AR1A066 Architecture Theory Thesis

Staying with the troubled tools?

On the omnipresence of Cartesianism in architectural drawings and towards ecologies of drawing.

Keywords: architectural drawing, (post-)orthography, imaging, Cartesianism, ecologies of drawing, ecologies of architecture

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april 2022

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Introduction

Monochrome floor plans, perspective sections, diagrams consisting of arrows and other graphic symbols, colourful axonometric drawings, technical details, photo-realistic renders, and many more—all these representational devices circulate within and around the architectural discipline. Large amounts of time are spent on drawing, modelling and seeking representational styles in both architectural education as well as in the profession.

Whenever I situate myself in the architectural field—be it during education, working in a professional environment, or immersing in the work of others—architectural drawings have been for me personally in one way an anchor of stability in the field. On the other hand, they sometimes strike me as abstract, volatile devices of experimentation that question why, how and for whom we draw.

There seems to exist a constant development of different representational styles and new (digital) tools and modes of production, while traditional methodologies are still thought of as the industry standard. Architectural drawings are becoming more and more complex in the sense that we are using more advanced projections and perspectives and introducing a new layer of seemingly dynamic graphic symbols (arrows, etc.). But are these truly new methods of operating or just representational gimmicks?

In this thesis I will elaborate on the way in which we in architectural practise are drawing and how we can be more aware of the implication of drawing(s); not to only focus on the input or output of the drawing practise, but to question and unravel how drawing is in itself never static, but a process, and is therefore part of the processes that shape current architectural practisce. How can (the) architectural drawing be in itself a very mechanical process, or a stable end-product, but at the same time become something that expresses and is part of non-visible, dynamic, non-binary and mobile processes? And how can contemporary architectural drawing practise and its mechanical tools be oriented to include processes like affordances, capacities, temporalities, movements, modes of inhabitation, and choreographies.

The thesis starts off by situating drawing as a (specific) way-of-doing using the concept of orthography and the development of the image in relation to the development of architectural practise. In situating drawing in this way, we can then gain understanding of the contemporary habitus of architecture, how it cannot seem to escape from the omnipresent Cartesian grid, and what this gridded habitus brings to bear upon the world. Moreover, in assessing

the implicated assumptions in these ways-of-drawing in the contemporary architectural habitus, we can develop insight into the Cartesian onto-epistemology that underlies the assumptions in this habitus. Then, using less conventional ways-of-drawing as heuristic devices leads me to speculate on the possibilities of drawing otherwise, of destabilising architectural conventions and open up space for renewed architectural experimentation from within entangled ecologies of drawing.

Drawing or image? What is (an) architectural drawing?

Whenever we consider architectural processes or practise, the architectural drawing is inevitably implicated. Yet within current architectural practises, what we mean by 'drawing' in a general sense is often rather ambiguous. Left unexamined, it seems to function as a shorthand for a multitude of 'drawing activities'—hand drawing, digital drawing, physical and digital modelling—that result in drawings—sketches, computer drawings, 3D models, technical details, renders, etc.—that seem to share very little in their appearance, using all manner of representational styles and devices, and are employed towards very different goals by having different (more or less designated) roles in architectural practises.

Orthographic drawing and post-orthographic images

When we try to describe drawing in its most technical, mechanical manner, it could be denoted as the act of inscribing 'geometric thoughts' through hand-mechanical actions (hand, pen, mouse) onto a seemingly stable surface (paper, software). In this mechanical depiction, a drawing is largely understood as something static: once drawn it does not move (May, 2017, p. 11).

In this sense, drawing entails a certain *orthographic* mode of production. Orthography is understood as a geometric method existing of rules, conventions, and assemblies that arrange the visual marks of a non-linear world into legible (repeatable, and retraceable) marks (May, 2017, p. 14). The '*linear graphism*' of orthographic modes of drawing thereby enables the capture of a non-linear world into a linear 'recording of the world' (May, 2017, p. 15). The speed of this recording was synchronous with the method of these drawing actions, enabling the capacity for historical sensibility; to tie the past to the present (source). So, this orthography depicts and values 'traditional' modes of drawing, as prescribed methods of production through retracing, wherein architectural experimentation and historical reasoning are concomitant.

In present times, with the previous and ongoing shifts in methods of production from analog to progressively digital forms practise, 'drawing' can no longer be understood in only this orthographic sense. Current architectural drawing practise is intertwined with digital methods of production to such an extent, and these drawings are so dependent and inscribed by the *tools* we use, that architects speak a whole vocabulary of *commands, functions, signs* to model, draw, calculate, communicate, and simulate—so much so that we hardly know how to practise without these methods, or outside these simulations.

Instead, May perceives these modes of contemporary architectural production as *post-orthographic*. With the digitalisation of architectural practise, architectural workers are increasingly '*processing images*' rather than engaging in the '*processes of drawing*' (May, 2017, p. 19). The post-orthographic surfaces of images are a way of detecting energy through signals, which can be processed, stored, managed, calculated, etc. Images thus are outputs of the signalisation of certain energetic processes, and interdependent with data and data processing (May, 2017, p. 12).

So while these digital tools may appear simply as ways of making tasks that were previously labour intensive more efficient, they are rather a part of a more profound transformation of architectural practise. This is reflected in the fact that the fact that architectural labour has, mirthlessly, itself not become less intensive for architectural workers; it has rather shifted to allow architecture to do other things. Perhaps, it is even the very ready availability of these digital tools, their supposed universality and seemingly endless possibilities, that precludes reflection on the fact that they are themselves very much an outcome of, and are framed by, specific, situated histories of both technical developments and political shifts. A recent, quite extreme example of this would be parametricism, an architectural paradigm that was an important driver of the rapid development of many of these tools. Despite the promises of endless possibilities for parametricism in architecture, it has quickly committed itself to the niche production of rather unimaginative formalisms for the rich—a development undoubtedly heavily inscribed by our political moment.

Surely, pre-digital drawings and methods of drawing were also shaped by the (mechanical) tools and political conceptions present back then. Alberti's orthogonal drawings—plan, elevation, section; precisely those categories that parametricism sought to overcome—can, for example, be understood as a certain conception of politics in which the politics of architecture are restricted to

the domain of the programme as represented in the *plan*, while aesthetics considerations are represented in *elevation*, and the section connects these two by elaborating on *structure* (Spuybroek, 2008). Rather than overcoming these categories and the political regimes they manifest(ed), parametricism has sided firmly with the current political status quo by aligning with the most powerful elites.

Representation has *never* been neutral, this is not only something of the present digitalisation. The tools and modes of production are constantly shifting throughout the years, never neutral but, tied to societal changes, are inherently political. In my experience, the current lack of reflection on the character of the digital shift has led to a situation in which there is a lot of time and effort spent on representing aspects of a project in a certain way, and (technically) figuring out how to produce such representations, rather than questioning why we represent in certain ways; how these technologies change the conditions of architectural production and what the consequences and possibilities of these technologies would be for architectural practise.

Returning to May's notion of (post-)orthography: while with orthography, architectural experimentation and historical reasoning were coupled, in the post-orthographic processing of images these are largely decoupled. With the rise of digitalisation, signalisation, datafication in architecture, the duration of retracing, the linear or mechanical conception that structured orthography in the past, is replaced by the immediacy of 'real time' imaging. With the advent of computerised drawing, the production of images is mostly based on functions, models, and calculations that happen at a *refresh rate* anterior to the perception of the human eye. Production nowadays is all about the anterior and posterior. Thinking in *commands* or *algorithms* asks for inputs to generate an output: from two mouse clicks to create a simple 2d straight line, or a highly complex mathematical script that 'generates' a certain 'fluid' shape, or generating a 2D floor plan from a 3D model. While these operations of course do not happen instantly, the ways and speeds of computation escape human perception, omitting the intermediate or interim, bypassing thought, thus precluding interaction or interruption in these processes. Doing away the interim, or the *trajectory* of making a mark, means leaving out an in-between in which new relationships (noise) can arise, which provoke thinking outsides or shifting boundaries.

Both the historical sensibility of *retracing* and the open-endedness of the *trajectory,* allowing for architectural

experimentation, are replaced by automated chains of inputs and outputs—black boxes that operate at a 'telematic' speed (May, 2017, p.13). Instead of a *representation* of the world, imaging strives to be a *presentation* of the world, a 'real-time' model of the world (May, 2017, p.19). Where we used to imagine architecture by tracing (*re*-presenting) the past to 'present' the future, we now justify architectural form by images of performance, control, efficiency, etc. (May, 2017, p.20). In the closed circuits of imaging, in which the automation of architecture and exclusion of architectural experimentation foreclose both past and future, architecture becomes *the managing of the risks of the volatile present*, with technologies such as BIM and the financialised architecture of the excel sheet rendering in real time *the spinning top of the scenarios of the present moment* (Gibson, W., 2003, as cited by Berardi, F., 2005).

Habit and habitus

However volatile our present, current modes of production have arguably become more static in response, certainly in relation to the more fluid production we know from the pre-digital (which will be elaborated on later). Here, my concerns with a lack of reflection on modes of drawing become explicated: the shift in the 'drawing activities' of the digital signifies a transformation of architectural *habits*. The reliable performance of digital tools and operations combined with their appearing as-if universal complete their black box-like condition, transforming the daily practise of architecture into an automated practise, in which there is little space left to speculate on the changing conditions of architectural production, or to explore or experiment with the possibilities of these technologies beyond generating inputs and outputs—the only questioning is on how to perform more efficiently. This transformation becomes (painfully) obvious when one enters an architectural office or school, especially when deadlines are approaching: bodies contorted behind screens for hours at end, bleary-eyed workers with tensed-up shoulders and painful backs. This time spent behind screens performing endless operations conditions the bodies of architectural workers—even if it concerns the bodily deskilling through the relative disembodiment of working with software—becoming anchored in daily architectural practise. As such, it manifests as a non-discursive, situated, bodily and technical knowledge - an architectural *habit* - within the architectural *habitus*, a 'network of dispositions toward doing things in a certain way', the *habitus* of a profession

(Bourdieu, 2008).

Paradoxically, drawing remains an important vehicle for discursivity in architectural practise (with the design process conceptualised as thinking (together) through drawing, whatever form this drawing may take). However, it is the very non-discursivity of (digital) drawing that shapes the condition for this discursivity, conditioning what can be thought, communicated, and designed; and necessarily precluding certain modes of thinking, communicating, designing. Drawing thus figures as a common sense, as a going without saying; drawing becomes a structuring structure which reconfigures the architectural *habitus*.

Drawing Reconsidered

Reconsidering the previous orthographic definition of drawing (the act of inscribing 'geometric thoughts' onto a seemingly stable surface), it strikes as a supremely Cartesian definition, one that presupposes a *mind-body dualism*: the mind operates independently from the body in its thinking, instrumentalising the body and medium to execute the representation of these thoughts. This conception of the act of drawing and its implications on the drawer and the drawing thus reproduces a transcendental ontology of Platonic idealism - albeit without necessarily appealing to eternal truths - carrying the implication that the world can be remade according to independently generated thought. Herein, in the illusion that one can think as if outside of the world, 'a view from nowhere', and act on it without being implicated in it, we can locate the heritage of Enlightenment rationalism. The vehicle that facilitates this illusion, then, is the Euclidean rationalisation of space, which is presupposed to be an empty, three dimensional space, that is then filled with matter. Again, Descartes intervenes by operationalising this space with his coordinate system; three axes along which matter can be organised. Cartesian mind-body dualism and rationalisation of space combine in producing an ontology in which everything can be reduced to Euclidean space, enabling the ontological centring of the Western 'universal' man, at once categorising producing a hierarchy in which he places himself above other species, the landscape and marginalised groups (Verzier, 2021).

Projected onto the architectural habitus, this disposition at once tends to overestimate the mastery of the architect over the world, while underestimating the creative potential of the world itself, reinforcing a subject-object relationship in which matter is instrumentalised to suit the architect's needs, a *hylomorphism* that at once constitutes and legitimises the

ontological hubris of Cartesianism. Rationalising space as neutral, uncharged by the 'objects', or rather *ecologies* within it, space is reconfigured as a tabula rasa. And with each architectural intervention, the site is considered as, and thus made into, a tabula rasa, which can be remade by instrumentalising matter, negating the entangled ecologies that populate it.

In the post-orthographic condition of imaging, we can now access the 3D Euclidean space and use Cartesian grids to manipulate virtual matter using software, rather than dealing with the translations of 2D renderings of 3D space of physical drawings. So even if the 'context' may play a major role in the conceptualisation of a project - then the tabula rasa it at least figures prominently in the empty 3D space of architectural software: a grid that allows the precise control and computation of (virtual) matter. The virtual space of the drawing or the model, modelled itself after Euclidean and Cartesian conceptions of space and matter, comes to replace the Platonic realm of ideal forms; instead of being ungraspable, ineffable, it is infinitely available and endlessly manipulatable. The onto-epistemological consequences of cartesianism become fully realised when the simulation and reality seemingly overlap to such an extent, that the simulation starts to encroach on the experience of reality as such and is taken as more real, or rather, more *ideal* and therefore more *valuable* than actualised reality.

However, this onto-epistemological regime that structures our current architectural habitus does "no justice to the ways humans and things get by in the world" (Latour & Yaneva, 2013, p. 84):

> "Everyone agrees that the drawing (or the photography) of a building as an object does not say anything about the 'flight' of a building as a project, and yet we always fall back on Euclidean space as the only way to 'capture' what a building is."
>
> (Latour & Yaneva, 2013, p. 82)

Rather than a universal way of conceptualising the world (and the role of architecture in it), we should take this to be a specifically Western tradition and history, a situated knowledge (Haraway, 1988) based on certain standards and conventions.

One way to understand the persistence of this situated knowledge is to draw out its alignment to the *efficient causality* of capitalism, that instrumentalises 'Nature' to be productive for capital. Cartesian

dualism and tabula rasa allow the selective in- and exclusion of objectified or othered bodies and ecologies through the supposition of externalities based on prioritising extractive potentials. In the regime of imaging, even when externalities are 'included', they are so by datafication of them: by capture through data it is ensured that these 'others' (that in actuality exist on the same ontological plane), reduced to inputs and outputs, can never threaten to expose the situatedness of the knowledge of the architect, maintaining their 'view from nowhere' (Haraway, 1988), simultaneously accounting for the risks (or opportunities) these externalities may pose.

> "The grid has already grown inside, its powerful permeating illusion of order conveying an ontological version of the world, of society, of architecture so perfected that it seems inevitable. A vision not at the service of equality, but primarily of the white masculinist subject who takes the world as his possession."
>
> (Verzier, 2021)

Trajectories: temporality and movement

Traditional orthographic notation system often only represents two extremes (the 'before' and 'after'; (Stalder & Kalpakci, 2018, p. 15); they do not show the processes that take place in between, all the adjustments and thoughts that happen in-between the 'design' and the 'finished' building.

Moreover, in the realisation of architectural projects, this Cartesian way of representation is reliant upon the internal knowledge of the building industry (architect, contractor, builder); the static semiotics limit who can read the drawing: only those readers who are acquainted with the project or are well-versed or -schooled in reading these drawings, can read the *anterior*, *interim,* and *posterior* of the process into the drawing. From the first start until the final construction drawings there is a constant need for (re)organising in Cartesian terms, always recapturing complexities and contingencies of the process in (post-)orthographics. This interim—the fundamental ambiguity and futurity of the in-between, an inherently political process of negotiation, deliberation—is never fully acknowledged through a differentiation of the (Cartesian) differentiation of before-after into ever smaller before-afters, always accounting for risks, always offering the illusion of control.

If we instead reconsider drawing beyond the object-subject relation, it can be understood as a *verbal noun (gerund)*: the act of thinking or designing is embodied in the practice of drawing, where the focus

is not on (mechanistic) technique but on the tacit knowledge of the producer (architect) through the united mind-body (Feuerstein, 2016, p. 46). The unity of mind-body is not static or linear, but instead rather fluid. This could extend to architectural drawings: they need not be the outcome or part of a linear trajectory, not only an immutable representation, but can be considered to always be *mobile* (Latour & Yaneva, 2013). Architectural drawings are thus never really *static*.

In orthographic drawing and post-orthographic imaging, geometric Cartesian patterns are projected onto planes. While these drawings explicate the topological relation between objects, these are not helpful to understand the processes of time and movement in the drawing (Meisenheimer, 1993, p. 75), and therefore suppresses thinking in these temporalities, paths, and trajectories. These processes are instead achieved by providing an additional layer to a drawing, explicating these relationships through the proximity of lines to each other, additional graphical notations, like connecting lines, symbols or typography. Graphic symbols can help to draw out non-visible and dynamic processes in the drawing. These points, lines, arrows, curves, etc. have been used to show certain direction, intention, or duration in these 'static' representations, for example arrows in transportation maps (Meisenheimer, 1993, p. 75). These ways of notation seem to be employed more frequently nowadays, although one could question whether the employment of this semiological register truly enables us to interpret the anterior, interim, and posterior better, or whether these seemingly fluid graphic symbols are merely a kind of poetic gimmick that suits, guides and supports the Cartesian (capitalist) habitus. As 'climatic sections', 'concept diagrams', with their graphic notations for airflow, routes, etc, become increasingly part of the architectural drawing set, the privileging of relations and their organisation over everything else in these diagrams should be critically assessed, as they may try to overly direct and therefor mislead the reader, or converge possible readings, leaving out other ways of thinking in the margin (Contingent Collective, 2021, p. 83). But when used carefully, these graphics may be helpful, diverge possible readings, to imagine the interim processes (affordances, choregraphies, relationships, etc.), as seen for example in figure 1.

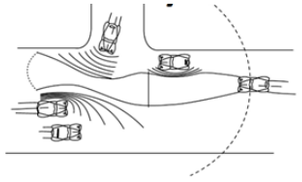

Figure 1:
Illustation of processuality.
From Gibson and Crooks (1938)
(Radman, 2022)

To express and embody these temporal and embodied relations and trajectories on a more fundamental level, instead of relegating the mobility of a drawing to an 'additional layer of semiotics', we should shift our drawing from a (Cartesian) ontology to (non-Cartesian) ontogenesis- from how things are (in ever smaller intervals), to how things become (Crampton, 2009, p. 845), centring the 'intermediate thinking' and prioritising the trajectory. It is on the trajectory that the 'thingly' nature, in contrast to the 'objective' nature, of architectural projects (i.e. buildings) arises, and where deeper understanding the more-than-human relationships and processes can be expressed (Latour & Yaneva, 2013, p. 89). With this said, are there ways that contemporary practises of architectural drawing and imaging allow for this 'thingly' nature to be expressed? Are there other ways in which contemporary tools could be used? To what end?

If we think of Deleuze's two methods of organisation; the smooth and the striated, as well as the space of science and arts, with somewhere in-between architecture (Grosz, 2003) , then the Cartesian *architectural habitus* positions itself more towards the science space, which is striated by our practical needs. How can the architectural drawing not only be used to reinforce the striation of space, but rather as a process that functions as a mode of conversation between one space into another?

One suggestion could be found in ways-of-drawing within other fields like choreography and calligraphy, which allow for focussing on this trajectory rather than only on the topological relation. A drawing of a musical dance (figure 2) or the drawing of calligraphic symbols (figure 3), relies on the relationship between representation and the embodied experience and the temporality of memory. In order to understand the meaning of the drawing presented, one has to interpret the lines, weight and flow to comprehend the path, duration and time, which are essential to make sense of them. While these ways of representation seem inevitably bound to the 'arts', creating routes and pathways is undoubtedly an architectural concern too (Meisenheimer, 1993, p. 66). Incorporating these 'freeform' modes of drawing into architectural drawing, for instance, may express the intensities and processes, the affectual mobility of a drawing. But how to translate these affects of the (hand)drawing into the contemporary digital methods of production, where the interim is far less obvious?

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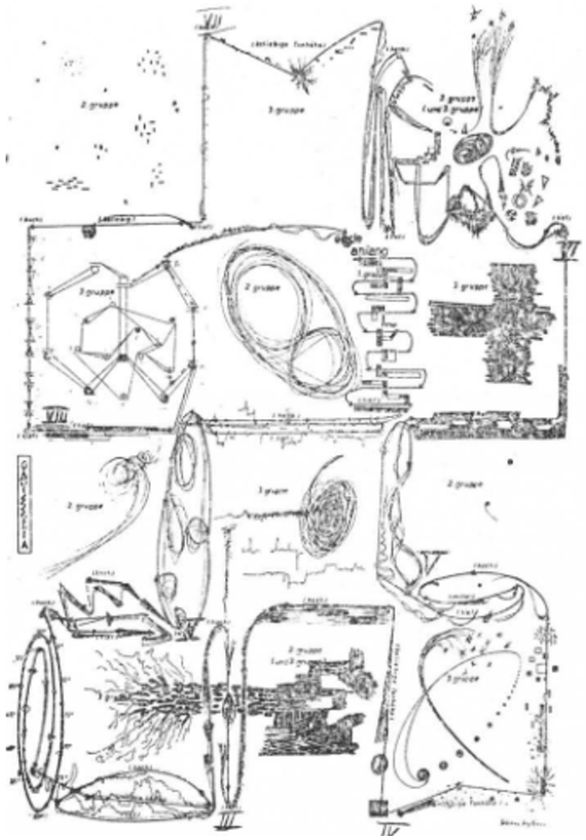

Figure 2:
Anestis Logo thetis Odyssey (ballett music). Universal-Edition Vienna 1964
(Meisenheimer, 1993)

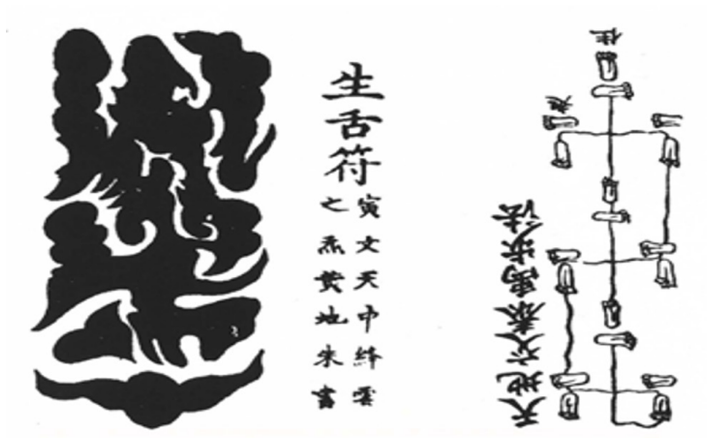

Figure 3:
Diagram of movement: Encounter between Heaven (Yang) and Earth (Yin) in the 'Footprint method of the Great Yu'
(Meisenheimer, 1993)

Towards ecologies of drawing

Not only is the drawing mobile in the sense of its temporalities and trajectory. The drawing is always part of a network of relations between human as well as non-human objects. In the sense that the architectural drawing could be seen in-between the human and non-human, therefore engages as 'an environment', capable of addressing other life forms (Baukunst, 2019). No matter how the drawing is being produced, it is always mobile in its relations. This though is nevertheless inevitably still part of an *epigenetic landscape* in which certain relations are more likely to arise than others. So in this way, the drawing is guided as well as guiding in a certain direction.

Everyone relates in a different way to the image/drawing that is presented. It could be stated that the representation of reality in the form of a drawing is interpreted differently and dependent on the memory and experience of the viewer/interpreter. In order to think in the 'language', or rather, *semiotics*, of the architectural profession, one should be familiar with the current architectural graphic symbols and style. One should understand that dotted lines represent items that are 'behind' the observer or thick lines represent constructive elements, etc. Through this vocabulary, the 'architect', 'constructor', etc. is able to imagine the processes, spaces, affordances, and dynamics of the thingly nature of the architecture represented in the drawing. The same is seen when we view architectural images within everyday media; images are often created with a certain intention to direct the viewer, leaving little room to understand the complex whole of ecological relations present. Like we see in the 'final' renderings on billboards that leave little room for the viewer to interpret the complexity of the intervention, this opacity effectively renders the viewer passive, or at least leaves them with an unrealistic, mythical view of a project (Minkjan, 2016). With the digitalisation of the architectural industry and rising complexity and use of digital architectural models, not only the processes of drawing/imaging the traditional plans, sections and elevations have shifted to more 'real time' refreshing images. Other methods of imaging like highly detailed perspective drawings and renderings have become more omnipresent, and constantly developed and elaborated, although the 'traditional' methods are still thought of as the industry standard.

The way in which the drawing/image is produced, is being interpreted and experienced in its intermediate and posterior moments, is always in a sense enabling a certain bi-directional relation of the objects in the drawing and the interpreting observer. The concept of *Umwelt,* as Jacob von Uexküll describes it, considers

how every object relates in its own manner to its environment (Uexküll, 1992). By taking this into account, it could be said that different ways of drawing or imaging account for different qualities of relationships or capacities for those actors that are involved (objectiles) to act. So, the amount that a drawing attempts to script the experience of the viewer frames the multiplicity of interpretations, or its ecological capacity, of the drawing. In order to explore some of the ecological possibilities of the architectural drawing, in the following passages, I will contemplate some 'non-standard' examples.

Figure 4:
Pencil drawing of 10 Houses on Cairns Street
(ASSEMBLE, 2015)

One example of a drawing that we can employ as a heuristic device, to explain these ecological affects in the drawing, is the illustration of 'Granby four streets' (Liverpool, GB) by Assemble (figure 4), which is drawn as an axonometric 'stage' in which all elements are represented equally (in its artistic style). The drawing it tries not to script or highlight specific features (Stappers, 2020). Instead, it shows most of the elements as equally important, as a sort of 'harmony'. One way of reading this drawing, then, could be to read into the suggested interdependencies between these elements the environmental, social, and mental ecologies of the project (Guattari's, 1989): the environmental (building properties, context, materiality, etc.), social (collaborative processes and mutual relations between the humans and non-humans alike) and mental ecologies (subjective interpretations, memories, thoughts, and imaginations of the future)(figure 5) stress not the Cartesian onto-epistemology, opening up space instead for that other philosophical avenue, that of *ethics*. The drawing *affords* different things to different actors; in this sense the drawing forms and is formed by an architectural ecology, not only highlights the ecological relations in the drawing itself—"to rethink all connected aspects of the project as a whole", as Bateson states (Braidotti & Hlavajova, 2018, p. 131)—it also suggests an ecology of actors connected through this image, which could then be seen as a multiplicity of a dozen images (figure 6). Therefore the drawing in a sense functions on different planes and can be interpreted differently by anyone or anything (Ballantyne, 2007, p. 40).

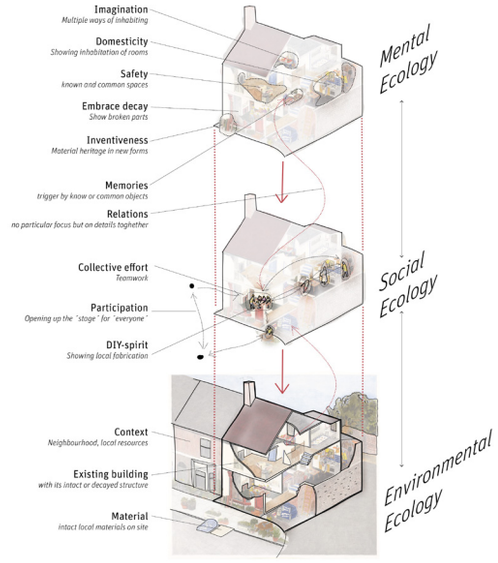

Figure 5:
Interpretation of the multiplicity of the drawing
(Stappers, 2020)

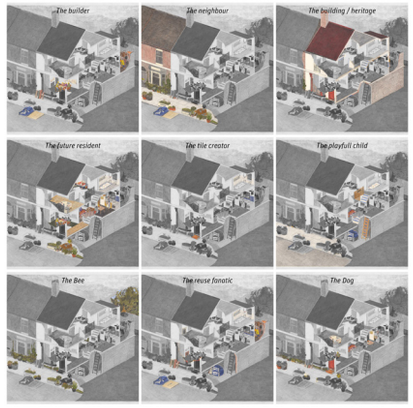

Figure 6:
Own interpretation of the drawing as a different Umwelt ('capacity to act') for each participant/objectile
(Stappers, 2020)

Staying with the troubled tools?

When drawing using orthographic/axonometric representation methods and by using drawing styles that do not prioritise one aspect above another (similar lineweights, colour, etc.), ecological thinking could arise because each object is drawn using the same visual importance (Atelier Bow-Wow, 2014. p121) (figure 7). By using a parallel projection that does not call out the identity of the observer or assigns weight to certain subjects, it shows a synchronised view of time in which all entities that populate the drawing become interrelated (Atelier Bow-Wow, 2014, p. 121). While such drawings depict entities in synchronicity, when observed, these entities are interpreted differently based on the disposition and experiences of the observer, thus subjectively giving the drawing an intentionality or direction. For example, by drawing non-static entities like people and vehicles in the image, one could imagine the image as non-static by associations with previous experiences (e.g. familiar routines) with these entities (Meisenheimer, 1993, p. 77).

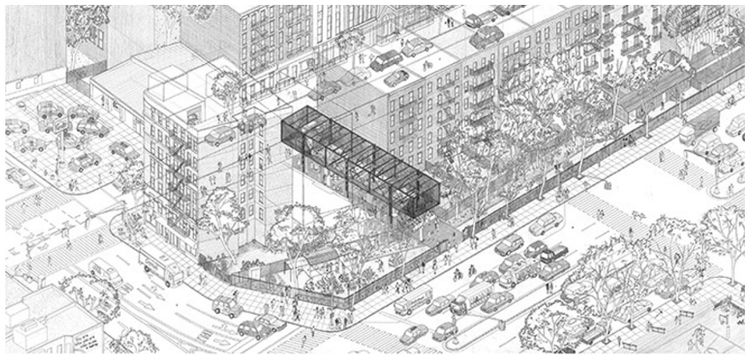

Figure 7:
Axonometric drawing (Atelier Bow-Wow, 2014)

In contrast to the axonometric representation methods, the perspective drawing adds an additional dimension of depth and therefore a certain hierarchy into the image. Previously non-Western / Asian drawings did not include perspective, so all elements in the image are viewed as having the same importance (Atelier Bow-Wow, 2014, p. 121). When using perspective drawing, one should be aware of the intention and hierarchy it introduces. This is not a harmful thing, per se, as it could also be used to highlight relations that are not achievable in axonomatric or planar representation methods.

Indeed, perspective is combined with planar drawing methods (section) in the contemporary methods of drawing/ imaging, for example in the perspective sections of Atelier Bow-Wow (figure 8). In this way, multiple 'pictures' / 'stages' are being juxtaposed in order to highlight relations that remain otherwise unseen. Not only is this a method of juxtaposing spaces in one image, these complex drawing methods can also juxtapose time and space, thus showing temporalities. Like the perspective section in which the anterior (what to build) is shown in the technical section and the posterior (space of occupation) is shown in the perspective by introducing silhouettes and daily activities into the drawing. The interim is nevertheless not shown in these drawings and still depends on the intrinsic knowledge of the discipline like we also see in traditional orthographic drawing methods the 'before and after' (Stalder & Kalpakci, 2018, p. 15). In the drawing of Assemble (figure) the interim is introduced by drawing the building as neither the *before* or *after* as well as by highlighting the building processes.

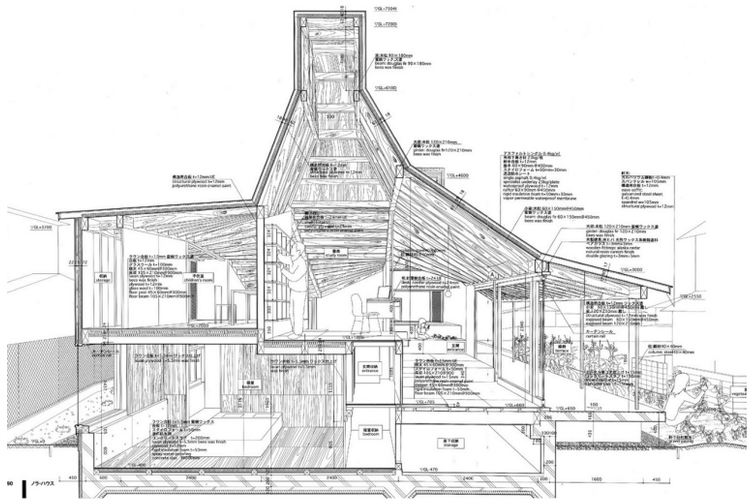

Figure 8:
Axonometric drawing (Atelier Bow-Wow, 2014)

How (much) to draw?

Drawing inhabitation, drawing both professionalised as well as non-professionalised processes, materiality, etc. as seen in the perspective drawings of Atelier Bow-Wow or the axonometric drawing of Assemble, could be seen as maximalist methods of drawing. Although these two differ quite a lot in their way of production and their aesthetics, both attempt to map different ecologies of inhabitation in the drawing that are not traditionally seen in architectural drawings. Although these seem like maximalist drawing approaches, it could be argued whether these are truly maximalist; the richness of ecologies of thought triggered by the drawing itself are perhaps only maximalist in relation to those traditional modes of drawing that are devoid of life.

Achieving similar effect by different means, the ‘minimalist’ drawings by Kajuyo Sejima, display the interpretation of space and function in a more abstract, almost ‘mystical’ way, and appear to be in stark contrast to the drawings discussed previously (Vidler, 2000, p. 3). One could question whether these ‘maximalist’ drawings leave enough room for interpretation of the observer or viewer of the drawing. For example, meticulously drawing modes of inhabitation could guide the observer in a certain direction of interpretation, to the effect that the ecologies of thought are diminished. When taking this into account while drawing in this ‘maximalist’ fashion, the ‘maximalist’ drawing enables multiplicities, though its different graphic elements or signs, are they not only able to create a certain specific signification but cross borders between different types of signs and therefore productively introduce new ecological relationships, as Félix Guattari calls these, ‘a-signifing semiotics’ (Stalder et al., 2016, p. 67). So if you selectively draw elements that are inherently fluid, living or organic, for example when you draw the lively environment of the proposed site, like the trees and soil in the drawing by Junya Ishigami (figure 9), the fact that these are drawn, then, inherently assigns value to these lively elements. While such a drawing is taken as a static image, it would already ‘need updating’ before it is even finished. But the drawing never really is, because it is evident that these lively entities exist in relation to the building. The drawing encourages to constantly re-examine the environment and its relations in regard to the building.

Although there could still be a necessity to add constraints to allow for new ideas to arise (Latour & Yaneva, 2013, p. 84), these constraints could help to situate other, less visible, more spontaneous ecologies to emerge in the drawing. Therefore graphical systems, or Cartesian organisation methods could help to highlight non-Cartesian, ecological relationships. An example of this would be a drawing of Junya Ishigami (figure 10) in which trees are drawn in an x/y grid system and in a similar representation style. This way of arranging them in a grid pattern makes the differences and similarities between them clearly visible.

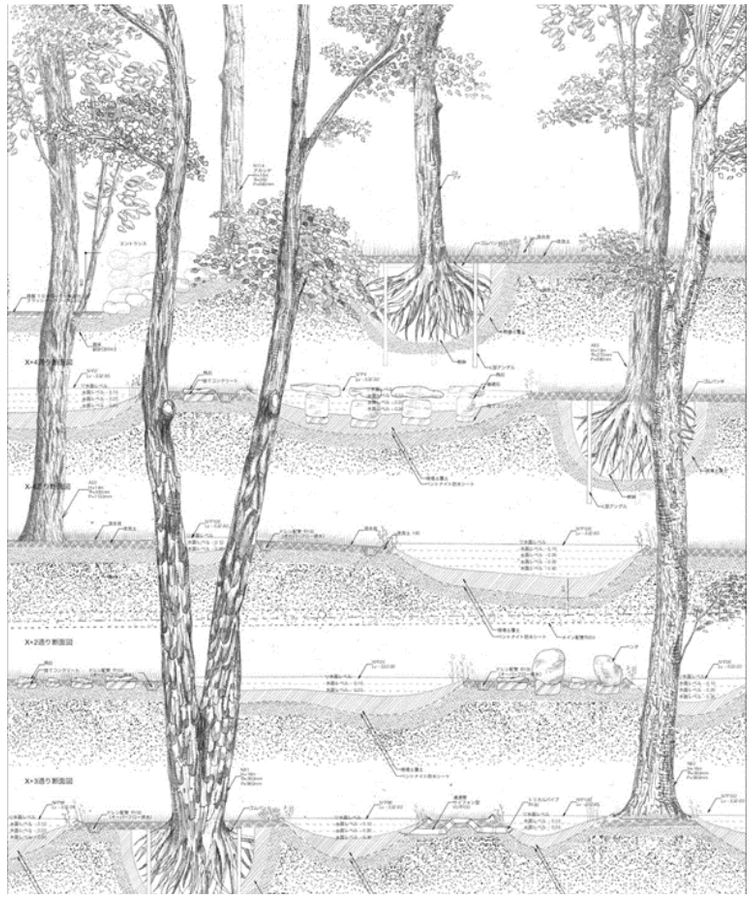

Figure 9:
Section drawing Biotop Water- Junya Ishigami
(Ota & Obrist, 2019)

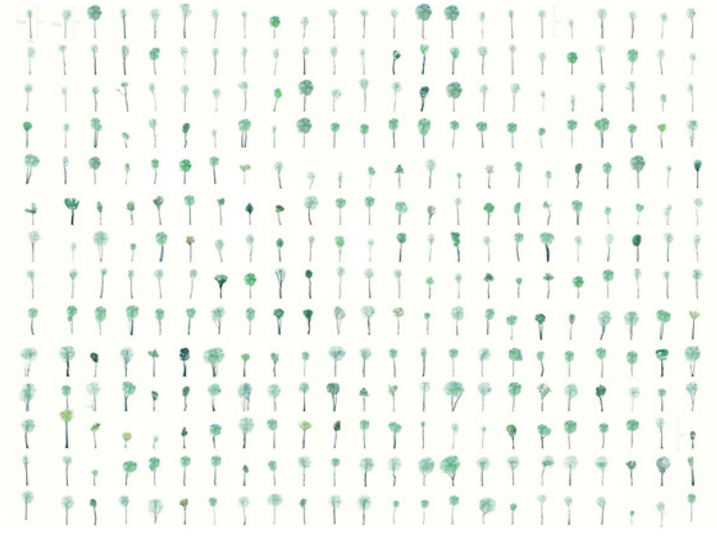

Figure 10:
Trees Biotop Water- Junya Ishigami
(Ota & Obrist, 2019)

Conclusions

Architectural conventions in the drawing are connected to predominant ways of realising architectural products and building industries. Drawing differently has implications on the building industry, and how the built environment is (re)produced. Not drawing the ground implies that the site is approached as essentially a tabula rasa. If you do choose to draw the ground, you do not do this in the hope that the developer might do something with it—no, the ecology of drawing is one part of shifting architectural practise towards more ecological forms of architecture; an architecture in which the architect becomes enmeshed in and attuned to architectural ecologies, in which the architect is in continuous negotiation and deliberation with the expanded ecology of architecture.

In order to steer the architectural drawing and therefore the architectural practisce, there should be an awareness of the 'tabula scripta' (Alkemade et al., 2019, p. 22) in which architecture is produced. But in order to shift, the concept of drawing should be truly acknowledged not as a singular idea to communicate or reflect, but more as having a quasi-autonomous existence, as having a life on its own that produces and continues in itself (Grosz, 2003, p. 78).

Here the tools of imaging and drawing of contemporary architectural practise should not be employed towards the automation of architecture and exclusion of architectural experimentation in a frantic effort to manage the volatile present in the closed circuits of post-orthographic imaging, forming an architectural habitus in which black-boxes are used to control, and optimise performance and efficiency. By understanding what this Cartesian 'image of thought' entails, we can start to understand what it does not entail, what possibilities still lie in drawing, opening space for speculation on other-ways-of-drawing using these Cartesian technologies to destabilise the Cartesian onto-epistemological regime itself, together with its binary logics of before-after, inside-outside, input-output, mind-body, object-subject. By employing architectural drawing(s) as a heuristic device, ecologies of drawing can be explored to counter the Euclidean rationalisation of space and the commonsensical 'view from nowhere' , providing possibilities for the destablisiation other other architectural categories and typologies. By investigating the interim, the trajectory, temporalities, the potentiality for the mobility of drawings, I hope to have opened up lines of flight for renewed architectural experimentation through drawing that is able to destabilise inscribed habits and recognise the potentiality of the architectural habitus to change.

Only when the potentiality of these tools to draw, think and produce otherwise is acknowledged in architectural practise can drawings as architectural concepts become truly productive and multiplicous (Grosz, 2003, p. 80). So, it is not all about the tools and only the need for new tools, but rather, as André Jaque states:

> "Using traditional drawing methods as an act of measuring, categorising, etc. to move against political structures, create values by representation. We should draw trees, soil and water, because they are all part of the system"
>
> (Andrés Jaque, 2022).

Architecture should not be a representation of culture of pluralism, but be a pluralist culture in itself. Architectural habitus and drawing practise should shift to accompany and co-constitute such a culture. Drawing and thinking differently means doing architecture differently.

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