**The Matter of Thinking: Material Thinking and the Natural History of Humankind**

**Matter without Materiality: The Algorithmic Turn**

In *The Human Condition*[[1]](#footnote-1)*,* Hannah Arendt described with concern the way in which images of process, algorithmic logics, formalism, and bureaucracy were already becoming privileged in contemporary life. She worried about the unworldliness, designed obsolescence of things, and atomic individualism that consumerist society was bringing in its wake, and the implications of the loss of *homo faber* and of things built to last, and the corrosion of public spaces. This has arguably been intensified in an era of big data, machine learning and automation of work. I do not raise these concerns in order to appeal to a nostalgic image of the human, although I want to hold on to a variant of *homo faber* as the technological species, whilst resisting those behavioural logics that risk reducing humans to a complex concatenation of data points, and education and learning to information processing. I wish to keep in mind the ways in which materiality, matter, and bodies can be occluded or forgotten, in particular when bureaucratic and computational modalities of thinking over-code different and distinct fields of knowledge, including those that have both constituted and cultivated the subject matters that have occupied human endeavour over millennia, whereby the learning is bound up with the doing.

The image of the student and the image of the worker are increasingly made equivalent. Virno[[2]](#footnote-2) claims that today the new wage labourer must exemplify ‘habitual mobility, the ability to keep pace with extremely rapid conversions, adaptability in every enterprise, flexibility in moving from one group of rules to another, aptitude for both banal and omnilateral linguistic interaction, command of the flow of information, and the ability to navigate among limited possible alternatives”, in short, “the habit of developing no durable habits at all”[[3]](#footnote-3). Elements of this image of the worker have gravitated into global policy discourses in education and research. The tendency to adopt forms of ‘info’ or ‘skills’ talk that abstract generic and transferable skills from specific practices can make it seem that that we are witnessing the dawn of a new era, not of Man as Machine, but Human as Algorithm. Although this paper won’t deal with the ‘algorithmic turn’ and our contemporary condition in detail, it raises questions about some of the implications of formal and procedural logics in other domains, such as education, when education itself appears to be evacuated of content. Even if education involves skills, it is not equivalent to skills acquisition. One becomes educated about something, or rather many things, and knowing, thinking and understand require intimacy with the subject matter; it is the practice of engagement through which we encounter the world, the stories of the past, the natural history of humankind.

Information talk and skills talk risk ushering in a new Cartesianism if they intimate, through metaphor and image, that information and skills can exist not only exist without bodies, organisms, artefacts or matter but also can have causal agency despite such abstract character. The discourses and the practices that emerge from the language of ‘skills talk’ risk both ‘thinning’ and proliferating experience because they have little too hang on to, and because reaction times and demands on our attention are accelerated. We are technical beings but we are also finite animals, organisms with limited capacities for integrating that which we encounter, perceive and undergo. If, as authors like Berardi[[4]](#footnote-4) argue, we are witnessing a de-materialising turn in relation to areas as diverse as education, work, and biology, it may be helpful to move from the meta-discourses about thinking and skills in order to explore some of the ways in which thinking is described by those engaging in the practice of thinking across a range of domains. Drawing attention to pluralistic and material practices of thinking helps to contest charges of both anthropocentrism and crude relativism by encouraging awareness of the ways that humans, things and other organisms are embedded and entangled in relationships at multiple levels from the bacteria that populate bodies to the retina’s relationship with light waves. A pluralistic, emergent and attenuated approach to thinking understands all thinking with, through and about a subject matter as material and contextual, be it working with symbols in logic or mathematic equations or gesture in choreography. It does not seek to too swiftly sever the epistemological from the ontological which in turn helps to keep thinking from being emptied into the kind of formal abstraction suggested by terms like generic skills which suggest that mastery and capacity is possible without the intimacy ordinarily entailed in the development of knowledge of and in a subject matter in a concrete situation. This is why this matters for education.

These new curious figures of student, researcher and worker intimated here are reminiscent of a story called “The Great Swimmer” from Kafka’s unpublished notebooks[[5]](#footnote-5). He writes,

Hail the great swimmer! Hail the great swimmer!" the people shouted. I was coming from the Olympic Games in Antwerp, where I had just set a world record in swimming. I stood at the top of the steps outside the train station in my Hometown - where was it? - and looked down at the indiscernible throng in the dusk [..] "Honored guests! I have, admittedly, broken a world record. If, however, you were to ask me how I have achieved this, I could not answer adequately. Actually, I cannot even swim. I have always wanted to learn, but have never had the opportunity. How then did it come to be that I was sent by my country to the Olympic Games? This is, of course, also the question I ask of myself.[[6]](#footnote-6)

At first glance the story seems absurd, however, it is not so far removed from contemporary images of work, research and study today. Tim Ingold[[7]](#footnote-7) states that “A skill like playing the cello, being a property of the organism established through practical experience in an environment, is every bit as ‘biological’ as walking on two feet”[[8]](#footnote-8). It is, however, the importance of practical experience that is key here. Even if skills become transferable, in some sense, they begin in practice.

The language of generic skills when uncoupled from material practices risk evacuating thinking of its substance and subject, focusing on the isolated individual, as though skills can be evaluated in abstraction from their exercise. Conceptualising skills as a form of material thinking underlines that skills involves thinking *with* something. I take up this specific issue to ask whether this discourse is symptomatic of a wider ‘dematerialising’ turn across a range of spheres of life and knowledge. A pluralistic approach that considers the practice and experience of thinking, as well as knowledge, will not be satisfied by a call for diverse epistemologies. What matters is to ensure that skills talk in education is embedded in the material practices of thinking be it in the sciences, social sciences or humanities. With William Connolly[[9]](#footnote-9) and Jane Bennett[[10]](#footnote-10), I am interested in a more delicate, irreverent ethics of responsiveness to organic and inorganic matter, playful experimentation with and exploration of matter, and perceptual openings to those relational qualities that reveal the expressive bodily materiality of existence shared by humans and other things, existents, and forces, sentient and otherwise.

This is, in certain respects, familiar territory. A good deal of criticism has been levelled at the idea that knowledge can and must be ‘abstract’. Francisco Varela argues that “proper units of knowledge are primarily *concrete*, embodied, incorporated, lived” as he articulates an enactive approach to cognition that emerges from practical engagement with the world[[11]](#footnote-11). Ingold states “[..] there can be no absolute division of method and objective between studying the lives and works of humans and of nonhumans. Why, then, should the participatory and interpretative approaches of the arts and humanities be limited to the study of human subjects? And why, conversely, should the observational and explanatory approaches of science be limited to the domain of nonhuman “nature”? Why, indeed, should these approaches be separated at all?”[[12]](#footnote-12). However, the purpose of this essay is rather more limited focusing simply on trying to communicate something of what it might mean to think *with* something as a counter-balance to generic skills talk.

**Bringing Thinking to Life**

Understanding thinking as a practice involves paying attention to both the *matter* of thinking and the ways in which thinking itself is *material,* for example, in philosophy, sound, film and metalwork. This is rather different from some of the ways in which *thinking something* has been conceptualised. For example, Gadamer described Martin Heidegger’s pedagogical approach in class as he philosophises aloud in class, noting, “One need only recall the way Heidegger approached the lectern - the excited and almost angry seriousness with which his thought was ventured, the way he glanced askance at the window, his eyes only brushing over the audience, and the way his voice was pushed to its very limit in all of the excitement”.[[13]](#footnote-13) This exemplified for his students, his thinking in action, visible, palpable, through the vibrations of the voice, following the concepts he created in speaking as though simultaneously trailing and tracking them. The thinking experience involves the most heightened and exhilarating feeling of being alive, says Hannah Arendt, describing Heidegger’s ‘passionate thinking’ as the idea of having ‘thought *something’* rather than ‘thought *about* something’. But what does it mean to ‘think *something*’? Whilst this image of the vitality of the experience of thinking captures something of what I want to suggest by material thinking, Arendt does not fully pursue the idea that thinking might be a material practice and that thinking *with* something might preserve such liveliness. ‘Thinking *something’*, for Arendt, requires that *something* be de-sensed as the mind withdraws from the body to think.This kind of passionate thinking, framed as thinking *something,* is not the same as the *material* thinking of thinking *with* something understood as practices of thinking embedded in concrete and specific contexts such that the genesis of thought is informed by an on-going interplay with its material. There are different kinds of ideas depending on the field in which one works, and ideas do not translate readily from one to the other.

Taking up the distinction between thinking *something* and thinking *about* something by offering the idea of thinking *with* something can help to begin to map qualitative and experiential differences between the different kinds of thinking in which one engages if one is, for example, writing philosophy, making an artwork, building a cabinet, studying the *drosophila,* or editing a film. In a short piece called “What is the Creative Act”,[[14]](#footnote-14) Deleuze elaborates on the specificity of ideas and the ways in which they are manifested differently depending on the expressive potential of the matter of thought. He says that “Treating philosophy as the power to ‘think about’ seems to be giving it a great deal, but in fact it takes everything away from it. No one needs philosophy to think […] If philosophy has to be used to think about something, it would have no reason to exist. If philosophy exists, it is because it has its own content”.[[15]](#footnote-15) For Deleuze and Guattari, the specific task of philosophy is to create concepts. Deleuze writes,

No one has an idea in general. An idea – like the one who has the idea – is already dedicated to a particular field. Sometimes it is an idea in painting, or an idea in a novel, or an idea in philosophy or an idea in science. [..] Ideas have to be treated like potentials, already *engaged* in one mode of expression or another and inseparable from the mode of expression, such that I cannot say that I have an idea in general.[[16]](#footnote-16)

Thinking is material not because it needs something to ‘think about’, but because as a practice it is responsive to the different expressive potentials of the matter at hand. If, as J.J. Gibson[[17]](#footnote-17) suggests, we need the ‘education of attention’ in our studies, we also need to cultivate the education of the senses that allows for a deep encounter with a subject matter, and to develop the capacity for expression and manifestation that communicates the sense of ideas and discoveries. Subject matters have different relational qualities that emerge in encounters of bodies, things, ideas and organisms and through such encounters different forms of material thinking and different kinds of ideas come to be worked through and manifested. Andrei Tarkovsky[[18]](#footnote-18) once suggested that life’s logic is poetic rather than scientific. He hoped that he might communicate through the temporal material of film something of the sensed and felt elements of experience undergone through those subtle shifts that mark changes in perception, affect and perspective: ‘documentary precision’ and ‘mechanical accuracy’, in his view, bring us no closer to reality. He elaborates on the careful process involved in making a film, and the obstacles one faces: “[o]ften the director himself is so determined to be portentous that he loses all sense of measure and will ignore the true meaning of a human action, turning it into a vessel for the idea he wants to emphasise. But one has to observe life at first hand, not to make do with the banalities of a hollow counterfeit constructed for the sake of acting and of screen expressiveness”[[19]](#footnote-19). Properly speaking, the technical is itself creative: one needs to think about the distance of the camera, the long fixed shot, how one edits the temporalities of the piece, whether one allows the camera to linger on the face (Bergman), intersperse contemplative scenes of domestic interiors through the narrative (Ozu) or film photographs with a voice over (Chris Marker). Different sensitivities to the matter of film and to film’s potentials as a medium allows the director to develop his or her own individuality and style of expression, thought, temporality, materiality, and sensibility. Likewise, there are many diverse forms of expression in poetry and literature – it makes a difference when a line runs into another stanza rather than retaining a sense of autonomy within a given verse, and or one uses ellipses, or plays with syntax, as in the work of Beckett in *Ill Seen, Ill Said[[20]](#footnote-20)*. “From where she lies she sees Venus rise. On. From where she lies when the skies are clear she sees Venus rise followed by the sun. Then she rails at the source of all life. On.”[[21]](#footnote-21) The possibilities are many. We could investigate the manifestations of the historical, the encounter with the archive, fossils, the conversation, the remnant, the coder, or oral histories with living beings that involve attentiveness to the stories of everyday life rather than monumental events.

Careful listening responsiveness to the (subject) matter before each of us invites new lines of enquiry and displaces the centrality of the human in an ongoing enquiry that is at the heart of the enterprise of knowing, thinking and understanding. This is what education should teach us. Tim Ingold writes that “[..] it is a fallacy—and one that is found very frequently in archaeological writing— to suppose that objects are ever finished in this sense. For one thing, their forms are not imposed by the mind, but arise within the movement of the artisan’s engagement with the material; another, in the course of being used for one purpose, objects may undergo further modification that make them peculiarly apt for another”[[22]](#footnote-22) He suggests that like humans, objects have histories, and that we ought to acknowledge rather better the ways in which relationships and practical engagement with one’s surroundings are formative and constitutive. A ‘blueprint’ model of design, by which an author or maker has an idea which then he or she realises, fails to comprehend the ways in which people both wrestle with their subject matter and do not know how those engagements and tussles will end. Ingold describes the way in which learning occurs as alternately guided rediscovery, showing, and the education of attention. He reminds us that observation need not be that of the distanced spectator but “requires the observer to place himself or herself, in person, in a relation of active, perceptual engagement with the object of attention [..] There can be no observation without participation, no explanation without interpretation, no science without engagement”.[[23]](#footnote-23)

**APPRENTICESHIPS IN THINKING**

Practices of thinking in different fields involve acts of both discovery and creation. Philosophers like Gilbert Simondon[[24]](#footnote-24) and Jane Bennett have questioned the value and validity of hylomorphic approaches to thinking about matter by which (active) form shapes (passive) matter. Analogously, the image and language of ‘transferable’ or ‘generic’ skills’ imply that skills can be not only uncoupled from material practices but even developed without any subject matter, operating effectively regardless of context, or any content. Bennett prefers, she says, encounters with creative materiality that anyone who is intimate with *things* experiences. She includes in her list artisans, mechanics, cooks, builders and cleaners, though we could readily extend that list to the ‘things’ of the humanities and the sciences more broadly. The intimacy of the relation of metalworkers with their material allowed them to discover the ‘polycrystalline structure’ of non-organic matter. Through a tacit knowledge of their ‘protean activeness’, metals could be worked with and upon. This image of creative materiality can be extended beyond the examples offered by Bennett in order to follow the inter-play of practitioner in any field with the material with which they are in dialogue. There is skilfulness in those practices but it is embodied, embedded, emergent and contextual, as described so well by Evelyn Fox Keller[[25]](#footnote-25) in her biography of Barbara McClintock. It is an immanent process through which each question and intervention opens up different possibilities for understanding and action. Skills do not exist in an ether divorced from the exercise and practice of specific embedded and embodied activities.

Susan Oyama[[26]](#footnote-26) is concerned by the ‘de-substantialisation’ of her field of knowledge – developmental biology in a way that resonates with some of our discussions of skills talk and education. She takes issue with the way in which the language of genetics appears to be able to do without materiality. The following quote illustrates this tendency, “Genetic information is said to be weightless and independent of its material substrate; for evolutionary biologist G.C. Williams it dwells in a “codical domain” separate from the physical one”.[[27]](#footnote-27) Richard Dawkins[[28]](#footnote-28) claimed that “life is just bytes and bytes and bytes of digital information”[[29]](#footnote-29),“[...] a river of information, not a river of bones and tissues: a river of abstract instructions for building bodies, not a river of solid bodies themselves. The information passes through bodies and affects them, but it is not affected by them on its way through.”[[30]](#footnote-30) This is not meant to offer a metaphor for life but is meant to be taken literally. Oyama calls this kind of talk ‘info-talk’ whereby information’s power seems to stem from (a magical) abstract immateriality. She argues that information is deified in the work of people like Dawkins and Daniel Dennett[[31]](#footnote-31), saying that, “The sprawlingly heterogeneous usage of information has only been touched on here, and part of my point is that the search for a one-size-fits-all organizational principle is misconceived”[[32]](#footnote-32). She notes that “[r]hetorically making matter disappear also encourages neglect of the histories and concrete arrangements - time and space - that generate biological marvels, and makes it harder to communicate them effectively”[[33]](#footnote-33)

Although Oyama is speaking about information in this passage, her words are instructive for those of us concerned by the de-materialising turn in skills talk and its implications for education. She writes, “But information is not some mysterious stuff, capable of being transmitted from one place to another, translated, accumulated, and stored; rather it goes out of kinds of relations. For Gregory Bateson[[34]](#footnote-34) information is a difference that makes a difference. This invites questions: a difference in what (What are you paying attention to?), about what (what matters?), for whom (Who is asking, who is affected?). Asking these questions leads us to focus on the knower, a knower who always has a particular history, social location and point of view”.[[35]](#footnote-35) Oyama claims that scientific knowledge has been habitually disembodied and the use of the passive voice erases the context specificity of the knower, including her cares, interests, perspectives, worries and power relations such that we forget even the romance of discovery described by Whitehead[[36]](#footnote-36). This reveals the operation of the politics of knowledge; questions can become framed in such a way so authoritative that no dissent is brooked, foreclosing other ways of describing the relation to knowledge, to practice and to skilfulness in different fields and domains. Oyama, however, states her position even more strongly. Speaking of biology, she asks that rather than seeking timeless truths, we might come to “appreciate *particular* perspectives as vehicles for empathy, investigation, and change [..]”.[[37]](#footnote-37)

It is not only those working in the sciences who must respond to and think with their subject matter. Those of us engaged in study, research and practice in the arts and humanities will be familiar with the experience of resistance and ambiguity of the material with which we are dealing. Much as we might *like* to make an argument or offer a particular interpretation, the material can be recalcitrant; it won’t be forced into a position it doesn’t ‘like’. We undertake careful processes of writing and of editing. We work to develop ideas, interpretations and arguments. We try to frame in a way that is generous and faithful to the subject matter. We try to ensure some kind of continuity or resonance between different elements, even in forms of experimental writing or philosophy. We seek ways for heterogeneous elements to communicate in installation and film. This is a matter of co-construction and interaction that also involves an ethical dimension. Oyama says, “Our cognitive and ethical responsibilities are based on our *response-ability,* our capacity to know and to do, our active involvement in knowledge and reflection”.[[38]](#footnote-38) Irresponsible approaches might include making ungrounded claims and statements and refusing to look at alternative arguments in a field like philosophy.

Isabelle Stengers[[39]](#footnote-39), Susan Oyama and Elizabeth Grosz[[40]](#footnote-40) offer alternative visions of philosophy that are born of different ways of thinking about method and understanding in the sciences and the humanities, drawn from practice and description. Rather than policing disciplinary boundaries, these thinkers are critical of dominant descriptions of the practice of research and thought in these domains. Such insights are particularly useful as we reflect once more on what it is that we *do* in the humanities, the arts, and the sciences. Of value are sustained engagement, the cultivation of skilfulness, the capacity for judgement and the kind of creative responsiveness that slowly emerges through deep and intimate familiarity with a subject matter that in turn may allow for trans-disciplinary encounters. This kind of skilfulness cannot be taught in abstraction from content nor is it readily transferable to other domains. Rather, the sustained interplay and dynamic relation with subject matter is creative of an immanent process of thought that is attentive to the *matter* of thought. When Oyama argues against reductionist conceptions of genes as sole causal factors or drivers of evolution in favour of a nuanced, context-driven constructivist interaction model of evolution, she argues that this is more faithful to the complex and material development of living beings, whilst Grosz’s turn to Darwinian sexual selection allows her to frame the pursuit of understanding in the sciences and humanities in a language that is non-instrumental: just as the bird cannot justify its song, it is a madness to ask humans to justify the many forms of expression and interest that are constitutive of this human animal as a linguistic, cultural, social, artistic, creative form of life.

**Material Thinking: The Matter of Thought**

It is important to become better attuned to the inhuman, pre-human and post-human dimensions of the human and to reflect on the risks of methodological imperialism by exploring the ways in which the sciences can become and have become ‘humanised’ through, for example storytelling. It would be not only an empirical error but a serious mistake for the humanities to see itself as having a somehow separate and special vocation from the sciences. The humanities have a tendency to make a *tabula rasa* of their forbearers, forgetting the human is animal, a living organism, part of a long evolutionary lineage, co-emergent with multiple forms of life and matter, co-emergent with the technologies that change human capabilities. So too Stengers asks scientists to allow themselves to be “confronted with the manifold richness that they have for so long given themselves the right to forget. From now on, they will be faced with the problem that some have wanted to reserve for the human sciences – whether it be to elevate or to diminish them – the necessary dialogue with preexisting knowledges concerning situations familiar to everyone. No more than the sciences of society can the sciences of nature forget the social and historical roots that create the familiarity necessary for the theoretical modelising of a concrete situation”[[41]](#footnote-41) This she describes as a poetic listening to nature, using ‘poetic’ in its etymological sense. Her emphasis on the concrete situation is important here. The form of engagement is determined by the concrete materiality of the situation and it is important to consider reasons that might be offered for decisions made to bracket, suspend or ignore aspects of that situation, such as the weather, or the soil.

Whatever subject matter we have come to love, we may feel an affinity with the words of Shirley Strum when she says “to understand them I take the risk of loving them, that is of being transformed by them”. Strum here speaks of her baboons in a way at odds with discourses that emphasise neutrality, a particular form of objectivity, or a replicable methodology. In this respect, Stengers’ descriptions of Nobel Prize winning molecular scientist, Barbara McClintock, allow us to articulate, and feel more confident in doing so, what it is that we do in the arts and humanities and the qualities of the kinds of responsiveness that the materiality of our different disciplines requires, rather than trying to translate our practices to fit into other languages and methodologies. She writes that “McClintock tracked down the singularity of the genetic material of the corn she was studying, she defined it with precision and relentlessness [..]”[[42]](#footnote-42) She names her “intense jubilation”, her empathy, which enabled her to descend ‘into’ the cells she was examining”, allowing her to *understand* in “the most intimate sense of the term”.[[43]](#footnote-43) McClintock laughed when her corn surprised her. For her, corn was capable of reacting.

Evelyn Fox Keller writes that “the research readily takes on the appearance of a conversation: the riposte has all the unexpectedness and charm that one finds in the response of an intelligent interlocutor”[[44]](#footnote-44) McClintock says, “If only we were content to let the material speak”[[45]](#footnote-45) but one has to learn how to ask the right questions and be open to the material. Stengers contemplates this saying, “But from the moment she chose to no longer make use of corn but to learn ‘with’ it…”[[46]](#footnote-46)It is one of the tasks of any practitioner to come to learn *with* the material, be it archives, a body in a yoga posture, the grain of wood or the genesis of a philosophical concept. This develops through experience, sustained engagement and openness to a wider range of factors than might be deemed relevant to understanding in a specialised domain.

In this respect, Stengers describes corn’s entangled histories, “its reproduction, its development, [..] its growth in the fields where it experiences the sun, the cold, predatory insects and so on” saying “Indeed scientists should not accumulate ‘neutral’ observations about corn, but learn from it which questions to ask it, because like every historical being, corn is a singular being. And to say ‘corn’ is already to say too much [..]” (ibid, 127). What is special for her about the science of evolution is that it precludes the power to judge *a priori*, as it discovers the need to put to work a more and more subtle practice of storytelling. McClintock helps us to gain a sense of the practical effort at understanding as experienced by the scientist, and her passionate commitment to understanding her subject without that understanding becoming subordinated to a further justificatory *‘for’* something else.

Grosz’s depiction of the humanities also resists instrumental language. She wonders what intellectual revolution would need to occur such that humanities might be re-imagined “to make man, and the various forms of man, one among many living things, and one force among many, rather than the aim and destination of all knowledges [..]”.[[47]](#footnote-47) As she seeks out the ‘inhuman’ in the humanities, and the affinities with other sentient beings (and for Bennett this also would include inorganic matter from chemical compounds to basalt or tin cans), she does not try to justify the humanities by appealing to their utility in cultivating character, citizenship or competence. The expressiveness of diverse forms of life, as described in the writings of Darwin, leads her to ask: What if the borderline between the humanities and sciences were to become less secure, more open, more interactive without being reductionist on either side? Oyama, Ingold, Grosz and Fox Keller invite us to begin to dismantle a nature/culture divide or a gene/organism divide that abstracts certain entities, giving them causative power, as though they could exist beyond the material world with which they co-evolve. What if we were to become better attuned to the eroticism of language, the sensuality it invites, be in birdsong or poetry, and the pleasures it create? Grosz turns to Darwin’s writings on sexual selection to show how Darwin clearly distinguishes sexual selection from natural selection. Tool-making, seduction, language, decoration, love, curiosity, pleasure are not specific to the human species and to reflect on these areas of common endeavour and experience allows us to dismantle the abyss of separation between the human and the animal. But it also gives us, if we explore it, the opportunity to see that the efforts to justify these forms of endeavour, by appealing to other reasons or causes for their existence, would be to force one into a position that life itself demands justification. Engagement in these activities is part of what it is to be a living human being, just as the bird sings or the beaver builds a dam.

**In Conversation with Matter**

In the sciences and the humanities, we develop skilfulness through engagement and conversation with our subject matter. Thinking *with* something undoes the notion that thinking only takes place in the mind. It demands a dialogical, rigorous and sensitive disposition and a skilfulness that needs something ‘other’. The language of probing, inquiry and investigation seem, sometimes, to rather better communicate this. Richard Sennett’s comments in *The Craftsman[[48]](#footnote-48)* are useful in this respect. Although he focuses on the making of concrete things, his insights are also important for those domains such as the humanities that are sometimes wrongly construed as ‘immaterial’, as only ‘theory’. Such domains also involve a relation to the world, usually manifested in material forms such as texts, archives, film or voice. He asks “[w]hat the process of making concrete things reveals to us about ourselves’, adding ‘[l]earning from things requires us to care about the qualities of cloth or the right way to poach fish [..]”.[[49]](#footnote-49) Sennett’s sense of what it is to do something well involves a fidelity to the ‘thing itself’ and requires “skill, commitment and judgement”.[[50]](#footnote-50). If “every good craftsman conducts a dialogue between concrete practices and thinking”[[51]](#footnote-51), as Sennett argues, it might help to begin to re-conceive the practice of subjects in the humanities and sciences in terms of the material knowing and thinking of craftsmanship, not in terms of an pre-conceived end product, but in the sensitive manner in which a craftsman works with his or her material. Sennett makes the following arguments in respect of his understanding of skills. “[F]irst all skills, even the most abstract, begin as bodily practices; second; that technical understanding develops through the powers of the imagination”[[52]](#footnote-52). The process of learning involves learning from the resistance and ambiguity of the given material, and the facility to improvise develops over time. He argues against any simplification and rationalisation of skills, such as a teacher’s manual, because of our nature as complex organisms – manuals simply cannot capture the elements and relations at play.

What if we were to tell the stories of the matter of our subjects and why they matter, as teachers, students, and researchers, detailing the subtle practices of storytelling that they demand? We could communicate practices of thinking responsive and in dialogue with their material, the need for deep attention in study in these areas and the tension of this with the direction of contemporary life. We might tell of our reservations about the meaningfulness and relevance of much of the *a priori* skills language that abounds, our refusal to subordinate educational aims to the short-term objectives of business, and resist servicing dominant discourses by re-framing our research within an instrumental rationale. We could refuse to apologise, and ask how we might retrieve a sense of our world and the natural history of humankind, a history far richer than the caricature of *homo economicus.* We could ask what possibilities are offered to a human life to explore the world, becoming attuned to the human as a being in becoming, a human who is natural, historical, cultural, linguistic, expressive, desiring, creative and sensual. When we witness the expressiveness and lack of utility of so much of nature, why do we feel compelled to impoverish our understanding of human existence, and tie it to key performance indicators? Why do we feel we need to justify life? Cultivating skilfulness in material thinking returns us to the rich materiality of the world and to practices of education that allows us to singularise each of our existence with all the exuberant superfluity of life.

1. Hannah Arendt, The Human Condition. (Chicago: University of Chicago Press, 1958). [↑](#footnote-ref-1)
2. Paolo Virno, “The Ambivalence of Disenchantment” in Radical Thought in Italy. Eds. A. Negri and M. Hardt. (Minneapolis: University of Minnesota Press, 1996), 13-36. [↑](#footnote-ref-2)
3. Virno, 14. [↑](#footnote-ref-3)
4. Berardi, F. (2011) After the Future. Edinburgh: AK Press. [↑](#footnote-ref-4)
5. Kafka, F. (1978) Wedding Preparations in the Country and Other Stories. London: Penguin. [↑](#footnote-ref-5)
6. Kafka, 314-16. [↑](#footnote-ref-6)
7. Tim Ingold, “Beyond biology and culture. The meaning of evolution in a relational world”. Social Anthropology 12, 2004: 209–221; Ingold, T. (2011) *Being Alive: Essays on Movement, Knowledge and Description.* London: Routledge; Tim Ingold ‘From Complementarity to Obviation:  On Dissolving the Boundaries between Social and Biological Anthropology, Archaeology, and Psychology’ in Oyama, S., Griffiths, P. E., & Gray, R. D. (Eds.) *Cycles of Contingency: Developmental Systems and Evolution*. (Cambridge: MIT Press, 2001), 255-280; Tim Ingold, *The Perception of the Environment: Essays in Livelihood, Dwelling and Skill.*(London: Routledge, 2000). [↑](#footnote-ref-7)
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