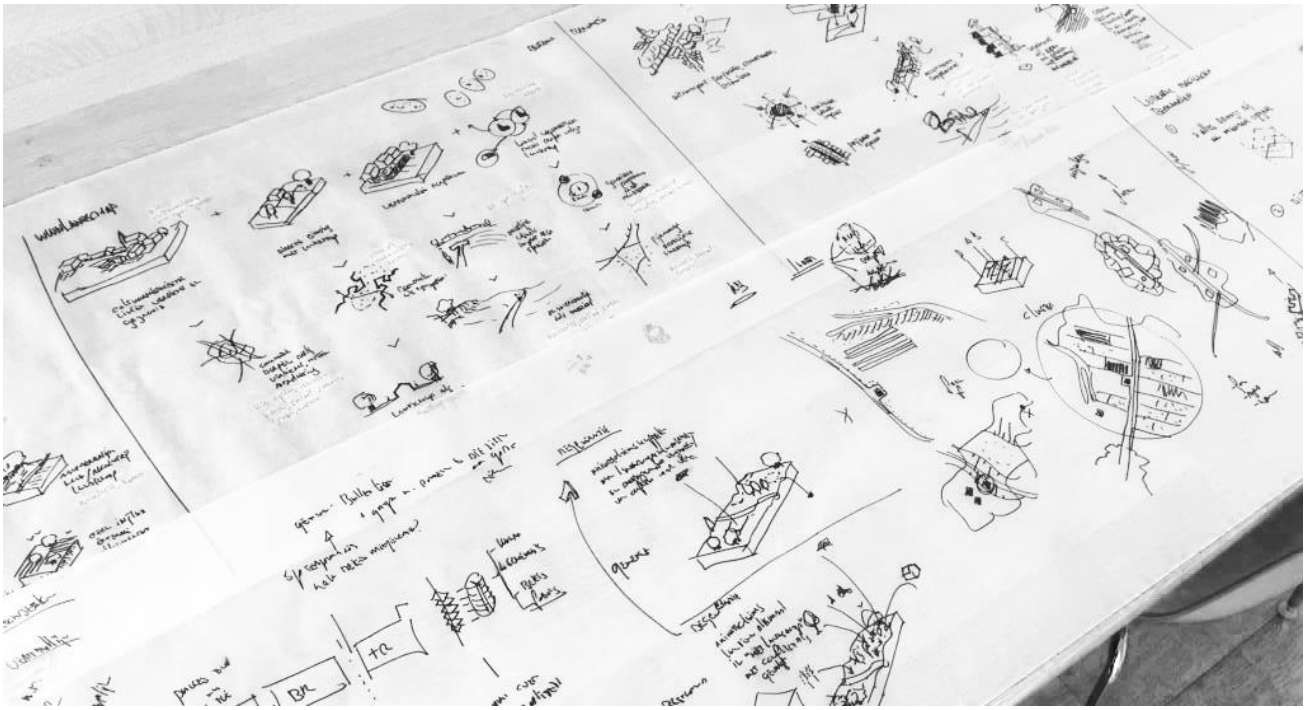
Opening Up the Space of Drawing: Lines and the Locus of Creation in Architectural Design[1]

Otto Paans



"Architectural sketches" (Author, 2022)

1. Introduction: Opening Up the Space of Drawing Again

One of the most destructive effects of the mechanistic worldview (see, e.g., Hanna and Paans, 2020), is that our thinking about cultural activities and techniques has been reduced to scientific, materialist explanations. Art, myth, tradition, animism, and imagination have been reduced to topics that require an explanation in empirical, reductionist, materialist/physicalist, and functional terms. The development of the modern sciences from the late 18th century onward provided us with a worldview in which the unexplained is regarded as a territory that grows smaller by the day, and that contains all the myths, superstitions, naïve beliefs, wild fantasies, and unexamined fallacies that the light of

[1] This essay was previously published in a slightly different form as (Paans, 2024a), except for the Introduction, which was written specifically for APP.

mechanistic Reason would dispel and explain away. The sleep of Reason may breed monsters, but the exacting omnipresence of mechanistic Reason flattens out the world, diminishing its lived and experiential aspects.

And so, the science of mind, including the study of consciousness, became cognitive neuroscience; the science of mental health became psychopathology; the arts became psychological aesthetics; and questions of existential meaning and morality became the province of ethics boards. Imagination was cast as "the manipulation of mental imagery," creativity became "problem-solving," and communication became "exchanging information," while finding our way around in the world became "decision theory."

There is something deeply wrong with this reductionist, functionalist picture. Simply put, it amounts to superimposing a scientistic research agenda on the fullness of human life itself, thereby constraining the range of thoughts, feelings, and actions that are deemed acceptable to make sense of the situations we encounter. However, the situations we encounter in science, arts, politics, and culture grow more complex by the day, and so the mechanistic worldview has to do more and more explanatory work, a task to which it is as yet spectacularly ill-equipped. The reason for this failure is that the sciences have their proper place in the rational human condition, but they cannot be used, without disaster, to be "the measure of all things," and to dominate all other frameworks of thought.

Moreover, we inherited a certain conception of what it means to do science: it amounts to believing in a deeply materialist/physicalist world-picture and the mechanistic worldview. But anyone who compares the range of scientific ideas and theories from the late 19th and early 20th century with those from a hundred years later can only conclude that our scientific understanding has narrowed and has become increasingly less imaginative. Yes, we have digital technology now; yes, we now know more about quantum mechanics than we did; yes, there have been advances in medicine. But the foundations for these advances were all laid over a century ago. And so have the tenets of the accompanying mechanistic worldview. Fundamentally, we are just building on foundations that have been in place for a long time without asking whether we are actually constructing the right type of building.

We could raise a similar point when it comes to the discipline of psychology. If one takes a look at the late 19th century theories regarding human development, the mind, and the life of the mind as well as its relationship to existentialist questions, we find that these theories were far more variegated and generalist than the conceptual frameworks that we use now. Gestalt psychology, anthroposophy, early psychoanalysis, Husserlian phenomenology, *Lebensphilosophie*, and Martin Buber's mystical theory of person-to-person relationality all

dealt with the life of the mind in broader and far more imaginative terms than we're currently using. Granted, not all of these theories were true, or even useful—some of them were even outright fraudulent. But the tapestry of discourse was much thicker, much richer, much more generalist, and much less reductive.

The notorious case of psychoanalysis and the plethora of misguided ideas that it spawned is often held up as a deterrent: do not leave the secure path of empirical psychology, for there be dragons! But when these complaints come from practitioners working in a discipline that faces such a serious replication crisis, we would do well to take these admonitions with a grain of salt. Psychology today is busy prescribing drugs to deal with any number of mental health issues that its impoverished, reductive framework cannot deal with. Indeed, Ritalin, painkillers, and antidepressants are some of the best-selling prescription drugs. Do these modern treatment protocols aid our understanding of the human mind? Not at all. We identified a number of buttons to push when we would like to make changes, but our fundamental understanding remains ultimately shallow.

Another area in which rampant reductionism and flat-footed functionalism have taken over is in the realm of cultural practices (*Kulturpraktiken*). Examples are handicrafts, food traditions, and annual festivals like Carnival, but equally practices that we nowadays categorize as "fine arts," like drawing, painting, sculpting, or dancing. While there is much interesting work that investigates the role of these artistic techniques in therapeutic settings, the professional academic discourse about them is often caught up in the conceptual frameworks that emerged after the Second World War, and that once again betray their mechanistic tendencies.

A particularly poignant case that I'll focus on here, is the practice of hand drawing in the design disciplines. What I will call "the representational paradigm" is in fact an attempt reductively to explain away what happens when we draw. The terms used to make sense of the drawing process are so one-sidedly taken from the Logical Positivist or Empiricist tradition and its expository ideal of communicative clarity, that any interesting contribution that could potentially be made by such an approach is prevented from the get-go. Instead, the design sciences took a tortuous detour through the "cold bath of scientization" before emerging as an autonomous discipline that had to be understood on its own terms (Bonsiepe, 2003). If hand drawing is just visual representation, then why is it so important for creative thinking, especially in the design disciplines and the fine and applied arts? And if it uses the imagination rather than linguistic structures, how do we make sense of this process on its own terms? What is the relation between bodily movement and the development of thought? Such questions were long pushed to the cognitive periphery, because they sat uncomfortably

within the prevailing mechanistic paradigm, and therefore were difficult or even impossible to investigate within that paradigm.

Correspondingly, in this essay I propose retracing our steps and opening up the discursive field again. The first task when thinking about hand drawing (or any cultural practice, for that matter) is to step out of the mechanistic cage in which the modern sciences have maneuvered us. We require different terms to think and speak about cultural practices, broadening our referential horizon. In doing so, we must learn to appreciate a radically different viewpoint than the one we're used to, and which we're conditioned to regard as true-by-stipulation. Doing so means overcoming and replacing the thought-shapers that pre-structure the discourse of what it means to make sense of cognitive processes in the first place (see, e.g., Hanna and Paans, 2021). In order to do this, I will make three claims that seems rather strange from our modern scientific and reductionist way of thinking about creativity. First, a drawing surface is a *topos* or habitat of ideas. Second, we do not draw representations, but figurations; Third, lines are not marks but processes. Jointly, these claims represent an *organicist* and *processual* approach toward hand drawing practices. It allows for thinking about hand drawing as an essentially embodied cognitive process but does so in terms that supplements and situates the mechanistic paradigm. I do not wish to belittle the progress that has been achieved by using empirical studies, or the advances that it made in trying to explain certain creative or cultural phenomena. As such, the challenge is not to remove the mechanistic worldview, but instead to situate it properly in organic fundamental reality. This means that the mechanistic worldview cannot play the role of dominant root metaphor any longer but has instead to content itself with a limited explanatory role against a fully organicist background. As all mechanist explanations are just systematic abstractions from an essentially richer reality, these explanations cannot be regarded as ultimate grounds. They provide a "principle of sufficient reason," but that is where their role stops. The resulting hybrid picture will—I believe—be more comprehensive, more imaginative, and ultimately more appreciative of our fully human capacities. It will situate the mechanistic framework of thinking into a richer biotope of thought and will allow it to play the role it is designed and suited to fulfil.

2. Structure and Argument

The practice of exploringly drawing by hand, or sketching, is ubiquitous in the design disciplines. It is taught around the world as one of the most straightforward techniques of developing ideas, exploring intuitions, prototyping solutions, or communicating concepts (Purcell and Gero, 1998). Seemingly simple and straightforward, the dynamics of drawing

by hand also seem easy to understand—that is, as long as one accepts that drawing is a form of mimetic, i.e. broadly imitative, visual representation, thereby considering it as a representational technique (Paans, 2024a). But to accept *that* viewpoint would be unnecessarily reductive, since it has been argued convincingly that drawing by hand is not just a form of representation, but that it constitutes a form of thinking in its own right (Hoffmann, 2020; see also Geer, 2011: p. 45; Pallasmaa 2015: p. 92; Paans and Pasel 2018). As such, the nature of drawing by hand is an issue that has its home in the realm of aesthetics. From Kant's Third *Critique* onward, aesthetics has predominantly focused on the notion of the beautiful. However, if we recast it as what Hegel aptly called "the science of sensibility," we see that aesthetics encompasses not only the notion of beauty, but the *dynamics* that characterize artistic practices such as painting, sculpting, or drawing in the broad sense. An anticipation of this approach is already found in Kant, who approached reflection as a type of sensibility-in-practice (Paans, 2023).

Returning now to drawing practices, the statement that drawing by hand is a genuine form of thinking—no matter how intuitively appealing—presents us with paradoxes left and right. If hand drawing is indeed an autonomous form of thinking, *how* is it so? How do visual and gestural creation guide the process of (creative) thinking, or tap into aspects of that process that no other activity can reach? If aesthetics is concerned with the sensibility inherent in artistic practice, then it must provide an answer, model, or tentative theory.

To address this question, I take an indirect route and elaborate a very simple claim: *that drawing lines by hand is a form of generating conditions for creative thought.*

To restrict the focus of this paper, I limit the discussion to drawing lines by hand in architectural design. Creating lines, as architectural theorist Marco Frascari argued, is itself a way of "architectural thinking" (Frascari, 2009). Although I'll also return to Frascari's statement later on, right now I'd like to extend his thesis to support an additional claim: not only is drawing lines by hand a form of thinking, but correspondingly, lines play indispensable roles in the emergence of *the locus of creation*. In the course of my argument, I'll explain what this claim means.

3. The Representational Paradigm: Three Basic Assumptions About Drawing by Hand

To lay out the position I'm criticizing, let's introduce three assumptions about drawing by hand and lines in architectural design that jointly constitute what I call *the representational paradigm*.

The first assumption about drawing by hand is that it occurs on a *neutral plane*. This idea can be traced back to Ancient Greek conceptions of the human mind. The mind was regarded as a *tabula rasa*, or empty plane that would be inscribed by impressions or marks.[2] Notice here the close analogy with the development of writing: the mind was conceived as a surface that would acquire its unique shape by external influence, just as the empty sheet of paper is marked with symbols or marks by an author. This assumption made it easy to lump drawing and writing together under the heading of "the production of traces."[3] In doing so, the act of drawing was silently subsumed under writing.[4]

Writing means permanence: a text can be read in the author's absence, because the marks have a lifespan that very often exceeds that of the human being. From the very first beginning of architectural drawing during the Renaissance, the material aspect of this permanence claimed center stage: first, a parchment had to be prepared, second, a line had to be engraved into it, and third, this line had to be filled with specially prepared ink (Frascari, 2017: p. 29; Emmons 2019: p. 102). Before the line could achieve its permanence, an entire sequence of material processes was required.

The second assumption is that drawings are *imitations* or *copies* of an object or idea that they are supposed to represent faithfully. The idea that the arts are essentially imitative can already be found in Aristotle's *Poetics* (Aristotle, 1984: p. 2318). Aristotle notices that imitation is a form of learning, and that imitation offers delight or pleasure. We encounter a similar thought in the Platonic corpus, which states that the arts focus on imitation (*mimesis*) in order

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[2] The idea is discussed in Aristotle's *De Anima,* referring back to Plato's *Timaeus*.

[3] This idea is inherent in Jacques Derrida's concept of *différance* (Derrida 1982). See (Derrida 1982; see Krämer, Kogge, and Grube, 2016).

[4] (Flusser, 2004) also discusses the link between writing and drawing. But in this case, Flusser conceives text as line-based thinking, and drawing as surface-based thinking. Flusser's account of the surface, however, bears close resemblance to the idea of the plane as a *topos*.

to achieve visual resemblance.[5] In some cases, this is true, since there are drawings that are meant to specify certain features. For instance, technical drawings must closely resemble the objects they depict in order to be useful at all.[6] However, Aristotle's theory adds a significant ingredient: there is a sense of pleasurable discovery of reverie that makes itself felt while drawing. Imitation opens up the mental space towards encountering the new. Yet, it is this aspect that is routinely downplayed within the representational paradigm.

Under this assumption, it is but a small step to imagine that a drawing is always a *visual representation* of an absent object that functions as a stand-in. A drawing is seen as a *copy* of an object. Or, it may also be seen as a *visual representation* of it. The distinction between these two is that a drawing may indeed represent an object (as in still life painting), but that object need not be absent. In the case of designing, the object-to-be is at least partially absent, and so drawing fills in an imaginative rather than a representational gap. This assumption directly follows from the idea that drawing is inherently imitative. The object that is depicted is absent, or does not even exist yet, but the drawing makes it present in a precise, descriptive, and tangible manner (Pombo and Magalhães, 2006). This conception of drawing owes much to Leon Battista Alberti's idea that drawing is the process of setting up a descriptive geometry (Pallasmaa, 2009: p. 29; Paans, Pasel, and Ehlen, 2019): that is, a precise, scale-drawn visual representation of an object that is to be built. Alberti codified drawing in such a way that it became a tool for transmitting ideas between designer and builder. Likewise, the drawing became a tool for "intellectualizing" an idea (Paans, Pasel and Ehlen, 2019). By means of geometric representation, otherwise fuzzy ideas become stable objects of inquiry (Goldschmidt, 1991; Ammon, 2016; Van Den Berghe, 2013; Paans and Pasel, 2018). Not only do they acquire a kind of "objectivity" or representational stability, but likewise, they become amenable to a process of control and metric measurement. In this type of hand drawing, the line was the mark of precision, through scale and metric precision corresponding to a future line or given measure in the real world. However, the lines from which the hand drawn object is constructed play vastly different roles in the process of creation. Again, the sense of pleasure and discovery that Aristotle describes is part and parcel of drawing by hand. The

[5] See for instance the work of French philosopher Philippe Lacoue-Labarthe on the subtle difference between *mimesis* and *imitation*. Often, the two terms are held to deal with replication, but Lacoue-Labarthe disputes this claim, arguing that they are in fact significantly different.

[6] We find a variation on this thought in the idea that designers draw in order to *communicate* their ideas. This claim is partially true, and it is easy to pinpoint drawings that primarily serve a communicative purpose. Such drawings may be final renderings of a project or plans that depict a plan. However, these drawings are made only when an idea has already been worked out in a process of designing.

role of lines in the drawing process is not reducible to merely to representing an object faithfully.

Third, *drawing* has been subsumed under writing as the production of a kind of script that serves a communicative purpose. This is not to say that drawing by hand *never* serves to communicate information—an obvious counterexample is technical drawing that is used to instruct the construction workers executing a plan. Instead, drawing by hand is a noun without a predicative completion; it is not a synonym for illustrating or codifying completed, well-formed thoughts. The written text has often been held up as a pinnacle of expressive precision at the expense of the drawing. 20th-century Continental and Analytic philosophy took quite some time to come to terms with forms of expression that were not syllogistic, propositional, or text-based, or that had no clear signifier-signified structure.[7] The discussion of what constitutes images has developed only recently with image theory and media theory. It should be indicative in this regard that we have a philosophy of language, but no philosophy of drawing. This is partly explicable because drawings cannot be reduced to propositions But even when we discuss language, we mostly talk about written language, propositions, or logically well-formed statements.[8] Language is reduced to either logic or the production of traces or marks. This has one important ramification for drawing: lines are seen as *passive traces* or *marks* of a *notation process* that bears a close analogy to writing, although the line itself cannot be treated as a proposition or statement (Cross, 1982; Whyte and Ewenstein, 2010; Krämer, 2015). But as poststructuralism and hermeneutics have both shown, text and image alike are very much active.[9] Drawing has a dynamic of its own: a regimen of operation that is not reducible to writing, although it is also notational (Paans and Pasel, 2018). Luckily, this fact is more and more recognized in architectural theory (Nigianni 2017), but some of the ambiguity remains.

Summarizing the results of this section, the representational paradigm rests on three assumptions: (i) drawing by hand occurs on a neutral plane, (ii) drawings are imitations/and or visual representations of an (absent) object, and (iii) drawing by hand is a kind of script

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[7] Some of this tension is implicit in Nelson Goodman's account in *Languages of Art* (Goodman, 1968). For a discussion of this theme, see (Paans and Pasel, 2018).

[8] Partially, this influence can be traced back to the philosophical roots of early Analytic philosophy and also the after-effects of John Austin's 1962 book *How to do Things with Words.*

[9] (Gadamer, 1960/2013: pp. 108–109; Derrida, 1982; and Yaneva, 2009) embed the idea of activity within the framework of Bruno Latour's Actor-Network-Theory (aka ANT), whereby artefact and social conditions become players in an integral network of conscious actors, materials, and processes.

and therefore lines are passive traces. In the next section, I discuss a critical and organicist alternative to this account.

4. Entering the Space of Drawing: The Performative Paradigm

To rethink drawing in architectural design in a direction that diverges from the representational paradigm, I propose an alternative philosophical account for each of the three assumptions introduced in section 3. In doing so, I provide several arguments for rethinking basic aspects of the nature of drawing by hand as utilized in architectural design[10] More importantly, these arguments support my claims that drawing lines by hand generates the conditions for creative thought. Put concisely, my claim is that drawing by hand is inherently performative. As such, the account sketched here can be regarded as a *performative paradigm.*

I discuss three countertheses against the representational paradigm (i): the drawing surface is not a neutral plane, but instead a *topos*, (ii) drawings by hand are *situated figurations*, and not visual imitations, and (iii) lines are not passive traces, but active processes.

4.1 From neutral surface to inhabited topos

Consider the conception of a drawing surface as a *neutral plane*. What does it mean to draw a line, or to trace a figure on such a plane? At first sight, it implies a form of notation on a medium for later retrieval. Although this answer is correct, it is also trivial. It tells us nothing about either the nature of the drawn line or the drawing surface, let alone about the relation that emerges between them. It is as applicable to any form of writing as to drawing. If we wish to know the nature of the *drawn* line, we have to move beyond functional explanations, and consider the effectiveness of drawing as a cultural practice.

A first hint of this effectiveness lies in the etymology of the verb "draw." To draw is to pull a sharp object across a surface, scratching the trajectory that it followed. The pulling

[10] I follow Frascari's distinction between (i) hand sketches meant to work an idea out and (ii) construction drawing or executive drawings that communicate the specifics of an idea (Frascari, 2009). Renderings of a finished project also fall in this category. A slightly different distinction is made by Graves when he distinguishes between early explorative sketches, descriptive sketches, and technical drawings (Graves, 1977). There is certainly more to be said about the creative value of even executive drawings, but that is a topic outside the scope of this paper. For a discussion of such drawings see (Ursprung, 2016).

activity is important, as it implies the exertion of force, something that we do not usually associate with drawing by hand nowadays. However, history shows that the relation between the drawing instrument and the surface was multi-dimensional. With modern drawing, the drawing instrument (pencil, marker) largely lost its material connection to the receptive surface. However, from classical antiquity up until the Renaissance, engravings and drawings were largely inseparable.

A poignant example is the *epure*, or engraved stone installed at the building site of medieval cathedrals. The outline of the building plan was engraved on a large slab of stone for consultation by the workers and the architect. It provided a physical guideline for those working on the building, even if it did not contain all the fine details. Given the fact that such buildings took often to more than a single generation to complete, and the fact that inscribing a large stone with a building plan must have taken a significant amount of work, the drawing became a material point of reference for a joint project—a stable site to which to return and to guide further progress. It materiality was of the utmost importance: it had to last for a long time, and many people would spent literally their entire life working alongside it.

The same relation between materiality and durability can be witnessed in renaissance drawings. To draw effectively, a parchment had to be prepared, inscribed, and filled with specially prepared ink. If anything, in this type of procedure the line lost much of its spontaneity. However, as we can witness in the drawings of for instance Leonardo da Vinci, sketching remained possible alongside writing.[11] But still, even when the material link between line and surface is weakened, putting down the line creates a new situation. Especially during a creative process, the relation between line and depiction grows more complex than one would suspect:

> I put down something on paper and then react to it. Once I make a line, it becomes a condition: does it look like what I thought? Does it make me want to draw another or shall I erase it? It encourages me to make decisions only I can make. It has instantly become something that already exists and it draws me into the world of its own need to be drawn. (Fitch, 2011: p. 147; see also Dernie, 2013)

In the quotation above, Doug Fitch describes the line as a *condition*: it transforms the surface on which it is drawn. It directly demarcates it as left-and-right, up-and-down, in-and-out, and it may even suggest depth. Through the presence of the line, the surface acquires an

[11] See (Güss, Ahmed, and Dörner, 2021) for an overview of da Vinci's drawings in relation to his creative process and their generative potential.

orientation. Simultaneously, the line invites further exploration. Even before we consider the line's instrumental value as a vehicle of visual representation, we must consider it as an effective cause. The line *transforms* the surface—it is not merely a passive trace on a passive canvas. Once the line is drawn on the surface, it engages in an interplay with it. The German term *Bildakt* (image-act) emphasizes this dynamic character: a line is a visual act rather than a static representation (Bredekamp, 2015). The anthropologist Tim Ingold investigated line patterns that the South Indian *Kōlam* use to ward off demonic presences. These patterns, writes Ingold, are "not made on a surface, but they define it as a geometrical plane" (Ingold, 2007: p. 57). However, in a refined form of artwork called *kampi*, even this clear distinction between line and newly defined surface becomes indistinct. The lines seem to dissolve the surface (Ingold, 2007: p. 57).[12] This simple example illustrates already something of the complex, dynamic relation between *line* and *surface*, or alternatively, *figure* and *ground*.

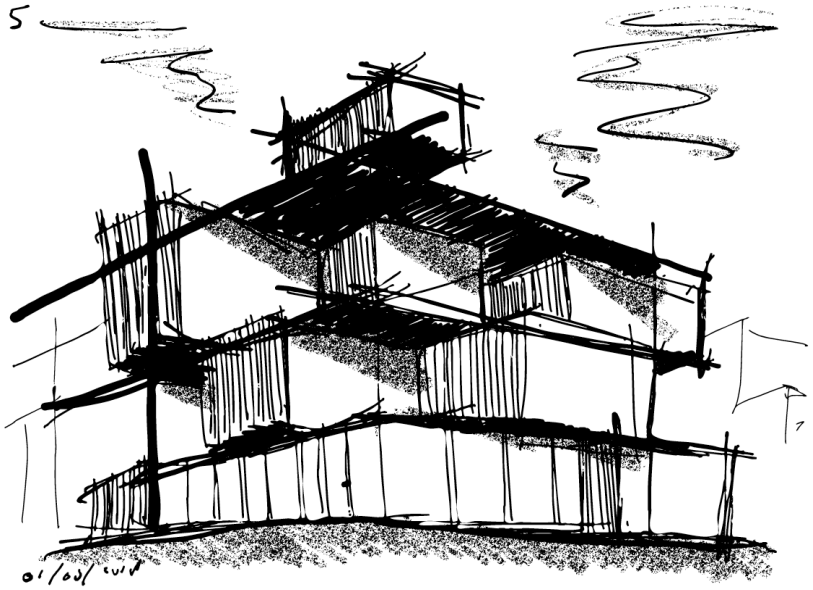

Figure 1: This sketch is expressive rather than descriptive, because its lining and shading suggests a depth and volume that adds an additional dimension to the surface. (Author, 2018)

Similarly, John Berger states that the paper "becomes what we can see through the lines drawn on it; yet it remains itself" (Berger, 2000: p. 124). All this points to an effectiveness exerted by the drawn line. Drawing a line is not an inconsequential act, but rather causes various visuospatial effects that are not just representational. Many of them have little to do with representation in the strict sense but are intended to create sufficient conditions for an idea to appear (see Fig. 1 above). In view of this, it makes sense to think of the line as an *event* rather than a symbol, mark, or trace.

[12] Ingold cites Paul Klee, who makes a similar point in his notebooks.

Fitch mentioned the line as the creation of a *condition*. As image-acts, lines actively create conditions that do not just happen to the surface, but that transform the surface into a space. We can quite literally wander in-between the lines in this imaginative space, and "take it in possession" (Polanyi, 2010: p. 18; Zumthor, 2014; Pallasmaa, 2009: pp. 109–110). With good reason, Michael Polanyi spoke of "indwelling" in an idea, regarding them as spatial rather than visual or conceptual entities. This inhabiting process allows for imaginative immersion. This is important since architecture is inherently spatial. The fact that drawing takes place on a flat surface or a digital screen does not remove the need for inhabitation. Paul Emmons took this thought a step further by coining the term "inhabitative imagination" (Emmons, 2019: p. 41; see also Emmons 2007). Echoing theories from the Renaissance onwards, the idea is that drawing by hand facilitates the process of mentally inhabiting the building or space that is being designed. As Le Corbusier put it: one must learn to "stroll" with a pencil (Emmons, 2019: pp. 41, 113). The drawn lines become instruments of inhabitation and perspective-taking. In a process of embodied acquainting oneself, the architectural space is traced out by situating oneself in it.

As Gaston Bachelard once remarked, *all* thinking is to some degree spatial (Bachelard, 1994: p. 212). We order our thoughts as up-and-down, inside-and-outside, above-and-below, in front-and-behind, and so-on. Even when constructing simple hierarchies or chapter structures, we are already involved in the spatiality of thought. Likewise, when we categorize, we erect an inside-outside barrier in which all objects A are situated inside, while all non-A's are situated outside. Even at the most basic level, thought cannot be without space. For this reason alone, we can see how putting down a line and creating a condition shapes thought processes, as a kind of mental ordering is implied form the very start.

Thinking is inherently relational and architectonic, in the sense that it turns towards systemic relations that have a certain spatial orientation. For this reason, Pallasmaa describes the "architectural image" as an organizing image (Pallasmaa, 2011: pp. 121–122). By "image" he does not mean just a visual representation of a building or a space, but instead the most basic categorical order that we use to think at all. This categorical order encompasses the distinctions between inside and outside, up and down, horizontality and verticality, static and dynamic, defined and undefined. These relationships are mapped out and carefully staged while one draws. The line as a condition marks the beginning of a thinking-through-

creation, utilizing the most basic spatial categories of thinking to inhabit and make sense of an idea.[13]

The French writer Michel de Certeau has drawn attention to the anthropological and symbolic languages that are used in this process (De Certeau, 1988: pp. 118-120; Paans and Pasel, 2020; see also Cook, 2014: p. 30). In the case of anthropological language, the drawing is approached as a space, and one can orient oneself in it. Descriptions like "follow the hallway and turn right at the end to enter the living room" imply a form of perspective-taking that occurs while drawing by hand – one has to "stroll along" with the description in order ot make sense of it. In doing so, one must imaginatively take a perspective. Likewise, in Donald Schön's seminal sociological study *The Reflective Practitioner*, this "conversation with the situation" occurs continuously during design processes (Schön, 1987). The fact that this situation is conducted through the embodied mind makes it a lived experience rather than dry theorizing. Recent findings have shown how important the relation to the first-person perspective is for architectural design. Drawing an idea from various perspectives involves perspective-taking, aided by embodied movements (Mittelberg, Schmitz, and Groninger, 2017). The process of inhabiting various perspectives brings an idea, or even a world, to life (see Fig. 2 below).

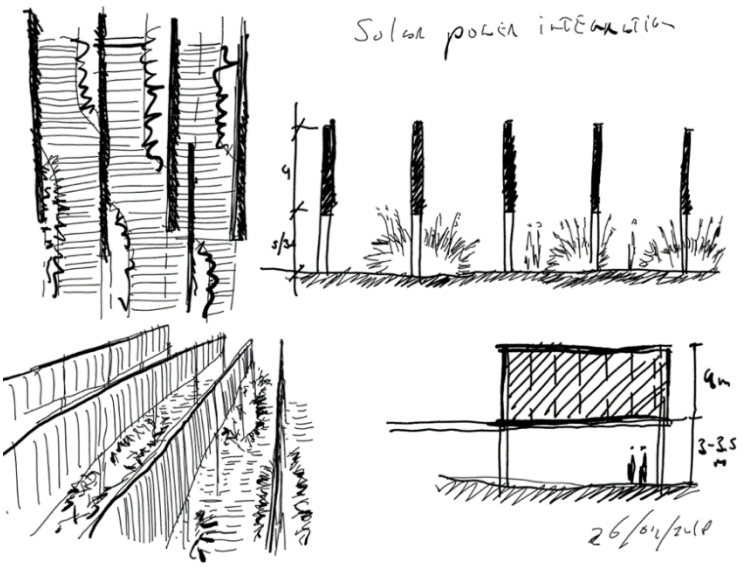

Figure 2: Different perspectives and human figures allow one imaginatively to "inhabit" a drawing or idea. (Author 2018)

[13] We should also notice here that the embodiment of the drawer is of enormous importance. Drawing by hand is always related to our sense of inhabiting spaces. As such, every drawing is by necessity perspectival: it is made by an author who necessarily inhabots a first-person viewpoint. See (Tversky and Hard, 2009).

By contrast, symbolic language stabilizes lived meanings. It uses a broadly standardized system to order the plurality of perspectives and notions. For instance, the architectural map is an abstract totality in which the viewpoint is changed from playful, perspectival exploration to systematic abstraction. The map represents a point of view and a level of abstraction that we do not encounter in everyday life.

But while drawing lines by hand, one visually constructs literally a space that is explored and that becomes an active participant in the creative process. The surface is instrumental in achieving this:

> The architect's drawing surface is not merely a neutral support awaiting the appearance of meaningful marks. Like soils on a site, drawing board materials impact the work. The drawing sheet is an active participant that is already propitious, or, as Chinese calligrapher Li Yang-ping wrote, excellent drawing paper is "generative" (sheng-chih) in that even when unmarked, it is not empty because fine paper is "endowed with life like fertile soil." Paper's qualities can inspire the consideration of a particular site's qualities. (Emmns, 2019: p. 35)[14]

Li Yang-ping draws attention to two aspects that deal with the materiality of the drawing surface.

First, the very materiality of the surface is generative by itself. The analogy with soil points towards a process of cultivation or actively working with the substrate. Like Frascari's notion of "sedimentation", the architectural idea requires a slow seeping-in and settling of its various aspects (Frascari, 2009). This growth process requires a physical locus, or "space" in which ideas develop. Again, De Certeau has taken up this theme, describing the space of writing (and drawing) as *un espace propre* or "proper space" (De Certeau, 1988: pp. 134–135; see also Paans and Pasel, 2018). The drawing surface provides such a proper, well-defined space. In it, ideas acquire a formal shape, yet their lived meaning is equally tangible as well. But ideas require this space to grow, flourish and to be properly interpreted as ideas or conditions. Not coincidentally, there is a direct link here to the idea of a designated, sacred space:

> Sacred space marks a break in homogeneity of undifferentiated space and provides a spatial orientation through which a world is founded. In the double operation of detaching and reframing, the ground re-appears as the site in its discontinuity. (Emmons, 2019: p. 35)

[14] Emmons is citing Li Yang-ping, *The Nine Generative Fa,* or *Chiu sheng-fa*, as quoted in (Hay, 1985: p. 98).

Like the architectural image that Pallasmaa alludes to, the drawing surface becomes a carefully differentiated site for thinking and world-building alike.[15] Demarcated as a space that qualitatively differs from its surroundings, the drawing surface acquires its special character. Put differently, we may approach it as a *generative habitat* or cognitive ecosystem. It is a space in which the conditions for world-building, thinking-through-gestures and organized visual experience are nurtured and developed. Above all, it is a space in which ideas are powerfully condensed and concentrated, forcing them to assume a shape.[16]

As I've discussed, from its very inception, drawing by hand involved the material of its surface, but it was only with the rise of descriptive geometry that the surface as neutral plane or projective background appears. The focus shifts from the interplay between line and surface towards the precision of the contents that are depicted. In digital drawing, this conception of the background as neutral space is ubiquitous, because the practice of drawing takes place on an empty artboard or blank modelling space. However, as Peter Cook argues, the drawing surface is anything but passive:

> Such [visual] indulgence allows the whole surface of the drawing to reach out to the observer, never letting one rest for a second, and somewhat in the manner of an illustrative cartoon feeds in many intriguing and diverting minutiae. (Cook, 2014: p. 163)

The surface reaches out and invites one in, never resting but always suggesting something new and fascinating. We might see it like a space or habitat for thought, rather than a flat canvas. It is more like a world than a visual representation. And, one should add, exactly this characteristic makes it possible to inhabit it. The surface must be world-like to engage with. It must involve the onlooker, turning them from spectators into participants.

Understanding the drawing surface as a *generative habitat* brings us to the second point that Li Yang-ping raises: the drawing surface truly is generative. Perhaps unintentionally, Yang-ping echoes classical Chinese thinking on painting. The idea is that the drawing surface is a space (*topos*) where aspects of ideas can be made to settle and to spring up (Jullien, 2016:

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[15] Notice here the close similarity to the symbolic act of tracing the first line for a city, divining the space in which a city is to be built, or even the on-site drawing of a Medieval cathedral. See (Luce, 2009). For a cognitive science perspective on organizing space, see (Tversky, 2010).

[16] Dutch architect Herman Hertzberger is known to have said that he liked to condense his sketching on A3 format paper. Apparently, he held that the spatial constraint imposed by the paper format concentrates the thinking process.

p. 49). Especially when sketches are allusive, incomplete, open and generally in a phase of exploration, this dynamic is at work.

This notion resonates with the classical notion of a "figure-ground phenomenon" introduced by early Gestalt psychology (Koffka, 1936; Maas, 2019). However, in this case, we should interpret the analogy that the surface is a "ground" or a "fertile soil" quite literally. The ground is not a static foundation against which a figure dynamically appears, but it is the condition of possibility for the figure to appear at all, to stand in a demarcated space and to become an object of inquiry. However, this object hovers in a strange realm that seems imaginal rather than real:

> It is the process of transforming the actual spatial datum, the canvas or paper surface, into a virtual space, creating the primary illusion of artistic vision. This first reorientation is so important that some painters who have become keenly and consciously aware of it tend to be satisfied with the mere creation of space, regardless of anything further to be created in its virtual dimensions—like Malevich, enamored of the magic squares that, after all, yield space and only space. (Langer, 1953: p. 80)

Modern art discovered the space within the canvas and moved consequently away from drawing as a form of pictorial representation. Correspondingly, the artistic—or designerly – gaze is by definition a distortion or semblance. From this point of view, it is strange that drawing by hand is on one hand equated with visual representation, while the modern mind realized all the time that the drawing surface suggests depth and space. In architectural design, however, the two issues touch: on one hand, design proposals have to be codified and communicated; on the other hand, they have to utilize the "space of the drawing" to explore and develop ideas, embracing the suggestive potentials of the drawing surface.

The designerly gaze introduces often viewpoints that do not exist in the real world, but that suggest a kind of spatiality or hidden order. The purely pictorial character of drawing is enlarged by an explorative, suggestive hue or tone. Because these viewpoints are introduced on a canvas or drawing surface, that surface becomes the space of architectural thought, experimentation and creation. Alberto Peréz-Goméz expands on the hidden complexity residing in this idea: the *topos* is a space in the world of lived experience *and* forms an integral part of our interaction with it (Peréz-Goméz, 2016: pp. 154–155). As Peréz-Goméz argues, architectural creation required the inscription of marks (*grapheíen*) into lived space (*topos*). However, in order for the inscription to be effective, the place itself must be respected und thoroughly understood. For classical architecture, this meant grasping it in all its complexity. So, the surface becomes a stand-in for the world outside, a place where the interaction

between the new and the existing unfolds through architectural meaning. However, we would miss a crucial point if we thought that the inscription is just a passive trace.

4.2. From traces to situated figurations

An idea that is being sketched out is situated within the *topos* of the drawing surface. We move now on from the surface of the drawing to the visual constellation that is realized on it.

The second assumption of the representational paradigm is that drawings are *imitations* or *copies* of an (absent) object or idea that they are supposed to faithfully represent, but which is a misconception:

> Architectural drawing is a unique locus of active thinking, itself the fertile wellspring of ideas, where a design emerges from within the effort of drawing. It is a common misconception that architectural design drawing merely documents something already fully determined in the mind. (Emmons, 2019: p. 1)

In many cases, although most strikingly visible in architectural drawing, the suggestion can be made that hand drawing serves not a *representational*, but a *navigational* purpose. The literature on thinking-through-drawing is unambiguous in this regard: architectural drawing by hand drawing serves as a means to explore rather than to illustrate (Paans and Pasel 2018, 2020; Have and Van Den Toren, 2012; McGuirk, 2008; see also Schütze, Sachse and Römer, 2003 for an empirical study). Instead of being imitations or copies, drawings by hand that emerge in the creative process are best understood as *situated figurations.* They are *situated* because their presence cannot be decoupled from the surface on which they appear; they are *figurations rather than figures* because they are not meant to be faithful representations of an object, but they create the conditions for an object to appear at all.

Figurations are visual attempts to articulate various aspects of an idea that thereby becomes possible. This process of articulation is anything but linear or predictable, although there are exceptions to this rule. Importantly, the figuration appears gradually and visually through the articulation of lines. In everyday language, we casually say that we "figure things out" when we are struggling with a problem or a puzzle. When we forcefully make a rhetorical point, we use a "figure of speech." The close etymological link between the figure, the puzzle, and rhetorical strategies tells us a lot about the aim of figuration. By articulating an idea through figurations, we forcibly draw it in the realm of visual and haptic perception. There is a close link between the concept of *Anschauung* (intuition or direct perception) and

figuration. Direct perception requires visual figures as basis for reasoning. Yet, these figures invite as much questions as they answer.

As philosopher Sybille Krämer has developed in detail, the very act of articulating an idea on a surface by visual means imbues it with a new, unique character. The drawing or figure is not just a copy of something that is absent, but acquires its own, unique presence that is synoptic and simultaneous rather than explanatory or analytic. The appearance of an idea *as a figure* opens it up towards our cognition and discursive capacities. Yet, the figure remains a figure, and is not amenable to reductive explanation (Krämer, 2009, 2016). There is always a representational surplus in it that cannot be grasped conceptually, but rather through fragmentation and aspectual development.

Still, it might seem paradoxical that an idea becomes only possible by articulating its various aspects. However, in his third *Critique*, Immanuel Kant made exactly the same point with regard to concepts when he discussed the faculty of reflection:

> To reflect (to consider), however, is to compare and to hold together given representations either with others or with one's faculty of cognition, in relation to a concept thereby made possible. (Kant, 1790/2009: p. 15, *CPJFI* 20: 211)

What Kant notes about the act of reflection applies even more to drawing by hand. By "drawing things together," that is, by extracting from the space of ideas visual cues and aspects, the idea assumes a kind of possibility (Latour, 1990). Once drawn, notions that appear as situated far apart when considered in isolation display a surprising proximity; correspondingly, ideas that seemed obviously linked lose their seemingly indisputable connection. Nowhere else has this been demonstrated better than in Schön's seminal study on reflection-in-action and many so-called "protocol studies" of designers at work (Schön, 1987, 1992; Goldschmidt, 1991; Palmboom, 2020; Mittelberg, Schmitz and Groninger, 2017). Reading the transcripts of designers verbalizing their thoughts, one cannot help to be struck by the connective potential of drawing. There is indeed a (pre-)cognitive bridge between the articulating mind and the gesturing hand, and it is this connection that makes drawing so fluid, evolving from one aspect of an idea to another.

The recent work by Fauconnier and Turner extend this thought towards the notion of "conceptual blending". Like a design idea, a new concept emerges as a kind of elastic entity that is enriched, transformed and shaped by introducing and juxtaposing various notions, blending them into a new entity (Fauconnier and Turner, 2002; see also Taura and Nagai,

2013). Importantly, one requires a connective practice to be able to cultivate and nurture a concept into a fully developed entity that seamlessly integrates the components and notions of which it is composed.

The possibility of such an entity is visually projected onto the drawing surface. If architectural hand drawings exhibit representational traits, they do so to the degree that the sketching process assists in projecting an idea into the world under the form of a figuration. As discussed, the link between the hand and the mind is fully activated in hand drawing, even to the degree that Le Corbusier claimed that his ideas flowed from his drawing hands to his mind, and not the other way around (Emmons, 2017: p.100). Such fluid, spontaneous drawing is *projective*:

> [T]he drawing is still committed to the project by the idea that promotes it. Drawing in design "associates itself" with drawing in art as a visible representation of the uncertainty of the object of design as an artefact of desire, but only as a "passing" formulation and not as the inevitable finality of design. (Pombo and Magalhães, 2006: p. 3)

To project is necessarily an act of experimentation, and even of risk-taking. Very often, the image that appears onto the drawing surface bears only scant resemblance to the imaginal impulse that underpins it. It is a tentative formulation of what appears in the creative consciousness.

For good reason, the German term for "designing" is *Entwerfen*. Literally, it means to throw something out, to make an idea flow out into the physical world. Once it is thrown out into the world, the projection acquires a peculiar ontological status as an open object (Paans, 2021). No longer is it a fluid notion that can hardly be grasped, but it has been projected as a relatively stable visual entity that appearing on a surface. Yet, it is not a physical object or a finalized design – there is no "inevitable finality" yet.

When we speak of *Entwerfen* as activity, we must also pay attention to the predicament of the ideas that are projected onto the drawing surface. The Heideggerian concept of *Geworfenheit* (thrownness) can in this context be read as an acute observation about the projective, oriented nature of our creative capabilities. We "throw" ideas into the world, mediated and aided by drawing. Although they do not (yet) exist as physical objects in the world, they acquire a tangible ontological existence that causally affects the creative thinking process:

> Drawing as the possibility of construction of the idea, determines the appearance of the object's form, while representation of the object. Drawing is for design the projectual instrument that enables the visible appearance of the idea. (Pombo and Magalhães, 2006: p. 3)

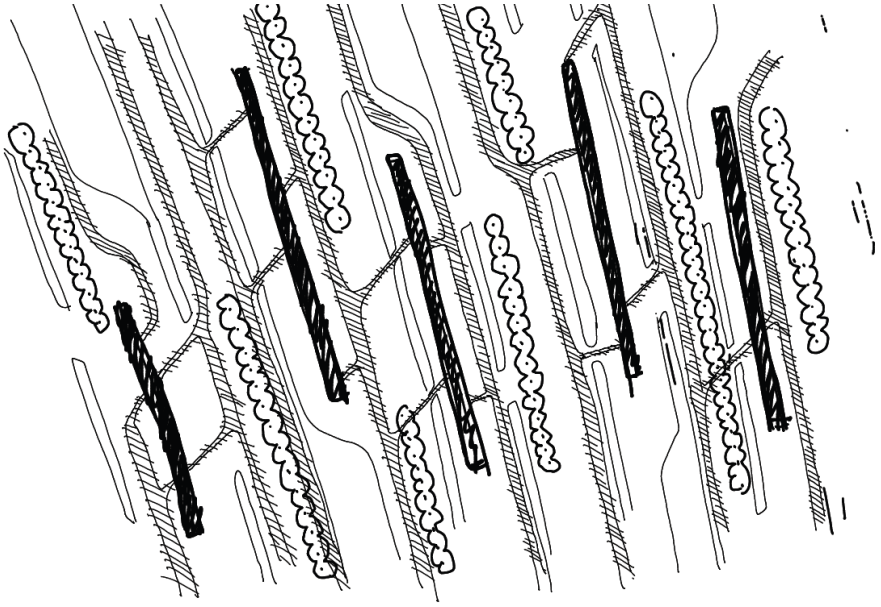

Figure 3: Visual concepts like these—even if not designs—play important cognitive roles in developing design ideas. (Author, 2018)

Through drawing lines, ideas develop in a process of gestation. Initially, an idea may be vague or only rudimentary developed. But instead of being depictions or illustrations of this vague idea, the drawn lines points beyond themselves towards the essential characteristics of what they depict (see Fig. 3 above). It should be said that these characteristics are inferred and encountered rather than defined. Lines are articulations, but not yet articulations of something final or even figurative. This leads once again to a paradox: before an idea fully crystallizes, it can only be hinted at in a circumspect, roundabout manner. The "thing" to which it refers cannot be conceptually caught. Indeed, it even requires some openness that to drive the creative process (Paans 2022; Pombo and Magalhães, 2006: p. 7).

The idea that drawing depicts or duplicates a virtual object that already exists, to some degree finished, in a kind of mental space is quite natural, and corresponds to what W.J.T. Mitchell called "naïve realism" about imagery (Mitchell, 1984: 508–509). Once more, the representational paradigm rears its head here, casting drawing as a practice of duplicating an (absent) object.

But as Michel Foucault put it "the object does not await in limbo to become embodied in a visible and prolix objectivity" (Foucault, 2002: p. 49). It is not as if there is a mental or virtual repository from which objects or ideas emerge as ready-mades. This point seems obvious, but it is worth remembering, as the often-mythical status of architectural sketches often unwittingly conveys the misleading idea that the "mastermind of the creator" knew all along what was going to be designed.[17]

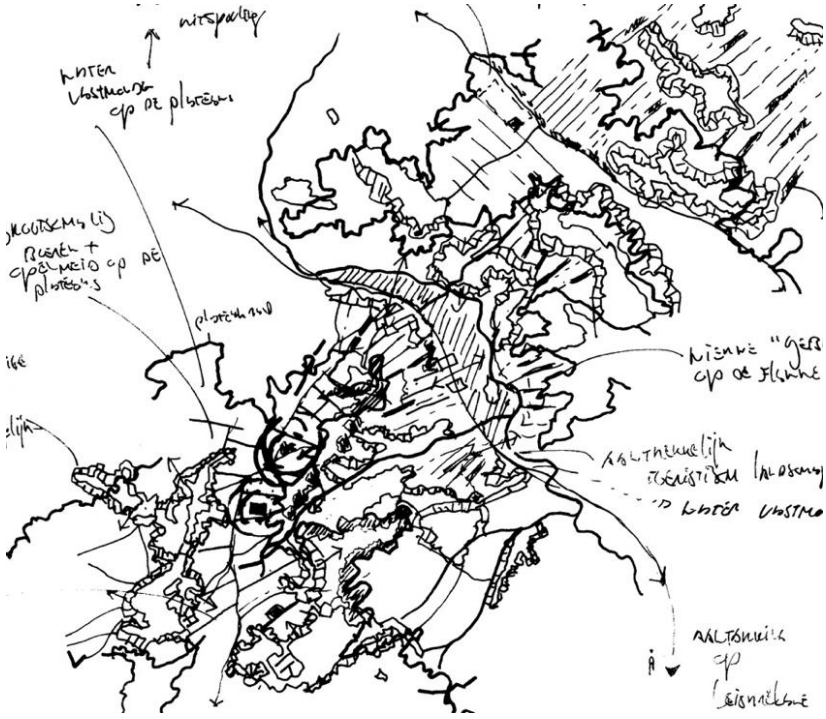

Figure 4: Lines as pure expression of abstract structures. They are not purely descriptive, nor are they completely accurate. Yet, they allow for identifying relations. (Author, 2021)

More than anything, an idea is drawn into being by producing a series of successive visual artefacts that slowly and jointly articulate its essence (see Fig. 4 above). In this process of projection, articulation and exploration, designers familiarize themselves with its structure. We have discussed already how a process of "indwelling" or "taking into possession" is necessary for acquiring a stable grasp on the open object that seems to hover beyond focus.

However, oppositely to the *inhabiting pole* of this process, we should also emphasize the *situating pole*. In projecting an idea through figurations, these visual constellations are situated or "thrown" in the world, from where they can be exposed to scrutiny and

[17] See (Graves, 1977) for a discussion of the role of the first sketches; see (Charitonidou, 2022) for a discussion of Frank Lloyd Wright's hand sketches.

(collective) discussion. In situating such visual artefacts, their structure, internal coherence, tensions, irresolvable or incommensurable elements is brought before the mind. Tim Ingold cites J. Arthur Thomson, who, in his 1911 *Introduction to Science* wrote:

> When we work long at a thing and come to know it up and down, in and out, through and through, it becomes in a quite remarkable way translucent. The botanist can see through his tree, see wood and bast…, The zoologist can in the same way see through the snail on the thorn, seeing as in a glass model everything in its place, the nerve-centres, the muscles, the stomach, the beating heart, the coursing blood, and the filtering kidney. So the human body becomes translucent to the skilled anatomist. (Ingold, 2007: p. 61; Thomson, 1911: pp. 27–28)

Up and down, in and out, through and through—like a navigator, the inquirer traverses the open object, tracing lines through it until its structure is comprehended by grasping the proper place of each element. Thomson's mention of translucency is noteworthy because it is not full transparency that is strived for, but a translucency that suggests depth, overlayering and the juxtaposition of simultaneous elements (Paans, 2024b). By positioning the drawn object in a *topos*, it becomes part of a wider environment. Like Kant's notion of reflection, representations and notions are held together in this environment, and gradually settle into meaningful structures.

If we follow the implications of this insight, it means that drawing is a mode of taking action, or "thinking equals knowing equals making" (Betsky and Eeuwens, 2008: pp. 143-176). Doing and making are acts of acquiring insight into the constitution of the open object that comes into being on the surface. That the accumulation of insight occurs by making or constructing objects and artefacts is an established fact. As the disciplines of artistic research (see, e.g., Haarmann, 2019) and design research[18] prove, *making* is an essential strategy for systematizing a body of ideas. To make is to search. It is for good reason that the philosopher Vilém Flusser described the process of getting acquainted with an idea or notion "*ein suchendes begreifen*," i.e., "a searching grasping" (Flusser, 1994: p. 60). To familiarize oneself with an idea, one must grasp it through gestures, through imaginative indwelling and through a process of searching it. The *topos* of the drawing is gradually grasped in a genetic process of coming to terms with its figurative appearance.

[18] See (Michel, 2005) for an overview. See (Hasenhütl, 2009) and (Ammon, 2016) for an overview of knowledge accumulation in drawing. A detailed account of how drawing and thinking interact is presented in a case study by (Vangrunderbeek, 2018).

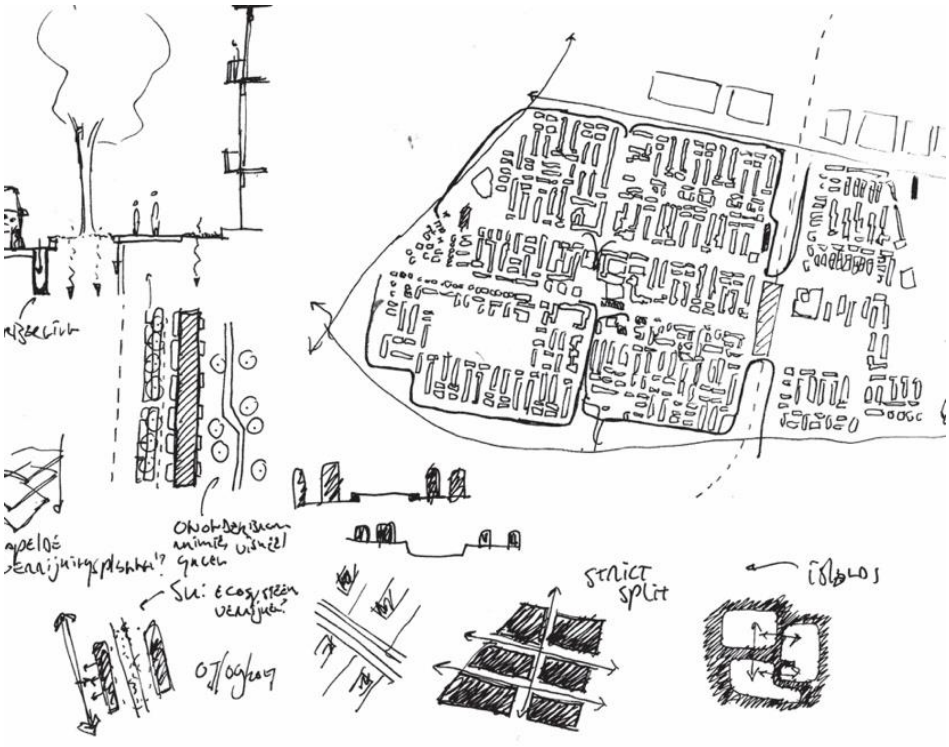

Figure 5: The entire area of a design project represented as an object that is visualized at different scale levels and with different levels of precision. (Author, 2017)

The so-called "practical turn" in the philosophy of science has shed considerable light on how scientists themselves are involved in constructing and reconstructing ideas in which drawing plays often a constitutive, if underestimated, role (Knorr-Cetina, 2006). Schön conceptualizes a similar process as a reflective conversation in which transactions between designer and designed take place (Schön, 1992: p. 4). Perhaps a better term would be a "creative conversation". The theme of conversation is also taken up by the sociologist of science Karin Knorr-Cetina. She states that during research, a researcher adopts sometimes the "perspective of the object" or enters into a direct, so-called "objectual" relation with it (Knorr-Cetina, 2006: p. 174). The example she uses is of a scientist who, in the absence of a microscope, visualizes a largely magnified version of a protein standing in front of him. This allows him to visualize and understand the reactions of the protein when brought into contact with other chemical compounds (Knorr-Cetina, 2006: p. 179). Like the hand drawing, the structure and the behavior of the protein is gradually grasped.

The imagined object (a protein in this case) that is in reality invisible is by this move situated before the mind's eye, and thereby brought into focus as a figuration or a open object. Its internal structure can responses can be understood and predictions about its behaviour can be made. It can be understood more thoroughly by visualizing it as a structure. The hand drawing in architecture accomplishes a similar feat: it succeeds in situating a

conceptual structure before the mind's eye (see Fig. 5 above). However, we should be careful in accepting all premises from sociology of science. In Knorr-Cetina's example, the scientist uses a visualization technique. However, this has the unintended consequence of pitting content (the protein) against form (its visualization). Decades earlier, the philosopher Susanne K. Langer had already cautioned against this division:

> An artistic symbol is a much more intricate thing than what we usually think of as a form, because it involves all the relationships of its elements to one another, all similarities and differences of quality, not only geometric or other familiar relations. That is why qualities enter directly into the form itself, not as its contents, but as constitutive elements in it. (Langer, 1953: p. 51)

Unlike the symbolic language that De Certeau invoked, the artistic symbol (and the hand drawing equally so) possesses distinct qualities and depicts not just structural or geometric relations. Likewise, the hand drawing has a tangible, artistic quality of its own and is not merely a geometric representation.

The process of visualization discussed by Knorr-Cetina remains descriptive. Unlike the drawing, its use is concerned with structure and rationalization. However, the architectural drawing process is not reducible to a kind of rationalized decision-taking or heuristics. Granted, drawings *may* be used as heuristic instruments, but especially sketches are much more than reasoning instruments. We can see this from the fact the drawn image contains empirical as well as poetic contents. Put differently, we might describe it as the "locus of tensions" caused by a poetic force that resides in it (see Fig. 6 below). Edmund Burke remarked acutely that images in the mind's eye produced a strong emotional response that far surpasses reasoning (Burke, 1757/2015: pp. 49–50).

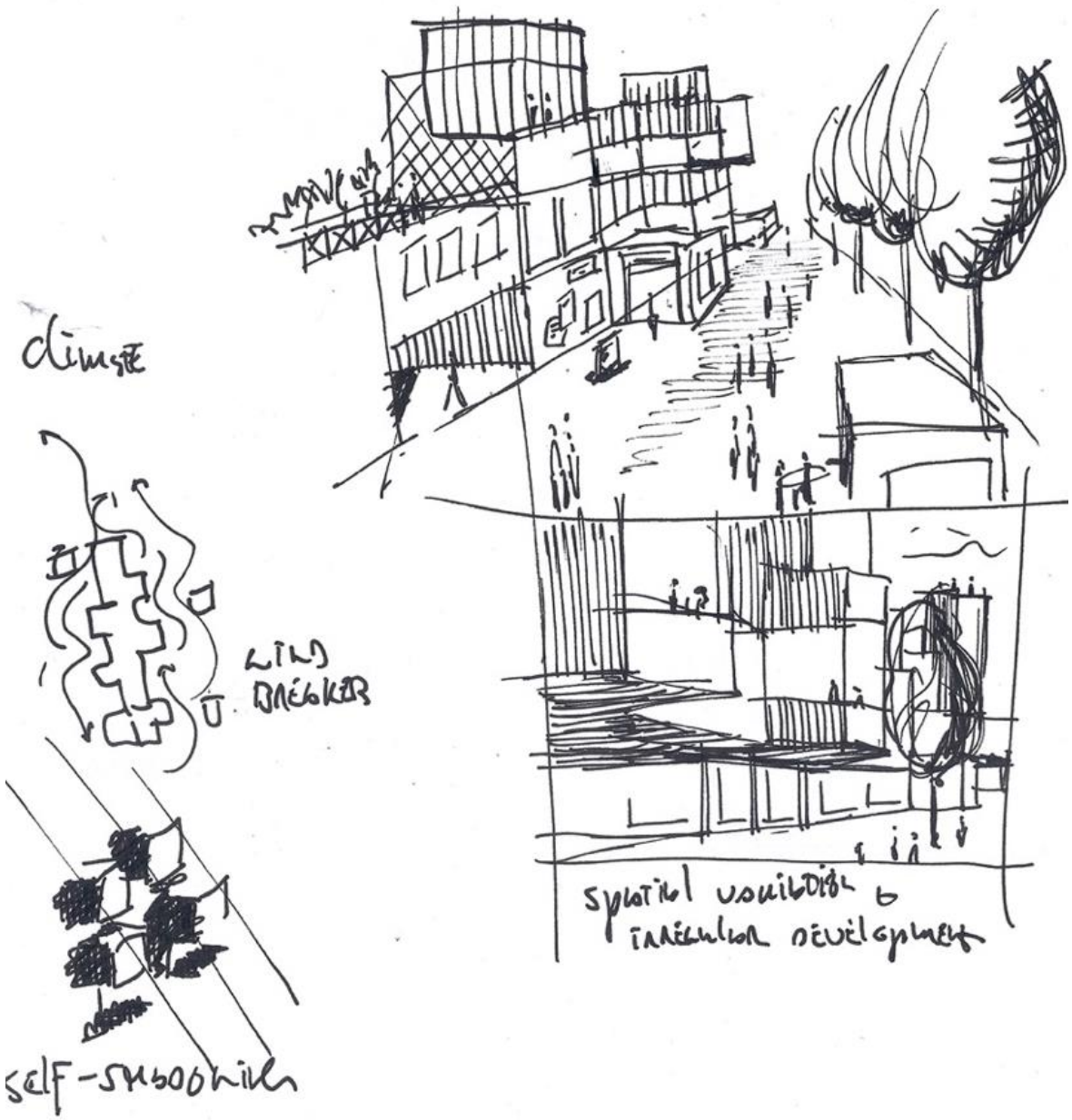

Figure 6: Evocative sketch that is not just about the precise geometry of an idea, but that represent a vision or idea. Notice how the perspective is not technically correct, but still conveys an architectural idea. (Author, 2016)

For instance, images of vastness invoke a certain imaginative power that transcends the descriptive capacity of reason. Kevin McLaughlin explored this idea in more detail, describing the *poetic force* inherent in images:

> The ability to communicate the feeling of reason transcending cognitive experience also brings with it internally a "withdrawal" of communicability. The language of the poets expresses the

> capacity and the incapacity to communicate the feeling of the divisive finitude of reason as a force and an unforce. (McLaughlin, 2014: p. xiii)

Poetic language inhabits a peculiar twilight zone. On the one hand, it is intelligible as language and has an impressive force and precision; on the other hand, and like the drawn line, it points ceaselessly beyond itself towards a realm that cannot be described by mere words. But on the other hand, unlike the word, which has a range of meanings, the drawn line is often pure expression.[19] Its meaning is inferred and demonstrated rather than linguistically determined.

McLaughlin invokes the image of the ocean as something that can be viewed in two different ways. On the one hand, we may view the ocean as an object that can be possessed and described to some degree. We can measure its depth, decide to use it for fishery or travel across its surface. But on the other hand, the ocean is so large and beyond the direct grasp of our human cognitive abilities that it become the site of myth. It is evoked as dark, threatening, bottomless etc.

According to Kant, the latter type of viewing the ocean lies at the heart of the aesthetic judgment. When our cognitive capacities fail to circumscribe an entity precisely in space and time, our mode of perceiving switches from the "finitude of reason" to the language of the sublime. No wonder, then that Burke invokes the idea of "vastness" in his discussion of the sublime. It is the fundamental "openness" of such entities that enables them to transcend our cognitive grasp: the very idea of possession and control vanishes from under our hands. The very fact that the image seems to restlessly oscillate between literal and poetic interpretations makes it unsettling but also open, especially in the case of drawing, where new variations and alternatives can quickly be manufactured:

> For drawing is … a great absorber of change, of inconsistency, of variability, of whim, of perverseness, of dogmatism and of waywardness. There is, after all, no such thing as a "correct" drawing. There is no ultimate obligation of the drawer to perform to a formula. (Cook, 2014: pp. 228–229)

It is not too far-fetched to apply this insight to drawn images instead of literary images. After all, both types of image operate with the tension that emerges between the empirical and the poetic, or the descriptive and the evocative. Moreover, like the elastic concept, the drawn

[19] That is, of course, as long as the line is not part of what C. S. Peirce would call a "symbol." A symbol might be a horizontal line to symbolize a floor, or a curvy line symbolizing a wave.

lines absorb, transform and transfigure changes, figments of the imagination and inconsistencies without becoming gibberish or nonsense. How this inherent, yet generative tension itself emerges has been described with acuity by Ingold in his study on the anthropological foundation of lines:

> Whether however a line is real or a ghost—whether, in other words, it is a phenomenon of experience or an apparition—cannot always be unequivocally determined, and I have to confess that the distinction is decidedly problematic. (Ingold, 2007: p. 50)

The line combines a sense of reality, but also a sense of being-unreal, because it points always beyond itself. Like the words in a poem always seem to open up beyond their literal meaning, the drawn line hints at a reality that is implied and beckoning rather than defined and precisely demarcated. Unlike the symbol, the drawn line short-circuits the relation between perception and automated response. Seeing a symbol like a red light does not just activate the idea of "stop," but activates an entire behavioral pattern geared to stopping the car, coupled to a sense of urgency and heightened perception. The symbol is not just a visual marker, but a cue to activate an entire range of embodied, affective and cognitive responses (Bohm, 2004: pp. 76–124). This insight about the relation between visual stimulation and bodily response allows us to rethink the nature of the line itself, especially when considered against the background of the creative process.

4.3. From lines-as-marks to lines-as-processes

How intertwined and complex this process of bodily activation through lines is, can be gauged from a passage from *A Thousand Plateaus* by Gilles Deleuze and Felix Guattari. In it, they discuss the nature of lines:

> Lines of writing conjugate with other lines, life lines, lines of luck or misfortune, lines productive of the variation of the line of writing itself, lines that are between the lines of writing. Perhaps the novella has its own way of giving rise to and combining these lines, which nonetheless belong to everyone and every genre. (Deleuze and Guattari, 1987: p. 192)

Although this text can be interpreted in several different ways, it seems possible to derive the following from it: the drawing surface organizes and aligns visual and experiential phenomena through the medium of the line. Lines involve concepts and ideas, but also equally affects and emotions or oblique allusions. Even the variation inherent in the "line" itself emerges because it meets, diverges from and crosses various other lines. For instance, consider a musical composition in which rhythm, melody, and counterpoint form three

individual lines that jointly constitute its structure. The line is active in the sense that it structures the *topos* in which it appears. It is an agent of thinking and producing, giving rise to variation and movement, and involving the embodied mind in its motion and productive power.

While structural elements cohere into the *formal* structure or geometry of a work, this structure co-extends well into the realm of affect. Deleuze and Guattari even go so far as to say that "figures are never separable from the affectations befalling them" (Deleuze and Guattari, 1987: p. 212). So, geometry is grounded on a primitive "protogeometry" in which we cannot think of figures without also thinking about the effects they exert on us. We can envision the protogeometry as an abstract space of events or occurrences. This space contains all the elements that are expressed in the drawn line. As such, it is open to interpretation and exploration.

The expressive qualities of lines invite forms of thinking that are freely hypothetical, yet not directly subjected to any rigorous examination. In the same way that a building can be said to be "dynamic," "swooping," or "sleek," the lines of the drawing evoke sensible qualities that bring associations to mind. However, even as these lines and figures are not depicting anything specific yet, they encourage the mind to indulge in them. They are saturated with possible meanings that find allusive and oblique expression:

> [T]he hypothesis emerges as autonomous critical activity, no longer bound by the repetitious cycles of testing and validation to which is it subjected in other fields. Its mere conjecture is rescued from the pejorative, recast as the pleasurable reverie of the thinking mind engaged in nascent speculation. Released from the stranglehold of teleological knowledge production, it is possible to discern specific properties or characteristics within the hypothesis that, in turn, point to certain critical operations at play within the practice of drawing. (Cocker, 2017: p. 98)

The mere conjecture that takes place during drawing is directly related to its core characteristics: the unfolding play of thoughts and notions occurring in the mind is almost directly transmitted into traces that appear on the surface or *topos*. Still, the drawn line is not yet subjected to the regimen of conceptual thinking or critical argumentation. It is an "open-ended sign" that can still grow and develop in all directions and that may evoke feelings rather than precise, well-formulated considerations.[20] This does not mean that drawing can

[20] See also (Suwa and Tversky, 2003) for a discussion of semantic saturation and (Hasenhütl, 2010) for a discussion of the role of hypotheses in architectural design. Cook uses terminology that is closely related to the idea of "settling" and "springing-up," for example, when he says the following:

never be evidential. Drawing by hand is not merely a tool for evoking atmospheres or emotive responses. Indeed, it requires a structure that is freely amenable to reasoned thought, if it is to be useful at all. Peter Cook describes it very precisely:

> For me, there is the delightful experience of carrying out a process that can enhance the primary decisions (of size, position, figure or direction), with such a mobile and extensive addition of evidence. It is as if the first part of the illustration is being illustrated by the second. (Cook, 2014: p. 172)

Likewise, the openness of the mind introduces a state of reverie or pleasurable inhabitation or wandering. Indwelling in the drawing is an act—and literally, one draws oneself into it. Layer after layer, new evidence of the usefulness of an idea is compiled, reworked and massaged. Old notions are illuminated in a process of drawing their consequences out.

Once we have engaged with the drawing, we find that certain ideas or notions are "springing up" and "settling." As Frascari emphasized, architectural ideas settle gradually, thereby "sedimenting" themselves. The French philosopher and sinologist François Jullien provides an alternative conception of this notion. Visual representations that are open and seemingly unfinished are necessarily not determined completely. Not every element in them is finished, unambiguous, or clearly demarcated. As such, the representation remains "at work." Because it is in an active, working state, it invites new readings and stimulates thinking. As Jullien argues, new elements "spring up" out of the drawing. Those elements that "settle" are determined for the time being:

> [T]his fundamental fact–that the determination (any determination) grasps what is settled and not the springing up; that the definition is situated downstream rather than upstream, in a state of flatness that is sterile and not fecund. (Jullien, 2016: p. 49)

Observing someone drawing by hand with intent shows how much concentration flows into it.[21] One could pleasurably loose oneself in the activity. The psychologist Mihalyi Csikszentmihalyi recognized his pleasurable indwelling in his seminal study on "flow states" (Csikszentmihalyi, 2008). Flow states are "autotelic": that is, they become ends-in-themselves

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> [W]e must respect the person who, having reached a state of clarification, sees the need to overlay another objective or criterion, and so the progress of the work is like a mist forming and clearing—and then forming again. The act of drawing, and particularly free-moving "scribbled" drawing, enables this. (Cook, 2014: p. 169)

[21] See also (List, 2009) on this topic. He describes it as *"nichtfestgelegtheit"* or "not-being-finally-defined."

while one executes them. They invite full involvement, reverie, detour, play, and immersion. Once again, recall how the geometric shape appears against a background of a protogeometry – the abstract space of possibilities and affects that is latently present in the drawing. The movement of reverie and immersion explores this protogeometrical space, loosing oneself in a free, speculative and hypothesizing form of visual navigation. They also provide a cognitive entrance into the subject matter, as they *fuse* action and awareness, joining both capacities to reach moments of insight (Csikszentmihalyi, 2013: pp. 101–102). Drawing by hand is the quintessential flow state—in it, one must bodily enact intentions and ideas in fluid lines, accurate gestures, and expressive traces. All this requires a certain aesthetic sensibility, reflective capacity and acumen.

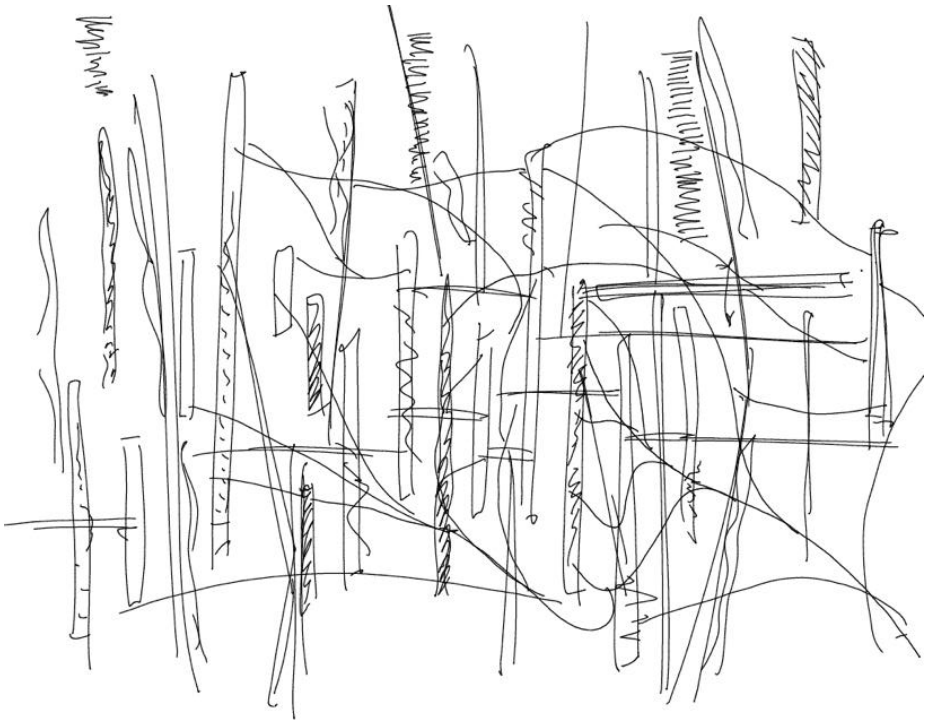

Figure 7: Purely abstract overlapping structures in a sketch study. The lines are non-figurative, yet they are expressive and evocative. (Author, 2019)

One of the advantages of this dynamic fusion is that it becomes easier to focus one's energy towards the external world, thereby aiding a deep involvement with the surrounding environment and highlighting the capacity to "see" new possibilities (see Fig. 7 above). Indeed, as David Bohm argued in his work on creativity, the capacity to perceive the new into the existing order of things is what underlies creativity as such; the novelty that is produced lies not only in making new objects or plans, but in conceptualizing relationships that were "hidden in plain sight." For designers, this is a very familiar thought: the designed object is not realized yet but has to be "drawn out." Some of its desired properties are (dimly)

known and are projected on a real-life context. In designing, the "ideal" is overlayed on the "real" and treated as a viable or fascinating possibility (Nelson and Stoltermann, 2014: p. 31).

A way of productively elaborating these thoughts is to say that lines are *processes* rather than marks or symbols. Drawn lines suggest not just movements; they *are* movements. They are so in a double sense.

First, we require bodily gestures to draw lines, whether this concerns lines in manual or digital space. The body must enact the line before it becomes visible. The tip of the pen traces the movement on a surface, which, as we have seen, is a *topos*. Such gestures are not part of our daily repertoire of motions. They fall in a different category than doing the dishes, driving a car or dusting the bookcase. They are "invented" for a very specific case and a very specific situation. Such "invented" gestures are unique, as they respond to a particular context in a particular manner (Kang and Tversky, 2016). These line-as-processes are deliberately enacted, and change therefore not only the surface, but the drawer as well. The "subject of design" acquires a level of mimetic awareness by tracing out the precise contours of an idea (Paans 2024a; Sheets-Johnston, 2013: p. 24; Goldin-Meadow, 2010: p. 665). Enacting the line leaves a trace in the memory as well as on the paper (Ingold, 2013: p. 162).

Second, lines *invite* movement. The eyes tend to actively follow the lines and stimulate embodied movement. Langer points to the fact that

> [m]ovement and lines are intimately related in conception, as also lines and growth…. A person "writing in air" makes letters appear to our imagination, invisible lines that grow before us though our eyes see only his moving hand. (Langer, 1953: pp. 64–65)

A line that seems dynamic is not just a visual mark with swooping characteristics attached to it. The line and its dynamic characteristic cannot be decoupled – the line is the movement, and is as such the conception of an idea. It is the invitation towards creative pursuit:

> Architectural lines are material, spatial, cultural and temporal occurrences of refined multi-sensorial and emotional understandings of architecture. Architectural lines create a graphesis, a course of actions based on factures by which architects actualize future and past architecture into representations.
>
> Architectural drawings must not be understood as visualizations of buildings, but as essential architectural factures. (Frascari, 2009: p. 203)

Frascari uses the term "facture" (It.: *fattura*), meaning "to make" or "to do." Rather than being illustrations or depictions, architectural drawings are embodiment of the "events that gave rise to them" (Frascari, 2009: p. 203). Each line is an event that occurs in real-time and that has to be bodily traced out in the real world. Such lines are gesturally acted out into the world, and it is not far-fetched to view lines and drawings as actors in the creative process. Indeed, the term "active image" is entirely appropriate. The drawing acts and is acted upon.

Like the graph or statistic, the line exerts a certain fascination, because it promises the possibility of "drawing together" otherwise disparate observations into a single gesture. As Latour points out, observers working in laboratories noticed the obsession of scientists with visual representation (Latour, 1990). The neatness of the graph or curve allows scientists to extract particular insights from a messy mass of data, aligning them in visual structures that are cognitively accessible and convincing. The graph, or the plotted function, is the essentialization of complex phenomena that occur in the real world. This is why statistical curves have such a rhetoric potential: they condense otherwise disparate phenomena and events in a single visual gesture that seems stripped from anything superfluous.

A similar process unfolds in hand drawings in architectural design. As visuals, they exert a certain rhetorical force, even to the degree that hand drawings of great architects acquire an often-mythical status, but equally to the degree that the drawing surface becomes a site to explore. The single drawn line unites disparate aspects of an architectural idea:

> The fruitful vagueness ruling architectural graphesis comes from the ambiguity embodied in the Latin spell: *nullo dies sine linea*, where *linea* (line), an heuristic device, must be understood as a line of writing, as a line in a drawing or as the pulling of a line on a construction site, but not as linearity. (Frascari, 2009: p. 202)

The line is a movement but is not always linear. It is a projection, a meandering search, a demarcation or condition. The line as a heuristic device serves the function of searching and navigating. Lines can be used to navigate a space of possibilities or to articulate a developing idea that seems only barely accessible. We should not couch this process merely in terms of decision theory. The so-called "first generation of designer researchers" did so, but they overlooked the autonomy of the drawn line.[22] Beyond its heuristic function, the line has a poetic and expressive power of its own.

[22] This term is commonly used to describe design researchers working during the 1960s and 1970s. Seminal figures are Herbert Simon, Allen Newell, Horst Rittel, and Charles Eastman.

The expressive power of lines stems from the fact that we catch the mind in movement when we draw. In almost no other activity is the link between mind and hand so short and its feedback so direct (Van Den Berghe, 2013). However critical we may be about regarding drawings as traces one aspect of this conception is very useful: the trace left behind by the drawing hand represents most faithfully a developing idea, expressed in a non-linguistic mode. As I've argued, drawings by hand are intensely active. They are not just illustrations of works but are *themselves* works (Ingold, 2007: p. 164). The swooping line is the conception of an idea, not a line with a certain "dynamicism" attached to it. Lines continue to play a cognitive role long after the drawer has finished working on them. All this points to the intimate conjunction of thinking, conceiving and drawing. Frascari speaks of a "a sapient working together of writing, drawing, and construction lines" (Frascari, 2009: p. 210). As we can freely switch between visual, textual, gestural, haptic, and verbal modes of expression, the drawing becomes an indispensable site of articulation.

Articulation, like sedimentation, is a gradual process. It requires time and the possibility of settling for one expression or the other; or, letting an idea rest and allowing various aspects to spring up again. Pallasmaa has in this regard spoken of the "hesitancy of drawing." Not every line is self-certain, swooping or even useful. The processes of transmitting thoughts to paper, and of exploring thoughts through drawing requires a delay, an action of "understanding-as" (Gadamer, 2013: p. 83). Every time a line is drawn, it can be understood *as* something to which it points or to which its orients the onlooker, however imperfectly and indirectly.

Yet, discipline and exercise are required to draw well and to imbue lines with an affective force that makes them truly come alive, thereby igniting their generative potential. In classical Chinese philosophy, the aesthetic characteristic that renders drawings effective is known as "*shi*," and it plays a major role in aesthetic cognition:

> [I]t is *shi* that "gives life" and that makes the slightest dot or stroke vibrate, as if we were reliving the moment of its execution. *Shi* always enhances what would be mere empty representation without it, for shi gives depth to a representation and exceeds its concrete limitations by revealing within the actualized static form, a dimension of perpetual, soaring flight. (Jullien, 1999: p. 78)

The art of sketching centers around evolving from one property of the drawing to the other—freely to navigate the new, diaphanous space that emerges between the elements. Jullien identifies a "divergence that is provoked" within the work. Each new line extends the play of forces and the architectural design process in its entirety.

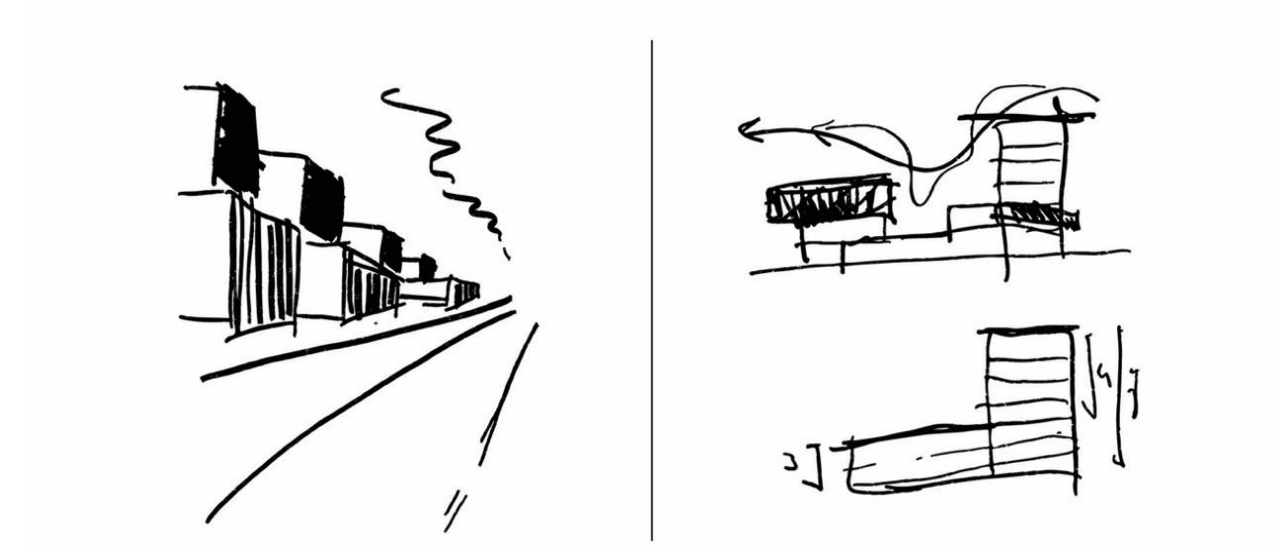

Figure 8: Two quick "form and flow" studies. Even with these rudimentary sketches, the contrast between flows and massive building volumes becomes tangible. (Author, 2019)

This explains why some architectural sketches have such an expressive and creative appeal: their unfinishedness keeps them effective. They exert tangible generative effects, allowing the designer to organically explore the ideas they suggest (see Fig. 8 above). The more one finishes and refines, the more the drawing becomes settled, losing the critical edge of its generative power (Jullien, 2012: pp. 69–70).[23] Its incompleteness causes its efficacy:

> In revealing to us the power of incompletion (or by revealing that plenitude is not completion), the sketch makes us feel the infinite richness of the indefinite, or the fecundity of the beyond and of possibility – in short, what we ordinarily understand as the powers of the virtual. (Jullien, 2012: p. 61)

The "indefinite" is the operative realm of creation: the domain of (visual) suggestion and springing-up as opposed to the domain of settling down and defining. Openness, creative divergence and unconstrained expressivity are integral ingredients of its visual appearance. While the representational paradigm views drawings as the endpoint in a determinative process, Jullien emphasizes the fact that "availability" or "space for development" is the most effective asset that the drawing possesses (Jullien, 2012: pp. 69–70). Once a drawer realizes

[23] (Cook, 2014: p. 88) is critical of such an account. To my mind, he is right insofar as not every sketch is equally generative, and not any finished drawing refuses to exert tangible effects. Moreover, there is certainly much to be said about the relations between sketches and for instance technical drawings that exceeds the scope of this essay.

how much can still be changed, and how many possibilities are still waiting to be worked out, can the creative process unfold and open up again.

5. Conclusion: The Locus of Creation Explored

Summarizing by way of conclusion, lines are active processes that are conjoined in situated figurations. In turn, these figurations appear within a *topos*, or generative space of architectural creation. Criticizing the representational paradigm, the alterative account I sketched out in section 4 aims to *animate* every element of the drawing, from the lines to the figure and the surface. Instead of being representational, the alternative paradigm I described is *performative*. It ascribes an active and animated character to the drawing and the practices involved in it.

To adopt this dynamic perspective is important, as it allows us to conceptualize the locus of creation in architectural design in a different manner. There is not enough space here to explore all aspects in-depth, but we can start by paying attention to two characteristics:

First, the locus of creation is not located "in the head". Nor is completely contained in the representational contents of a drawing. That which is depicted in an image always points beyond itself and opens up towards the non-conceptual and the allusive. The locus of creation is not some originary point where an initial idea comes from but is contained in the process of creation itself. Unless it is witnessed, it cannot be found, pointed at or defined in clear terms.

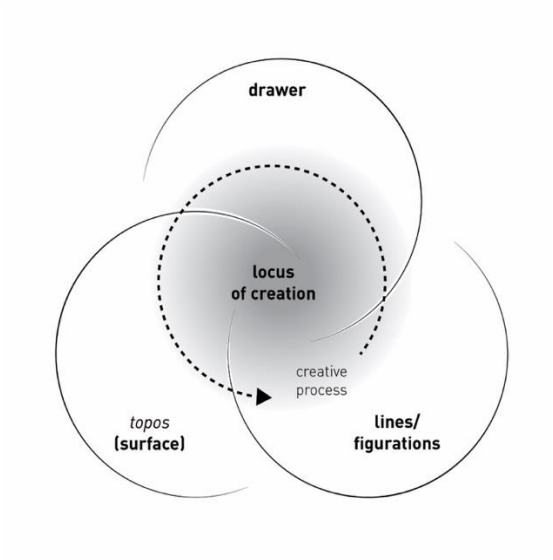

Figure 9: A model of drawing practices and the locus of creation. The creative process unites drawer, lines, and figurations in the context of a *topos*. (Author 2024)

One must catch the creative process "in motion" in order to understand where the locus of creation resides. Correspondingly, it is misleading to focus too much on the "master sketch" that acquires a mythic status. Instead, we would acquire a much more accurate view of the creative process if we investigate the developing relations between the drawer, the drawn, the surface and the resulting thinking process. It cannot be emphasized enough that the drawing surface is a *topos*, while lines are processes. Keeping these two points in mind enables us to fully appreciate the inherent performative character of drawing, as opposed to its representational counterpart. The person drawing the line is changed by the practice of drawing, as the body remembers the structures that are gesturally enacted on the surface. While the idea might be intellectually elaborated through the capacity for deliberative reasoning, the entire body is materially involved with the drawing to actualize it in the world. The drawer, the drawn, and the space of drawing by hand form an aggregate, a locus of creation that can only be observed "in action." In this sense, the aesthetics or "the science of sensibility" is first and foremost a practice of observing the emerging relations between drawer, *topos* and lines/figuration in action within the context of a creative process (see Fig. 9 above). By paying attention, the inherent richness of the drawing opens up and allows for inhabitative imagination and expansion.

Second, the idea of a locus implies a locality, a focal point. So, we should inquire where the "locus of creation" is actually located. Put concisely, it resides in the effective juxtaposition of its contributing elements. In the moment that thinking processes, drawn lines, embodied gestures, the spatiality of the surface and perceptual experiences come together, all elements for true creativity are brought together in a single point in space and time. The fact that the drawn line possesses a certain permanence but is not yet completely "settled" turns it into a visual instrument that is perpetually effective. It can be revisited again and again yet allows also for further definition and determination. Above, I described the drawing as a "locus of tensions"—the incomplete and the defined, the vague and the precise, the technical and the poetic all exist side by side. Often these elements resist closure but they spur the process of creation. The tension inherent in the drawing is often the result of incongruities between the elements that are present in it: logically strictly speaking, there seems little reason to juxtapose them. By concentrating these elements in the space of a single drawing, new perceptual experiences suggest themselves, emerging into the cognitive foreground once an idea is revisited again and again. The effectiveness of the drawing keeps it "at work." No matter how active and dynamic the drawing is, however, it is only so in relation to a perceptive and creative subject who is open to what it suggests. The very space of the drawing exerts its own character and creates a place for thinking through its elements. Its inherent orientation is organized by the most basic categorial system of our thinking, and as such resonates with it.

So, by adopting a dynamic view of the practice of drawing lines, we can grasp, in the context of architectural creation, how inherently relational, embodied, gesturally anchored, navigational, and spatially oriented the hand-drawn lines are. Moreover, we can see how they play out within the productive tensions of openness and determination, poetic force, aesthetic sensibility and reasoned argument. But above all, we can grasp how in situating even the first line on a surface, we fully enter the "space of drawing" itself.

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