. Moreover, vernacular architecture embodies local narratives and cultural symbols that often require contextually nuanced understandings, posing significant challenges for representation through algorithmic processing. As Dilaveroglu [Dilaveroglu 2024] argued, biases are intrinsic to cultural heritage collections, and their digital representations further risk simplifying complex cultural symbolism.

While users may attempt to diversify outputs the results still depend on the model's dataset. As such, even prompts featuring diverse figures can produce outcomes shaped by Western-oriented training data – or the limited vault of 'signifieds' within the Gen AI model, reinforcing representational imbalances. Addressing this requires deliberate expansion and curation of training data to include broader architectural

traditions and cultural contexts. While this raises important cultural, methodological, and technical questions about achieving more inclusive generative representations, such concerns lie beyond the immediate scope of this study. Above all, my aim is to demonstrate that Gen AI is not a disruption but rather another drawing medium, as evidenced by its underlying linguistic-semantic nature.

Conclusion

The rise of digital and computational tools necessitates a recontextualization of Massironi's [Massironi 2002] notion of drawing as a language by architects and interior designers. While concerns about the diminishing brain-to-hand interactions in design thinking are valid [Boudier et al., 2023; Florio 2023], it is crucial to understand that digital and computational tools are, in fact, just another set of conventions that shape current societal meanings [Culkin 1967; Dade-Robertson 2011; Lim, Jung 2018]. The purpose of this paper is to draw evidence from a publicly available subset of text-to-image Gen AI –DiffusionDB 2M (part-000001)– to show architects and interior designers in the post-information era how the relationship between drawing and writing evolves with new medium. Henceforth, rather than opposing these technological advancements, we might instead, embrace them.

The implications of my findings are two-fold. First, architects should utilize text-to-image Gen AI as a tool for translating their architectural vocabularies into precise visual outputs – using more specialized signifiers rather than general key terms like 'building' and 'design' to ensure that the generated images align with both conceptual and disciplinary nuances. Second, interior designers might experiment with prompt variations centered on both stylistic expression and functional efficiency, allowing them to generate images that highlight the aesthetics essential to interior design while maintaining functionality.

One consideration regarding the findings is the uncertainty about how many real users who generated the prompts in DiffusionDB 2M (part-000001) were architects and interior designers. While the language and thematic patterns observed in the dataset strongly align with professional design vocabularies, the absence of verified user credentials makes it difficult to confirm whether these prompts truly reflect the insights of trained professionals or are largely the work of enthusiasts.

Despite this consideration on the professional backgrounds of real users in DiffusionDB 2M (part-000001), my graduate research assistant in Data Science independently re-ran and re-inspected the original code on the same dataset, and the results remained consistent. This reproducibility suggests that the thematic patterns and semiotic structures observed in the prompts are robust, regardless of potential uncertainties about user credentials. The consistency of these findings reinforces the analysis reliability and indicates that the core dynamics of 'signifiers' and 'signifieds' in text-

to-image Gen AI remain stable. Moving forward, I will scale the semiotic protocol in this paper to larger datasets to better validate the anatomy of text-to-image Gen AI prompts established in this paper. As using identifiable data raise concerns on research ethic and implications on users of Gen AI models, working with a large dataset can strengthen the findings' generalizability and deepen understandings of how drawing—as a language—emerges from the interplay of textual prompts and AI-generated visuals in the fields of architecture and interior design.

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Bruno Munari: Communicating through Graphic Language

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Abstract

This article examines Bruno Munari's contribution to visual communication, with a particular focus on his approach to graphic design and the graphic-visual language. The aim is to highlight how Munari redefined the processes of visual design by developing a method which, moving beyond a purely aesthetic perspective, integrates formal rigour, expressive synthesis and perceptual experimentation through a 'structural' exploration of how meaning is conveyed through images. The methodology adopted is based on a critical analysis of Munari's major graphic works, enriched by theoretical references to semiotics, Gestalt theory and visual pedagogy. Through the examination of case studies –from the illegible books to editorial design and graphic experimentation for children– the study reveals the process by which Munari constructs an autonomous visual syntax, in which the graphic sign becomes a self-sufficient communication system. The purpose of this study is to demonstrate how Munari's graphic thinking anticipated and influenced concepts that are now central to contemporary design and visual communication. His ability to transform illustration, typography and editorial graphics into tools for cultural and cognitive reflection makes him a key reference point in contemporary design, not only as a practitioner, but also as a theorist of a new visual grammar capable of transcending traditional conventions to create a universal, essential and immediate graphic language.

Keywords: visual culture, graphic-visual language, illustration, publishing and advertising, children's books

Introduction

Within the artistic landscape of the mid-twentieth century, the designer Bruno Munari (1907-1998) stands out as one of the most significant figures, not only for the breadth of his interests [1], but also for his rare inventiveness and his exceptional ability to experiment with new forms. Pablo Picasso even described him as a twentieth-century Leonardo da Vinci, likely struck by Munari's unusual ability to interpret art and by the imagination with which he approached each artistic exploration, employing a wide variety of techniques and materials. His ability to perceive the world from a step ahead –transcending spatial and temporal limits and projecting himself into the future while engaging with

contemporary artistic movements [2] and anticipating their trends– makes Munari a truly contemporary visionary.

While much has been written about his work as a designer and his theoretical contributions to creative education –understood as a pursuit achievable through art– less attention has been paid to Munari's contribution to drawing in general, and to graphic-visual language in particular [Munari 1991]. Yet this contribution is essential for fully grasping the innovative nature of his cultural message, which can serve as a starting point for renewed reflections in the field of representation and visual communication.

His deep interest in the formal coherence between the parts and the whole of an object, and his ability to discern the underlying structure of both tangible and represented forms, led him to reflect on the importance of observing reality in order to uncover its fundamental rules—geometry, proportions, lines of force (fig. 1)—which become the foundation for developing objects or images capable of clearly conveying meaning, beyond the apparent playfulness of the outcome [Munari 1997].

His reflections on lettering and compositional form—genuine intellectual *divertissements*, often aimed at children and their play (which he himself defined as ‘a very serious activity’)—also highlight the communicative potential of visualization and of the relationship between signifier and signified inherent in visual language.

Indeed, throughout the work of the undisputed Milanese genius, one can identify clear signs of innovation in the field of graphic-visual expression.

Starting from these considerations and focusing on his output—particularly that linked to the worlds of graphic design and publishing—this study retraces the processes underpinning image construction that inform the design of visual messages, rendering them effective and capable of conveying meaning beyond their surface appearance [Franchi 2024] (fig. 2).

Graphics and visual communication

In examining Munari's role within the field of visual culture, it becomes immediately evident that his graphic work—far from being a mere accessory to the visual arts—constitutes a privileged space of coherent and lucid experimentation aimed at developing a grammar of perception centered on the essentiality of the message. His graphic language is thus grounded in a rigorous system of rules and signs—each endowed with its own form, dimension, texture and color—capable of articulating a visual syntax designed for maximum communicative immediacy.

Munari's reflection proceeds through reduction and synthesis. Every element within a composition responds to a functional logic, with no concessions to the arbitrary. Yet simplicity, far from being a principle of subtraction, is for Munari the very condition of communicative effectiveness, the result of an ongoing process of refinement [3]. In his graphic creations, the conscious use of structure and the

Fig. 1. Top left: Bruno Munari, drawing of a tree showing its geometric structure (photo by the authors).

Fig. 2. Top right: covers of the magazine 'Domus' designed by Bruno Munari. <<https://www.artribune.com/arti-visive/2022/10/munari-mostra-copertine-milano/>> (accessed 2 February 2025).

Fig. 3. Bottom: Bruno Munari, 'Libro illeggibile bianco e rosso' [1953]. <<https://www.anca-aste.it/it/asta-1377/libro-illeggibile.asp>> (accessed 2 February 2025).



balance between formal precision and semiotic clarity are rooted in a conception of imagination not as mere digression, but as a central, structuring force. This vision, clearly articulated in *Arte come mestiere* [Munari 1997] and *Design e comunicazione visiva* [Munari 1991], does not arise from an attitude of formal austerity, but rather from a structural necessity, placing the incisiveness of the sign at the core of visual language.

This approach is exemplified by the series of illegible books (fig. 3), pioneering examples of a new genre of visual language [Zaffarano 2015], produced between the late 1940s and early 1950s. These works represent a radical exploration of the graphic code, carried to its extreme consequences. The text is eliminated entirely and narration unfolds exclusively through graphic signs, allowing reading to occur intuitively, mediated solely by the act of seeing.

As Zaffarano insightfully observes, in these books “Munari creates compositional rules that take form through the shape of the pages and the cut of the paper; but these rules do not generate a finished work: it is up to the reader to construct their own sequence, their own composition. Thanks to the device of shaped pages, there is no single path through the book; by leafing through it in reverse, sudden areas of color may appear. The work is not meant to be read sequentially in the traditional sense, like a conventional book, but rather to be used by interacting freely with its formal structure, discovering its possibilities in the process” [Zaffarano 2015]. The relationship between reader and work thus becomes essential, as the viewer is no longer a passive decoder, but an active participant in the construction of the narrative.

A particularly significant example is *Libro illeggibile N.Y. 1* [Munari 1967], held at the MoMA in New York. In this work, pages made from cardboard, oiled paper, transparent or colored sheets and string overlap to create a play of visual layers that suggests an alternative mode of reading, one whose sequence is not dictated by words, but by the perceptual relationships between forms (fig. 4). This is not a provocation for its own sake, but a demonstration that visual communication can function independently of verbal language, revealing itself as self-sufficient through the imagination's capacity to construct meaning from perceptual stimuli [Cantelli 2018].

From this perspective, as Zanoletti [Zanoletti 2020] observes, Munari never regarded graphics as a purely aesthetic matter. Rather, it exists within a broader dimension where logic and imagination work together to

Fig. 4. Top: Bruno Munari, 'Libro illeggibile N.Y. 1', 1967 [Maffei 2002, p. 123].

Fig. 5. Bottom left: Bruno Munari, 'Pubblicità a scoppio', 1931. <<https://www.munart.org/index.php?p=6>> (accessed 2 February 2025).

Fig. 6. Bottom right: Bruno Munari, 'Negativo-Positivo', 1953. <<https://www.anca-aste.it/lasta-1617/negativo-positivo-.asp>> (accessed 2 February 2025).





Fig. 7. Bruno Munari, illustrations from 'Little Green Riding Hood' [Munari 2007a], 'Little Yellow Riding Hood' [Munari 2007b] and 'Little White Riding Hood' [Munari 2004] (photo by the authors).

generate meaning. It is not inappropriate, therefore, to see in many of his graphic inventions an empirical anticipation of concepts that would later be developed in semiotic theory. The construction of a cognitive process through visual and tactile experience alone introduces a structural shift: the alphabetic syntax is replaced by a visual syntax. Consequently, semantics is entrusted to the reader's perception, which must interpret the message through the interplay of chromatic variations, textures and forms.

However, since these are not shared codes in the conventional sense of semiotic theory [Eco 1975], Munari's signs—lacking fixed correspondences between sign and meaning—should be understood as autonomous experiments in encoding a visual language.

A semiotic analysis of his work also reveals a number of characteristic graphic strategies, articulated across multiple levels of perceptual and conceptual subversion. Among these are inversion and reversal, which Munari employs both visually and intellectually. A striking example is his sketch for the *Almanacco dell'Italia veloce* (1931), rooted in the aesthetics of Futurism, where the reading order of the phrase *Pubblicità a scoppio* is deliberately disrupted, seemingly with the intent of unsettling the viewer (fig. 5). A similar principle is evident in some of his later works, including the *Negativi-Positivi* series, produced in various versions between the 1940s and 1960s (fig. 6). Here, Munari

plays with the ambiguous perception of figure and ground, which alternate depending on formal and chromatic combinations, making it impossible to establish a fixed distinction between the two visual roles [Munari 1989].

Another form of reversal occurs on the narrative level, as in his retellings of *Little Green Riding Hood* [Munari 2007a], *Little Yellow Riding Hood* [Munari 2007b] and *Little White Riding Hood* [Munari 2004], where the traditional fairy tale is reinterpreted through the chromatic dimension. The monochromatic nature of the illustrations—even their total absence of color in *Little White Riding Hood*—provides alternative and unconventional visual-narrative readings of a universal story (fig. 7).

Even in the field of typography, Munari introduces a process of deconstruction and visual reorganisation of language. In his typographic collages—from the sketch for the book *Le Macchine di Munari* [Munari 1942] to *L'alfabetiere* [Munari 1960]—the irregular arrangement of letters, sometimes aligned to principal axes or distributed 'like rain' according to the shape of the grapheme, recalls the principles of visual poetry. The text is not only to be read—in *L'alfabetiere*, in fact, the nonsensical text serves primarily to play with the sounds of letters—but also to be observed and interpreted as an image (fig. 8). The variety of typefaces and their layout imbue the pages with a dynamic quality that directly evokes Futurist experiments, as seen, for example, in the illustrations from his article

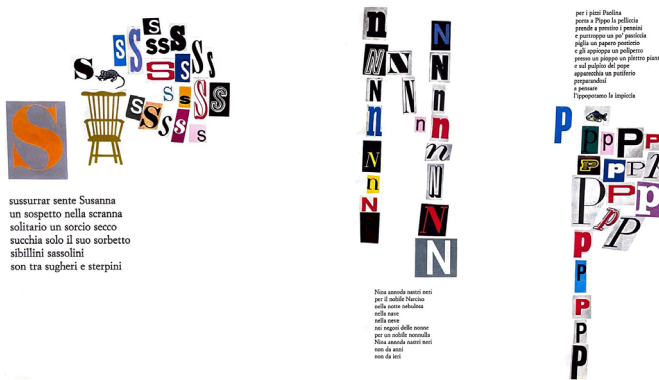


Fig. 8. Left: Bruno Munari, pages from the 'Alfabetiere' [1960] (photo by the authors).



Fig. 9. Right: Bruno Munari, 'Campari', 1965. MoMA Museum. <<https://www.moma.org/collection/works/6373>> (accessed 2 February 2025).

Tipografia, published in *La Lettura* [Munari 1937] [4], or in his *Campari* posters (fig. 9).

As Munari himself wrote: "To be understood by the public [...] in the field of images means using objective images, recognized by all as carriers of certain messages and combining them in such a way that they convey other, previously unknown messages" [Munari 1977, p. 104].

It is precisely this idea of generating previously unseen meaning-constructs that leads him to adopt an approach that could be described as topological, insofar as it is based on the perceptual and structural alteration of visual objects. In other words, rather than focusing on form in and of itself, Munari explores the relationships between elements within the visual field, placing emphasis on structure and perception. Images thus become instruments of transformation and flexibility, subject to shifts in position, unexpected juxtapositions, superimpositions and dynamic interplay between figure and ground. This mode of operation, which in many ways echoes the principles of *Gestalt* theory, highlights the importance of perceptual relationships over isolated elements, leading to a concept of visual composition that unfolds through successive connections and interactions. An example of this is *ABC con fantasia* (fig. 10), an educational game designed and marketed by Munari in 1960, which features small modular shapes—rectangles of various sizes, semicircles and segments of circular crowns—that can be arranged to create the letters of the alphabet, as well as a wide range of other images.

Color contrast, too, assumes a structural—rather than merely aesthetic—function in Munari's work, though the aesthetic is never absent. Contrasts such as red and black, white and black, blue and white are not simply visual oppositions, but serve as devices to articulate the graphic space, to mark rhythms and reading paths. This logic is clearly visible in the aforementioned 'illegible books', where the relationship between colors becomes a key to interpretation and the object itself resists any single mode of reading, opening instead to a subjective perceptual experience. Munari's interest in chromatic contrast can be traced to his Futurist roots, a movement with which he shared a spirit of experimentation and a desire to explore visual perception through the dynamic use of color.

The notion of topology is also evident in his treatment of spatial layering and interaction. In his cover designs for Einaudi, such as those for *Il diario di Anna Frank* [Frank 1954] or *Se questo è un uomo* by Primo Levi [Levi 1958], the use of overlapping planes and chromatic blending creates an effect of perceptual simultaneity. The viewer is not faced with a static structure, but with a visual system in which multiple layers of information coexist and intersect, generating an experience shaped by the interaction of its components. In this sense, color becomes a hinge between layers, a means not simply of shaping form, but of connecting elements and constructing meaning through their interrelation (fig. 11).

Fig. 10. Top: Bruno Munari, 'ABC con fantasia', 1960. MoMA Museum. <<https://www.moma.org/collection/works/147958>> (accessed 2 February 2025).

Fig. 11. Bottom: Bruno Munari, Einaudi book covers for 'Diario di Anna Frank' [Frank 1954] and 'Se questo è un uomo' by Primo Levi [Levi 1958]. <<https://www.tribune.com/arti-visive/2022/10/munari-mostra-copertine-milano/>> (accessed 2 February 2025).



Closely related to this logic is Munari's interest in the boundary between sign and support, a theme that again recalls the ambiguity between figure and ground. In many of his works, the support is not a neutral background but an active component of the image, contributing to the construction of its meaning. This idea resonates with the principles of 'plastic semiotics', as developed by theorists such as Greimas and Bertin [5], wherein visual meaning arises not solely from signs themselves but from the spatial relationships between and within them. Munari explores this ambiguity both in his graphic work and in his three-dimensional pieces, where light and shadow function as design elements capable of continually redefining the boundaries between image and material.

All these aspects –color contrast as perceptual structure, transparency as a simultaneous layer of interpretation, and the fluid relationship between sign and support– do not act independently, but rather intertwine continuously, giving rise to a system in which images are never static, but live within a network of relationships. It is precisely this logic that makes Munari's work interpretable through a topological lens: meaning is never absolute, but emerges in the movement between forms, in shifts of state, in the transformations of visual space.

Graphics and illustrations for children

The centrality of the image as a visual vehicle for conveying meaning finds its fullest expression in the illustrations Munari created for children's books [Maffei 2002].

His ability to combine clarity, creativity and innovation within these works offers a compelling synthesis of his deep awareness of the power of visual communication, particularly when applied to the narrative and pedagogical dimensions that characterize children's literature.

Munari's earliest illustrations in this domain date back to the late 1920s, when he earned a living by producing cartoons and drawings for various magazines, including the *Corriere dei Piccoli*. In 1929, he collaborated with the writer Giuseppe Romeo Toscano, illustrating *L'Aquilotto implume* [Toscano 1929], a novel aimed at introducing young readers to Fascist ideology. His early engagement in editorial graphics thus involved projects targeted at a young audience. However, in the years that followed, Munari appeared to distance himself from this field, turning his attention toward a more explicitly artistic context. These were the years in which he pursued research aligned with Futurist theory, translating those

principles into images and demonstrating a sharp analytical capacity to see beyond surface forms and their immediate meanings, reinterpreting reality with irony and wit, and experimenting with innovative techniques and materials [6]. His use of lithography, zincography, collage, photomontage, the integration of text and image, and his employment of unconventional materials—such as transparent papers, fabrics, metal spirals, plastic or composite elements—soon led to editorial products distinguished by what journalist and writer Aristide Marino Gianella had already described, years earlier, as “layouts rich with bold graphic interventions” when commenting on the early work of “a mechanical draughtsman in love with his own technique [...] [with] endearingly personal flourishes [...] [and] a clear humorous sensibility” [Gianella 1927, p. 12].

From this period onward, and throughout the interwar years, Munari also engaged in interior design, stage design, editorial graphics [7] and sculpture and art in highly unconventional ways—think of the three-dimensional experiments of the ‘useless machines’ or the ‘tactile tables’, or of the curious devices described and illustrated in his *Le macchine di Munari* [Munari 1942] (fig. 12). These activities, while seemingly tangential to children’s illustration, in fact offered Munari a broad platform for experimenting with materials and methods to represent and communicate dimensions of reality not always immediately perceptible. His return to this genre was linked to the birth of his son Alberto, which gave him direct insight into children’s needs, their nature and their ways of understanding the external world, shaped by the different cognitive phases of development [8]. It did not take long for Munari to realize that “there was a whole unexplored area, where a book—even for children who can’t yet read—would make perfect sense, like the *Prelibri* I later created: I’d look at the typical children’s books, just text, with a few line drawings, because that was cheaper [...] But with all the possibilities offered by the printing industry—folds, papers, cuts, holes, die-cuts—there were so many other ways to communicate. A book, after all, is made not just of words and images, but of visual communication, of communication through the senses” [Meneguzzo 1993, p. 10].

Determined to offer a more democratic and accessible way of conveying the meaning behind words [9] and driven by a desire to educate children in reading, art and creativity, Munari broke away from traditional, highbrow models, revolutionizing editorial design for children’s publishing. The strength of his approach to visual storytelling—didactic,

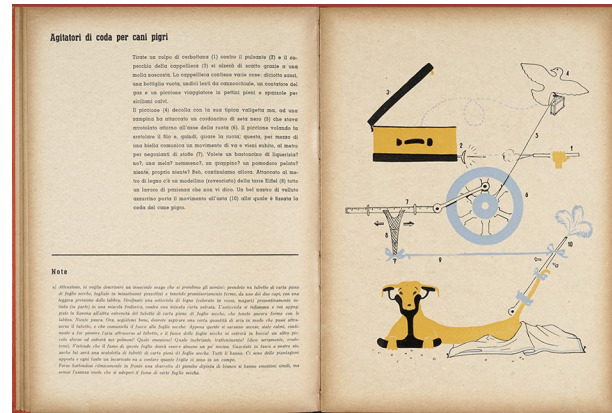


Fig. 12. Bruno Munari, *Le macchine di Munari* [Munari 1942]. Description and illustration of the ‘Agitatore di coda per cani pigri’ (‘Tail Wagging Device for Lazy Dogs’). <<https://www.gonnelli.it/it/asta-0032/munari-bruno-le-macchine-di-munari-.asp>> (accessed 2 February 2025).

light-hearted and engaging—“rests not on the frivolous [...] but on stripping weight from themes, techniques, formulas, artistic ideas designed for an elite and shaped by critical-academic categorizations” [Antonello 2021, p. 308].

Munari’s masterful use of layout, signs, typography, transparent elements, flaps, cut-outs—or other unexpected components that ‘pierce’ the pages and reveal hidden content—quickly transformed his books, both educational and entertaining, into genuine works of art accessible to the very young. Following his early experiments in 1940, which led to the production of books to cut out, assemble and compose—such as *Mondo, Acqua, Aria, Terra* [Munari 1940c], *Il teatro dei bambini* [Munari 1940a] and *I negozi* [Munari 1940b] (a series comprising seven volumes: *Cappelli*; *Pasticceria*; *Antica farmacia*; *Orologiaio*; *Sali Tabacchi*; *Salumeria*; *Musica*)—a new wave of titles appeared in 1945: *Mai contenti* [Munari 1945e], *L’uomo del camion* [Munari 1945d], *Toc toc. Chi è? Apri la porta* [Munari 1945g], *Il prestigiatore verde* [Munari 1945b], *Storie di tre uccellini* [Munari 1945f], *Il venditore di animali* [Munari 1945c] and *Gigi cerca il suo berretto* [Munari 1945a].

Many more would follow as part of the same series, conceived as containers to be opened and explored, revealing the surprises hidden within (fig. 13). These works stage a kind of ‘centripetal’ play, unfolding inwardly upon themselves and drawing the reader into an immersive experience [10].



Fig. 13. Bruno Munari, 'Il venditore di animali' [Munari 1945c]. Sequence of internal pages. <<https://www.gonnelli.it/ita-0032/munari-bruno-la-collana-completa-de-i-libri-asp>> (accessed 2 February 2025).

These are, in a sense, interactive objects that evoke curiosity, wonder and anticipation, offering an 'open' form of reading in which the child is the true protagonist [11], actively shaping the narrative's development, one that unfolds in unexpected, often surreal, ways despite its simplicity.

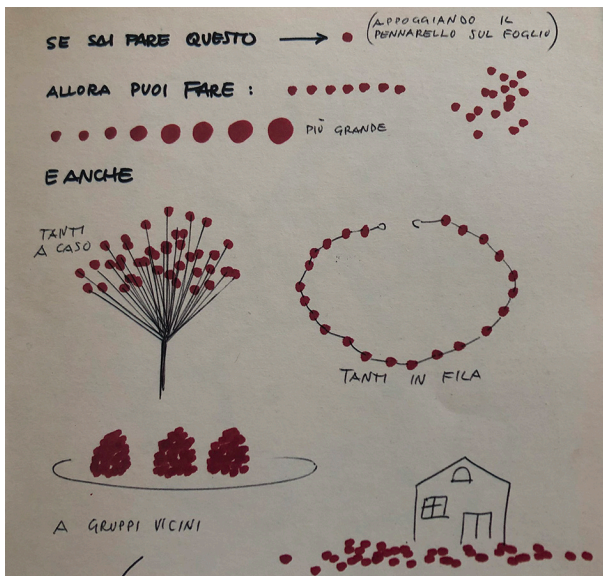
As Munari conceived it, illustration for children's publishing becomes an opportunity not only to tell, describe and reveal meaning embedded in a message, but also to experiment, investigate and observe reality through a divergent gaze [12]. The storytelling – anchored more in the visual than the verbal – often unfolds through a visual code in a kind of 'voiceless' narration, built fundamentally on two primary semiotic elements, shared by both written and graphic language: the point and the line (fig. 14). These marks, when treated according to the principles of graphic semiology, vary in form, size, color and orientation, acquiring different meanings through context and transformation. The 'Sign' becomes the main character in *Prima del disegno* [Munari 1996a], where Munari narrates the adventures of this multi-identity figure, which – whether still or in motion – can become many things, represented as point-based, linear or areal elements [13]. The compositional structure of Munari's illustrated stories, always driven by the goal of clarity and simplicity for the young reader, is often interwoven with logical-conceptual ambiguities that, with his trademark irony, open the door to multiple interpretations. This helps the child think in unconventional ways and nurtures their creative development. Perceptual games emerge, revealing how a visual sign may carry a meaning quite different from that suggested by its initial appearance; or word games that gain new interpretations simply by shifting or transforming a single mark within the composition.

A striking example of this interplay is Munari's collaboration with Gianni Rodari, for whose books he created numerous illustrations. Like Munari, Rodari had a deep understanding of communication – in his case, linguistic – and the generative process by which an idea (meaning) is linked to a sign (signifier).

Rodari's playful approach to writing is grounded in 'the metaphorical interpretation of reality and the literal interpretation of metaphor; the substitution of one letter for another in a word that, by changing, produces a paradoxical reality; the use of conventions to reveal their absurdity, uselessness, and imaginative potential when broken; the collision of elements from different worlds or seemingly incompatible logical systems (fantasy and mathematics, humor

Fig. 14. Top: Bruno Munari, graphic activities for children using points and lines. <<https://www.succodarte.com/noi-si-che-parliamo-di-bambini-con-bruno-munari/>> (accessed 2 February 2025).

Fig. 15. Bottom: Bruno Munari, 'Il merlo ha perso il becco' [Munari 1987]. <<https://www.anca-aste.it/it/asta-0917/il-gioco-dei-quattro-cantoni-illustrazioni-di-asp>> (accessed 2 February 2025).



and semiotics); and the syllogism employed for humorous effect, showing a certain 'rational absurdity' in logic, and the gap between linguistic logic and everyday common sense (in comic terms). In short, Rodari dismantles everything his gaze rests upon, and Munari often follows a similar path in his own generative mechanisms" [Franco 2007], though in the visual rather than verbal realm (fig. 15).

Moreover, Munari himself emphasizes the multiplicity of interpretative layers inherent in the signs at the foundation of communication –visual communication, in this case– in a short essay entitled *Un linguaggio di simboli e di segni?*, in which he observes that it is possible "to use symbols as one uses words in poetry: words with more than one meaning that, depending on how and where they are placed, change expression [...]. The discourse should be very clear in some parts, too clear even, and in others deliberately obscure, like in poetry" [Munari 1997, pp. 76, 77].

Children's books are, then, worlds to be explored: all one has to do is open the 'door' and allow oneself to be guided by words, graphemes and signs that tell a story waiting to be discovered. In these works –perhaps even more so than in other editorial products– typographic devices "should never dominate the page, in fact, they should go unnoticed. They are meant only to guide the eye across the page, to create a kind of imaginary path, like the equator: something that exists but cannot be seen" [Munari 1937].

And while in some cases –particularly in books for which Munari served only as illustrator– the drawing serves to reinforce the mental image evoked by the text, discreetly accompanying the narrative structure and occupying the remaining white space so as not to distract the reader; in others –when Munari is both author and illustrator and designs the entire layout himself– text and image are not always visually aligned or directly dependent on one another, yet they remain semantically interconnected [Franco 2007].

Conclusions

Bruno Munari's work stands out within the landscape of twentieth-century visual culture with an innovative force that resists any singular classification. The protean nature of his research, the multifaceted quality of his thinking and the eclecticism of his output –along with his ability to traverse, with both rigor and inventiveness, fields ranging from design to pedagogy, from artistic



Fig. 16. Bruno Munari, 'The Circus in the Mist' [1996b], English edition of 'Nella nebbia di Milano'. Transparent overlays simulate the visual effects of city fog. <<https://www.anca-aste.it/it/asta-0917/il-gioco-dei-quattro-cantoni-illustrazioni-di-.asp>> (accessed 2 February 2025).

experimentation to visual communication— attest to a form of operational and speculative intelligence that does not settle into adherence to any single expressive code. Rather, it is grounded in a structural reflection on the image, deeply informed by perceptual as well as semantic considerations.

Notes

[1] On his artistic versatility, Munari stated: "I am asked how it is possible to reconcile the work of a graphic designer with that of an industrial designer; and that with the work of an illustrator; and the illustrator's with that of a painter; and ultimately, with that of a writer. It always seems to me a wrongly posed question. A cat has claws, fur, agile paws and a flexible tail: all elements that are part of him and define him. The personality of any artist should be like this, curious and varied, complex, capable of approaching every single operation with full and context-sensitive engagement". In [Rauch 1988, p. 83]. For further information on Munari's work, see <<https://www.munart.org>> (accessed 14 February 2025).

[2] Munari, from a very young age, became close to the Futurist movement, embracing its core principles but interpreting them with irony and personality, often even deconstructing them.

[3] In *Fantasia* [Munari 1977], his analysis of invention, rule and freedom clearly shows how visual creativity, stimulated by graphic design, is a process of synthesis rather than accumulation.

[4] These are Munari's reflections: "Since writing is one of humanity's greatest discoveries, typography—understood as the art of writing—assumes an extremely important role in shaping taste, thanks to its

According to Munari, the graphic product must be rooted in a visual investigation that takes into account the 'psychological' characteristics of the object, the user and their mutual relationships, ultimately identifying the most coherent image, that is, the one most effective at transmitting a message, also in relation to the 'reading time' [14] and the time required for cognitive processing. For instance, Munari reflects on perceptual criteria for calibrating typeface forms and the spaces between characters [15], or on the importance of white space within the page layout, understood as a moment of pause, of reflection [16]. At the same time, one must possess an understanding of the structural rules that underpin the 'narration' of a graphic product. Graphic storytelling is therefore organized according to frameworks and constructs based on a language composed of visual codes and compositional rules—which may, where appropriate, be intentionally subverted—to guide the formation and transformation of mental images (fig. 16).

This is a language—just like the gestural one explored by Munari in his *Dizionario dei Gesti* [Munari 1994]—that is substantiated by a visual grammar: it refers to modes of non-verbal communication endowed with powerful expressive force, through which it becomes possible to represent even the invisible: meaning beyond form.

broad diffusion [...]. If all of these printed pieces follow a certain aesthetic, even the public [...] will become accustomed to proportion, rhythm and harmony [...]. In graphic art [...] harmony is an indispensable condition for good results: starting from the typeface itself, which must be perfectly balanced [...]. The letters must be proportionate to one another, must have graphic affinities and must present to the eye a uniform blotting effect, such that—even when forming a word with letters that don't harmonize—the whole appears coherent. Then come the issues of layout, that is, the distribution of these well-balanced lines of text (each formed from well-balanced letters) on a page, also considering [...] the blank space left around the text [...]. When preparing a booklet, one must also take into account the curve of the page as it opens, i.e., the binding; thus, to facilitate reading, the text must be slightly offset from the crease and harmonize with the facing page, as if the two pages were one. These, in turn, must be linked to others through a guiding thread" [Munari 1937].

[5] Various studies in the 1960s focused on semiology applied first to linguistic, then to visual communication. Among them are *Sémantique structurale* by Algirdas Julien Greimas, which investigates the semiotics of forms and the many ways they can be interpreted as instances (horizontal) and levels (vertical) of meaning [Greimas 1966]; and

Sémiologie Graphique by Jacques Bertin, which outlines a theory for visualizing data and information using points and lines, through so-called visual variables (position, size, shape, orientation, color, value and texture) and their graphic treatments, which produce variations in meaning [Bertin 1967].

[6] Technical and material innovation forms a continuous thread in Munari's work. In the early 1950s, for instance, he was among the first to experiment with xerography, using Xerox photocopiers for creative purposes, playing with image deformation produced by motion during scanning. He also reintroduced to Italy the technique of light painting –first used artistically in 1935 by Man Ray and later made famous by Picasso in the 1940s– where light, used as a graphic tool, describes invisible lines in space that become visible traces when captured photographically.

[7] From 1939 to 1945, Munari worked as a graphic designer for Mondadori, Bompiani and the Montecatini group, overseeing the artistic direction of *Domus* (for which he also wrote articles) and other magazines including *Grazia* and *Tempo*. This experience also highlights the primacy of graphics over text, which often functions as a written note supporting the images. Drawings, photographs, diagrams and photomontages –skillfully treated with screens, textures and colors– become the true protagonists of the page [Colizzi 2012].

[8] The idea of rethinking the traditional book format and creating innovative products for children arose when Munari wanted to give his son Alberto a book for his fifth birthday, only to realize that publishers produced books according to adult expectations and standards, treating them as the primary (or only) readers.

[9] In this respect, Munari follows in the footsteps of Marinetti, who in 1913 proclaimed: "I launch a typographic revolution aimed at the beastly and nauseating conception of the outdated and D'Annunzio-like book: seventeenth-century handmade paper adorned with galleys, Minervas and Apollos [...]. The book must be the Futurist expression of our Futurist thought. Not only that. My revolution targets the so-called typographic harmony of the page [...]. With this typographic revolution, I intend to double the expressive power of words" [Marinetti 1913, p. 4].

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[10] This conception of narrative experience marks an opposite approach to that of the *Prelibri*, which instead project their content outward, encouraging a tactile and multisensory cognitive process external to the book itself.

[11] In an interview, Munari himself emphasized the importance of not assigning a fixed protagonist in children's books: "because the protagonist 'indoctrinates' the child. In my books, the protagonist is the child [...] who walks into the fog, who looks at the giraffe through the hole in the page –in the book *Chi è? Apri la porta*– who opens the door: there are many characters and many simple yet curious stories inside the books, but no fixed protagonist. The child should feel like the protagonist" [Meneguzzo 1993, p. 12].

[12] The concept of 'divergent thinking' was later developed by American psychologist Joy Paul Guilford in the 1950s, referring to a form of intellectual creativity that enables problem-solving through unconventional means (as opposed to 'convergent thinking', or standardized approaches) [Guilford 1967].

[13] The sign, as Munari puts it, can be vertical and imposing, can break silently, curve and thicken, represent the space of a breath, the start of a field, an undefined insect, or the motion of a spinning top, just to name a few possibilities.

[14] In *Telegrammi e poesie* Munari considers how the designer must choose typefaces, word spacing and even the spacing between letters based on the reading time and speed of the text –whether quickly scanned like a road sign, or slowly savored like literary prose [Munari 1997, pp. 66-68].

[15] See also *La forma delle parole*, in [Munari 1997, pp. 62-65].

[16] On the importance of white space, Munari says: "Everyone knows what a typographic 'brick' is, that page crammed with text, dense as sand, with no paragraph breaks or white space. White space plays a crucial role. It's like the greenery in a city, a resting area for the eyes while reading. Once, however, a client told the artist who was designing a newspaper ad: 'I paid for this space you left blank, so you must fill it with text.' A comprehensible mistake, but a mistake nonetheless" [Munari 1937].

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RUBRICS

Readings/Rereadings

Readings/Rereadings

Vedere con il disegno, or Art is Made with the Eyes

Daniele Colistra

When an artist writes

The title of this book is a synesthesia. It makes you think of a text based on the suggestions that art, by its nature, is called to evoke. Manfredo Massironi was a visual artist –or rather: a ‘visual operator’, as he defined himself– who never loved conventions. We would not expect methodical writing from one of his books. On the contrary, he follows the artists (Paul Klee, Vasilij Kandinskij, György Kepes, among others) who, when writing about visibility, adopt a scientific rigor.

A witness of his time

The book *Vedere con il disegno*, published in Padova by Muzzio editore 1982 and republished in 1989 without changes except for the cover (figs. 1, 2), has the classic format of 17 × 24 cm. Bound in sixteenths, 192 pages plus an introduction of 12 additional not numbered pages, paperback with 132 black and white illustrations. Composed in transitional fonts, title in lowercase (even the publisher forgoes the use of capitals), it adopts a rigorous asymmetric grid based on a column of 10 cm inside for the text and larger images, a column of 4.5 cm outside for the notes, captions and smaller images.

The text is divided into an *Introduction* and four parts, plus a *Preface* by Sergio



Fig. 1. *Vedere con il disegno*. Cover of the first edition (Padova: Muzzio editore, 1982).

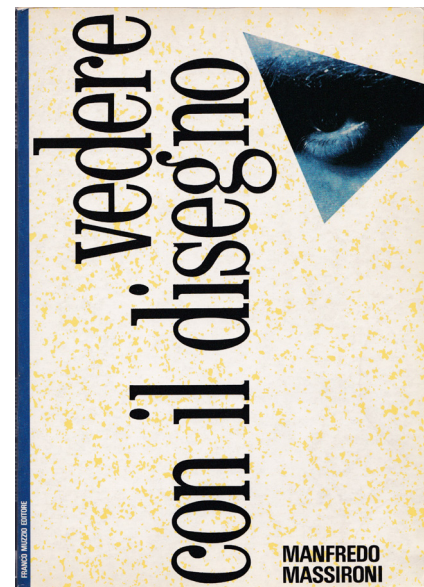


Fig. 2. *Vedere con il disegno*. Cover of the second edition (Padova: Muzzio editore, 1989).

Los, director of the series that hosts the volume, a figure very close to some members of the Enne group (of which Massironi was a co-founder). Los writes mainly about Carlo Scarpa, as well as about himself, and does not anticipate or add much to the contents that follow. The author's brief *Introduction* immediately declares the aim of the work: to explain how the language of drawing works by relating the processes of perception of images to the processes of production of signs.

A double keystone

Sign and perception are the two key words of the first chapter, entitled *Structural components of drawing*. With a didactic approach, Massironi shows the countless mental processes to which drawing can adapt, and that drawing itself stimulates in the observer: Views, diagrams, schemes, sketches, executive drawings, pictograms, brands, geometric constructions, optical illusions, illustrations, project and survey tables serve as examples to demonstrate that drawing is a tool capable of documenting reality, but only if there is an appropriate interpretation of the signs by the observer. The designer and the observer trigger two reversible processes, keystones of the perceptive-interpretative mechanism, entirely based on the significant power of signs. Recalling the still recent works of Rudolf Arnheim, Massironi analyses the function of the line as an object, as an outline and as a filling texture; then the function of the plane, which can accommodate the drawing of objects arranged in a perpendicular or inclined position with respect to the optical

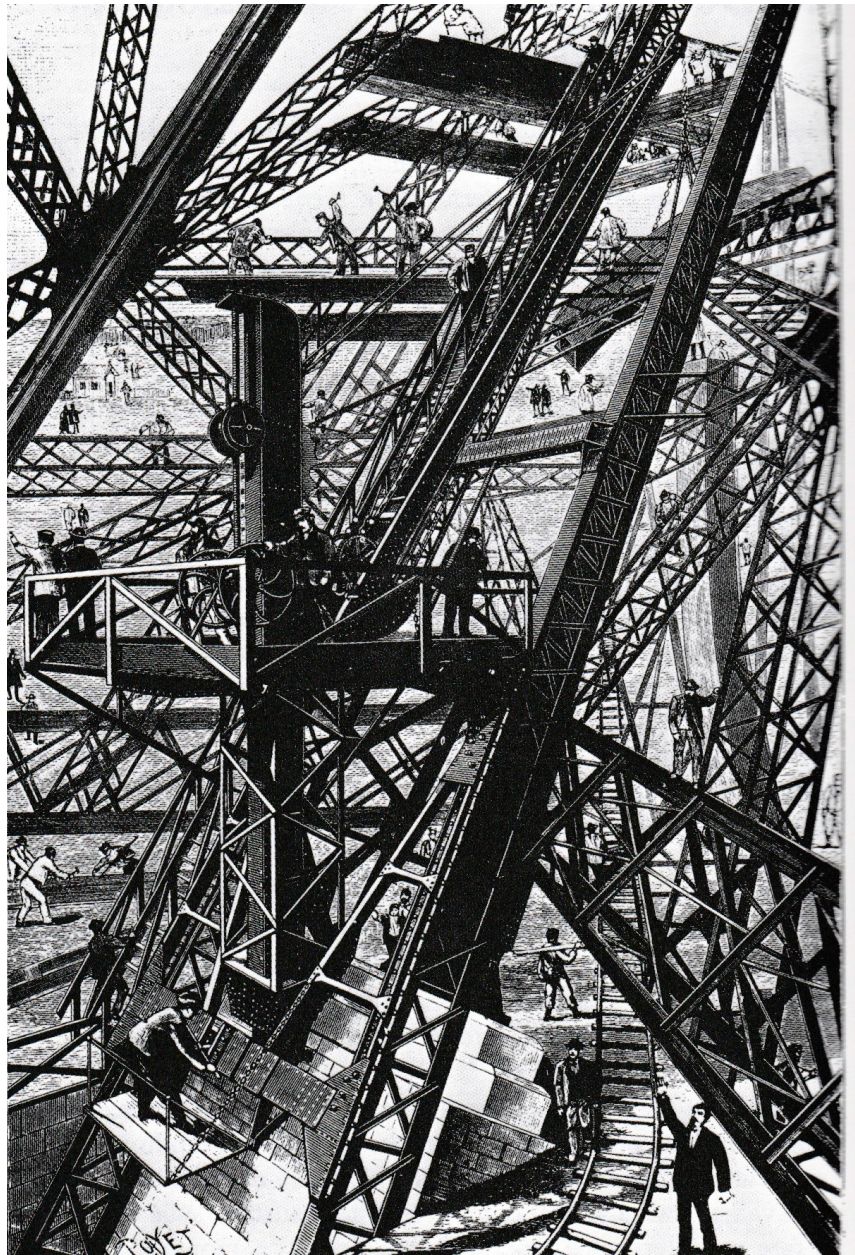
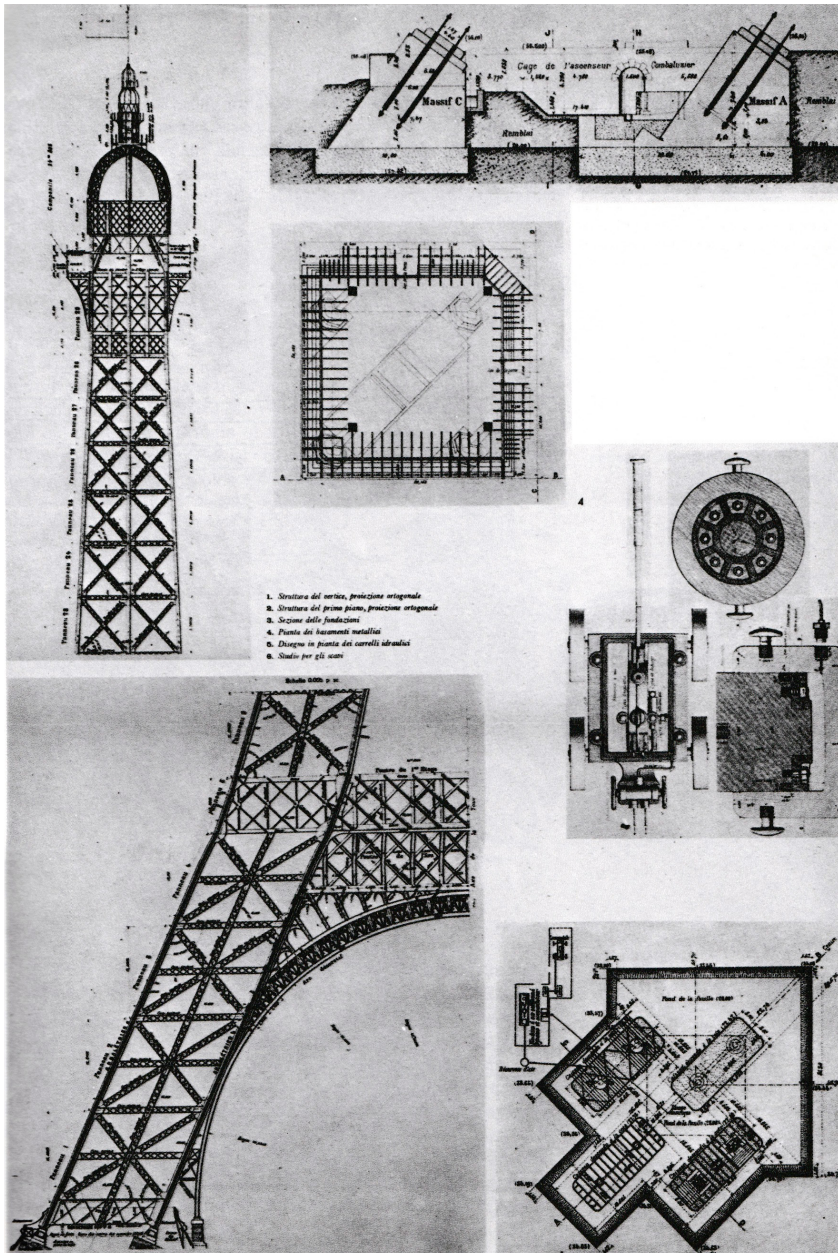


Fig. 3. Louis Poyet. *Grues de montage, lors de la construction de la Tour Eiffel (1887)* (1982, fig. 49, p. 40).



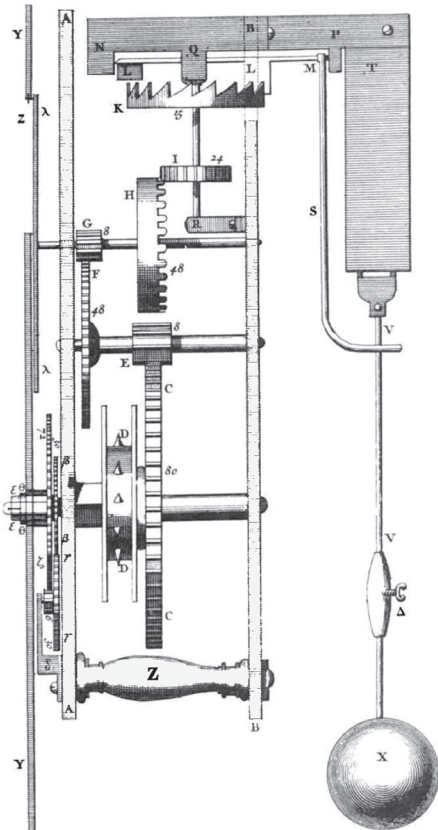
axis. The latter is an unconventional but effective way to distinguish the two-dimensional world of Mongian projections, ideal for technical drawing and signage, from the three-dimensional world of perspective projections, intended for figurative representations. The author chooses two different representations of the Eiffel Tower to show two antithetical ways in which it is possible to represent the same object (figs. 3, 4). A reflection on the analogies between perspective and images with a taxonomic function follows. Apparently, they are two different ways of reproducing reality. But just as perspective is based on the construction of a rational, continuous space, in which the parts are regulated by precise metric ratios, taxonomies also follow rational, rigorous and stable rules, placing all the elements in a condition of logical continuity.

Drawing means choosing

The second chapter, *Emphasis and exclusion in drawing*, shows how each drawing emphasizes some elements and simultaneously excludes others. This particularly delicate choice makes an image something very different from what it represents. However, the process of emphasis/exclusion tends to leave no gaps because perception is the reference of visual experience and is sufficient to give completeness to the image. Drawing, therefore, is a profoundly critical act, based on a choice of emphasis and exclusion. From this point of view, "an object exists twice, three times, many times. Indeed, each object is, for the purpose of representation, multiple different objects, and each representation tends to put in

Fig. 4. S.a., Some construction drawings of the Eiffel Tower (s.d.) (1982, fig. 50, p. 41).

Fig. 5. Christiaan Huygens. *Horologium Oscillatorium* (1673) (1982, fig. 63, p. 70).



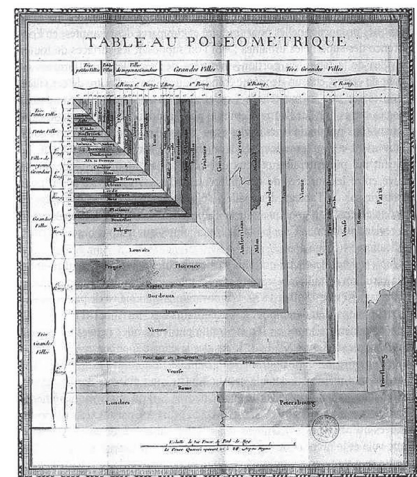
brackets, without completely excluding them, the other possibilities of existence of the object, to particularly exalt one of them" (p. 67; trans. of the text is by the author). The section, for example, focuses on parts and connections of the internal structure of an object and deliberately eliminates all connotations relating to its external appearance (fig. 5). However, Massironi observes, exclusion does not only concern the act of drawing. There is a mechanism of exclusion also in the observation of the representation, and in this game of losses there is something irreducible: it is the core of communication, that is, "the thing that is being discussed independently of what is being said about it or through it" (p. 74). And just as the sender loads the message with communicative intentions, which fill the content level of the message object, so the receiver fills with his own contents all the gaps that derive from the reading process, further relaunching the subtle game of emphasis and exclusion. The central theme of the first chapter returns, therefore: the double keystone constituted by the awareness of the one who draws and the awareness of the one who observes.

Drawing: semantic exposure

The third chapter deals with the relationship between *Drawing and the problems of communication* and addresses them from a predominantly semiological point of view. Massironi observes that designers (painters, graphic artists, architects, engravers, etc.), when dealing with the theory of representation, always focus on techniques and almost never on the meaning of images; they leave this task to scholars of verbal language who, for obvious reasons, apply procedures

to figurative analysis that have been tested for texts and are therefore unsuitable for the purpose. Recalling the work of the authors who have provided the most important contributions on the topic (Umberto Eco, Tomás Maldonado, Georges Mounin, Jacques Bertin, as well as the less recent but still valid Charles Sanders Peirce), and warning against the inadequacy of the methods of linguistic analysis applied to graphics, Massironi insists on a theme that is central to him: drawing is not a tool for representation, but rather for clarification and explanation. Diagrams and graphs are a very clear example of this: they do not represent objects, but rather qualities, quantities, distributions, subdivisions and reciprocal relations between phenomena (fig. 6). The differences between perspective, orthogonal projections and axonometry clearly highlight the role of drawing

Fig. 6. Charles-René de Fourcroy. *Essai d'une table poléométrique, ou amusement d'un amateur de plans sur la grandeur de quelques villes* (1782) (1982, fig. 77, p. 99).

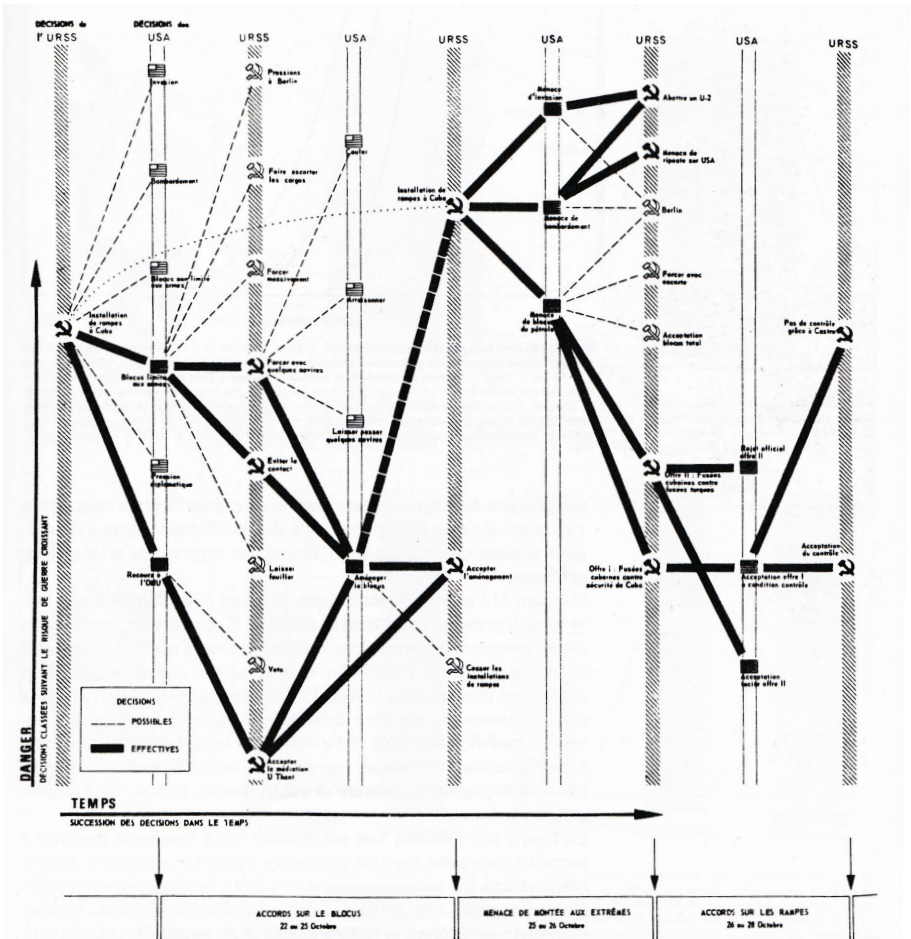


as a semantic exposure. Each of these forms of representation is based on codes that clarify and explain only some of the infinite qualities possessed by an object. They function as "semantic chains that are able to convey particular and specific contents" and are nothing more than "languages for the image" (p. 93). The author compares verbal expressiveness and the expressiveness of drawing, highlighting the differences between the world of objects communicated more effectively by images, and the world of concepts, conveyed more pertinently by words. He does so through a long series of assertions, close to aphorisms, in which the rules of the two communication systems are highlighted through a large series of examples.

There is, however, an area of overlap between language, which proceeds through concepts, and perception, which relies on objects: it is pictography. If, for example, a pictogram represents a man, it is valid for all men, regardless of their external characteristics. A pictogram therefore reproduces a concept, an idea. From the pictogram derives the ideogram, a broader term from a semantic point of view. It presupposes a process of categorization whose graphic translation is based on codified rules (frontal representation plane, line as margin, absence of shades, omission of the background, centrality of the figure etc.).

The reasoning extends to the "marginal conditions in which a communicative instrument stops and seeks help from another"; in particular, to those cases in which "verbal discourse withdraws to leave space for those modes of graphic signification that integrate and expand its communicative limits" (p. 112). A theme that will be developed further on.

Fig. 7. Jacques Bertin. *La crise de Cuba* (1967) (1982, fig. 110, p. 149).



A successful neologism

The title of the fourth chapter does not suggest any great innovations (*Drawing as a tool for scientific investigation and information*), but the incipit immediately goes to the heart of the matter: "There are mental productions that have the characteristic of being structured only in a visual manner" (p. 119): in some cases, drawing is the only expressive form to be able to transmit a content. The representation of the benzene ring, for example, allows us to inform about both the quantitative and qualitative composition of this hydrocarbon. Even if the drawn shape has no connection with the real configuration of the compound, it shows the components, the reciprocal relationships between them and, therefore, summarizes all the knowledge necessary to understand the element in question. In this case, as in the numerous other examples reported, the drawing is configured as a hypothetical and non-exclusive model. This type of representation is widely used in scientific journalism and in all cases in which it is necessary to visualize something that does not have a shape. These are representations that cannot be experienced perceptually and, therefore, lack rules of graphic execution. To define them, Massironi coined the term '*ipotetigrafia*' ('hypothetigraphy'), that is, the "graphic product that contributes to giving visual form to hypotheses formulated to explain the behaviour or functioning of natural conditions intuited or observed experimentally and of which it constitutes an explanatory model" (p. 126).

Science has been using hypothetigraphy for a very long time; in the past through allegorical figures, then through increasingly rigorous notations. For example, a vector is characterized by length, inclination, direction and point of application. Its graphic coding can isolate, define and rigorously express all the elements that characterize a force. But hypothetigraphy can go much further: it arises from an intuitive process and, therefore, it is not possible to establish its outcomes *a priori*, but only to reconstruct a taxonomy in reverse to identify its internal structure. Usually, the process starts from the need to express data provided by measurements; the latter are arranged within a formal, graphic or plastic structure, characterized by rigorous geometries, and it is precisely this geometrization that allows the observer to identify it as an abstract and non-verisimilitude configuration, precisely because it is the description of non-visible phenomena (fig. 7). It also highlights once again the fact that perception does not only consist in acquiring and processing external data, but also internal data to the observer. From a graphic and projective point of view, hypothetigraphy prefers points and lines in frontal view. Furthermore, it always requires a caption, in order to promote, through a well-structured interaction between visual and verbal, an unequivocal understanding: abstract lines, characterized by a low degree of motivation, need to be supported by a text that associates them with the hypothesized and schematized phenomenon.

Occam's razor of representation

I discovered Massironi's book in 1996, reading *L'oggetto della raffigurazione* by Giovanni Anceschi (Milano: ETAS libri 1992). The subject of the two works is the same, but *Vedere con il disegno* is more structured, didactic, ordered, methodical, iterative. It helped me a lot in my studies, however I have never recommended it to students because I fear they would not appreciate it, and I would be disappointed. It is a book I am fond of, like those records in which there is a song that reminds you of something and therefore becomes precious: but only for you.

The book shows its age, and this makes it even more fascinating. It is based on a simple idea, common in the Seventies, that the work of art is made half by the artist and half by the observer. I think this idea of a horizontal art may seem weird to those who were born and live in a world of ever greater imbalances. The concept of hypothetigraphy for me is a crowbar, an Occam's razor that I use to quickly and mnemonic classify graphic representations. Some time ago I wrote an article on this very subject, on the ways in which hypothetigraphy can be sought, evoked, imposed, avoided, rejected by a drawing [1]. I reread it a few days ago, and it didn't seem very convincing to me. It's right that it should be this way: the aura of a reading cannot be reinfused into a writing. You must change your point of view. A drawing sees differently, and perhaps manages to illuminate the corners that words are forced to leave in shadow.

Note

[1] See Colistra, D. (2020). Ubique sunt leones. In *XY digitale*, n. 9-10, pp. 78-91 <<https://dx.doi.org/10.15168/xy.v5i09-10.168>>.

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Reviews

Reviews

Valeria Menchetelli

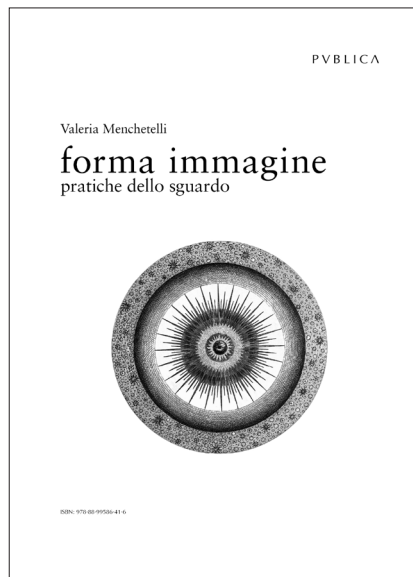
Forma immagine. Pratiche dello sguardo

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*Image form/Still image*

To present Valeria Menchetelli's volume, it is worth starting from here and from what the author herself suggests in her interpretation of the semantic ambiguity of this binomial, evoking the idea of "a snapshot, of an overall view taken from a particular framing, the one given by observing from a specific point of view" (p. 14). And it is a particular point of view from which the author observes the vast sphere of the contemporary 'society of images'. It is the point of view of those who understand the practices of the gaze as the protagonists of an argumentative itinerary with which the author moves with agility within the vast horizon of the culture of images, without claiming to deal with it in its overall dimension, but rather aiming from the outset to identify in the logic of categorisation and the exemplificative approach the key to interpret a large number of practices through which it is precisely the gaze that gives form to the image or at least gives it 'one of the possible forms' in a given interpretative context.

If in the title the author seems to want to emphasise the conceptual distinction, now widely shared, between the planes of visual perception and those of graphic production – on the one hand 'form' refers to the creative act of configuration through design, on the other hand 'image' carries with it the idea of the perceptive act brought about by vision – in the development of the subsequent arguments the distinction between the planes blurs in favour of an interpretation that, in several passages, emphasises how the process of shaping images necessitates a continuous transition between these two planes and condenses into that complex operation of 'attribution of meaning' that remains the ultimate reason for both the production and reception practices of images in the context of visual culture.

The articulation of the volume therefore revolves around certain categories of images,

interpreting them precisely as vectors of as many ways in which through the gaze we not only relate to reality, but act in it, in it we experience behaviour, in it we produce effects.

It is no coincidence that the volume opens with a reflection on the relationship between images and society and closes with a concerned observation on the phenomenon of image overload. Images, as the author explains in the opening of the volume, not without reference to a broad scenario of critical reflection on the subject, are born with the aim of connecting man with reality and the eminently visual substance – with all that can be included in this term – that permeates contemporary society, inescapably defines the nature of the relationship between man and his world, and structures his dimension as *homo videns*. And yet, images today experience a paradox, clearly expressed by the crisis of their communicative content and the emptying of their original function, that of, as the author herself tells us, "expressing and conveying an informative message through a process of putting it into graphic form and using specific languages" (p. 24). The rampant 'pan-visual' dimension of the image runs the risk of rendering "its manifestation sterile and inessential, which reduces it to the embarrassing absence of communicative content" (p. 24).

Starting from this consideration, the urgency that animates the text and that in some way makes it not pleonastic, but necessary, to argue once again around the horizon of visual culture, seems to be that of helping the reader to orient himself and move around in the redundancy of images that characterises media behaviour today, by trying to subtract them from a randomness of interpretation and inserting them in a certain number of 'thematic containers', certainly not exhaustive, but useful in opening as many windows of reflection on more general themes around the practices of the gaze, visual culture and contemporary media behaviour.

The 'speaking images' are the first to take the stage, opening up a reflection on the relationship between verbal language and graphic-visual language in which the balances between word and image show themselves with all their power in the processes of thought development. Starting with Calvino's enlightening words regarding the two imaginative processes –that which starts from images and that which starts from words– the author develops a thought rich in references and examples to the point of bringing the dichotomy back into the realm of a "necessary collaboration" (P. 46). It is then the turn of the 'synoptic images' through which the author emphasises and investigates the extraordinary taxonomic and synthesis power with which images have, over time, constructed complex forms of knowledge organisation and promoted the development of critical thought through systemic and overall visions. Catalogues, lists, replicas, series, follow one another in demonstrating the power of "simultaneous vision" (p. 56) and its ability to dominate space and time in a single conceptual synthesis. 'Wrong images' are an opportunity for the author to investigate a critical theme of great interest inaugurated by the new 'aesthetics of error'. From crime to aesthetic ideal, the

error clearly manifests the experimental attitude in digital visual production and not only, intriguingly introducing the category of the unexpected as a value and as an unforeseen activator in the creative process. An aesthetic change whose semantic scope is investigated by the author, starting from the experiments of the 1950s up to an interesting insight into glitch art and its dimension as a collective phenomenon in which error is emancipated to the point of becoming an independent art form. Reflection on the social responsibility of communication is addressed starting with an analysis of the main posters of the 1960s, first and foremost the famous *First things first* by Ken Garland. Attention is then turned specifically to 'life-saving images' with a focus on their ethical and social values, but with particular attention on their ability to convey messages that are fundamental for human health and safety and therefore on the ability of images to modify behaviour. The analysis of the vast and fascinating subject of infographics and their sign-symbolic power is opened by the definition of 'interactive images' with which the author inaugurates the reflection on those systems of signs and symbols that make intelligible the infinite series of visual devices with which we

now interact with the real world. The term 'icon', its hybrid meaning, its clear distinction, from Pierce onwards, with respect to the meanings of index and symbol, its classification in degrees of abstraction, are analysed, through the thought of Moles, Anceschi, Massironi, in order to investigate its coding and decoding mechanisms in the context of informational representations.

It is clear, therefore, that the overview of declinations through which the author classifies the phenomenological dimension of images and the imagery connected to them should not lead us to think that the structure of the volume is exclusively exemplary. The categories identified are only the starting point from which reflections are developed, never trivial, that aim to frame the phenomena from a historical-critical point of view with a large recourse to bibliographic sources and with a rich iconographic apparatus that accompanies and facilitates the comprehension of the themes that cross a broad spectrum of the images' production and of those practices of the glance that, as the author suggests, never as in our times must be "guided by a real awareness and by the opportune cultural instruments to interpret the images that surround us" (p. 25).

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Reviews

Alfonso Giacotti

Nuovi Mondi. Il potere assoluto dell'immaginazione

Lettera Ventidue

Siracusa 2025

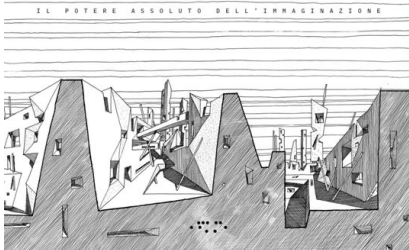
128 pp.

ISBN 9791256440283

ALFONSO GIANCOTTI

N	U	O	V	I
M	O	N	D	I

IL POTERE ASSOLUTO DELL'IMMAGINAZIONE



The volume of Alfonso Giacotti's drawings, set in a horizontal format, is a precious editorial work, in terms of paper quality, binding and concept, especially because it appears to be specifically designed on the features of the drawings themselves. The elegant black and white contrast between text and the pages echoes the graphic quality of the sketches. The table of contents itself is conceived after a panoramic drawing with proportions of 1:5 between height and width that fills the reader's field of vision thanks to the side flaps, as also happens in other parts of the book.

The seven sections into which Giacotti's drawings are divided – *Territories*, *Soundscapes*, *Islands*, *Constellations*, *Homage to Sartre*, *(Un) finished*, *Alterations* – have titles borrowed from geography, music and literature that testify to the interdisciplinary and intrinsically poetic nature of his work. In this sense, the task assigned to the framing texts is also significant. Often quotes and aphorisms, they expand and orient the semantic exploration of the works, eventually attributing a central role to the observations of Maurizio Sacripanti, an undisputed Roman master of architecture and drawing.

From a content point of view, the drawings stage geometric-architectural configurations between the urban and

the geological. Their notable formal homogeneity is achieved through a carefully selected alphabet of morphemes, purged, for example, of curved elements, of rigorously Cartesian systems and, more generally, of those figures that could inevitably refer to specific architectural typologies. Instead, they are abstract artificial landscapes, familiar yet alien and as such disturbing, which on the one hand repel and on the other intrigue, like the ruins of a remote civilization.

Even from a formal point of view, the drawings appear very homogeneous, probably thanks to their constant and rigorous elaboration over the years (the works contained here range from 2008 to 2024) as well as the auto-graphed texts contained here. The drawings, constructed with continuous black lines in ink or marker with a constant thickness, can ideally be traced back to an overlapping of various layers of graphic information. The first layer is made up of the contours of the shapes, oscillating between monolithic masses and plates of variable thickness variously folded in space. Their external surfaces are often articulated in triangles and trapeziums by edges that connect them to the numerous quadrangular openings, like meshes of digital models. At the same time, these shapes are

crossed by thin tubular elements that support some volumes as pillars or struts would do but that much more often penetrate them from one side to the other, like pins in a maquette waiting for new pieces to be added.

The second level is instead composed of the field treatments of the surfaces that are made (from light to dark): with dots; parallel lines, often according to the contour lines or the straight lines of maximum slope of the surfaces; crossed lines; and, when the complexity of the case requires it, with black fillings. It is important to underline that most of these treatments contribute coherently to the rendering of light effects according to what we know as the Theory of Shadows, also respecting the convention according to which the shades are lighter than shadows. Despite their intuitive application –after all, they are freehand sketches often made in spare time on pocket sketchbooks– these treatments contribute in a fundamental way to the reading of the complex three-dimensional structures, highlighting even the slightest variations in the position of the surfaces.

The third level is formed by the sky, occasionally rendered with dots but more often with continuous horizontal lines at variable distances which, ideally passing behind the forms, accentuate their three-dimensional value, while, from an iconographic point of view, they seem to rework the graphics of eighteenth-century engravers.

The fourth level is that of the reflections on the bodies of water, made with dotted lines, which ideally divide the observer from the structures or, as in the case of the Islands, which completely surround them. While the surface of the water is represented by horizontal lines that thicken approaching the horizon line, the image of the landscape

is constructed not as the geometric reflection of the three-dimensional structure but as the optical reflection of its image, thus amplifying its ideal and iconographic value.

To these four ideal levels, a fifth is occasionally added, a digital layer composed of inserts of colored textures that never fill the entire drawing but that limit themselves to testing the possibility of some fragments to also express material and tactile values, the possibility of becoming built architecture. The seven sections into which the works are divided do not only describe the different origins of the drawings, such as those dedicated to Sartre's thought or inspired by listening to pieces of music, moreover through the intermediation of small summary diagrams. Despite their formal homogeneity, differences emerge between the groups of drawings, especially when one reflects on the relationship and distance between the observer and the structures.

A first group includes distant landscapes, mirages often mediated by water and reflections; a second group includes landscapes that appear closer, such as sets or ephemeral machines momentarily placed on a stage; a third group is instead formed by glimpses that show only partial views of the structures, the result of specific perspective explorations that sometimes penetrate inside the buildings, like the *Non-finiti* or the *Constellations* that, framed in their regular squares, seem to be waiting for a narration capable of chaining them in a sequence. It goes without saying that these distances and observation methods correspond to the different moments of the design action, characterized by the continuous transition from analysis to synthesis, from the particular to the general, to then identify a new point of view and start the exploration/transcription again.

A further element of formal investigation, transversal to some groups, is constituted by the vertical plane of the perspective frame that occasionally manifests itself by cutting the structures. These perspectival sections (or sectional perspectives), which unconsciously respond to the curiosity of those who explore their imagination through drawing, simultaneously exhibit constructed spaces and thicknesses, sometimes filled with parallel lines oriented at 45°, as in the case of the drawing on the cover. While inserting an epistemological distance from the observer, they reveal not only the actual proportions between the parts involved –the only case among the many drawings presented– but also the complex relationship between solid and void and between visible and hidden. It is much more difficult to probe the size of these structures, except in the case of seven pictures (out of a total of 233) in which fleeting human figures suggest a possible, approximative scale of reduction; needless to say, this incommensurability appears to be a precise intention of the Author.

A separate discussion is constituted by the digital images that form the Epilogo, where the results of two competition projects for the Château de Chambord in France and Villa Adriana near Tivoli converge. Here the Giacotti has experimented with both different languages, with great attention to the tactile value of the surfaces, and polycentric perspective views, as in the long underground section under the castle, in which the polymorphic rooms, here crowded by countless human figures, show autonomous perspective views. In conclusion, Giacotti's work inspires several considerations. It bears witness to the importance for the architects to cultivate and protect a mental place

where they can take refuge from time to time, a secret garden where they can find a familiar lexicon of gestures and forms useful for processing the solicitations of the external world and translating them into architectural propositions through the mediation of drawing. In this sense, the book constitutes a sort of call to arms of the imagination as an attitude for the architects who, in their role as a figure that is culturally sensitive to the environment and society, are capable of proposing forms that guide

their development in a mutually compatible and sustainable way. Indirectly, it also bears witness to the growing marginality of this figure in contemporary society. This is perhaps not a novelty, given that the phenomenon of “paper architecture” has its origins in the treatises of the second half of the fifteenth century, but that is not the point. The drawings contained in the volume are apparently useless: except for a small part, they are not even finalized to a project; moreover, they required a lot

of time and a years-long elaboration. And yet, this is precisely what ‘making architecture’ is. Making architecture is something that short-sighted political-economic thinking increasingly deems useless and impractical, because it transcends the mere functionality and stability of a structure in the attempt to embody the spirit of an era and a community and, above all, because it requires attempts and time, a time that today seems increasingly difficult to find.

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Reviews

Laura Carlevaris

L'Ottica di Claudio Tolomeo nella storia della Prospettiva

Edizioni Quasar
Roma 2024

182 pp.
eISBN: 978-88-5491-450-6



Laura Carlevaris's volume *L'Ottica di Claudio Tolomeo nella storia della prospettiva* (Claudius Ptolemy's *Optics in the history of perspective*), published in 2024 by Edizioni Quasar of Rome –specialized in the fields of Antiquities and Archaeology– has been available since 2024 on the digital platform Torrossa, in digital format [1]. It is a volume of 182 pages, with a *Presentation* by Riccardo Migliari, in which the implications of the work of the Alexandrian author are taken into consideration not only on the origins of the so-called 'ancient perspective' but also on its Renaissance (re)foundation.

Those (like the writer) who do not deal with these topics daily but have found themselves dealing with issues related to the history of perspective even marginally during their studies, immediately realize the complexity of the topic addressed. As with any thoughtful and conscious dive into the historical foundations of the disciplines of Drawing, the choice of the research topic proves to be courageous and requires one to grapple with radical questions, whose sources of reference become discontinuous and fragmentary and with respect to which even the meaning of terms still in common use is confronted with such a distance of meaning as to require the patient interpretation of documents

and procedures, separated from us by a sort of frosted glass that clouds our perception, blurs the profiles and leads us onto slippery ground that only the exercise of the most subtle knowledge together with a thoughtful philological approach can thin, realigning our aim.

The familiarity necessary to tackle the drafting of a monograph on topics of this kind is developed only with the patient application refined over the course of years –decades in this case– guided by a passionate curiosity that slowly clarifies the contours of the questions, allowing us to identify a vaunted system of references that can serve as cornerstones for scientific exploration. This volume by Laura Carlevaris is prepared by a series of other works that investigate similar themes or close topics, such as –among others– the two articles published in *Disegnare. Idee, Immagini/Drawing. Ideas, images* in 2003 and 2006, the essay dedicated to the Hall of Masks published in *Ikhnos* in 2006, the most recent writing of 2015 on the perspective 'expedients' from Antiquity to the Renaissance [2]. As the author shows us with her work, topics of this kind require patience and tenacity, together with the willingness to get involved in the terrain of comparison explored by scholars of different disciplines in which studies are organized on

other methodological tissue, sometimes very distant from those that characterize historical studies on Representation. In his dense *Presentation* to the volume, Riccardo Migliari emphasizes how even today there is no organic study available on the History of Representation, whose object of investigation does not coincide, if not partially, with the history of Descriptive Geometry or some figurative arts. The History of Representation is an intrinsically interdisciplinary field that, moreover, can be profitably explored only by those who are able to understand its essential issues well and these can be fully identified only by those who possess the most suitable tools, that is, in short, by those who know how to draw. Precisely for this reason, Migliari continues, Carlevaris' volume can rightfully be considered the first chapter of this History, yet to be written, a piece to which many others can be added, maintaining an open and inclusive approach. On the other hand—as this monograph demonstrates by continuously referring to knowledge of geometry, physics, physiology, literature, history, cartography—it appears increasingly evident that, although this may seem paradoxical, the central nucleus of each discipline is clearly defined only by crossing its frontiers and crossing over into the closest ones, rather than by entrenching itself in its presumed uniqueness. While we explore the new frontiers of technology, our discipline is (again) re-establishing itself, acquiring new operational tools, slowly reconsidering the value of research paths that appeared to be priorities or others that seemed to us to be exhausted and that now show us all their urgency. The volume is organized into five chapters. The paper opens with a *Introduction*, in Italian and English, which clarifies the themes that the study deals with,

namely the question of ancient perspective—probably destined to remain open and partially unresolved—, the repercussions of ancient geometry in Renaissance perspective, the relationships that, in much more recent times, all this has had with the practice of photography and with the instances that have determined its development. In the chapter *Ottica, prospettiva, scenografia* (*Optics, perspective, scenography*), the connections between vision and perspective in the ancient world and in the Renaissance are discussed, the relationships with the practice of theatrical scenography and the openings that on these topics are determined in the eighteenth century following the archaeological discoveries that overturn the knowledge acquired until then. In the chapter *L'ottica antica e il modello euclideo* (*Ancient optics and Euclidean model*), the different conceptual models relating to vision developed in the ancient world are examined. In the chapter *L'ottica di Claudio Tolomeo* (*Claudius Ptolemy's optics*), the influence of the Alexandrian author's work is studied, also retracing the reflections of other scholars, including those of Vladimir Valerio. Furthermore, the structure of Ptolemy's treatise is clearly examined, making its contents accessible, with measure and critical sense, even to non-specialists. At the end of this part, Titus Lucretius Carus' contribution to the theme of vision is addressed. In the *Conclusions*, also in Italian and English, a summary of Ptolemy's contribution to the theory of perspective is drawn, showing how consistent this is even though in Optics he dealt with vision and not with representation. The volume closes with various apparatus, including a specialist bibliography that gives an account of the breadth and intensity of the path taken.

Despite the vastness of the topics and ideas, Laura Carlevaris' book is a book that maintains brevity that, together with the clarity and pleasantness of the writing, allows the reader to access complex areas that he or she would hardly be able to explore independently. This probably also happens thanks to a precise narrative strategy, to the choice of putting information and reflections in order using an effective and original structure, expertly stitching together fragments, dissecting phenomena, sharing opinions. In analogy with the topic covered, the writing selects and alternates points of view, combines them in a clever game of mirrors, exploits their reflections, influences, transparencies, almost as if it borrowed from the language of vision an arsenal of concepts and dialectical devices that in this writing are transformed into a precise narrative mode, welcoming the complexity of the research topic with clear and essential choices. On the other hand, as the author writes on page 15, "When history is involved, the direction we take is undoubtedly crucial". Few other topics like that of perspective have taken on an emblematic value in showing the perception that modern Western culture has developed with respect to itself. Its profound connection with the idea of presence and identity, both personal and collective, has ended up transforming what could have been simply a device for the production of images into one of the most fertile areas in which to express and compare thought and self-perception. Twenty years ago, on the pages of *Ikhnos*, at the height of the spread of computer drawing, with the maturing of profound questions on the meaning and the very survival of traditional drawing methods, Riccardo Migliari in a stimulating and passionate essay asked himself "Does perspective have a future?" [3]. Today

the work of Laura Carlevaris, precisely by addressing questions that have their roots in the ancient world, contributes to providing an answer to that question, showing once again how the history of perspective innervates the very history of scientific, artistic and literary culture that supports the sense of our identity and our actions.

Notes

[1] The volume is available at <<https://www.torrossa.com/it/resources/an/5756664>> in .pdf format (consulted in May 2025).

[2] Carlevaris, L. (2003). La prospettiva nell'ottica antica: il contributo di Tolomeo. In *Disegnare. Idee, Immagini*, n. 27, pp. 16-29; Carlevaris, L. (2006). La questione della prospettiva antica: oltre Panofsky, oltre Gioseffi. In *Disegnare. Idee, Immagini*, n. 32, pp. 66-81; Carlevaris, L. (2006). La Sala delle Maschere nella «questione» della prospettiva antica. In AA.VV. *Ikhnos. Analisi grafica e storia della rappresentazione*, pp. 11-42. Siracusa: Lombardi; Carlevaris L. (2015). Progettare la terza dimensione. Espedienti prospettici dall'antichità al Rinascimento. In Stefano Bertocci, Fauzia Farneti (a cura di). *Prospettiva, luce e colore nell'illusionismo architettonico. Atti del Convegno Quadraturismo e grande decorazione nella pittura di età barocca*, Firenze-Montepulciano, 9-11 giugno 2011, pp. 21-30. Roma: Artemide.

[3] Migliari, R. (2005). Ha la Prospettiva un futuro? (Has Man a future?). In AA.VV. *Ikhnos. Analisi grafica e storia della rappresentazione*, pp. 133-160. Siracusa: Lombardi.

Autore

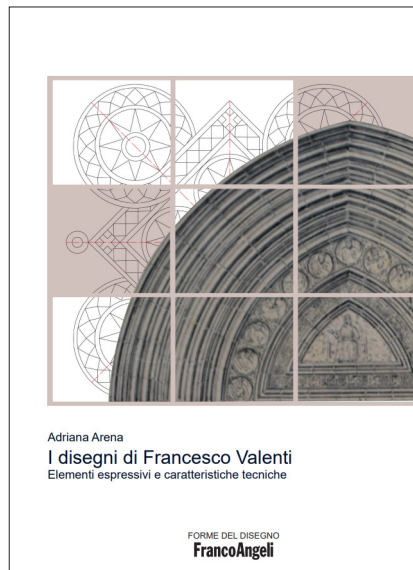
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Reviews

Adriana Arena

I disegni di Francesco Valenti. Elementi espressivi e caratteristiche tecniche

FrancoAngeli s.r.l. Editori
Milano 2024
148 pp.
ISBN: 978-88-351-1935-7



The book *I disegni di Francesco Valenti. Elementi espressivi e caratteristiche tecniche* (Drawings by Francesco Valenti. Expressive Elements and Technical Characteristics), edited by Adriana Arena and scheduled for publication in 2024 as part of FrancoAngeli's *Forme del Disegno* series, offers an in-depth study of the graphic works of architect and engineer Francesco Valenti, who was active from the late 19th century into the early 20th century. The research examines the technical and expressive dimensions of his drawings and places them within the broader context of architectural representation of that era. His work reflects a sustained interest in surveying and graphic practice, shaped through his extensive restoration efforts on Arab-Norman monuments and medieval architecture. The study is noteworthy for its philological approach. It forms part of the Arena's ongoing research, which aims to explore the intricate relationship between designers and graphic language, viewed as a medium for new semantic codes shaped by the cultural context of the time. As Francesca Fatta mentions in the preface, drawing effectively becomes a medium, an actual language, a "series of phases through which the entire system of subsequent formal inventions passes; each method

has its own 'symbolic form'". From this perspective, Adriana Arena employs drawing to explore the technical aspects highlighted by Valenti and serve as a critical lens for understanding the transformative dynamics of contemporary society.

Organized into three primary sections, the volume begins with a hermeneutic analysis of the architect's study notes, preparatory sketches, and technical drawings, some of which lack autographs. The documents provide the author with crucial insights, approached holistically across various levels of depth. The initial investigation focuses on the theme of authorship, uncovering how non-autographed representations serve as a collective design model. This paradigm, rooted in the operational traditions of Renaissance workshops, positions the designer as the pivotal figure steering the collaborative process in a clear direction while preserving its critical and expressive value. A further interpretative insight comes from the classification of preparatory sketches, which fall into a crucial transition between academic expressive drawing and the rigorous rationalist codification introduced by the technical regulations of the 1920s. The high quality of the graphic mark, often elaborate, stands in stark contrast to the period's

emphasis on technical simplicity. In this context, the author identifies a strong connection between the historical and cultural environment and the designer's unique characteristics, suggesting that Valenti's distinct style can be traced back to his educational background, which was at the *Regia Scuola di Applicazione per Ingegneri di Roma* (Royal School of Application for Engineers in Rome). However, the refinement of his strokes and meticulous attention to detail more closely reflect the Sicilian academic environment and highlight his fascination with medieval architecture, which was the primary focus of his studies. Analyzing the executive drawings, Arena declares the urgent need to preserve this rich figurative heritage. This necessity has multiple dimensions: it holds significant documentary value, uncovers the deep connections between representation, design processes, and construction practices, and emphasizes its inherent narrative quality. Within the narrative framework, the author explores the intense tension between conservation and technological innovation that defined the era, a dynamic that Valenti effectively illustrates by depicting the transformation of artifacts over time.

The volume's second section provides a comprehensive examination of the narrative structure that supports the designer's works, focusing on his contributions to architectural surveying, especially regarding the Cathedral of Messina and the Church of SS. Annunziata dei Catalani. The research uncovers a dialectical, idealistic, and operational graphic system deeply rooted in the epistemological and methodological

principles of architectural restoration. Using precise conventions, his drawings go beyond the purely illustrative or aesthetic purposes typical of 19th-century surveys; they adopt a technical-analytical and communicative function that anticipates the surveying methodologies characteristic of 20th-century restoration practices. His innovative approach is marked by direct observation, graphic representation, and thoughtful design proposals. The plates, created with a sense of plastic mastery, promote dialogue with artisans to ensure the accurate execution of restoration interventions. Arena's linguistic analysis of Valenti's survey representations highlights a significant transformation in the role of drawing. This role evolves from simple objective transcription to a more critical interpretive process that recreates a coherent and idealized image of the building. The section concludes with a comparison to the surveys conducted by European travellers in the 19th century.

The volume's third section examines the designer's graphic portfolio, a significant portion of which remains unpublished and is housed in the specialized collection at the Palermo Municipal Library (*Biblioteca Comunale di Palermo*). The drawings, often created as preparatory studies, underscore the vital role of graphic documentation in comprehending and reconstructing historical buildings, particularly as they pertain to the concept of 'fabric' especially in restoration contexts following armed conflicts. The selection features projects from notable monuments in Palermo and Messina, except the Mother Church of Naro, located in the

province of Agrigento. This study robustly advocates for the enhancement of technical-engineering iconographic repertoires. The author highlights their significance by analyzing the designer's graphic corpus, which, while displaying technical precision, also unveils a remarkable expressive quality. This component is essential for grasping the designer's identity and cultural choices. Consequently, these works are invaluable for exploring restoration culture and architectural representation during the early 20th century.

Adriana Arena's research is based on a thorough and firsthand understanding of Francesco Valenti's graphic work. The volume features approximately seventy detailed executive and analytical drawings, organized in a narrative structure that elevates drawing from a mere technical tool to a critical historical and architectural interpretation method and a guide for the design process. The book, titled *I disegni di Francesco Valenti. Elementi espressivi e caratteristiche tecniche*, makes a significant and methodologically rigorous contribution to the study of representation history, architectural surveys, and the complex relationship between graphic expression, cognitive processes, and restoration. Arena's careful and systematic analysis of figurative processes and extensive cataloguing of graphic documents enhance the recognition of the cultural value of architectural and engineering archives. These archives serve as places for preserving memory and act as generative spaces that can stimulate critical reinterpretations, in-depth studies, and new perspectives within design culture.

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Events

Events

EVA Conference Berlin 2025. Electronic Media and Visual Art

Dominik Lengyel

From March 12-14, the *Fraunhofer Heinrich Hertz Institute* hosted the EVA Conference Berlin 2025, focusing on *Electronic Media and Visual Arts* (fig. 1). This 28th edition of the conference series brought together scientists and practitioners from diverse disciplines to discuss current developments in digital media and visual arts.

The conference unfolded across three thematic days: 'AI and the Arts', 'CH Digitally Formatted' and 'Hybrid Realities'. Day one began with a keynote from the Max Planck Institute for the History of Science, followed by four sessions on AI applications in artistic contexts. 'Generative Identities' examined how AI transforms architectural visualization, creates photorealistic imagery, and raises complex questions about authorship in AI-generated content. Meanwhile, 'Connected to the Machine' investigated how generative AI is reshaping art education and revolutionizing concept art design.

The second day shifted focus to digital cultural heritage formats. Following the opening session, participants dove deep into the concept of 'Memory Twins' through two intensive sessions. These discussions encompassed digital twins for cultural heritage preservation, virtual memory systems, and creative AI applications in heritage work.

'On Display-Experiencing the New Museum' explored innovative museum formats, while 'CH In Conversation' fostered meaningful dialogue among cultural heritage stakeholders.

The final day tackled 'Hybrid Realities' through sessions on 'Knowledge Architectures', 'CH Digitally Reproduced' and local Berlin initiatives showcased in 'What's on in Berlin'.

This year's conference witnessed increased international engagement. The internationalization process began in 2023 when BTU University's Chair of 'Architecture and Visualisation' assumed leadership of the event. By adopting English as the primary conference language, organizers enabled participation from scholars around the globe. This geographical diversity brought varied methodological approaches and cultural perspectives to the discussions.

Presentations showed diverse strategies for integrating AI technologies into cultural studies research. The 'Memory Twins' sessions highlighted approaches to digital cultural preservation that extend beyond conventional digitization methods.

Contributors explored practical virtual reality applications in exhibition spaces, new visualization techniques for historical materials, and multimedia approaches to barrier-free communication.



Fig. 1. Event program.

Projects transforming scientific collection objects into interactive experiences were particularly noteworthy. Beyond the academic sessions, the conference included exhibitions, performances, and a visit to the *Fraunhofer Institute's Innovation Centre for Immersive Imaging Technologies*. The second evening's social event provided opportunities for informal networking among participants.

The conference maintained rigorous scientific publication standards throughout. Organizers plan to publish contributions online with 'Digital Object Identifiers', ensuring long-term research accessibility through the *Artbooks platform*.

Integration within the international EVA network –spanning London, Florence, and Paris– facilitated connections with related events and research communities worldwide.

Conference discussions addressed numerous technological advances, particularly those bridging science, art, and exhibition practice. Participants examined both promising applications and critical concerns including authenticity and copyright implications.

Additional topics encompassed security considerations for digital cultural applications and strategies for managing problematic content in digital environments. These conversations highlighted ongoing

challenges stemming from accelerating cultural digitization. *EVA Berlin 2025* provided a platform for exchanging ideas about current developments in digital media and culture. The international participation contributed to broader discussions. The conference agenda addressed current trends and challenges within digital humanities. By combining theoretical frameworks with practical applications, the event offered insights into various aspects of digital cultural work.

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Events

PNRR Mask

Sonia Mollica

On 2 and 3 May 2025, the day of studies and public activities took place in Lipari, at the Archaeological Park of the Aeolian Islands and the Luigi Bernabò Brea Regional Archaeological Museum (fig. 1), as part of the project *Restituzione alla teatralità delle miniature di maschere rituali nella necropoli di Lipari*, funded by the PNRR (NextGenerationEU). The initiative was promoted by universities and cultural institutions, with the aim of combining scientific research, technology, theater and cultural inclusiveness. The Archaeological Park of the Aeolian Islands, in line with the new frontiers of enjoyment, inclusiveness and accessibility, therefore equips itself with all those useful expedients to overcome physical, cognitive and sensorial impediments, enhancing the tourist and cultural offer and communication. These aspects were defined as central during the conference *Dal Museo al Teatro. Un progetto di cultura diffusa e inclusiva*, during which numerous interventions by scholars followed one another who highlighted the historical, artistic and communicative value of masks. The program was divided into two days: the first, held at the former church of Santa Caterina, structured in interventions aimed at understanding the finds and the methodologies of valorization, together with the exhibition of

masks and costumes used for the representation of Aeschylus' *Prometheus Bound*; the second in a workshop aimed at inaugurating the multisensory rooms financed by the project, and by the performance of *Prometheus Bound* at the theater of the Castle of Lipari. More specifically, during the first day, following the institutional greetings from the local and regional authorities, Rosario Vilardo, director of the Archaeological Park of the Aeolian Islands, presented the PNRR project, followed by interventions aimed at deepening the theme of museum use and the use of terracotta. Maria Clara Martinnelli, an archaeologist at the Aeolian Islands Archaeological Park, explored the sensorial role in museum enjoyment; Elisabetta Matelli, professor at the Catholic University of the Sacred Heart in Milan, illustrated the collection of miniature terracotta masks; Naoum Elpiniki, an archaeologist at the Ephorate of Antiquity in Pella, offered a comparison with the theatrical figurines of Pella in Greece; Natale Spineto, professor at the University of Turin, explored the role and relationship between theatre and the Dionysian rite; Roberto Danese, professor at the University of Urbino Carlo Bo, discussed the 'Casinara' project from Plautus to the masks of Lipari.



Fig. 1. Event brochure.



Fig. 2. Multisensory laboratory.

The morning of the first day finally concluded with a speech by Francesca Fatta, professor at the 'Mediterranea' University of Reggio Calabria, during which the importance of digital humanities in the inclusive valorization of cultural heritage was underlined. In the afternoon, the role of digital technologies in the reproduction and reimagination of masks was discussed: Domenico Mediati, professor at the 'Mediterranea' University of Reggio Calabria, and Andrea Marraffa, architect at the company NaosLab, discussed digitalization at the service of inclusive fruition through storytelling; Francesco Stilo, research fellow at the 'Mediterranea' University of Reggio Calabria, showed the process of acquisition and prototyping of the Lipari masks for theorizing a new wearability on stage; Aretta Sterrantino, research fellow at the Catholic University of the Sacred

Heart of Milan, explored new performative techniques with skullcap masks, towards new perspectives for theatrical performance.

The first day finally concluded with the exhibition curated by Elisabetta Matelli and Stefania Parisini of the masks and costumes for Aeschylus' *Prometheus Bound*, during which the process of selection and artisanal reconstruction of the masks for the representation of Aeschylus' *Prometheus Bound* was explained, starting from the digital reading of eight miniatures preserved in the Luigi Bernabò Brea Museum.

The second day saw the inauguration by the director of the Archaeological Park, Rosario Vilardo, of the multisensory laboratory curated by NaosLab, during which users were invited to explore and enjoy the spaces by Lidia La Rocca and Roberta Nisticò (NaosLab) (fig.

2). Finally, the laboratory saw a possible enhancement and development from the project *Digital work. La maschera teatrale: dal Museo al Teatro* curated by Paola Raffa, Sonia Mollica, and Lorella Pizzonia, respectively professor and research fellows at the 'Mediterranea' University of Reggio Calabria.

The event concluded with the performance at the Teatro del Castello di Lipari of Aeschylus' *Prometheus Bound*, with masks reconstructed starting from the miniatures of Lipari, obtained from the photogrammetric survey curated by Francesco Stilo and from the artisanal reconstruction of the masks for the life-size stage curated by Andrea Cavarra. The direction of the show was entrusted to Christian Poggioni, with the scientific direction of Elisabetta Matelli. The show, the result of the collaboration with the Kerkis Association, represented the

culmination of the project: an authentic return to theatricality, from archaeology to the stage. The audience was able to dialogue with actors and artisans at the end of the performance.

The event showed how the synergy between archaeology, technology, performance and accessibility can give new life to cultural heritage, making it accessible to a broad, engaging and inclusive audience. The initiative therefore represented a moment of reflection and advanced experimentation around the complex theme of active and performative musealization, restoring the value of use and original function to the clay miniatures of theatrical masks found in the necropolis of Lipari. Through an integrated approach – which saw the collaboration between scholars

of archaeology, classical philology, digital humanities, performing arts and communication design– the event offered an innovative model of transformation of the archaeological find into a performative object.

From a theoretical and methodological point of view, the initiative has underlined the centrality of the concept of widespread and accessible culture, in line with the objectives of the PNRR and European policies for the removal of cognitive, sensorial and physical barriers. The creation of a multisensory laboratory and the use of inclusive theatrical practices have promoted an experiential and participatory use of museum contents, reactivating the interaction between body, gesture, voice and object.

The importance of the event therefore lies in its ability to combine scientific research and restitution to the viewing public, combining the languages of theatrical performance with the most recent developments in digital technology, with a view to intercultural dialogue and expanded accessibility.

This approach opens up new perspectives for the valorization of archaeological heritage, transforming it into a narrative, educational and aesthetic device, capable of generating meaning in contemporaneity. The results of the project can finally be consulted in the volume published by Carocci Editore, in which all the themes addressed during the event are explored in depth.

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Events

FORTMED 2025

International Conference on Modern Age Fortifications of the Mediterranean Coast

Andrea Pirinu

Since its first edition in 2015, hosted by the Universitat Politècnica de València (Spain), the international FORTMED conference – dedicated to the study of Mediterranean fortifications – has established itself as a key annual event for the academic and scientific community. The 2025 edition took place in Caserta on April 10th–12th, promoted by the Department of Architecture and Industrial Design (DADI) of the University of Campania “Luigi Vanvitelli.”

The conference organization, coordinated by Professor Ornella Zerlenga and Professor Vincenzo Cirillo, was supported by an Advisory Committee, a technical-scientific secretariat, an operational staff, and several Topic Chairs, responsible for assigning the submitted papers to one of the seven thematic areas that structure the conference. This framework ensured a clear organization of the contents within the proceedings and enabled effective planning of the oral sessions.

The figures for the 2025 edition highlight a growing interest in the subject of defensive architecture: following a double-blind peer review process carried out by an international scientific committee, 195 papers were selected. These were published by DADI PRESS (University of Campania “Luigi Vanvitelli”) and edUPV (Universitat

Politècnica de València) in the Defensive Architecture of the Mediterranean series, equipped with ISBN/ISSN codes and available in open access. A large portion of these contributions was presented during oral sessions organized in parallel tracks.

The academic sessions were opened by institutional greetings and keynote lectures, offering diverse perspectives on key conference themes.

On the morning of April 10th, three keynote addresses were delivered: Professor Leonardo Di Mauro (former Professor of Architectural History at the University of Naples Federico II), Architect and artist Cesare Battelli, Professor Andrés Martínez Medina from the Universidad de Alicante (Spain).

The first keynote, titled *Fortifications of the Kingdoms of Naples and Sicily: Research Advances and Misguided Restorations*, examined the evolution of studies on the fortified heritage of southern Italy. Through extensive archival documentation, Professor Di Mauro highlighted ongoing research opportunities while also recognizing significant progress in methods for analysing military heritage. However, he strongly criticized the frequent implementation of misguided and imaginative restoration interventions that compromise the original architectural integrity of many historic buildings

– exemplified by the emblematic case of the Castle of Rocca Cilento.

The second keynote, titled *LIMES. Digital Fortifications* was delivered by Cesare Battelli. His presentation showcased an artistic and theoretical investigation centred on the reinterpretation of the concept of the wall in contemporary terms. Starting from historical examples such as Persian gardens and the Cyclopean walls of Ancient Greece, Battelli introduced a critical reflection on the notions of boundary, threshold, and virtual wall in the context of architectural representation and storytelling mediated by artificial intelligence.

The third keynote, *El Muro del Mediterráneo en el siglo XX*, presented by Professor Andrés Martínez Medina, focused on a project aimed at identifying, cataloguing, and analyzing the network of bunkers distributed along the Mediterranean coastline. Using integrated methodologies, the initiative seeks to lay the groundwork for valorisation and conservation strategies for this “uncomfortable” heritage.

Sessions organized by topic continued April 11th. The papers covered a broad range of themes – from historical and documentary research to theoretical frameworks, from built heritage analysis to geomaterial characterization, from digital heritage to cultural heritage man-



Fig. 1. Event poster

agement, and a miscellaneous section. This thematic organization encouraged a multidisciplinary and cross-cutting exchange, reflecting the complex nature of military architecture, which demands collaboration across various specialized fields.

The wide array of case studies presented attracted a scholarly audience from Italian and Spanish universities and research centres, as well as from numerous other Mediterranean and non-Mediterranean countries. This international dimension reinforced the conference's identity as a platform for academic dialogue and knowledge exchange, fostering the development of new research networks and collaborations. Furthermore, it encouraged a comparative approach to geographically diverse yet historically and conceptually similar contexts of fortified land-

scape construction and transformation. At the close of the second day, the traditional and highly anticipated Best Paper Award ceremony took place, honouring one outstanding paper in each topic area based on peer review evaluations and the quality of the oral presentations. The third day of the conference, traditionally devoted to field exploration, offered participants the opportunity to visit two significant architectural sites: the fortress of Sant'Elmo, overlooking the city of Naples, and the medieval village and castle of Caserta Vecchia. These visits provided a valuable occasion to complement theoretical approaches with on-site observation, reinforcing the link between academic research and built heritage.

The 2025 edition of FORTMED concluded with notable success, both in terms of scientific quality and the high

level of international participation. Special attention was given to the announcement of the next edition: the IX FORTMED conference, to be held in Rome on February 19th–21st 2026, and hosted by the Department of History, Drawing and Restoration of Architecture (DSDRA) at Sapienza University of Rome.

The announcement was met with strong interest from attendees, further confirming FORTMED's central role as a venue for scientific and interdisciplinary debate on Mediterranean defensive architecture. Edition after edition, the conference continues to expand the international research network, promote the understanding and safeguarding of fortified heritage, and stimulate new reflections on its representation, conservation, and valorisation in the contemporary context.

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Events

URBAN / NOMADIC

Research Innovation and Internationalisation, Comparing National and International Experiences.

Martina Suppa

The UID Symposium on Internationalisation and Research Innovation in Ferrara on 26th March is part of the 7th edition of the *Days of Restoration and Cultural Heritage 2025*. It aims to promote the internationalisation of research and its continuous innovation.

The Symposium was held in line with previous years' editions, consolidating the roadmap of the Innovation Commission's work based on strategic development areas that include the themes of digitalisation, visualisation, and *Social Innovation* for the enhancement of cultural heritage, the conservation of built, historical, and artistic heritage, and the contexts of city, territory, landscape, and environment.

The focus of the 2025 edition addressed the theme of the *Urban/Nomad* oxymoron, opening up the opportunity for a comparison between what can be defined in the contemporary world as *urbanus* (der. of *urbs urbis* 'city'), grounded and structured, networked and connected, and what is 'wandering spirit' and meditative thought, wandering but also 'adapted language', mutable and related, intersecting tangible and intangible heritage (the latter often nomadic by definition and in some traits elusive). The syntactic union of the two themes, *Urban* vs *Nomadic*, induces the development of multiple comparisons

such as: standardised/adaptive, concentration/distraction, identity/inclusive, superfluous/necessary.

The event, organised by the DIAPReM departmental research centre and the *TekneHub* laboratory of the University of Ferrara in collaboration with UID - Italian Union for Design and the *After the Damages* International Academy, saw the submission of thirty contributions in this edition, of which six were selected for oral presentation and divided into the two sessions *Nomad* and *Urban*.

Emanuela Chiavoni (Department of History, Design and Restoration of Architecture, Sapienza University of Rome), President of the UID 'Internationalisation' Commission and Marcello Balzani, (Department of Architecture, University of Ferrara), President of the 'Innovation' Commission, opened and moderated the day's proceedings.

The Urban session was opened by Caterina Morganti (Department of Architecture, Alma Mater Studiorum University of Bologna), who presented the research developed with Alfonso Ippolito and Federico Rebecchini (Department of History, Design and Restoration of Architecture, Sapienza University of Rome), Cristina Bartolomei (Department of Architecture, Alma Mater Studiorum University of

Bologna) and Davide Mezzino (Department of Humanities, IULM University) entitled *KNOW.it: Virtual Return of Italian Architectural Heritage in Southern Brazil*, aimed at promoting the protection and enhancement of eclectic architectural heritage of Italian origin in the state of São Paulo.

The definition of a methodology for the knowledge and digital and analogue documentation of the decorative apparatus of earthen buildings in the Elqui Valley and the Limari Valley (Chile) was the focus of the presentation by Elena De Santis, Emanuela Chiavoni (Department of History, Design and Restoration of Architecture, Sapienza University of Rome) and Natalia Jorquera Silva (University of Chile, Chile) as the result of an extensive study that led to the realisation of research activities with local communities for the recognition and sharing of the fragile earthen heritage rooted in collective memory and the identity of the place.

Anna Osello, Michele Zucco, Davide Lorenzo, Dino Aschieri and Laura Fiorino (Department of Structural, Construction and Geotechnical Engineering, Polytechnic University of Turin) presented the paper *Memories in Motion: The Strada dell'Assietta* developed within the *Spoke 4 - Digital and Sustainable Mountain* of the NODES



Fig. 1. Event poster.

project (North West Digital And Sustainable), an Innovation Ecosystem funded by the PNRR. The project integrates Digital Twin, BIM/GIS platforms, and open-access online models, emphasising the importance and potential of Virtual Reality for training, education, and natural risk management.

The *Nomad* session opened with the contribution of Maria Elisabetta Ruggiero, Maria Linda Falcidieno and Ruggero Torti (Department of Architecture and Design, University of Genoa) focused on cognitive nomadism and urban identity, with particular attention to the influences that another urban environment (such as Beijing, the research's case study) can have on our perception and understanding of living and urban identity.

Massimiliano Ciammaichella (Department of Project Cultures, Iuav University of Venice) addressed the phenomenon of digital nomadism closely connected to the themes of innovation, in terms of a radical transformation of the concept of travel and 'living', where continuous mobility and ease of movement have a significant impact on material needs, pushing towards a re-evaluation of the essential, which is reflected in the concept of versatile and multifunctional clothing.

Alberto Pettineo and Sandro Parrinello (Department of Architecture, University of Florence) presented a study on traditional Berber architecture in the pre-Saharan areas of Morocco, analysing the link between settlements and caravan routes. The research integrates advanced digital surveys and technological analyses with studying traditional construction techniques for integrated documentation.

The UID Symposium on Innovation and Internationalisation of Research 2025 represented a significant oppor-

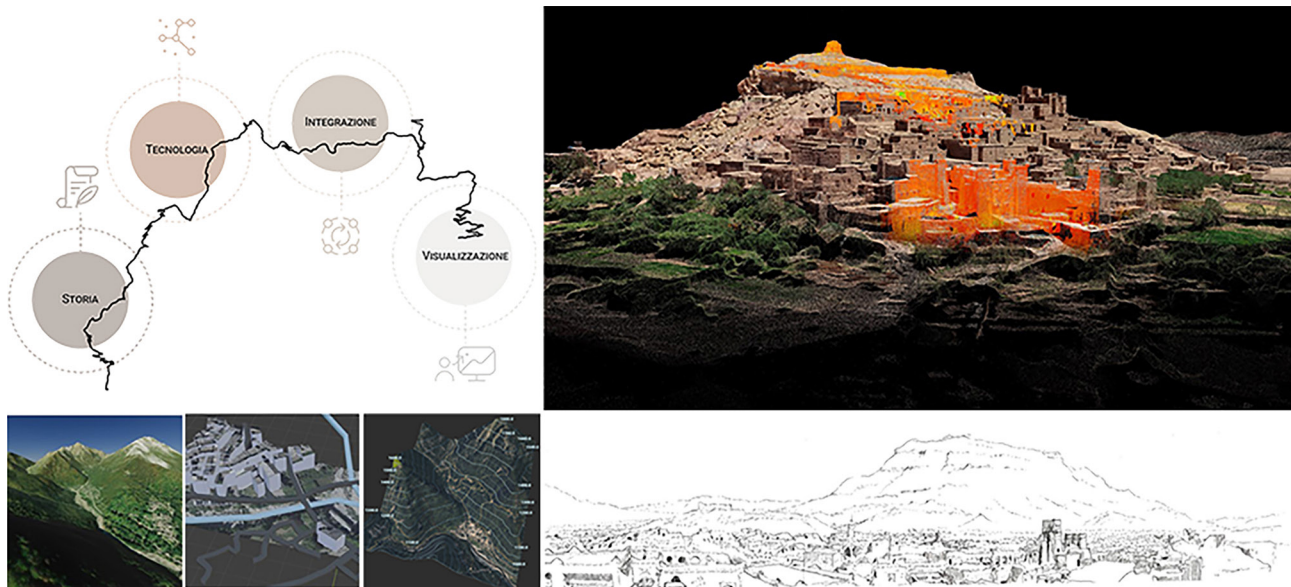


Fig. 2. On the left, for the Urban session, the integrated approach presented by Polytechnic University of Turin; on the right, for the Nomadic session, the documentation of the Presaharan Berber architecture through digital surveys presented by A. Pettineo and S. Parrinello.

tunity for discussion and the definition of possible future research directions in enhancing and conserving cultural, urban, landscape, and natural heritage, contributing significantly to a broader debate in the discipline.

The papers presented demonstrated how *Urban/Nomad* can be addressed through multiple approaches, including stories of places, buildings and cities, landscapes and territories, and innova-

tive techniques for describing tangible and intangible cultural heritage.

The theme of digital nomadism or technological nomadism proved to be of particular interest and relevance, allowing the opening of innovative segments towards future scenarios in the application of surveying, documentation and representation technologies.

The proposed thematic oxymoron stimulated reflection on the contem-

porary dichotomies that shape our relationship with the built environment, territory, and identity. It highlighted the richness and multidisciplinary nature of the approaches needed to address current challenges.

After selecting contributions, the symposium's outcomes will be published in issue 1/2025 of the scientific journal *Paesaggio Urbano*, published by Maggioli Editore.

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The UID Library

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