

The textility of making

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Contemporary discussions of art and technology continue to work on the assumption that making entails the imposition of form upon the material world, by an agent with a design in mind. Against this *hylomorphic* model of creation, I argue that the forms of things arise within fields of force and flows of material. It is by intervening in these force-fields and following the lines of flow that practitioners make things. In this view, making is a practice of weaving, in which practitioners bind their own pathways or lines of becoming into the texture of material flows comprising the lifeworld. Rather than reading creativity ‘backwards’, from a finished object to an initial intention in the mind of an agent, this entails reading it forwards, in an ongoing generative movement that is at once itinerant, improvisatory and rhythmic. To illustrate what this means in practice, I compare carpentry and drawing. In both cases, making is a matter of finding the grain of the world’s becoming and following its course. Historically, it was the turn from drawing lines to pulling them straight, between predetermined points, which marked the transition from the textilic to the architectonic, debasing the former as craft while elevating the latter as technology.

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1. The hylomorphic model

In his notebooks, the painter Paul Klee repeatedly insisted that the processes of genesis and growth that give rise to forms in the world we inhabit are more important than the forms themselves. ‘Form is the end, death’, he wrote. ‘Form-giving is life’ (Klee, 1973, p. 269). This, in turn, lay at the heart of his celebrated *Creative Credo* of 1920: ‘Art does not reproduce the visible but makes visible’ (Klee, 1961, p. 76). It does not, in other words, seek to replicate finished forms that are already settled, whether as images in the mind or as objects in the world. It seeks, rather, to join with those very forces that bring form into being. Thus the line grows from a point that has been set in motion, as the plant grows from its seed. Taking their cue from Klee, philosophers Gilles Deleuze and Félix Guattari argue that the essential relation, in a world of life, is not between matter and form but between

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materials and *forces* (Deleuze and Guattari, 2004, p. 377). It is about the way in which materials of all sorts, energised by cosmic forces and with variable properties, mix and meld with one another in the generation of things. And what they seek to overcome in their rhetoric is the lingering influence of a way of thinking about things, and about how they are made and used, that has been around in the Western world for the past two millennia and more. It goes back to Aristotle.

To create any thing, Aristotle reasoned, you have to bring together form (*morphe*) and matter (*hyle*). In the subsequent history of Western thought, this hylomorphic model of creation became ever more deeply embedded. But it also became increasingly unbalanced. Form came to be seen as imposed by an agent with a particular design in mind, while matter, thus rendered passive and inert, became that which was imposed upon. My critical argument in this article is that contemporary discussions of art and technology, and of what it means to make things, continue to reproduce the underlying assumptions of the hylomorphic model, even as they seek to restore the balance between its terms. My ultimate aim, however, is more radical: with Deleuze and Guattari it is to overthrow the model itself and to replace it with an ontology that assigns primacy to the processes of formation as against their final products, and to the flows and transformations of materials as against states of matter. Form, to recall Klee's words, is death; form-giving is life. I want to argue that what Klee said of art is true of skilled practice in general, namely that it is a question not of imposing preconceived forms on inert matter but of intervening in the fields of force and currents of material wherein forms are generated. Practitioners, I contend, are wanderers, wayfarers, whose skill lies in their ability to find the grain of the world's becoming and to follow its course while bending it to their evolving purpose.

Consider, for example, the operation of splitting timber with an axe. The practised woodsman brings down the axe so that its blade enters the grain and follows a line already incorporated into the timber through its previous history of growth, when it was part of a living tree. 'It is a question', write Deleuze and Guattari, 'of surrendering to the wood, and following where it leads' (2004, p. 451). Perhaps it is no accident that the word used in Greek antiquity to describe the skill of the practitioner, *tekhne*, is derived from the Sanskrit words for axe, *tasha*, and the carpenter, *taksan*. The carpenter is 'one who fashions' (Sanskrit, *taksati*), a shaper or maker. Yet the Latin verb for 'to weave', *texere*, comes from precisely the same root (Mitchell, 1997, p. 330). The carpenter, it seems, was as much a weaver as a maker. Or more precisely, his making was itself a practice of weaving: not the imposition of form on pliant substance but the slicing and binding of fibrous material (Ingold, 2000A, pp. 64–5). His axe, as it finds its way through the wood, splitting it as it goes, is guided—as Deleuze and Guattari say—by 'the variable undulations and torsions of the fibres' (2004, p. 450). As for the axe itself, let us suppose that the blade has been knapped from stone. The skilled knapper works by detaching long thin flakes from a core, exploiting the property of conchoidal fracture taken on by the lithic material through its history of geological compression (Pelegrin, 2005, p. 25). Before each blow of the hammer, he locates or prepares a suitable striking platform, whence, on impact, the line of fracture ripples through the material like a wave. The wrought surface of knapped stone, at least until it has been ground smooth, bears the scars of multiple, interleaved fractures.

In the history of the Western world, however, the tactile and sensuous knowledge of line and surface that had guided practitioners through their varied and heterogeneous materials, like wayfarers through the terrain, gave way to an eye for geometrical form, conceived in the abstract in advance of its realisation in a now homogenised material medium. What we could call the *textility* of making has been progressively devalued, while the hylomorphic

model has gained in strength. The architectural writings of Leon Battista Alberti, in the mid-fifteenth century, mark a turning point in this development. Until then, as David Turnbull has shown in the case of the great medieval cathedral of Chartres, the architect was literally a master among builders, who worked on site, coordinating teams of masons whose task was to cut stones by following the curves of wooden templates and to lay the blocks along lines marked out with string. There was no plan, and the outcome—far from conforming to the dictates of a prior design—better resembled a patchwork quilt (Harvey, 1974, p. 33). For Alberti, however, architecture was a concern of the mind. ‘It is quite possible’, he wrote, ‘to project whole forms in the mind without any recourse to the material, by designating and determining a fixed orientation and conjunction for the various lines and angles’ (Alberti, 1988, p. 7). Such lines and angles together comprise what Alberti called the ‘lineaments’ of the building. These lineaments have a quite different status from the lines that masons cut from templates or laid with string. They comprise a precise and complete specification for the form and appearance of the building, as conceived by the intellect, independently and in advance of the work of construction. On paper, the lineaments would have been inscribed as drawn lines, which could be either straight or curved. Indeed, Alberti’s lines have their source in the formal geometry of Euclid. ‘The straight line’, he explains, ‘is the shortest possible line that may be drawn between two points’, whereas ‘the curved line is part of a circle’ (Alberti, 1988, p. 19). What art historian Jean-François Billeter writes of the line of Euclidean geometry applies with equal force to the Albertian lineament: it ‘has neither body nor colour nor texture, nor any other tangible quality: its nature is abstract, conceptual, rational’ (Billeter, 1990, p. 47).

2. Following materials

Thus the textility of building gave way to an architectonics of pure form. And from that point on, despite their common etymological origin, the technical and the textilic were set on radically divergent paths. While the former was elevated into a system of operational principles, a *technology*, the latter was debased as mere craft, revealing the almost residual or interstitial ‘feel’ of a world engineered in the light of reason. Embodied within the very concept of technology was an ontological claim, namely, that things are constituted in the rational and rule-governed transposition of preconceived form onto inert substance, rather than in a weaving of, and through, active materials (Ingold, 2000B, p. 312).¹ ‘Technology’, in other words, is one answer to the question, ‘what does it mean to make things?’ It is an answer, however, that does not readily stand up in the theatre of practice. For makers have to work in a world that does not stand still until the job is completed, and with materials that have properties of their own and are not necessarily predisposed to fall into the shapes required of them, let alone to stay in them indefinitely (Ingold and Hallam, 2007, pp. 3–4). Building contractors, tasked with the implementation of architectural design, know this all too well—as Matisse Enzer, a contractor with long experience of working with architects, explains:

Architects think of a building as a complete *thing*, while builders think of it and know it as a *sequence*—hole, then foundation, framing, roof, etc. The separation of design from making has resulted in a built environment that has no ‘flow’ to it. You simply cannot design an improvisation or an adaptation. It’s dead (cited in Brand, 1994, p. 64).

¹ Precisely because ‘technology’ is an ontological claim, it makes no sense to treat technology as a subject *about* which ontological claims can be made. If the claim embodied in the concept is without foundation, then so is the concept itself.

Or as Stewart Brand puts it, there is a kink between the world and the architect's idea of it: 'The idea is crystalline, the fact fluid' (Brand, 1994, p. 2). Builders inhabit that kink.

Contemporary architecture is not, however, universally blind to the disjunction between theory and practice. The distinguished Portuguese architect Alvaro Siza, for example, admits that while he can build and design houses, he has never been able to build a *real* house, by which he means 'a complicated machine in which every day something breaks down' (Siza, 1997, p. 47). Besides builders and repair-men of diverse trades—bricklayers, joiners, slaters, plasterers, plumbers and so on—the real heroes of house building, according to Siza, are the people who live in them who, through unremitting effort, shore them up and maintain their integrity in the face of sunshine, wind and rain, the wear and tear inflicted by human occupancy, and the invasions of birds, rodents, insects, arachnids and fungi (Siza, 1997, p. 48). Like life itself, a real house is always work in progress, and the best that inhabitants can do is to steer it in the desired direction. Likewise the gardener, armed with spade, fork and trowel, has to struggle to prevent the garden from turning into a jungle. More generally, whenever we encounter matter, as Deleuze and Guattari insist, 'it is matter in movement, in flux, in variation'. And the consequence, they go on to assert, is that 'this matter-flow can only be *followed*' (Deleuze and Guattari, 2004, p. 451). What Deleuze and Guattari call 'matter-flow', I would call *material*. Accordingly, I recast the assertion as a simple rule of thumb: to *follow the materials* (Ingold, 2007A, p. 314).¹

To apply this rule is to intervene in a world that is continually 'on the boil'. Perhaps it could be compared to a huge kitchen. In the kitchen, stuff is mixed in various combinations, generating new materials in the process, which will, in turn, become mixed with other ingredients in an endless process of transformation. To cook, containers have to be opened and their contents poured out. We have to take the lids off things. Faced with the anarchic proclivities of his or her materials, the cook has to struggle to retain some semblance of control over what is going on. An even closer parallel might be drawn with the laboratory of the alchemist. The world according to alchemy, as art historian James Elkins explains, was not one of matter that might be described in terms of its molecular composition, but one of *substances*, which were known by what they look and feel like, and by following what happens to them as they are mixed, heated or cooled. Alchemy, writes Elkins, 'is the old science of struggling with materials, and not quite understanding what is happening' (Elkins, 2000, p. 19). His point is that this, too, is what painters have always done. Their knowledge was also of substances, and these were often little different from those of the alchemical laboratory. As practitioners, the builder, the gardener, the cook, the alchemist and the painter are not so much imposing form on matter as bringing together diverse materials and combining or redirecting their flow in the anticipation of what might emerge.

In their attempts to rebalance the hylomorphic model, theorists have insisted that the material world is not passively subservient to human designs. They have expressed this, however, by appeal not to the vitality of materials but to the agency of objects. If persons can act on objects in their vicinity, so, it is argued, can objects 'act back', causing persons to do what they otherwise would not. The speed-bump on the road, to take a familiar example adduced by Bruno Latour, causes the driver to slow down, its agency here substituting for

¹ I mean following to be understood here in an active rather than passive sense. It is not blind. The hunter following a trail must remain ever alert to visual and other sensory cues in an ever-changing environment and must adjust his course accordingly. In following materials the practitioner does the same. The consequence of failure would be that the work goes off track and cannot be carried on. I should add that it is not only practitioners who are bound by this injunction. So too are those who would study their work. For the latter too, if the observational thread is lost, then the description falters.

that of the traffic policeman (Latour, 1999, pp. 186–90). We may stare at an object, explains Elkins (with acknowledgement to the psychoanalysis of Jacques Lacan), but the object also stares back at us, so that our vision is caught in a ‘cat’s cradle of crossing lines of sight’ (Elkins, 1996, p. 70). And in a precise reversal of the conventional subject–object relations of hylomorphism, archaeologist Chris Gosden suggests that in many cases it is not the mind that imposes its forms on material objects, but rather the latter that give shape to the forms of thought (Gosden, 2005, p. 196). In this endless shuttling back and forth between the mind and the material world, it seems that objects can act like subjects and that subjects can be acted upon like objects. Instead of subjects and objects there are ‘quasi-objects’ and ‘quasi-subjects’, connected in relational networks (Latour, 1993, p. 89).

Yet, paradoxically, these attempts to move beyond the modernist polarisation of subject and object remain trapped within a language of causation that is founded on the very same grammatical categories and that can conceive of action only as an *effect* set in train by an agent (Ingold, 2007B, p. 52). ‘Agents’, according to Alfred Gell, ‘initiate “actions” which are “caused” by themselves, by their intentions, not by the physical laws of the cosmos’ (Gell, 1998, p. 16). The intention is the cause, the action the effect. Assuming that human beings alone are capable of initiating actions in this sense, Gell nevertheless allows that their agency may be distributed around a host of artefacts enrolled in the realisation of their original intentions. These artefacts then become ‘secondary agents’ to the ‘primary agency’ of the human initiators (Gell, 1998, pp. 20–1). Not all would concur with Gell that actions are the effects of prior intentions, let alone with the identification of the latter with mental states. Intentionality and agency, as Carl Knappett argues, are not quite the same: ‘artifacts such as traffic lights, sleeping policemen, or catflaps might be described as possessing a kind of agency, yet it would be much harder to argue that they manifest intentionality’ (Knappett, 2005, p. 22). It would indeed be foolish to attribute intentions to catflaps. But is it any less so to suggest that they ‘possess agency’? Rather than attributing the action to the agency of the flap (along with that of the cat, and of the cat’s owner who installed the flap in her door so she would not have to open it herself), would it not make more sense to attribute the operation of the flap to the action into which it was recruited, of the cat’s making its way in or out of doors? Surely, neither the cat nor the flap possess agency; they are rather *possessed by the action*. Like everything else, as I shall now show, they are swept up in the generative currents of the world.

3. Flying kites

The world we inhabit is not made up of subjects and objects, or even of quasi-subjects and quasi-objects. The problem lies not so much in the *sub-* or the *ob-*, or in the dichotomy between them, as in the *-ject*. For the constituents of this world are not already thrown or cast before they can act or be acted upon. They *are* in the throwing, in the casting. The point may best be illustrated by means of a simple experiment that I have myself carried out with my students at the University of Aberdeen. Using fabric, matchstick bamboo, ribbon, tape, glue and twine, and working indoors on tables, we each made a kite. It seemed that we were assembling an object. But as soon as we carried our creations outside, they leaped into action, twirling, spinning, nose-diving and, occasionally, flying. How did this happen? Had some animating principle magically jumped into the kites, causing them to act most often in ways we did not intend? Were we witnessing, in their unruly behaviour, the consequences of interaction between—in each case—a person (the flyer) and an object (the kite), which can only be explained by imagining that the kite had acquired an ‘agency’

capable of counteracting that of the flyer? Of course not. The kites behaved in the way they did because, at the moment we went out of doors, they were swept up, as indeed we were ourselves, in those currents of air that we call the *wind*. The kite that had lain lifeless on the table indoors, now immersed in these generative currents, had come to life. What we had thought to be an object was revealed as what I would call a *thing*. And the thing about things, if you will, is that far from standing before us as a *fait accompli*, complete in itself, each is a ‘going on’—or better, a place where several goings on become entwined.¹

As the philosopher Martin Heidegger put it, albeit rather enigmatically, the thing presents itself ‘in its thinging from out of the worlding world’ (Heidegger, 1971, p. 181). It is a particular gathering together or interweaving of materials in movement. Thus, the very ‘thinginess’ of the kite lies in the way it gathers the wind into its fabric and, in its swooping, describes an ongoing ‘line of flight’. This line should on no account be confused with the line connecting the kite with the flyer. For lines of flight, as Deleuze and Guattari insist, do not connect. Like the stems of plants growing from their seeds, to return to Klee’s image, such lines trace the paths of the world’s becoming—its ‘worlding’—rather than connecting up, in reverse, sequences of points already traversed. The line of flight, write Deleuze and Guattari, ‘is not defined by the points it connects, or by the points that compose it; on the contrary, it passes between points, it comes up through the middle . . . A becoming is neither one nor two, nor the relation of the two; it is the in-between, the . . . line of flight . . . running perpendicular to both’ (Deleuze and Guattari, 2004, p. 323). Moreover, what goes for the kite-in-the-air, in its thinging, also goes for the flyer-on-the-ground. If the kite is not endowed with an agency that causes it to act, then neither is the human flyer. Like the kite, the human is not a being that acts—an agent—but a ‘hive of activity’ (Ingold, 2007A, p. 317), energised by the flows of materials, including the currents of air, that course through the body and, through processes of respiration and metabolism, keep it alive.² Like the kite’s line of flight, so the life-trajectory of the flyer follows a course orthogonal to any line we might draw connecting the kite as (quasi-)object with the flyer as (quasi-)subject.

In practice, then, flyer and kite should be understood not as interacting entities, alternately playing agent to the other as patient, but as trajectories of movement, responding to one another in counterpoint, alternately as melody and refrain. We could say the same of the builder, in relation to the brick and mortar of a house under construction, the gardener in relation to the soil in his or her beds, the cook in relation to the ingredients of a pie, and the painter in relation to pigments and oils. Daniel Miller, a leading figure in the study of material culture, has argued that it is by studying ‘what people do with objects’ that we can best understand how they create worlds of practice (Miller, 1998, p. 19). However, neither brick nor mortar, nor soil, nor the ingredients in the kitchen, nor paints and oils, are objects. They are materials. And what people do with materials, as we have seen, is to follow them, weaving their own lines of becoming into the texture of material flows comprising the lifeworld. Out of this, there emerge the kinds of things we call buildings, plants, pies and paintings. In the very first move that isolates these things as objects, however, theorists of material culture have contrived to rupture the very flows that brought

¹ Further reflection led us to conclude that the kite had never been an object in the first place, although it had seemed like one. Instead, we came to think differently about our process of making. We saw it less as an assembly of elementary components into a final composite, and more as a binding of materials each of which had particular dynamic properties—of runniness, stickiness, rigidity, flexibility and so on—calling in our work for specific bodily postures, gestures and manoeuvres.

² In this sense, of course, there is no opposition between persons and things. Rather, persons are things too or, as Timothy Webmoor and Christopher Whitmore put it, ‘Things are us!’ (Webmoor and Whitmore, 2008).

them to life. The ‘problem of agency’ is thus one that they have created for themselves, born of the attempt to re-animate a world already rendered lifeless by an exclusive focus on the ‘objectness’ of things. There is a world not of things that exist in the throwing, but in which the die is already cast. It is indeed striking that the more theorists have to say about agency, the less they seem to have to say about life. To rewrite the life of things as the agency of objects is to effect a double reduction, of things to objects, and of life to agency. And the source of this reductive logic lies in the hylomorphic model.

4. Sawing planks

My aim is to restore things to life and, in so doing, to celebrate the creativity of what Klee (1973, p. 269) called ‘form-giving’. This means putting the hylomorphic model into reverse. More specifically, it means reversing a tendency, evident in much of the literature on art and material culture, to read creativity ‘backwards’, starting from an outcome in the form of a novel object and tracing it, through a sequence of antecedent conditions, to an unprecedented idea in the mind of an agent. This backwards reading is equivalent to what anthropologist Alfred Gell has called the *abduction of agency*. Every work of art, for Gell, is an ‘object’ that can be ‘related to a social agent in a distinctive, “art-like” way’ (Gell, 1998, p. 13). By ‘art-like’, Gell means a situation in which it is possible to trace a chain of causal connections running from the object to the agent, whereby the former may be said to index the latter. To trace these connections—to look through the work to the agency *behind* it (see Knappett, 2005, p. 128)—is to perform the cognitive operation of abduction. From the argument set out in the previous paragraphs it should be clear why I believe this view to be fundamentally mistaken. A work of art, I insist, is not an object but a thing and, as Klee argued, the role of the artist—as that of any skilled practitioner—is not to give effect to a preconceived idea, novel or not, but to join with and follow the forces and flows of material that bring the form of the work into being. The work invites the viewer to join the artist as a fellow traveller, to look *with* it as it unfolds in the world, rather than behind it to an originating intention of which it is the final product.

Following, Deleuze and Guattari observe, is a matter not of *iteration* but of *itineration* (Deleuze and Guattari, 2004, p. 410). Artists—as also artisans—are itinerant wayfarers. They make their way through the taskscape (Ingold, 2000B, pp. 194–200) as do walkers through the landscape, bringing forth their work as they press on with their own lives.¹ It is in this very forward movement that the creativity of the work is to be found. To read creativity ‘forwards’ entails a focus not on abduction but on *improvisation* (Ingold and Hallam, 2007, p. 3). To improvise is to follow the ways of the world, as they open up, rather than to recover a chain of connections, from an end-point to a starting-point, on a route already travelled. Here are Deleuze and Guattari again:

One launches forth, hazards an improvisation. But to improvise is to join with the World, or to meld with it. One ventures from home on the thread of a tune. Along sonorous, gestural, motor

¹ I emphasise that this is so even if they are following directions laid down in a plan, score or recipe. In practice, planned action and itineration are not alternative procedures. The practitioner does not have to choose between one and the other, or to find some way to combine them. This is because directions do not, in themselves, tell practitioners what to do. A signpost means nothing until it is placed somewhere in the terrain. Likewise, every direction draws its meaning from its placement in a taskscape that is already familiar thanks to previous experience. Only when so placed does it indicate a trail that can practicably be followed. And to proceed from one direction marker to the next, practitioners have to find their way, attentively and responsively, but without further recourse to explicit instruction (Ingold, 2001, pp. 137–8).

lines that . . . graft themselves onto or begin to bud “lines of drift” with different loops, knots, speeds, movements, gestures, and sonorities (2004, pp. 343–4).

Life, for Deleuze and Guattari, issues along such thread-lines or lines of drift. Along them, points are not joined so much as swept up and rendered indiscernible in the current of movement (Deleuze and Guattari, 2004, p. 324). Life is open-ended: its impulse is not to reach a terminus but to keep on going.

Elsewhere (Ingold, 2006), I have illustrated the difference between iteration and itineration with the example of sawing through a plank of wood. Sawing a plank is like going for a walk. In walking, steps do not follow one another in succession, like beads on a string. Rather, every step is a development of the one before and a preparation for the one following. The same is true of every stroke of the saw. Moreover, just as no two steps are quite the same, so too, every stroke is a little different. As the cut proceeds, the force, amplitude, speed and torque varies, albeit almost imperceptibly, from stroke to stroke, as does the posture of the body and the muscular-skeletal configurations of tension and compression that keep it in balance (Ingold, 2006, p. 74). From a point of view external to the action, it may look as though the carpenter is merely reproducing the same gesture, over and over again, or that sawing is just the repetitive execution of a single step in the operational sequence (*chaîne opératoire*) involved in, say, making a bookcase. For the carpenter himself, however, who is obliged to follow the material and respond to its singularities, sawing is a matter of engaging ‘in a continuous variation of variables, instead of extracting constants from them’ (Deleuze and Guattari, 2004, p. 410). The carpenter who has a feel for what he is doing is one who can bring the many concurrent variations with which he must engage more or less into phase with one another.¹ This calls for continual correction, in response to an ongoing perceptual monitoring of the task as it unfolds (Ingold, 2006, pp. 76–7). That is why no two strokes are identical. And it is also why sawing has a rhythmic quality. For there to be rhythm, movement must be *felt*. Rhythmicity, as the philosopher Henri Lefebvre argues, implies not just repetition but *differences within repetition* (Lefebvre, 2004, p. 90). Thus there is no rhythm in the perfectly iterative rotations of the mechanical cutter. The mechanism feels nothing and is wholly unresponsive to what is going on while it rotates. The same is true of the oscillations of the pendulum or metronome. Iteration is metronomic, itineration rhythmic.²

Let us imagine the carpenter in his workshop, in a village high in the French Alps, where the art critic, novelist and painter, John Berger, has made his home. The workshop, or *charpente*, occupies the second floor of one of the outbuildings of an old farm. Its floor,

¹ Charles Keller has described what he calls the ‘playing out’ phase of artisanal activity, such as in silversmithing and weaving, in terms ostensibly similar to mine. ‘What appears to the observer to be a linear series of steps, a *chaîne opératoire*’, Keller argues, ‘is a complex reciprocal process for the practitioner’ (Keller, 2001, p. 27). But behind the similarity lies a fundamental difference of approach. For Keller remains wedded to a mentalist view of action according to which for every movement there is a corresponding ‘kinaesthetic image’. The challenge for the practitioner, then, is to coordinate the images rather than harmonise the movements themselves.

² It might be objected that the distinctions I draw here between the handsaw and the rotary cutter, and between the arm of the carpenter and that of the pendulum, are arbitrary and without foundation. In the real world, mechanical contrivances are sensitive to environmental perturbations, just as people are. A pendulum, for example, may respond in its swing to the contours of the surface on which it is mounted, as well as to air pressure, heat and humidity. Even the metronome may not be truly metronomic. But while I would concede that the perfect machine is an ideal that cannot be realised in practice, the mechanical ideal is nevertheless driven by an aspiration of systemic closure. While in operation, the machine is designed to be as exact as possible in the execution of a course determined by settings fixed in advance. It *should* not feel anything even though perhaps it does.

walls and roof-beams have been hewn from timber, just as have the planks on which he now works. You can see in the beams traces of the movements of the axe that cut them, following the grain that reveals the provenance of every beam from a tree once growing in the forest. The *charpente*, Berger observes, is ‘filled with time’. There is the time it took for the trees to grow, the time to let their wood dry, the time to build with them and—now that the building has reached the end of its useful life and its planks can fetch a good price elsewhere—the time spent putting away, taking out and pulling down (Berger, 2005, p. 139). But why does Berger choose to include the story of the *charpente* in a dialogue with his daughter, Yves, on the subject of *drawing*? The clue comes right at the end: ‘*Le dessinateur comme charpentier. Le dessin comme forêt?*’ (Berger, 2005, p. 144). Could it be that drawing is an activity like carpentry, or even that there is a parallel between the drawn lines of a sketch and the lines of growth of living trees? I believe the parallel is apt, and that a consideration of drawing can serve very well to bring out the itinerant, improvisatory and rhythmic qualities of making as a way of working with lines.

5. Drawing lines

The act of drawing, Berger argues, is intrinsically dynamic and temporal, leaving its traces ‘as eddies on the surface of the stream of time’ (Berger, 2005, p. 124). It is about becoming rather than being. You cannot *be* a mountain, or a buzzard soaring in the sky, or a tree in the forest. But you can *become* one, by aligning your own movements and gestures with those of the thing you wish to draw, as Heidegger would say, in its ‘thinging’. ‘It’s a flowing’, says Berger, and at the same time, a ‘continuous correcting’ (Berger, 2005, pp. 124–5). The draughtsman with her pencil, just like the carpenter with his saw, must feel where she is going, and must continually adjust her gestures so as to maintain alignment with a moving target. Moreover, as with the mountain path, the buzzard’s flight or the tree root, the drawn line does not connect predetermined points in sequence but ‘launches forth’ from its tip, leaving a trail behind it. Or, as Klee famously put it, the line ‘goes out for a walk’ (Klee, 1961, p. 105). It has no end-point: one can never tell when a drawing is finished. In this regard, according to art historian Norman Bryson, drawing differs from painting—or at least from oil painting as it has developed in the Western tradition (Bryson, 2003, p. 149). The density and opacity of oil paint is such as to obscure the processes that led up to the work of art. All the revisions, alterations, erasures and false starts that went into making it remain hidden, buried under the surface that meets the eye. We are thus more inclined to treat the work as a finished object, and to treat it as an index of the intentions of the artist, as though the latter were linked to the former by a simple chain of cause and effect. In short, the painting predisposes viewers towards the logic of abduction.

But with drawing it is quite otherwise. For the drawn line is irretractable.¹ Once made it cannot be covered up. Other lines may be drawn over or across it, but it is still there for all to see, an indelible record of the pressure of the fingers on the pencil that made it, driven by the impatience, control or anxiety of the maker. In the ways it is both drawn and seen, as Elkins observes, any drawing is strongly tactile, ‘an archive of its maker’s muscles’ (Elkins, 1996, p. 227). Thus, drawing leaves nowhere to hide. ‘Relentless, it forces everything into the open’ (Bryson, 2003, p. 149). Whereas a painting exists ‘in the tense of the completed past’, in drawing the time of completion never arrives. It is always ongoing, always work in

¹ It is true that lines drawn with a pencil can be erased. But rubbing out, as an action, has a quite different quality from drawing. The movement entailed is one of scrubbing rather than tracing, and is oriented to surface rather than line. It is in this sense akin to painting over. Complete erasure, however, is almost impossible, since the pencil leaves its mark as a groove in the paper.

progress. The last line to have been drawn is never the last line that *could* have been drawn: even that final line 'is in itself open to a present that bars the act of closure' (Bryson, 2003, p. 150). And so drawing carries on, dicing with the hazards of improvisation, tracing a path that runs not from an image in the mind of a maker to its expression in the material world but orthogonally, looping in and out between mind and paper rather as a swimmer dives into water and comes back up for air (Berger, 2005, p. 125), or as the embroiderer's thread loops over and under in stitching. The mark on paper, writes Bryson,

leads as much as it is led: it loops inward from the paper to direct the artist's decision concerning the line that is next to be drawn, and loops back out, as a new trace on paper, *sewing* the mind into the line, binding mind and line in a suturing action . . . into a knot that grows tighter and tighter . . . Every drawing that is made re-enacts the same fatal rhythm, following an open expanse . . . that gradually yields to a network of lines that close in on the drawing and pull the net tight, immobilizing the design (Bryson, 2003, pp. 154–5).

I would like to suggest that what Bryson says of drawing applies generally to the skilled practice of making things. This, in turn, gives us an answer to a key question posed by social anthropologist Karin Barber. In a world of fluid process, how can emergent forms be made to last? What makes things stick (Barber, 2007, p. 25)? Our answer is that it is not because of the inertia of the materials of which they are made that things endure beyond the moment of their emergence, but because of the contrary forces of friction that materials exert on one another when they are ever more tightly interwoven.

In conclusion, however, I would like to return to the 'lineaments' of Alberti. For on the face of it, these abstract, conceptual and intangible lines could not be more different from the marks made by carpentry, drawing or embroidery, with all their vivid presence, dynamism and tactility. The lines of Renaissance art and architecture did indeed come to lie *in between* mind and world, projected onto paper as if on the glass of a window through which the viewing subject fixes his gaze on the objects of his attention. Yet even Alberti imagined these lines as threads, like those of a veil stretched between the eye and the thing seen, and so fine that they could not be split (Alberti, 1972, p. 38). In effect, Alberti's lineaments were threads pulled taut. The taut thread or string, as I have argued elsewhere (Ingold, 2007C, p. 159), was the precursor of the drawn line of architectural design, whose straightness was compared to that of a ray of light. Sixteenth century treatises on perspective even depicted sight lines as lines of tightly stretched thread, but with loose ends that betrayed their nature (Mitchell, 2006, pp. 348–53). The example of Chartres Cathedral, however, shows that the master-builders of medieval times were already stringing out lines on the ground, much as methodical gardeners still do today (Turnbull, 2000, pp. 53–87). But this string had first to be spun. Spinning, as Victoria Mitchell has pointed out, is itself a ubiquitous form of line-making, 'drawing out through the actions of the fingers and body a continuous trail of thread' (Mitchell, 2006, p. 345). In the turn from spinning a thread to stretching it from point to point lies the 'hinge' between bodily movement and abstract reason, between the textilic and the architectonic, between the haptic and the optical, between improvisation and abduction, and between becoming and being. Perhaps the key to the ontology of making is to be found in a length of twine.

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