

DRAWING POWERS

By Fernando Poeiras

There is an enormous difference between seeing a thing without a pencil in your hand and seeing it while drawing it.

– Paul Valéry

One of the most valuable uses that a collection of drawings and models can have for practitioners is to enhance their own skills and practice. In drawing theory we can seek to surpass the limits of individual practice by experiencing such a collection in a broader way, tracing the diverse paths it opens up, and using the resulting map to review what we already know, or thought we knew, about drawing practice. Thus, this is a promising area of study for the theory of drawing in design, and begs the question: how does drawing increase the capacity to understand, imagine, and validate a design?

Despite their diversity, all physical design media (such as drawings, *maquettes*, models, simulations, prototypes, etc.) enable a process of interaction and involvement.



Le Corbusier, Plaster model (1956) and section drawing (1954) for the Open Hand monument for the Capitol at Chandigarh.

In the case of drawing, this is a process in which one both acts, and is acted upon. For example, among other interactions in the process, the drawer draws, but what is drawn also has an effect on the drawer.

As sentient beings, we are fully involved in interacting with others and with our world. [1] An analogous process occurs in drawing. In the overall drawing process, many of the different acts of thinking – from imagining to analysing – are inseparable from their interaction with the body of the person drawing. We can develop Arendt’s insight through Deleuze’s understanding of the body. [2] To put it briefly: in different interactions our body experiences different ‘affects’ and, accordingly, develops different interaction ‘organs’. This powerful understanding of bodily experiences focuses our attention on what happens to bodies while drawing, and on what ‘organs’ are developed in the process of drawing.

First, several enhancements take place in the drawer’s body. As many practitioners and theorists have remarked, drawing fosters a more acute sense of vision, and the *maquette* amplifies the sense of touch. What is less noted is the fact that the whole body is involved in an all-encompassing sentient process. Thus, every perception, feeling, or thought can equally be exercised, enhanced, and transformed while drawing.

This sentient process includes the suspension of immediate involvement, i.e. drawing also leads the drawer to pause and distance themselves from it, allowing more detached critical observation and thinking to take place. Those drawing also deliberately suspend their immediate interactive involvement in the process. This latter is the focus of theories that only stress types of intentionality in the design process, and in the designer's thinking and pursuit of identifiable goals in the project's design. This reduction of sentient processes to intentional operations needs to be re-assessed.

In some cases, design media are used to stimulate a more direct and immediate involvement, thereby triggering other acts of understanding and imagining. So, with any medium, it is necessary to consider not only its physical nature, but also how it is sentiently experienced, and whether that medium and its use is more directed to one form of sentience or another.

It is not just our mental capacities that are enhanced by our sentient interaction with different mediums. This learning of bodily thinking has (enduring) consequences that go beyond the designer, to the designed objects and to buildings themselves. Design mediums can also suspend some limits of reality. This is to say that, through these mediums, each successful study, essay, or experience operates on a selected aspect of that reality, making it more significant and more manageable, and unshackling the imagination and understanding of the designer, although (in different ways) it is always subject to validation. [3]

Let us return to our initial question: how does drawing increase the capacity to understand, imagine and validate a design? To answer it, we will consider only design drawings, excluding other types of drawing such as presentation drawings. We will also consider only architectural drawings, although this study applies to drawing for most areas of design (such as product design).

We have identified three aspects of drawing practice that exercise our sentient faculties in three sufficiently distinct ways:

1. 'The object in the drawing': The problems and solutions explored by drawing as circumscribed by the scope of representation.
2. 'The drawing in the object': The problems and solutions explored by drawing as circumscribed by drawing languages, or more accurately, by drawing styles and drawing crafts.

3. 'The drawing-object': The problems and solutions of a design project as internalised and explored by a process of experimentation through drawing.

These distinctions serve to make visible different powers of drawing. There is no clear boundary between them, as they are all present in practice, but some of these powers are more prevalent at different times in the design process, while others are favoured in certain strategic drawing practices or even personal styles, without falling into the domain of idiosyncrasy. Thus, essentially, this series of essays will seek to understand the different effects of these drawing powers on the design project and on the draughtsman.

Notes

1. Hannah Arendt, *The Life of the Mind: Vol. 1. Thinking* (San Diego: Harcourt Brace Jovanovich, 1971).
2. Gilles Deleuze, *Spinoza: Practical Philosophy* (San Francisco: City Lights Books, 1988).
3. Étienne Souriau, *Vocabulaire d'Esthétique* (Paris, Presses Universitaires de France, 1993).

THE OBJECT IN THE DRAWING

First, I consider drawing as an adequate medium of construction. To make the project visible, measurable, verifiable in all its phases, to anticipate solutions, so to speak, with a spirit of truth: this, and no other, is the specific function of drawing, of any technique or mean of representation that is taken as such.

– Giorgio Grassi

At the core of many drawing practices is a process of clarifying the ‘object in the drawing’, which is also a process in which the drawer gains a better understanding of themselves.

Focusing on the intentional aspect of an experience that, in some sense, defines the design process, may obscure our awareness of the role drawing plays. This may lead us to eliminate the actual experience from our understanding, so that this rich and fertile process of clarification can falsely appear as a sequence of purely rational operations by an automaton. We must rescue these experiences to identify what drawing truly brings to this process of clarification and validation.

This drawing practice is characterised by a central form of involved interaction: the reasonable dialogue between the drawer and the drawing. [1] The aim of this reasonable dialogue is a valid clarification of the object, primarily its effectiveness.

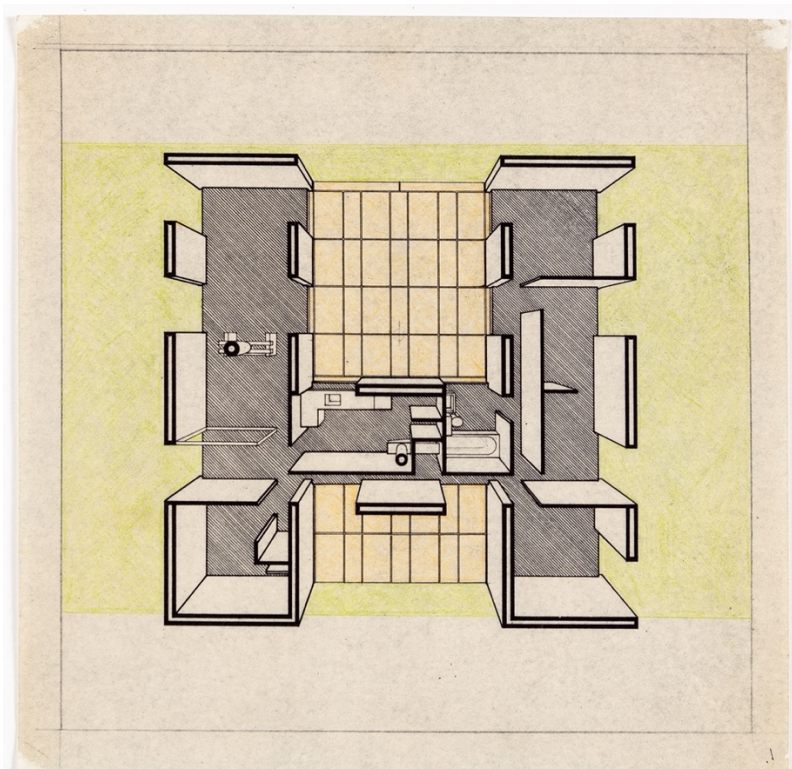
Many drawings lack the fixity, clarity, and communicability of a final representation. As a result, the importance and intelligibility of this clarification through drawing only becomes apparent if the drawings are framed within a certain design concept, a certain design strategy, a certain project phase.

Looking at the records left by the dialogue between drawer and drawing, it is easier to recognise the repetitive but cumulative process known as re-representation. [2] It is harder to see the parallel processes involving other types of representation, such as the divergent representations that can take the design – or parts of it – in other directions. The importance that the cumulative sequence of representations has for achieving design objectives reinforces (retrospectively) the perception of a determinant ‘intention’ in the

drawing process. This selective interpretation of the drawing process may also cause us to overlook all the work involved in judging and choosing the best approach to a problem, the rich inventiveness of finding the most suitable mode of representation, or even the consequences of clearly seeing that an idea does not work. [3]

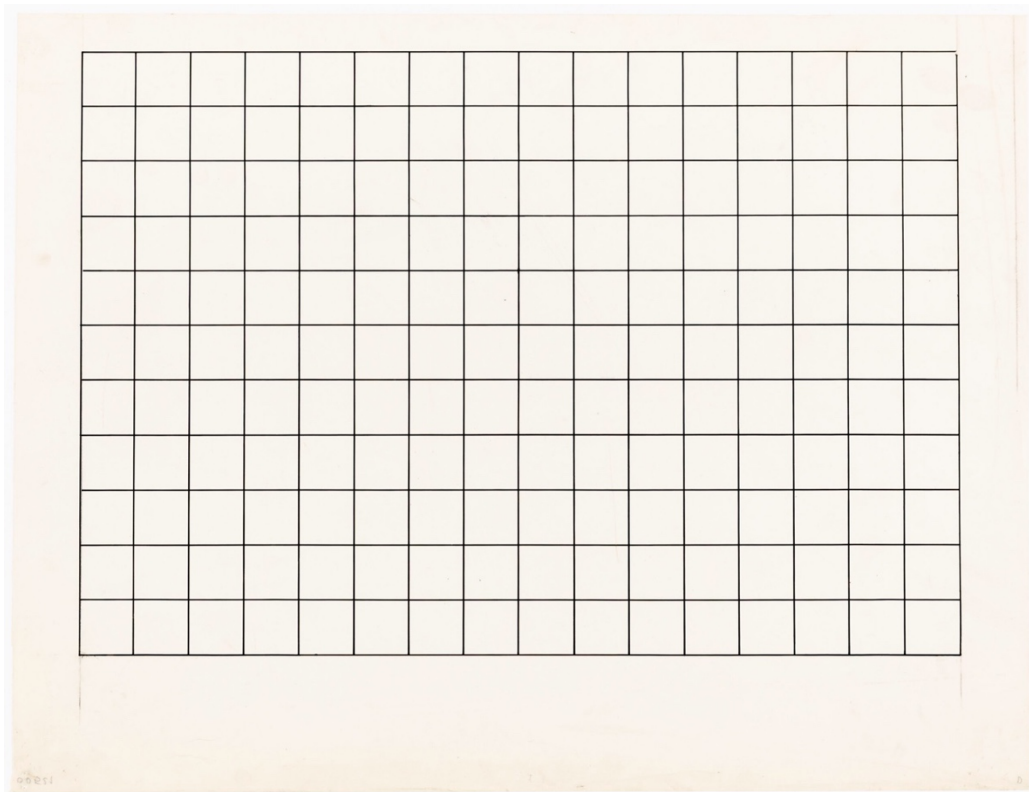
The powers of clarification through drawing – firstly, to be able to make an idea visible, rigorous, and effective – are exercised throughout the process to deal with many problems: invisibility or any kind of visual uncertainty, such as imprecisions; and redundant or ineffective aspects of the design. The range of visualisation, in the context of design, goes beyond the limits of both the inner mental image and of natural perception.

This is manifest in some techniques such as sections and projections. James Gowan's drawing (DMC 2789.2.1) shows the inventiveness of visualisation by establishing qualified relationships in space, beyond standard metric architectural visualisation), practicing visualisation as a problem-solving device, and adjusting it inventively to specific design problems.

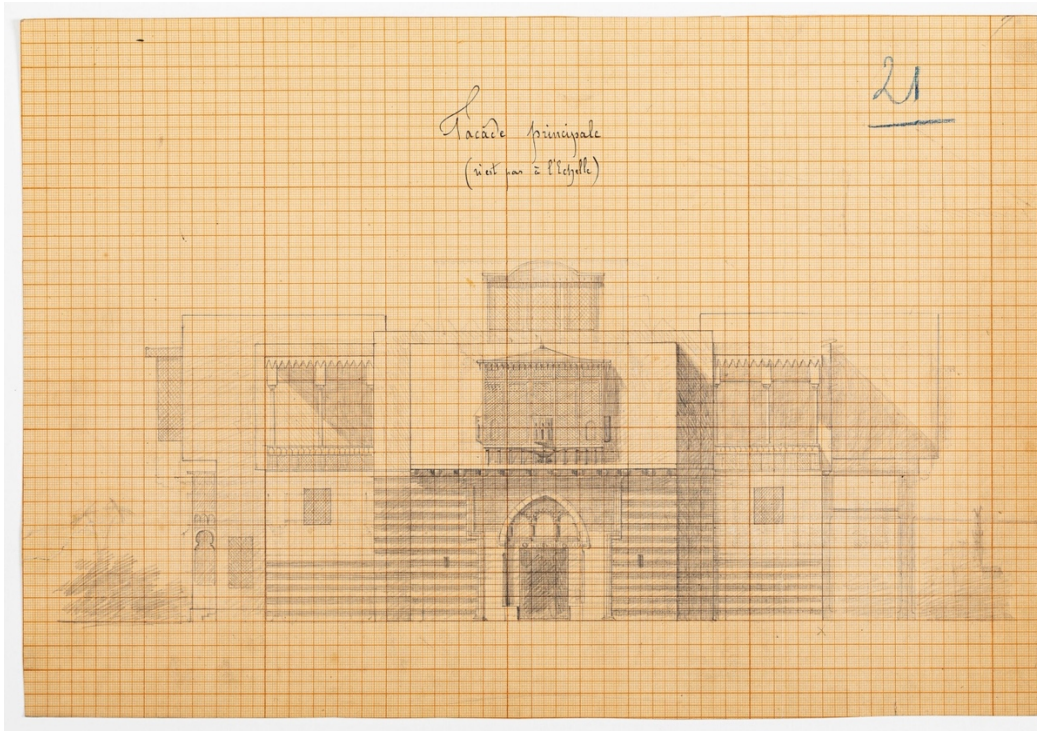


James Gowan, Isle of Wight House, 1956–1958. Pencil, pen, ink and coloured crayon over print base on paper, 218 × 215 mm. DMC 2789.2.1.

Measurements play a fundamental role in design, as a rigorous and efficient organising element. Instruments and materials not only support different metrics, from rulers to graph paper, but also techniques and codes. We can compare different uses of the 'grid' technique to understand the productive aspect of metrics. Grids are commonly used in the transference of images, but they can also help discover relationships within objects (or their contexts) and suggest changes in them (DMC 2098; DMC 2141.3,. Conversely, a grid can simply be used to unequivocally lock-down a design, precluding any further exploration through drawing (DMC 3337.2.1).



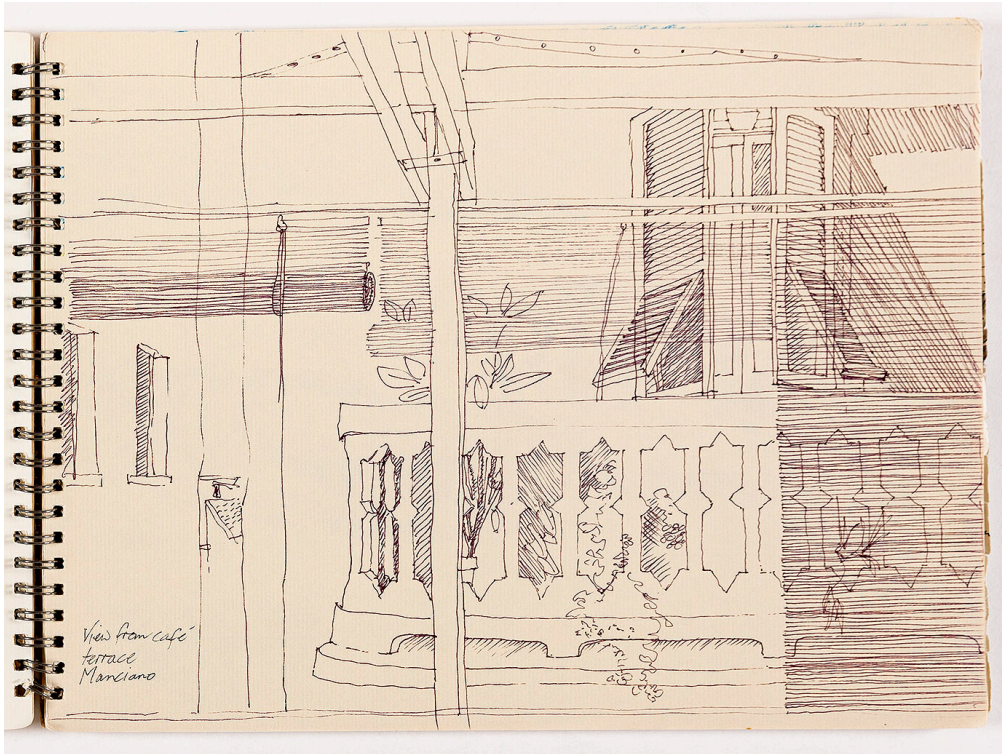
Superstudio, grid drawing, c.1969. Indian ink on mylar, 427 × 555 mm. DMC 2098.



Schmitz & Drévet, Egyptian pavilion, Exposition Universelle, Paris, 1867. Pencil on graph paper, 290 × 420 mm. DMC 3337.2.1.

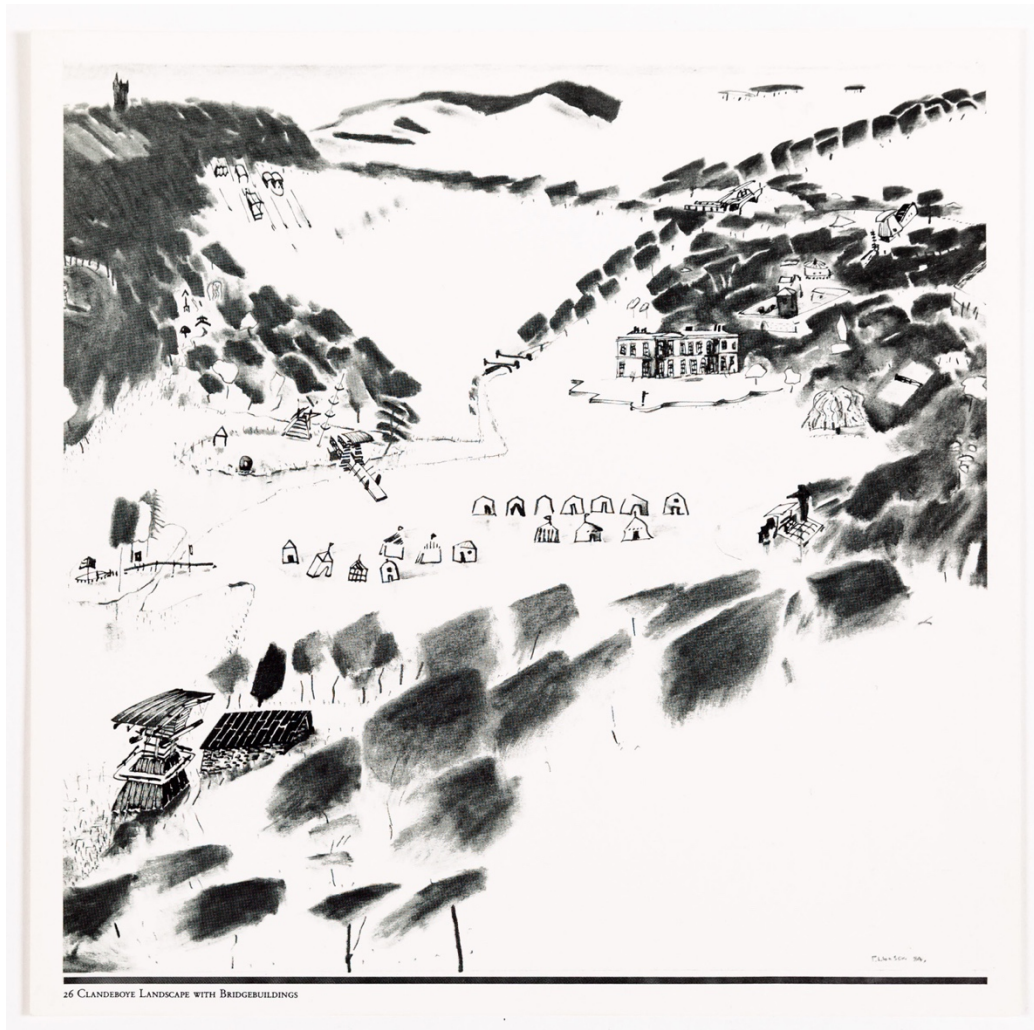
The definitive nature of the drawn line in resolving some uncertainties explains its prominence in design drawing. Due to its characteristics, line is a structuring element of architectural drawing, but line has different uses and many qualities.

In some of the drawings in Kate Macintosh's sketchbook (DMC 3330.0.14) line is employed in the service of observation – whether for rigorous description or schematic suggestion – rather than to represent design. In these drawings, Macintosh's line acquires qualities of direction and rhythmic frequency that are used for representation – in the sense that they provide a perceived correspondence with the real – but are not strictly used for the measurable and effective representation of design – suggesting that representation can provide an insightful and extremely subtle dialogue with reality.



Kate Macintosh, View from Café terrace, Manciano, page from a travel sketchbook, 1993. Pen and ink on paper, 230 × 320 mm. DMC 3330.14.

Another example that explores the qualities of drawing beyond (standard) design representation, but in a different direction from Macintosh, are the drawings of Peter Wilson (DMC 2902). In a pleasurable exercise that is expressively aesthetic, this drawing explores the use of spots and patches of shading and is organised with rhythms and diagonal lines of force. In other words, in this case, Wilson draws the drawing rather than the design.



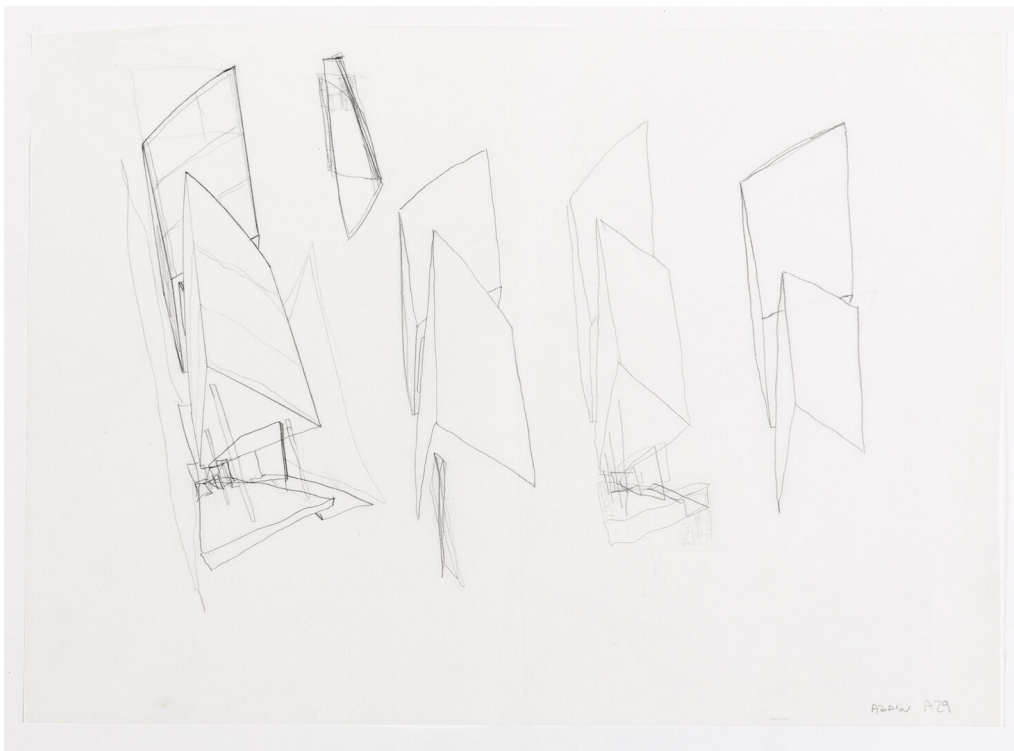
Peter Wilson, *Clandeboyne Landscape with Bridge buildings*, 1984. Print, 350 × 350 mm. DMC 2902.6.1.

Some of these problems only become apparent in the drawing itself, although the overall record predominantly bears witness to the pursuit and finding of the final resolution. Right at the beginning, when there is an initial idea (and designing does not always start or finish with ‘initial ideas’), drawing is what transforms the idea from (mental) invisibility to (exterior) visibility, and this makes the sensible and sensitive transition from the draughtsman’s soliloquy to a dialogue with the drawing, using a range of visibility that exceeds natural human vision.

Turning an object into a drawing is an attentive process of clarification, of seeing the object more clearly, resolving obscurities, invisibilities, errors, illusions, etc. Thus, in this use of drawing, insofar as representations are transitive, ‘representing’ becomes a task of clarifying objects through drawing them and, therefore, a certain experience of the ‘object in the drawing’ is essential.

An equally significant aspect is that drawing amplifies and disciplines certain capacities of the drawer, namely those of schematising (abstracting), revealing the implicit, describing (in detail) and (communicatively) explaining.

These Zaha Hadid sketches (DMC 3077) exhibit some of the virtues of abstraction in drawing: an abstraction exercised materially through drawing. Hadid's sketches convey the essence of the design idea in a speedy process of thought-notation that remains imaginatively and visually open – a core operation of schematising through drawing.



Zaha Hadid, perspective studies, Azabu-Juban, 1986. Pencil on tracing paper, 418 × 297 mm. DMC 3077.29.

These visual-mental operations are central to many techniques and codes of design representation, a fact that sometimes leads the process of clarification to be confused with the techniques and codes of representation itself. But the fundamental issue is that, in practice, drawing amplifies the clarification of the object (in the drawing) and enhances the process by which the designer gains a greater understanding of the object and of themselves.

Notes

1. Gabriela Goldschmidt, 'The Dialectics of Sketching,' *Creativity Research Journal* 4 (2) (1991), 123–143.
2. Rivka Oxman, Design by 'Re-representation: A Model of Visual Reasoning in Design,' *Design studies* 18 (4) (1997), 329–347.
3. Bill Buxton, *Sketching User Experiences: Getting the Design Right and the Right Design* (Burlington, MA: Morgan Kaufmann, 2010).

THE DRAWING IN THE OBJECT

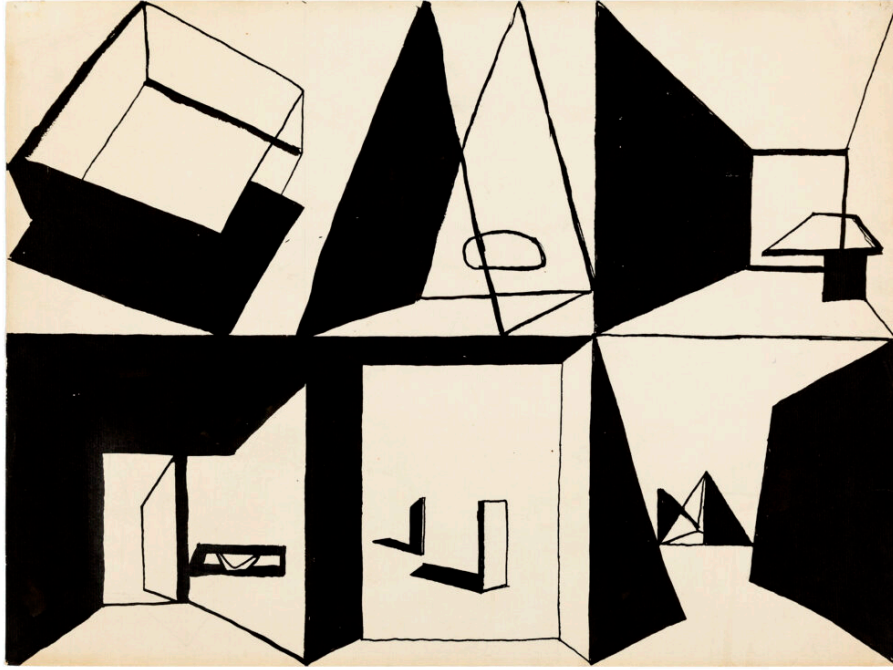
It was the drawing that led me to architecture, the search for light and astonishing forms.

– Oscar Niemeyer

Sometimes architects talk about the ‘drawing’ in a building, a landscape, or even animals and people. The drawing experience they describe can help us to identify and understand another set of drawing powers. These are the capacities added by what many authors call the ‘drawing language’ or ‘visual medium’, [1] but which, here, are studied in terms of drawing styles and drawing crafts.

When considering drawing language, we continually run the risk of ignoring concrete practices and thus subsuming them into a common, but too generalised, ‘drawing language’. There is also another risk: that of placing excessive emphasis on visual perception; and of eliminating all the material conditions present in the process of drawing. When this occurs, the drawer is reduced to a great disembodied eye, and drawing merely becomes the formal language of the starting point and conclusion of a design.

Louis Kahn exercises a specific drawing language – akin to some gestalt theory principles; a theory that has become omnipresent in much drawing theory and practice. In drawing DMC 1382, strong contrasts, planes and shadows organise both perception and design. Kahn provides an example of drawing style as an optics, a style of visual language.



Louis Kahn (1901–1974), sketch for a mural, c.1951–1953. Ink on paper, 298 × 400 mm. DMC 1382.

We can partly correct this distortion by understanding the ‘universal and formal’ vocabulary and grammar of drawing language as a particular kind of drawing language, but principally, by understanding the various drawing styles and drawing crafts themselves.

Some manifestations of drawing language in a design are clear and have consciously operative results for the drawer. Hence, the productive value of a drawing may be found in the different drawing vocabularies and grammars employed, and in their self-reflexive power. This is illustrated by the many ways in which the two dimensions of drawing are transformed into a three-dimensional construction, or by use of geometric abstraction to provide both operative simplification and to make a complexity of forms intelligible – a means of searching for the ‘whys’ and ‘hows’ of forms. Still, other examples can be found in the qualities and values of elements and composition in drawing and their relationship with construction. This self-reflexive capacity of drawing can also be traced in the different drawing poetics that constitute the most legible signature of many practitioners.

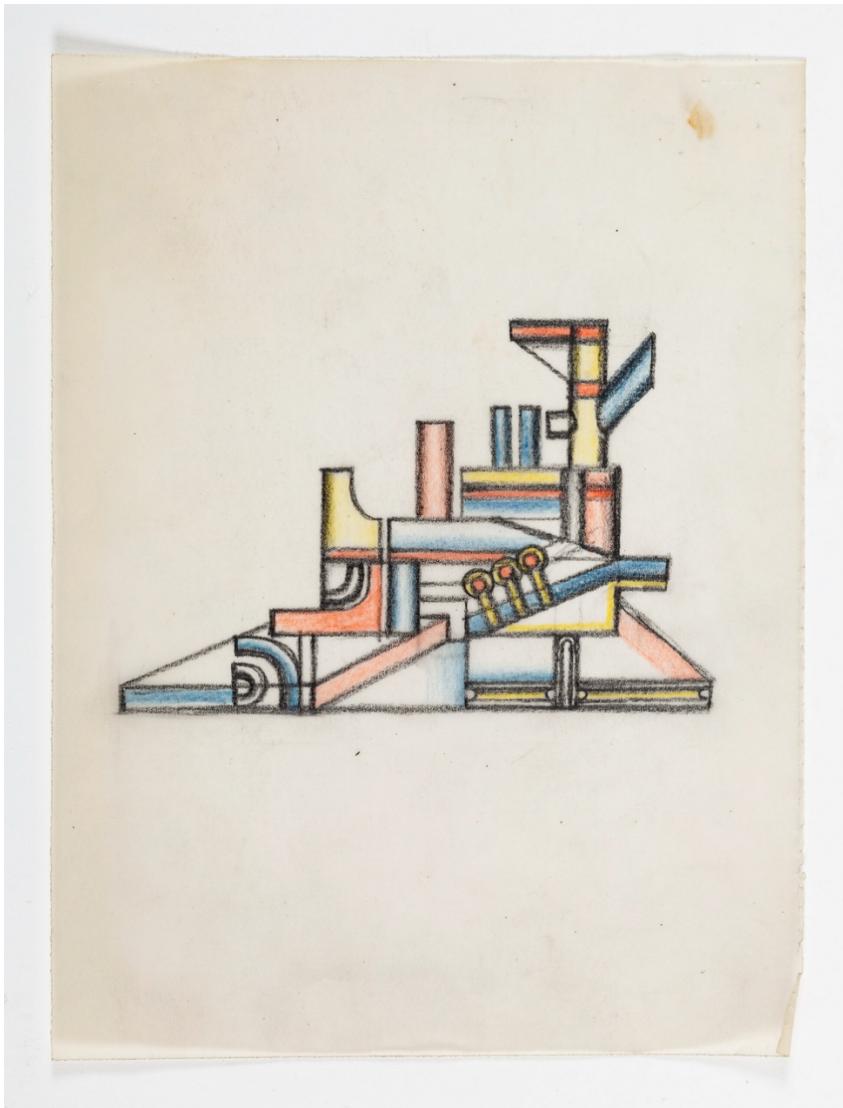
Let us now consider drawing styles and drawing crafts. They are means of formal and material organisation that allow the broadening of perception and sensitivity and reveal new ways of understanding and imagining. The interaction and involvement between the drawer and the drawing are now in

the relationship with the specific medium of drawing and the translation operations it enables.

Fundamentally, in design, drawing language, drawing styles and drawing crafts are material systems for translating. The creation of ‘models’ – a core operation of design practice is a kind of translation, in which different modes freely, but only ever partially, translate reality and ideas into a design. Some results of this operation are easily visible in drawing, but others are more subtle and must be carefully discovered or inferred.

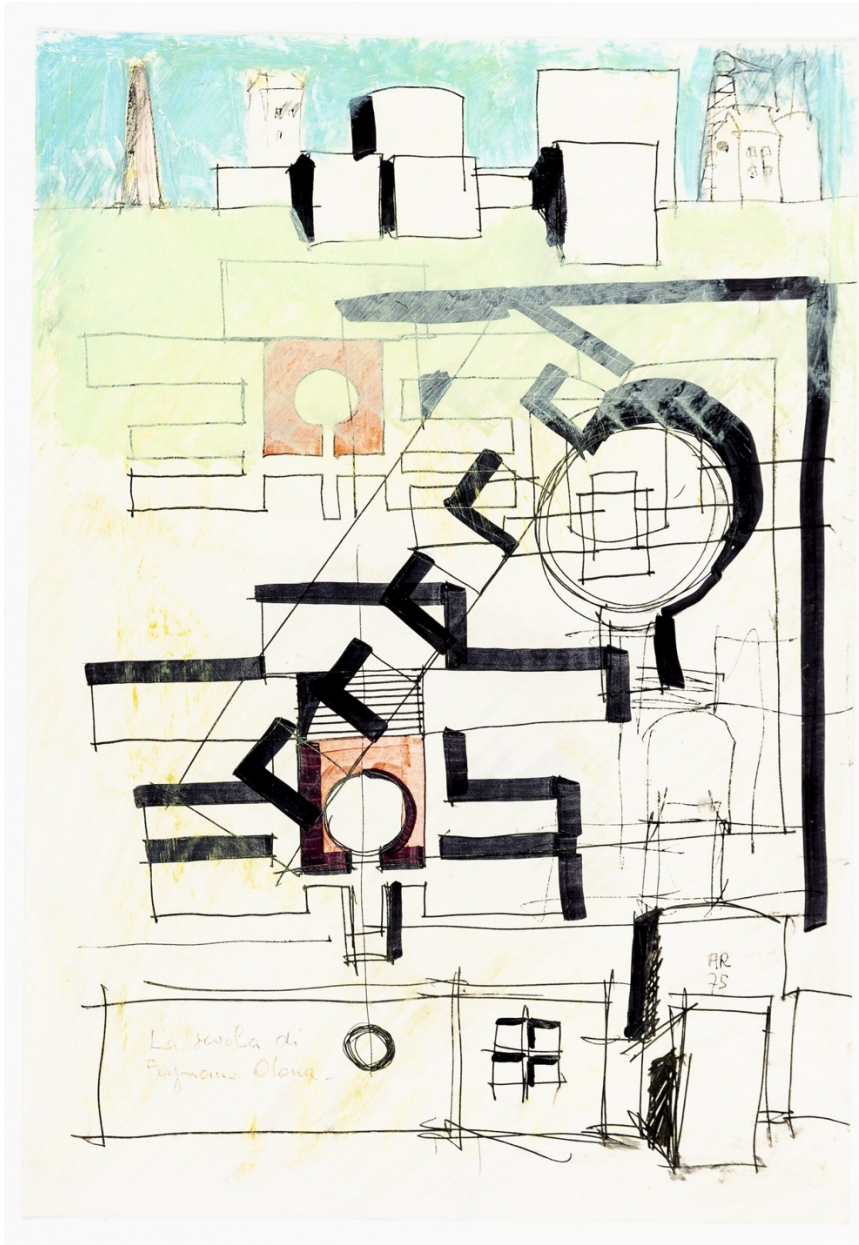
Drawing crafts are inseparable from both the materiality of drawing – the materials used, the instruments, tools, the sequence of actions, etc. – and from their contextually specific materiality, whether that materiality is introduced by the drawer’s body or by the physical environment in which they are drawing. Craft styles are not the impersonal, repetitive, isolated, and economic procedures of ‘industrial’ drawing styles. [2] Although experience indicates otherwise, we still tend to ignore everything that happens to the drawer and to the design during the material interaction and involvement in a particular drawing craft.

In this drawing by James Gowan (DMC 3347.6), the relationship between a way of seeing, thinking, and imagining, and the crafted drawing style of the architect becomes manifest. Gowan’s registers are not sketchy, they are assertive and clear, and his inventive play with drawing forms is generally at the service of architectural invention. In this case, they seem to be playful techno drawings whose central theme is the volume within an imaginative free play of construction.



James Gowan, Imaginary Projects. Pencil and coloured crayon on tracing, 212 × 160 mm. DMC 3347.6.

In Aldo Rossi's drawings we find another crafted drawing style. If the metaphor is admissible, his drawing is that of a painter-architect in which the expressive qualities of forms and volumes are explored, using other instruments. This enables different types of inscriptions, the inclusion of colour, different materials, and a different visual vocabulary in which geometry meets a type of 'expression'. In the drawing DMC 1096, the organisation of the plan synthesises all these aspects in a solution of great expressive and chromatic intensity.



Aldo Rossi (1931–1997), Scuola di Fagnano Olona, Fagnano Olona, Varese, 1975. Pen and marker on paper, 295 × 205 mm. DMC 1096. © Eredi Aldo Rossi.

To illustrate this argument, consider how the types of paper change during the design process. The consecutive changes in its size, colour, texture, and degrees of transparency all constitute the material conditions for the process and for specific translations. It seems evident that perception and sensibility are affected in each of these successive changes. The ways in which ideas are induced by these movements are less noticeable, but all these material changes and corresponding transitions in the design sharpen the designer's attention and intentions. Designs are transformed throughout the elaboration of these consecutive material versions, and all the events that ensue from

material changes during the process, also provide a time-period and rhythm more conducive to the maturation of ideas.

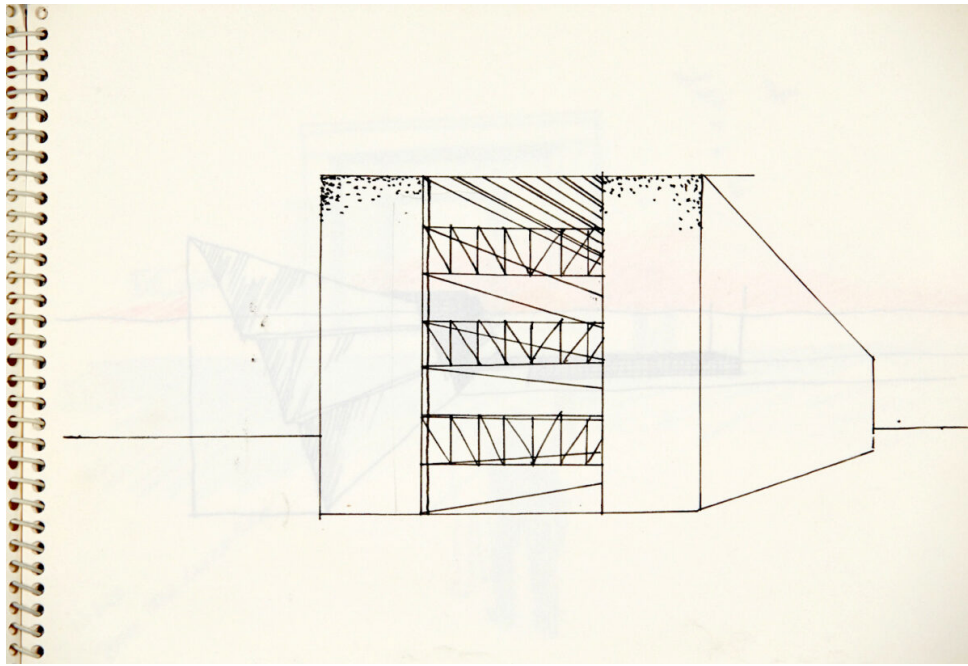
Pages of Gowan's sketchbook – for example sketchbook 7, 2658.7v–8r – show the material organisation of space surpassing (pure) visualisation. Through collage, drawings are assembled according to constructional and economical values, presenting an architectural composition on paper. As with any craft, a drawing craft style can provide profound insights into the material aspects of practice and the individual draughtsman.



James Gowan, 'Leicester re-hash' and other sketches, 1977. Pen, pencil, crayon on paper, 148 x 210 mm. DMC 2658.7v–8r.

The productivity of craft and styles is irreducible to the solitary draughtsman, and can only be fully appreciated in the living process of design; but we find many traces of it in the drawings, and in some drawing strategies and techniques that deliberately take advantage of it.

In many drawings by Adolfo Natalini we find a specific drawing style at the intersection of the graphical and the geometrical. Sometimes Natalini employs an improbable line to assist a geometric sketch (sketchbook 10, 2083.12), well-suited to visualise his solutions. This illustrates the ability of drawing to adapt to the singularities of the making, understanding, and imagining of each individual drawer.



Adolfo Natalini, page from a sketchbook of architectural and furniture designs, 1969. 175 × 250 mm. DMC 2083.12.

Many criticisms have been levelled against drawing because it can take the design process away from what is essential to it: understanding and imagining a given construction. According to these critical arguments, the ‘drawing language’ can easily distract the designer from the essential task, and may even create a series of pitfalls. [3] The architect or the designer may explore possibilities of a drawing that are impossible in the real world, or evaluate a solution on the strength of the drawing alone, etc.

Experiences of the ‘drawing in the object’ reveal that design solutions can be explored within the scope of drawing language, styles and crafts. However, drawing may lead to experiments that, by overemphasising visual relationships and perceptions, underestimate the real complexity of a design. [4] For this reason, it is also necessary to understand the specificity of drawing styles and crafts, as they enable translation operations to occur that develop and strengthen perception, sensibility, understanding, and imagination throughout the design process.

Notes

1. Mandredo Massironi, *The Psychology of Graphic Images: Seeing, Drawing, Communicating* (Hove: Psychology Press, 2001).
2. C. Wright Mills, *The Sociological Imagination* (Oxford: Oxford University Press, 2000).

3. Bryan Lawson, *How Designers Think: The Design Process Demystified* (London: Routledge, 2006).
4. C. T. Mitchell, *Redefining designing: From Form to Experience* (New York: Van Nostrand Reinhold, 1993).

THE DRAWING-OBJECT

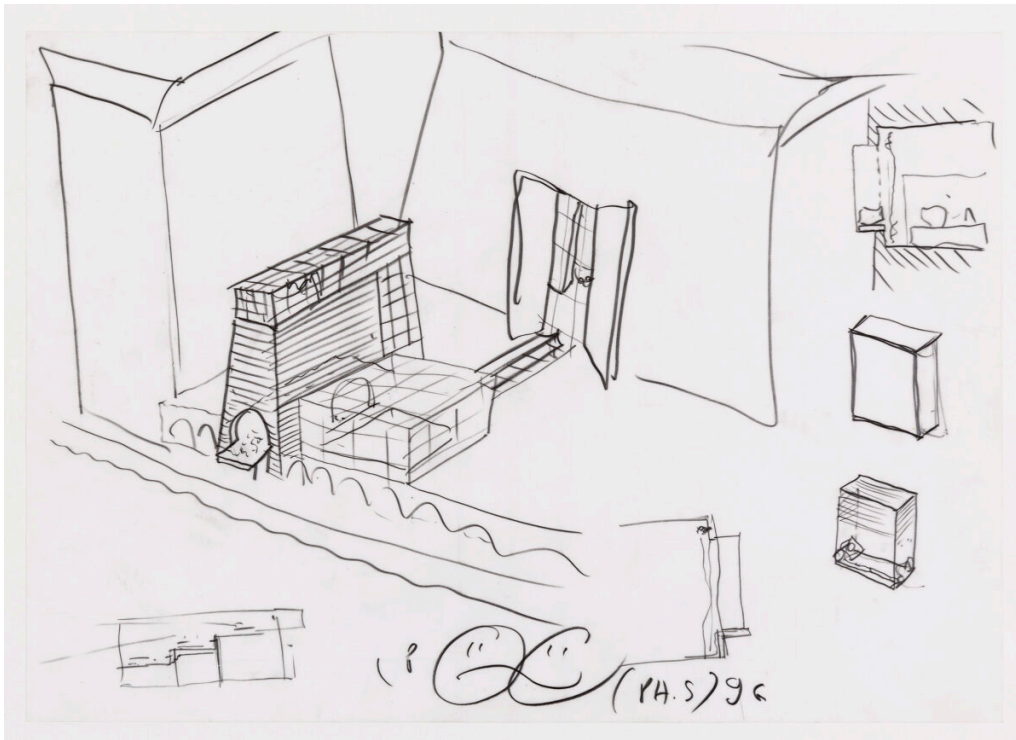
After I have developed a feel for the programme, and its innumerable demands have been engraved in my subconscious, I begin to draw in a manner rather like that of abstract art. Led only by my instincts I draw, not architectural syntheses, but sometimes even childish compositions, and via this route I eventually arrive at an abstract basis to the main concept.

– Alvar Aalto

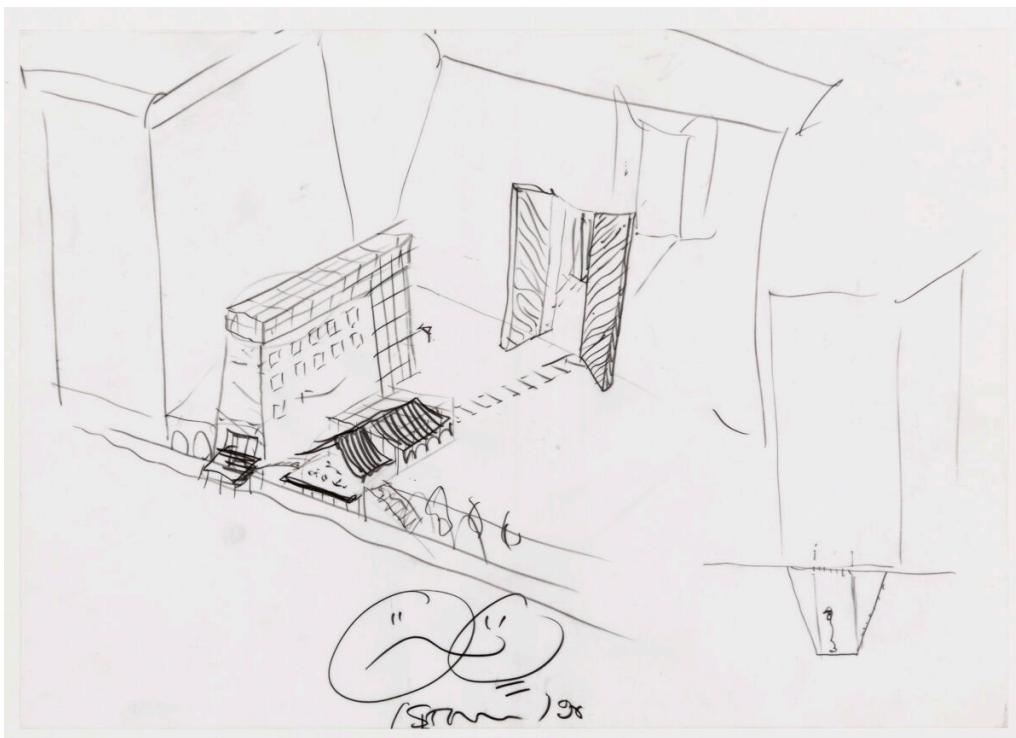
The term ‘drawing-object’ designates the exploration through drawing of zones of undifferentiation between the drawing, the object, and the drawer. [1] Exploring these zones can help overcome unnecessary limits, obliging the drawer to learn in the face of the new, the previously unperceived, unfelt, unthought, and unimagined. This is the fundamental potential of experimentation through drawing that we will now investigate.

Experimentation may reveal itself through the practice of unusual drawing techniques, or in non-representational aspects of drawing, such as drawing speed or drawing intensity. [2] Different speeds reveal different thought notations, while different intensities elicit different drawing actions from the person drawing.

These drawings by Philippe Starck bring up an important feature of experimentation: speed. Drawing speed expresses different kinds of thinking. Fast drawings reveal a difficult balance between the notation of immediate thought and the information needed to think through the problem at hand. In this case allusions to localisation, volumes, textures, and structures are rapidly manageable but never vague.

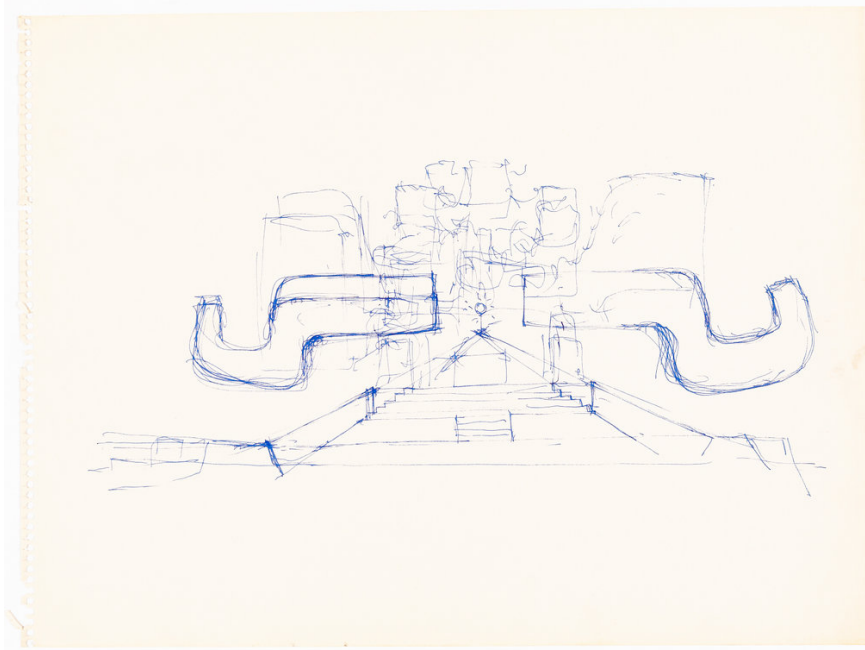


Philippe Starck, perspective and details, Canary Wharf Hotel, 1996. Pencil on tracing paper, 210 × 297 mm. DMC 2762.1.



Philippe Starck, perspective and section, Canary Wharf Hotel, 1996. Pencil on tracing paper, 210 × 297 mm. DMC 2762.2.

Hans Hollein presents a particular construction of intensity: the solution found by Hollein is an expressive composition in which the outstanding organic forms are set off against orthogonal lines. It is a mode of constructing intensity like a heterogenous 'collage', amplified by using different strokes and tones (DMC 2490.19).



Hans Hollein (1934–2014), *City, Communication Interchange*, 1962. Blue ink on wove paper, 329 × 418 mm. DMC 2490.19.

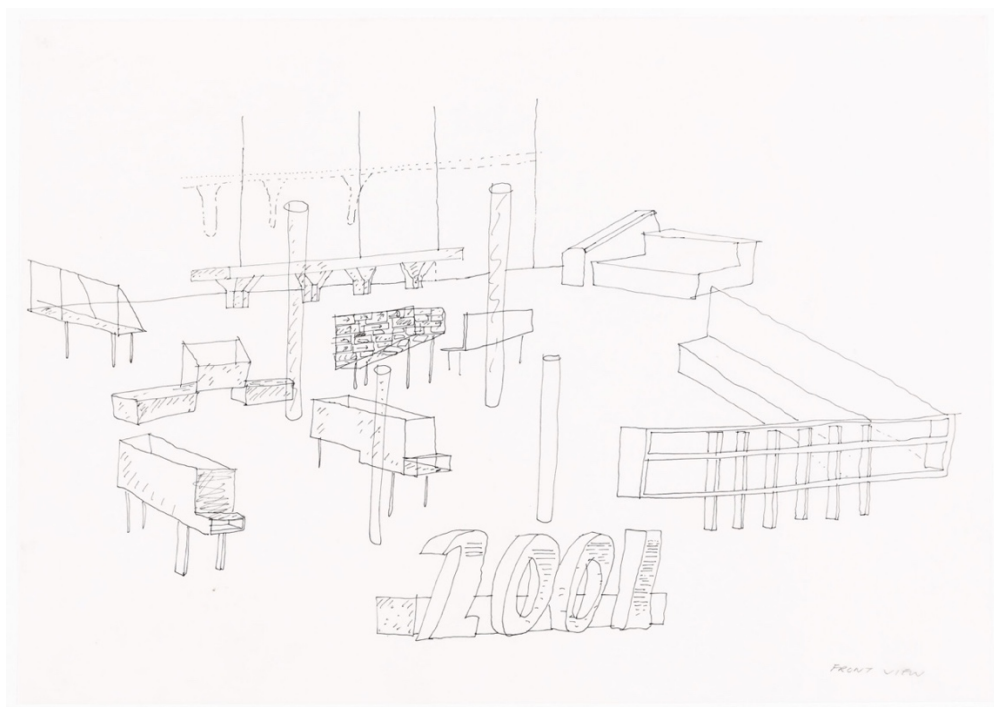
Very often, experimentation is organised using identifiable drawing strategies in a series of drawings in which a problem and its solution is addressed and explored. But it is necessary to understand what drawing experiences feed this process of experimentation. The metaphor of navigation, as used by Álvaro Siza, gives some insight into the specific interaction and involvement – both passive and active – of experimentation through drawing.

Firstly, in this kind of navigation the destination of the journey is kept sufficiently open-ended, with no clear and definitive path marked out to reach the destination. Each process of navigation is unique, because each design project has specific conditions, and different paths are found to resolve it every time. Thus, each design solution is different and sometimes that solution may be unique. Through this practice of drawing the designer carefully learns the novel aspects of each case and its particularities. This

open and exploratory process often reveals itself in a particular drawing, or series of drawings.

Secondly, some experimental drawings actively engage with internalising and problematising through drawing. [3] Procedures of internalisation are essential to any process of modelling but, in experimentation, these procedures include aspects of the object that are usually alien to drawing.

By subtracting the (omnipresent yet frequently unconscious) exterior limits, Tony Fretton is able to visually consider interior spaces in their various local organisations; this strategy suggests specific functional systems – in their multiple aspects of action, perception, and feeling – that are closer to our ordinary experience of interior spaces, which is always situated (DMC 2890.1).

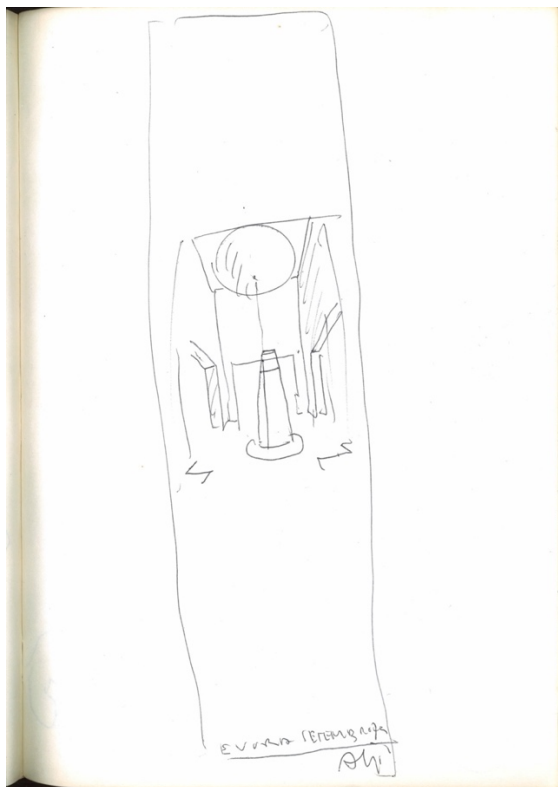


Tony Fretton, 2001 Exhibition of Finalists in the Southbank competition, 2001. Pen and ink on tracing, 418 × 593 mm. DMC 2890.1.

Problematisation through drawing – as distinct from the routine recognition of design problems – actively produces irresolution and difficulties of various types, which must then be overcome in the process.

Thirdly, in addition to the open-ended orientation mentioned above, the openness of drawing also includes a receptivity to heterogeneous multiple events in drawing and through drawing. The drawer must learn how to accept them and even to generate them.

Many of Siza's drawings explore spatial perceptions and experiences. For example, Siza uses conic perspectives to model the users' or inhabitants' perception of architectural space. This drawing is difficult to analyse – we can only form hypotheses – but it shows the creative importance of drawing for Siza's exploration of space. (DMC 2536.22, Sketchbook 42). In it, his use of the rectangle reveals a very particular understanding of drawing. On the one hand, it acts as a compositional drawing element on the sheet to frame and balance it, addressing the perception of the drawing rather than the architecture. Conversely, the rectangular form could also represent a multitude of architectural elements. This 'simple' rectangle form reveals how interiorisation can be experienced through drawing.



Álvaro Siza, page from sketchbook 42, September 1979. Biro on paper, 300 × 210 mm. DMC 2536.22.

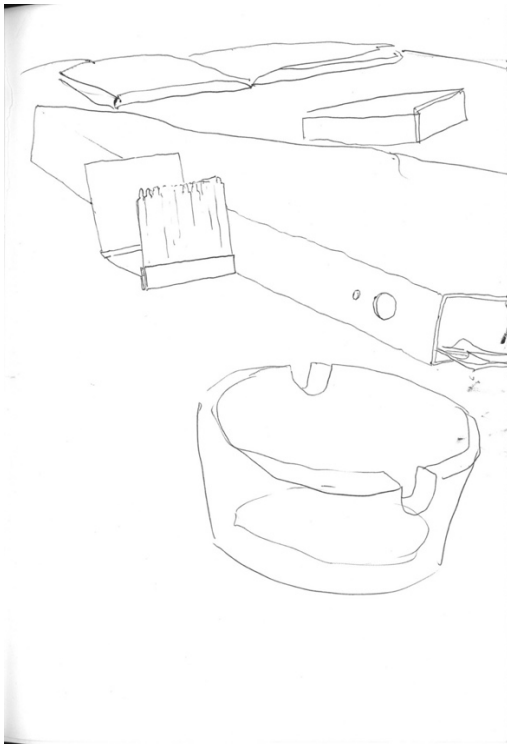
As with navigation, engaging in an emotionally-rich activity heightens the designer's attention, making it more receptive to the many events that may

happen during the process of drawing. These events range from small unforeseen surprises to accidents, or chance occurrences, etc. Through these different modulations of attention, the crucial experience of being acted upon by drawing is acknowledged and worked through.

Lastly, as in navigation, different emotions tend to lead to – though never determine – different perceptions, different thoughts, different ideas, and thus different actions. [4] In parallel to experiencing all this, the person involved and interacting in producing the drawing goes through different sentient states. Sentience, and not just rational consciousness, is the thoughtful experience resulting from being fully absorbed in the corporeal movement of ‘navigation’. As well as the distant and reflective observations that occur in navigation, there are also states of thought immersed in sensations and perceptions that lead us to think in different ways. This varied sentient rhythm is converted into the many different speeds of drawing, and the corresponding quantity and nature of the information contained in each drawing.

We may not appreciate the full importance or consequences of the time a designer indulges, through the useful and intelligent pleasure of drawing, in recognising a particular problem and finding ways to solve it.

Siza’s Sketchbooks show a large range of drawing types, for work and for pleasure. Drawings made for pleasure are frequently effortless – avoiding resistance and difficulty – or opportunistic – as when a motif catches the eye, and they are sometimes produced almost absent-mindedly. They exercise a kind of free and boundless practice, as opposed to strictly goal-oriented working drawings (see for example: sketchbook 35; 2532.7).



Álvaro Siza, page from sketchbook 35, April 1979. Biro on paper, 300 × 120 mm. DMC 2532.7.

Fundamentally, experimentation exists embryonically in experiencing the unstable imbalance between the drawing and the drawer, through the act of drawing and of being acted upon by the drawing. [5]

This relationship has many versions in design drawing: drawing and (really) seeing what has been drawn; imagining, and having the imagination spurred by the drawing; seeking to clarify, but then being perplexed by unexpected results, etc. This experience of the unstable imbalance between drawing and the drawer is enhanced by all the active and sometimes strategic procedures of experimentation.

Notes

1. Gilles Deleuze, *Spinoza: Practical Philosophy* (San Francisco: City Lights Books, 1988).
2. José Gil, *Sem Título: Escritos Sobre Arte e Artistas* (Lisbon: Relógio D'Água, 2005).
3. John Rajchman, *Constructions* (Cambridge, MA: MIT Press, 1998).
4. Jean Claude Kaufmann, *Le Coeur à l'ouvrage: Théorie de l'action ménagère* (Paris: Armand Colin, 2015).

5. Fernando Poeiras, 'Pragmáticas do Desenho em Design II: A Não Coincidência Entre a Ideia e a Imagem no "exercício" de Desenho', *Cadernos PAR* (2009), p. 10–25.

CONCLUSIONS

What surprises me most in architecture, as in other techniques, is that a project has one life in its built state but another in its written or drawn state.

– Aldo Rossi

This means we are entirely free to help ourselves wherever we can from the experiences and the thoughts of our past.

– Hannah Arendt

In these short studies I have tried to answer a single question: how does drawing increase the capacity to understand, imagine and validate a design?

I have identified a series of ‘drawing powers’, and sought to understand how drawing contributes to the operational and operative value of drawings. Operational, because drawing can both pose and solve a series of modelling problems, and operative, because of the many actions drawing exerts on the drawer, and consequently on multiple aspects of design and its process.



Le Corbusier, study model and photograph, Olivetti Centre, Rho-Milan, 1962.

To fully understand operational and operative values we need to examine the interactive and involved sentient process that drawing represents. But we also need to look carefully for the exact and limited contribution that drawing makes to the design process, to the design, and ultimately, to our constructed reality, because a monolithic and all-encompassing concept of drawing produces no intelligible conclusions.

To answer these many questions, we must investigate the productivity of drawing, while recognising and dealing with its concrete practices and rich diversity. We must discard the false idea that only the techniques of representation can be transmitted and that, beyond representation, there are only personal and idiosyncratic drawing practices. Some architects and designers do not use drawing, while others just use it for exteriorising previously-defined solutions. However, there are some who think, imagine and feel through the process of drawing. From the many drawing practices in evidence, this study has sought to isolate and analyse certain common traits.

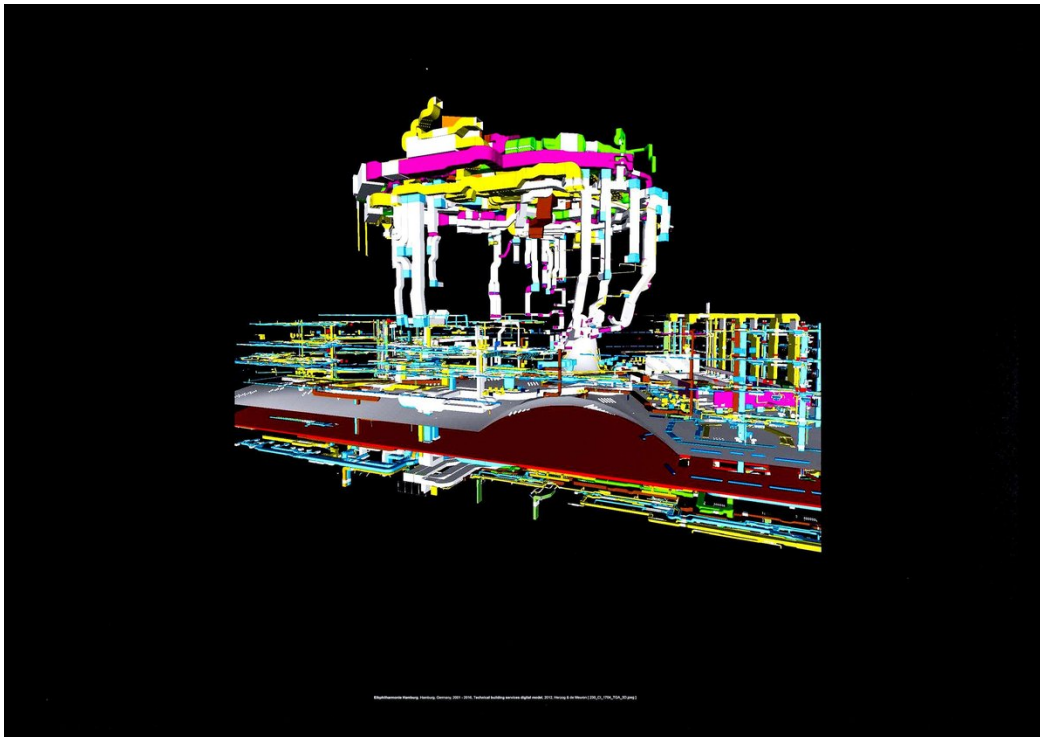
Although intentionality is one of the elements of design practice, we have seen that, even in the ‘instrumental’ use of drawing – in which drawing is supposedly neutral, unproductive and completely subject to the intentions of the drawer – it is also productive through the many forms, techniques, and strategies by which the drawer gains a better understanding of both the design object and themselves. In this practice, the main pitfall is that of reducing the sentient exercise of human faculties to a mere shortcut for illustrating ideas, i.e. an impoverished and repetitive ‘re-presentation’.

More than being just a ‘drawing language’, each drawing style and each drawing craft is also productive: it enables different translation operations to occur. Here, the risk is that ‘drawing languages’ can acquire a kind of autonomy that may lead to empty formalism or excessive ‘overdrawing’.

Finally, experimentation through drawing can create many other ways in which drawing can be productive. Procedures for this experimentation can open up new lines of exploration and discovery, which are often surprising, and may surpass the intentional framework; one of the most productive outcomes of drawing practice. However, once again, there is a risk that this practice may induce ineffective experimentalism if it is not tied to the actual design and the exercise of the drawer’s faculties.

The specific characteristics of design drawing are found in its operational values. However, there are other ways – sometimes improbable but never to be ignored – to develop the process and intelligibility of a design, and to anticipate and experiment with its reality.

The Drawing Matter collection preserves and extends drawing heritage by incorporating many unconventional uses of drawing, and including contemporary drawing media. How can this heritage be used? Hannah Arendt indicates the right direction. Faced with a partially renewed world, with its new possibilities and difficulties, and no longer being bound to repeat a tradition, we can make free use of the knowledge available in drawings and other models, in studies and essays, and in collected testimonies.



Herzog & de Meuron, Technical building services digital model, 2017. © Herzog & de Meuron.

Thus, we can use this collection to study and confront problems, both persistent and new – we can experiment with it and, through it, experiment with ourselves.

Our experimental studies here, although theoretical, were rooted in strong ‘affects’. The selection of drawings resulted from an affinity with certain

drawings, and lack of affinity with others. From time to time these relationships changed; some intensified or ended, while others emerged; some relationships were enduring, and some were not. Encountering, observing and comparing drawings was central for these texts; the copying of some was also instructive. This proved to be a rewarding way of learning from drawings, gathering the knowledge they hold, and generating new knowledge.

Drawing remains an enduring form of knowledge that, because it is exteriorised in immutable and tangible drawings, can be shared within the community of practitioners and passed on to the future.

Final notes:

I would like to thank Niall Hobhouse and Drawing Matter for all their support; I include in this support the assistance of Matt Page, the first critical reader of these studies to whom I am most grateful. Finally, I would also like to thank my friend Júlio Silva for our many precious conversations about drawings and about this collection.

The translation of this research was funded by of LIDA – Arts and Design Research Lab, with the financial support of FCT – Fundação para a Ciência e a Tecnologia, I.P, through National funds.

