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DO NOT SCALE: A LAMENT FOR DESIGN DRAWING

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Producing scaled artefacts — models, maps, and especially drawings — is crucial to design fields that anticipate and mobilise projects beyond the scope of a single human body to perceive, encompass, or enact. To consider intermediary drawings is to confront the remoteness and loss of immediacy produced by displacing the human body. But if physical presence and warm human bodies are sacrificed in the abstraction and distancing of schematic drawings, they return in displaced and peripheral ways through scaling. That is, scale becomes a means to recuperate loss. In this article, I consider the losses of scaled drawing and confront a large unscaled work, Monique Jansen's Overcast (2017), using it to prompt a reconsideration of scale. I suggest that although Overcast does not have a scale (in that it is not referential), Jansen's Overcast can be considered to scale, because it participates in circuits that take us beyond the scope of an individual human body.

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A Path Around Objects

Producing scaled artefacts — models, maps, and especially drawings — is crucial to design fields that anticipate and mobilise projects beyond the scope of a single human body to perceive, encompass, or enact. When something is too big (or too small, or too complicated) to work on directly, scaled intermediaries become necessary.[1] Such intermediaries prefigure, anticipating something that hasn't arrived yet (and won't be able to arrive unless the drawings can mediate effectively). To consider intermediary drawings is thus to confront the remoteness and loss of immediacy produced by displacing the human body: physically, through abstraction and standardisation, and imaginatively. In this article, I will consider the losses of scaled drawing and confront a large unscaled work, using it to prompt a reconsideration of scale. Central to this reconsideration is the compulsion to return repeatedly to a scene of trauma.

According to architectural theorist Catherine Ingraham, "the sense of an object-loss or object-lament runs long and deep in architectural history" (1988, p. 126) because, for all their obsession with anticipating the substantial and immediate, architects typically work obliquely, indirectly, and from a distance by means of drawing. To the extent that it intricately converses with and defers to something that eludes its grasp, architectural drawing has "a divided loyalty: it is linguistic but it is also object-crazed" (p. 115). Rather than being felt as sadness, however, this mourning or obsession with elusive objects may manifest as frustration, rumination, or endless circling. Like a lament, architectural drawing according to Ingraham is "a form of discourse that describes quite specifically a path around objects as a recapitulation of their loss" (p. 114). Although particularly plangent in architectural theory, we might reasonably listen for this lament in any design practice that approaches its object indirectly.

One of the symptoms of this loss is the elimination (or at least abstraction) of the drawer's body by the standardised notational form of design schematics. In contemporary construction drawings, the hand of the drawer is suppressed (Fig. 1). The material thickness of a line scored across paper or the blunt smearing of a finger across a trackpad are abstracted into pure geometry, annotated with crisp formulaic specifications, apparently "rinsed clean of all matter" (Hedges, 2010, p. 79). Computer-aided drafting is only a recent stage in the progressive mechanisation of the drafter by a tightly constrained repertoire of practical techniques, conventions and geometrical theory (Pérez-Gómez and Pelletier, 1997). The drawer herself is "repressed through numerical relationships or reduced to an eye/mind mechanism", diminished to a set of initials in a title block (Agrest, 2000, p. 169).[2]

[1] Much has been written about the reliance of some kinds of design on representative drawing. Robin Evans wrote, "Bringing with me the conviction that architecture and the visual arts were closely allied, I was soon struck by what seemed at the time the peculiar disadvantage under which architects labour, never working directly with the object of their thought, always working at it through some intervening medium, almost always the drawing" (Evans, 1997, p. 156). Drawings have been often analysed as imperfect or hybrid translations or mediations. Less has been written specifically on the scaled nature of these representative drawings (Emmons, 2007; Hedges, 2010).

[2] Zeynep Çelik and John May argue that architectural drawing has dissolved into a more complex practice of imaging, writing that "in a technical sense, we have not used a drawing to build anything in decades. Everything is now built from simulated orthography (images), with its attendant forms of transmission, duplication, repetition, and instantaneous modification—all of which have coalesced into a form of telematic managerialism unknown to orthography." (Çelik Alexander and May, 2020, p. 232). In my reading, the endless circulation of this telematic managerialism is another symptom of the anxiety of object-loss.

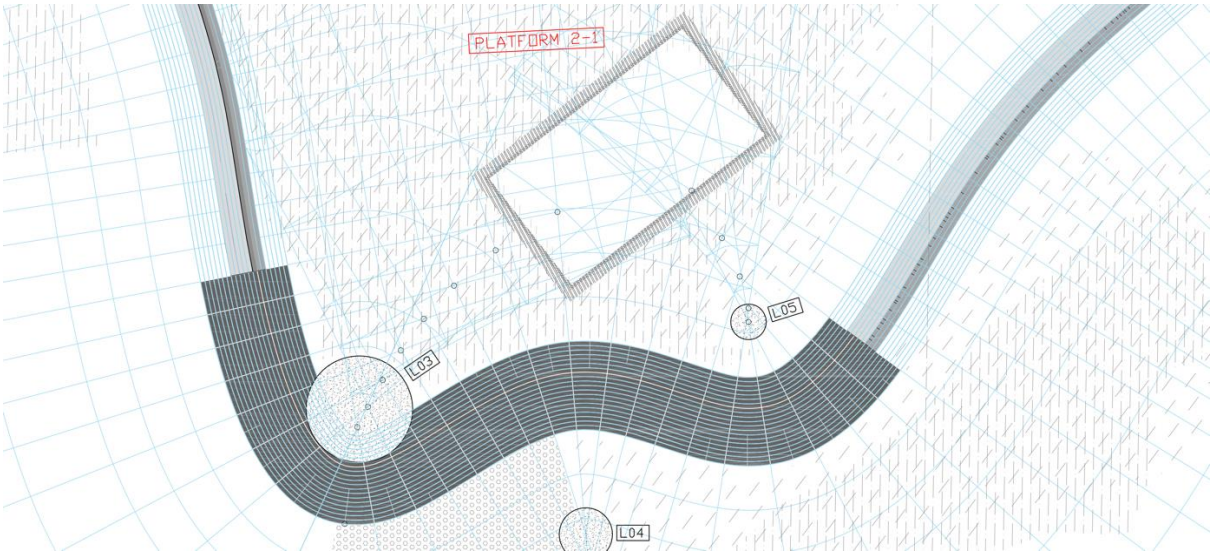

FIGURE 1. CAD DRAWING: CIRCUIT 2, OTAHUHU (2017, CARL DOUGLAS).

The loss of the object and the drawer's body, however, can be traced back to a more primordial trauma of drawing. Hélène Cixous described drawing as a progress into the unknown, in which we "advance error by error, with erring steps" (1993, p. 93). As we venture forth, the drawing escapes us at every turn, not quite what we bargained for and yet somehow more. Playing on the homophony of *le décollage* (to take off, like a plane would) and *la decollation* (beheading, executing), Cixous suggested that each mark both escapes and drops dead in the same moment, launches something into motion and curtails its flight. The drawing gets away from us and our relationship to it becomes like a response to trauma. A sheet of paper, she writes, is "a field of battle on which we, writing, drawing, have killed each other ourselves… all is disputed, and sacrificed" (p. 101). Like Ingraham, Cixous sees the drawing as a place we can't pry ourselves free from but keep returning to, laden with responsibility and discomfort.

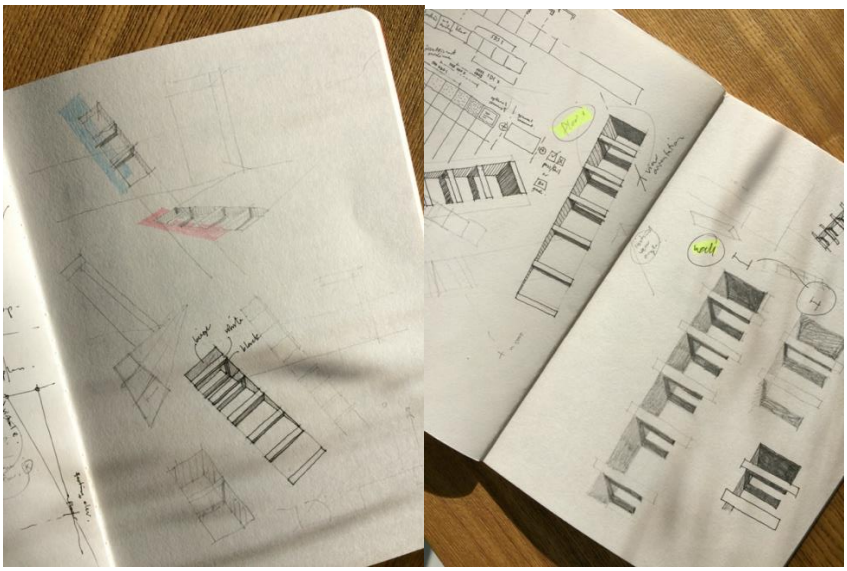

FIGURE 2. SKETCHBOOK REPETITIONS. SKETCHES FOR [MUTED] (2020, CARL DOUGLAS).

A designer's sketchbook is often a repetitive place (Fig. 2). In my books, I find similar configurations drawn over and over as I circle an idea, wander off, and return to things long abandoned. There is an obsessive quality to design drawing: by multiplying intermediary drawings, sketches, diagrams, notations, and specifications, it advances towards something that continually eludes it. The price of this obsession with an absent object is to be haunted by the loss of an (imagined and idealised) immediacy and the displacement of the drawer's body. For the drawing to take flight, mediating effectively to coordinate and control a production process (the construction of a building, the implementing of a set of plans in a workshop), sacrifices must be made.

Scale as Recuperation

But if physical presence and warm human bodies are sacrificed in the abstraction and distance of schematic drawings, they return in displaced and peripheral ways through scaling. That is, scale becomes a means to recuperate loss. This is what Ingraham refers to as recapitulation, the obsessive path around objects that is more like reconstruction, re-enactment, or substitution motivated by the impossibility of simply undoing or reversing loss.

In an abstract sense, scaling is a mathematical function applied as a technical procedure (Emmons, 2005). It uses a geometric ratio to make large or small things a more convenient size to work with. For drawings to mediate, communicate, and mobilise successfully, they must fit onto sheets of paper or screens, be portable and physically manageable, and carry information at a density that can be read reliably in whatever context they are to be used (perhaps a building site, a workshop, or a conference room). The use of conventional scales (architectural plans for example are commonly drawn at a ratio of 1:50 or 1:100) allows regular drawing users to develop an intuition for the intended size of represented things. In other words, scale pertains to human bodies and their capacity to carry, comprehend, perceive, and communicate.

Scale also induces bodily imagination. It "invites the inhabitation of a drawing, the anticipation of occupation and is a means to imagining measure through projecting oneself into the drawing" (Hedges, 2010, p. 73). The reader of the drawing walks it and grasps its objects. The drawing may not communicate touch directly, but its lines and contour imply tactility. This might happen according to convention: hatching patterns could invite us to recall the feeling of sanded timber grain or the granularity of concrete. But it might equally communicate through the materiality of the drawing, suggesting tension, mass, or sharpness through the thickness, tone, or variation of lines. A scaled drawing is felt by a surrogate body, not merely read by the eyes. Scale is a means to project, to cast the body of the viewer elsewhere.

In her fieldwork studying designers at the offices of Dutch architecture firm OMA, ethnographer Albena Yaneva observed this projection in practice. She noticed designers would frequently jump or shuttle between scales by physically placing their eyes close to a model, or drawing back for an overview. The design didn't progress linearly from overview to detail. Instead, she observed that designers maintained more and less detailed versions of the design concurrently. Scaling, she concluded, is an "experimental situation" that "relies on procedures for partial seeing: scoping, rescaling, extending and reducing" (Yaneva, 2005, pp. 868-9). Scaling practices do not respond only to the need to manage size or anticipate inhabitation; they are also ways to abstract, frame, manipulate, edit, filter, and omit.

Scaled drawing is a restless occupation. Yaneva's designers jump in and out, looking over and over again, but never settling into a single view. They know that each drawing or model is a provisional and partial abstraction of an absent future object, and therefore that it cannot be relied on completely. Documentation sets are typically riddled with injunctions that limit how they are to be read. 'DO NOT SCALE' is one such common marking, warning the user not to measure directly from the drawing, but to only trust specified dimensions. A complex system of cross-references point to other drawings, or require that certain conditions be confirmed on site. According to this prescribed manner of reading, the projection Hedges refers to may be illicit, a matter of reading too far. At the same time, however, it is essential for the designer to cast herself into the drawing and take others with her if the drawing is to take flight and mobilise some new reality. In getting carried away by an absent future object, the restless designer cannot escape circulation, partiality, indirectness. The drawing's gain and loss manifest through deferral and denial.

Studies of grief and perhaps our own experiences tell us loss can manifest in unexpected and displaced ways. Psychoanalytic philosopher Julia Kristeva refers to this as "transposition", moving "always further beyond or more to the side" (Kristeva, 1989, p. 42). Transposition, the move sideways or beyond, "retroactively gives form and meaning to the mirage of the primal Thing" (p. 41). The object is a void we circle. Like the designer's object it is "something quasi-unreachable and at the same time ever-present in all models and states: a multiple, cumulative object" (Yaneva, 2005, p. 888). This is not just a metaphor. Kristeva argues that we become embroiled in sign-systems like writing or notational drawing because we are mourning a loss: "language is, from the start, a translation, but on a level that is heterogeneous to the one where affective loss, renunciation, or the break takes place" (p. 41). If we take Kristeva seriously, we see scale as not simply a matter of technique, and the lost object as more than merely a practical problem for designers to solve. The very step into reference is itself a recapitulation of loss.

To explore this, I turn now to a particular drawing: *Overcast*, by New Zealand artist and printmaker Monique Jansen, a work that gestures towards the inaccessible spaces of global carbon cycles. It is a non-representational work, so the question I ask in the following section — what scale is it? — may seem distinctly inappropriate. In asking it nonetheless, and reflecting on why it doesn't apply, I suggest that we might ultimately find alternative ways to see scale.

Escaping Scale with Jansen's *Overcast*.

Overcast was a large charcoal drawing made by Jansen for the exhibition *Heat: Solar Revolutions* at Auckland's Te Uru Gallery in 2017 (Fig. 3). The show, curated by Amanda Yates and Janine Randerson, responded to the problems and possibilities of decarbonisation. Its central tension was between spaces of individual or group activity and global spaces (Yates and Randerson, 2017). A number of works in the show confronted the inaccessibility and yet immanence of global spaces, manifesting as probes, programmes, mediations, and samples that gestured across the gulf between the local and the remote, the comparatively small and the inaccessibly large. The future was indicated as a space of both loss and transformation, and the present a moment of catalysis.

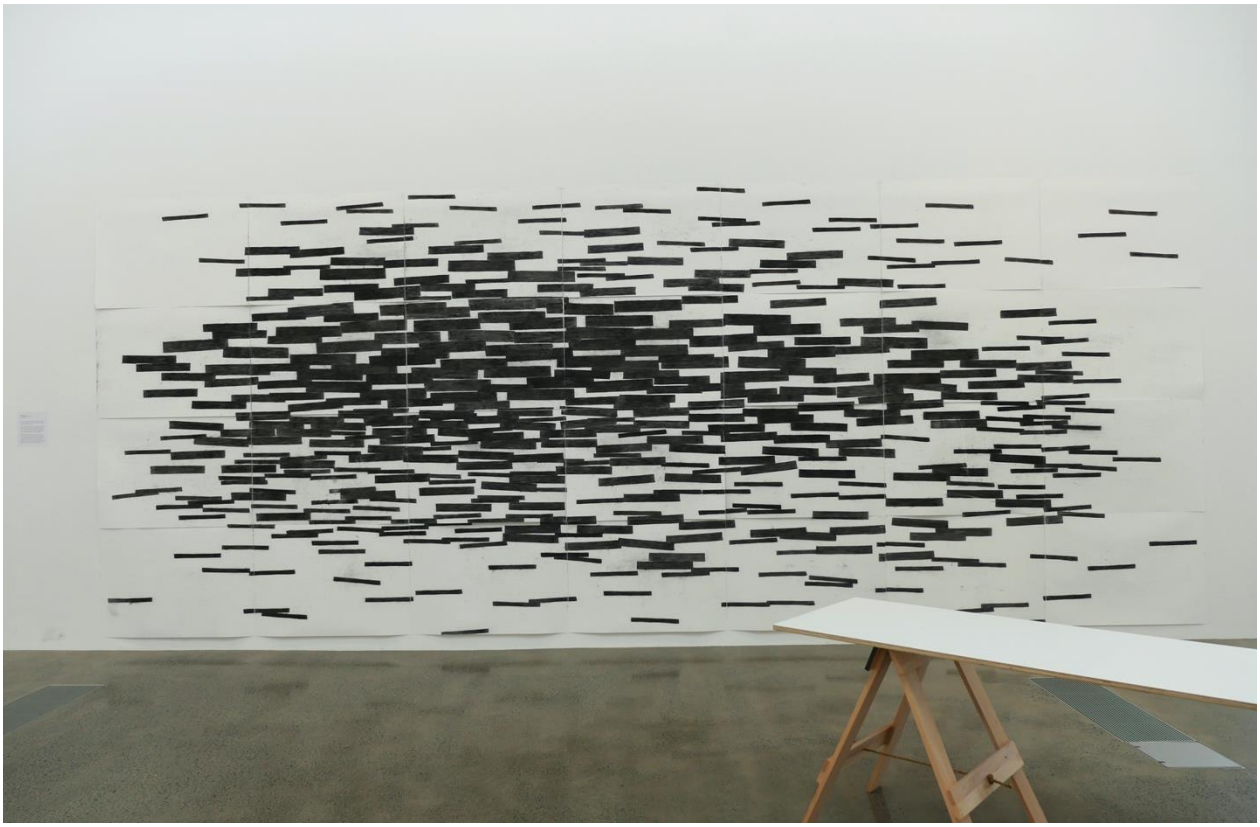

FIGURE 3. OVERCAST (COURTESY M. JANSEN, 2017)

By titling her work *Overcast*, Jansen invokes the weight of the future and the problem of its scale. She refers to the gathering of clouds before rain, and the diffused, neutralised atmospheric condition of a uniformly cloudy sky. The overcast sky runs past the horizon, enveloping us, a paradigm of the ungraspable. The drawing itself suggests a cloud, although it isn't explicitly an image of one. It is large, over two metres tall and almost six metres wide, consisting of a conglomeration of short black bars drawn in charcoal onto sheets of white A1 paper butted together to form a single drawing surface (Fig. 4). The bars, thick and thin, are packed closely, overlapping at the centre but diffusing towards the edge. While they all run in roughly the same direction, they are not aligned, and their irregular angles create the sense of jostling, vibration, or turbulence. Unframed against the white wall the black figure seems to float.

Overcast is not a design drawing in the sense of being preliminary to another work. It does not anticipate another process of production, or specify a forthcoming realisation. For precisely this reason though, it provides an opportunity to trace the boundaries of such referential drawing, and invites questions about scale and temporality. I have suggested that the obsessive forwardness of design drawing is reconfigured as circularity conditioned by the indirect grasping, rumination, and transpositions of object-lament, and offer Jansen's drawing as a means of examining this circularity.

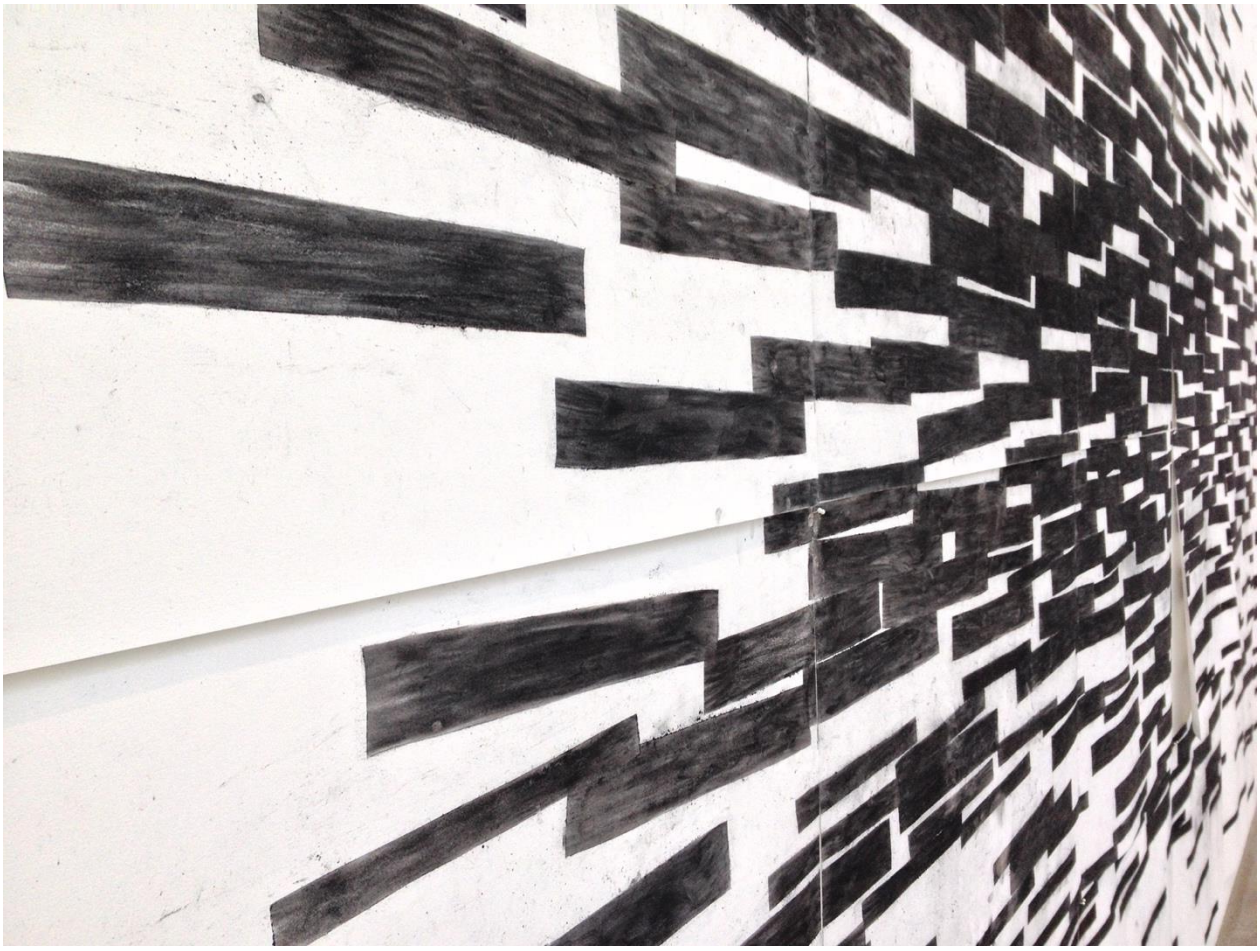

FIGURE 4. DETAIL OF OVERCAST (COURTESY M. JANSEN, 2017)

Here is a problematic, perhaps even foolish question: what is the scale of Jansen's drawing? The question is obviously ridiculous because *Overcast* is not a measured schematic or even a representation at all. Why would we expect it to have a scale? Even if we said the drawing was intended to be a representation of a cloud (which Jansen explicitly denies; personal communication, 25 July 2019), we couldn't establish a proportional relationship because clouds come in all sizes and don't typically stick around for long enough to measure. We could say in this case that the drawing is *not to scale*. This would put it in the class of sketches and diagrams that represent without having a measured relationship.

But *not to scale* leaves open the possibility that a scale could be applied, even if it is currently unknown, variable or approximate. A drawing with an *unknown* scale has lost its proportional relationship, but it might be re-established by comparing measurements. A drawing with a *variable* scale would be more difficult to recover because different parts of the drawing could have different proportional relationships. An *approximately*-scaled drawing might only have a rough relationship to what it figures. In each case, though, we would still be concerned with the distance between something and its referent. A sense of imprecision or uncertainty would only be heightened by the feeling that a scalar relationship was just out of reach. None of these options take us outside the paradigm of reference, however. To designate a drawing as being of an unknown, variable, or approximate scale we need to assume the existence of a relationship to a referent, even if it is lost, broken, or unreliable.

FIGURE 5. JANSEN WORKING ON OVERCAST (COURTESY M. JANSEN, 2017).

If the drawing is not to scale, it still has a particular size. It corresponds with the size of Jansen's body: her height, the length of her arm, the distance she could reach (with a step-stool or some other prosthetic, perhaps; Fig. 5), the amount of charcoal she was physically able to apply in the time allocated to the work. It also corresponds with the bodies of viewers, who might move in for a close examination, or step back to where they can take it all in at once. In this sense, the drawing acts as a kind of interface between Jansen and her viewers. Architect Marian Macken points to the peculiar qualities of full-scale drawing, in which a drawer "enters and makes the drawing" (Macken et al., 2019, p. 3). As a kind of motion-capture it is an index of movement and gesture, not only a sign of it. The oddly self-effacing term *full-scale* is commonly applied to mock-ups, trials, or prototypes (for example the clay models still used when designing cars).[3] The relationship between drawing, the referent, and the viewer overlay one another in the same space, and yet remain remote from one another. The more strenuously the drawer tries to close the gap between drawing and object, the more strongly it is reasserted.

[3] For a discussion of the scale and the full-scale ("a form of approximation… maintaining a critical distance") in terms of models, see Lee and Johnston (2020, p. 55).

All these scalar possibilities would force an inappropriate framework onto Jansen's drawing (although as a heuristic model they might be of value for examining other drawings). But another question arises: can scale have a meaning outside a referential paradigm? Is reference to an object the only kind of scalar correspondence a drawing might enter into? And how might the obsessive path around objects, the object-lament of design drawing, be shifted by moving outside representation?

FIGURE 6. DRAWING EQUIPMENT FOR OVERCAST (COURTESY M. JANSEN, 2017).

Circuitous Times and Scale

The temporality of Overcast provides a way to broach this other kind of scaling. Jansen drew it in the gallery over the course of five days, and the performance of the drawing is as significant as its finished condition. In fact, she weighs lightly the idea of a finished or final state. Her physical presence, her drawing paraphernalia, and interactions with gallery visitors are all aspects of the work. She describes it as "semi-process work"; no strict plan guided its exact organisation (personal communication, 25 July 2019). In a stricter form of process art the final state may be explicitly unanticipated, or even rendered unanticipatable, but Jansen has a loose configuration in mind.[4] This configuration, however, doesn't act

[4] In process art, according to Robert Morris, "considerations of ordering are necessarily casual and imprecise and unemphasized", with the indiscriminate taking priority over a gestalt or form (Butler, 1999, p. 26).

as an imagined object towards which her activity is directed. Plans, writes ethnographer of human-computer interaction Lucy Suchman, are "resources for situated action but do not in any strong sense determine its course" (2006, p. 72). The time of the drawing is oriented as a vector, rather than being defined by a particular goal.

For this reason, it would be better to see Overcast (and indeed many of Jansen's works) as *procedures*. Each bar of the drawing was produced by rubbing charcoal through a paper cut-out (Fig. 6). Stencilled sheet after sheet was stuck to the wall and the drawing slowly accumulated from the bottom up. On the first row of sheets the black bars are sparse, and a narrower stencil is used. As the drawing rises it densifies and a wider stencil takes over, until at about eye-level charcoal covers most of each sheet. From this point it begins to dissolve again, following Jansen's intuition that it should fade away. The forward movement of the drawing is not set with reference to a destination, but by defining how to take a single step and setting out. There is a kind of standardisation (even mechanisation) at work, but instead of the standardisation of reference in the manner of notations it is the standardisation of becoming-routine, of deliberate self-constraint and repetition.

Other works by Jansen have employed a similar approach. For Metric Conversations (2007), she took a used school maths book and meticulously cut out each gridded square, leaving the existing lines of the page visible and rendering the entire book a filigree. The Parkin-prize winning A0 Folded Moiré Drawing (2013) was similarly intricate: tens of thousands of regular hand-drawn lines were layered to create the sense of a folded sheet. In each work the procedure is open-ended and the endpoint is arbitrary. The work is done when the exercise book is finished, the edge of the page reached, or the allotted time runs out. It is, in a sense, myopic, feeling its way ahead. Jansen certainly spends a long time staring closely at her works (*Metric Conversations* took nearly a year to complete). Routine patterned action takes us from small to large by steps rather than jumps.

Operating procedurally, Jansen moves in tight circles. Kristeva writes that mourning leads us not only into transpositions, but into repetition. That repetition, however, is not simply a recurrence, but becomes a reduplication that carries the full weight of all the preceding iterations:

> *Reduplication is a jammed repetition. While what is repeated is rippled out in time, reduplication lies outside time. It is a reverberation in space, a play of mirrors lacking perspective or duration. A double may hold, for a while, the instability of the same, giving it a temporary identity, but it mainly explores the same in depth, opening up an unsuspected, unfathomable substance (Kristeva, 1989, p. 246).*

Routine procedures could thus be seen as a different mode of scaling, one that opens a reverberant space of depth rather than distance. This space is "a no man's land of aching affects and devalued words", unmoored from the plane of reference (Kristeva, 1989, p. 246).

Overcast also opens to a wider world from which it coalesces and into which it dissolves. The charcoal used is locally-sourced biochar, made by burning tree trimmings at a specific temperature and under low-oxygen conditions (Fig. 7). Jansen is an avid permaculturist. In her Titirangi garden, she has cultivated a flourishing garden on the principle of taking as little as possible from outside, and reusing as much waste as possible. Biochar is prized in permaculture because it improves and remediates soil, creating habitat for micro-organisms, retaining and stabilising nutrients, and pulling heavy metals out of the ground. When the show had finished, Overcast was composted back into the garden, closing the

loop (and feeding the tomatoes). If, as Jansen hopes, there can be an "ecology of drawing" it requires coming to terms with before and after the work, with times of decomposition and reincorporation (personal communication, 25 July 2019). Embedded in wider ecological circuits, and manifesting a procedural logic, *Overcast* corresponds with a wider world.

FIGURE 7. BIOCHAR USED TO DRAW OVERCAST (COURTESY M. JANSEN, 2017)

Scaling as Worlding

The temporality of the design drawing described by Ingraham is oriented by reference to an elusive object. Design methodologies are haunted by the illusory possibility of a single linear path to this object. According to this illusion, the object can be anticipated rigorously, with scaling techniques facilitating a smooth translation between the preliminary matter of the drawings and the conclusive matter of the final production. But in use scaling is more complex. As a technical practice, a means of imaginative projection, and a mode of abstraction, it produces an irregular pattern. Rather than a linear path, the time of design drawing is a "rhythm with fine undertones of variation and distance, acceleration and slowing down" (Yaneva, 2005, p. 888).

Ingraham's architects compulsively repeat, driven by awareness that no single drawing will ever be adequate. She invites us to see this repetition as obsessive, a form of transposed grief over the loss of immediacy. All drawing may participate in this obsession to some degree, but design drawing, with its

underlying paradigm of conventionalised reference, cannot escape it. As a result, the designer is carried by the object: "the obsessive is transported, compelled by his/her object, and is less authoring of it than authored by it" (Dorrian and Hawker, 2003, p. 188). To be carried by the object, crazed by it, always aiming at it and missing, and surrounding ourselves with substitutes for it, could be a source of frustration.

Perhaps being carried, however, might also be a way to become entangled with things beyond ourselves. I have suggested that although it does not *have* a scale (in that it is not referential), Jansen's Overcast can be considered to *scale*, because it participates in circuits that take us beyond the scope of an individual human body. This more general sense of the term 'scale' prompts us to consider a broader range of human practices. As historian of climate science Deborah Coen writes:

> *scaling is also something we all do every day. It is how we think, for instance, about how one individual's vote might influence a national election, or whether buying a hybrid car might slow global warming. It can also be a way of situating the known world in relation to times or places that are distant or otherwise inaccessible to direct experience. Scaling makes it possible to weigh the consequences of human actions at multiple removes and coordinate action at multiple levels of governance. (Coen, 2018, p. 16)*

In Coen's sense, scaling is an everyday activity of understanding and negotiating our relationships to the distant or removed. Scale would thus be bound up with the question of agency: how do scaling practices enable us to access, affect, or be affected by large, small, or remote things?

Such a scalar imaginary might form in various ways in addition to the geometric ratio of the scaled design drawing, as our brief encounter with Jansen's drawing here indicates. Scaling might occur as a performative relation to the space and place of drawing. *Overcast* unfolds in time and at a specific location (a gallery of particular dimensions, open at particular times, for a specified duration). In this specificity, present place may come to take the place of the absent object, and the temporalities of that place condition its relations to other bodies.

Scaling might also occur through the abstraction of procedural constraint and repetition. In the sense that Jansen automates herself she replaces the closure of representation with open-endedness. Instead of being oriented by the lost object (as is Ingraham's architect) the drawing is oriented by objects-yet-to-come. The myopic drawing has a situated "epigenesis" rather than a genesis (Miller et al., 2021, p. 118).

Finally, scaling might occur when a drawing participates in cycles that implicate transitions of size. *Overcast's* boundaries are explicitly provisional. Its procedure could continue to operate and spread outward, and true again because the start and end of the work are hard to determine. What appears in the gallery is only one temporal slice through a carbon trajectory: plants become biochar, which is used to draw, and composted back into the ground.

By looking at *Overcast*, I have attempted to develop a provisional taxonomy of the unscaled and give meaning to the concept of scale beyond that of the calculated ratio. Scaling, I suggest, can be what Donna Haraway refers to as a "worlding practice" (Haraway, 2016, p. 127). To scale as *Overcast* does may be "to make possible partial and robust biological-cultural-political-technological recuperation and recomposition, which must include mourning irreversible losses" (Haraway, 2016, p. 101). To scale might not only be to take a path towards to an absent object, but by circulating to recuperate and recompose worlds.

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