Making as critical interrogation – An autobiographical reflection

It is nearly an insoluble pancake, a conundrum of inscrutable potentialities, a snorter. (O'Brien 1967)

I have been invited to contribute this self-portrait, I believe, because of my work on the cognitive dimensions of making practices. Here, I attempt to briefly explain how I came to that work. I was schooled (if you can call it that) at a very liberal art school in Adelaide, South Australia, nominally in sculpture. I say 'if you can call it that' because for three years (after the traditional foundation year), there were barely any classes and I recall being bemused at seeing my report card (when I bothered to look at it): I was getting A grades for classes I didn't know I was enrolled in. Out of wisdom or laziness, my teachers (all formalist sculptors) left me alone to do what I wanted. I am deeply grateful for that. It was the best possible thing I could have done at the time because it gave me time to establish a well-founded position, a working method and rigorous self-critique.1 I was sympathetic to the definition of art offered by Donald Brook, a local Anglo-Australian art critic: 'non-specific experimental modelling' (North 2006). 'Art' was for me a descriptor I could deploy that gave me license to pursue radically interdisciplinary practice-based research that to many appeared absurd.

As an undergraduate getting a first view of the art world, I recall saying 'I don't want to make cultural widgets for the gentry'. Then as now, I have a deep commitment to practice, but I cannot endorse the 'art world' socio-economic niche and the professionalized narcissism that it seems to encourage. While I know and respect a good many artists, I am suspicious of the 'wave-through' that is granted to someone (by some sectors of society) on the announcement that something they did is 'art'. All too often this seems like a free pass for sloppiness and lack of discipline in thinking or making. I've become increasingly reticent to identify myself as an artist or call what I do 'art'. I have a general suspicion that when someone calls their work 'art', it probably isn't. This leaves me in a bit of a dilemma when asked what it is I do. Today, I'd describe my practice as a combination of experimental design and engineering bricolage, with theoretical reflection.

The aspect of my art school education which I now value above all was the time I spent with Owen Broughton (one of three professors in the sculpture department at the South Australian School of Art, Adelaide), the things he taught me and the things I learned from him that he may have had no intention of teaching. Owen was a slight man, with curly white hair and an impossible stutter – he barked. Owen had been Henry Moore's foundry foreman and had been responsible for casting many of Moore's giant bronzes. He was a pacifist: when the Second World War broke out, he volunteered as a bomb diffuser. One day he saw his partner blown to bits. From then on, he had white hair and a terrible stutter. Owen was a treasury of knowledge about making and tools. He could tell you how the Romans cast bronze centurion's sandals or how Indians quarry granite with waterlogged wood. He brought his harmonograph to show us

and taught us how to survey land on horseback. He would present large exhibitions from his collection – one month it was drill bits of all sorts, medieval ones and straight fluted ones from the Rolls Royce factory. The next month it was files. He had a collection of barbed wire in an album made of masonite pages. He could say precisely where each was found, when it was made and what the machinery and process was. He was an amateur archaeologist and would take long trip into the desert in his old Land Rover searching for artefacts, which often wound up in the South Australian Museum. The only things in his small, austere office were an exquisite set of Platonic and Archimedean solids he'd made, arrayed on two shelves. I learned toolmaking at the forge with him, experience I treasure. I recall him telling me to hit the glowing work piece on the anvil, and when I did, he barked: 'No! HIT IT'. He grabbed the sledgehammer, raised it over his head and brought it down with alarming force. I think I stood wide-eyed at the show of strength and conviction from this little old man. Owen left me with a gift whose value has steadily increased – a fascination with tools and the sensibilities associated with them – the embodied knowledge of skilled tool use, that I now call the 'intelligences of the body'.

My 'practice' was all over the place, at least that is the way it seemed to others (as they sometimes told me). After nearly a decade building machine and kinetic sculptures, dabbling in painting and video, teaching myself electronics and establishing an Art+Tech collaborative (Virtual Object) in Sydney in the mid-1980s, I wound up landing a position at Carnegie Mellon University in Pittsburgh, PA – one of three centres of robotics and AI research in United States (the others being MIT and Stanford) where my title was professor of art and robotics (I used to joke that I was the worst professor of art and robotics in the world). This was in the early 1990s, when digital arts were just beginning to be recognized as the next big thing. In particular, there was much interest in the concept of interactivity.2 Later it occurred to me that I got the job at CMU because I'd been researching automated interactivity in/as art for the previous ten years, though neither I nor anyone else could name it, but I had an inchoate sense that the diverse things I was doing had a focus, even if I could not articulate it.

At the time, I was in the process of building my autonomous robotic artwork Petit Mal (1993). Petit Mal is an artisanal, 'bespoke' robot. Its form is unusual, derived from an eccentric design brief: I characterized it as 'a sculpture you could dance with'. My technical goals were in the spirit of the emerging school of 'bottom-up' or reactive robotics and the artificial life movement (which itself was a reaction to the collapse of first-generation artificial intelligence), but my ideas had arisen autonomously out of a deep sense of the importance of materiality, embodiment and bodily dynamics, a commitment I had developed, no doubt, through the previous decade working in performance and installation art, where the temporality and spatiality of bodily engagement were always part of the larger work.

I was disenchanted with the lumbering research robots around me as I was with what I regarded as technologically naive caricatures of robots by artists. Petit Mal had to be nimble and have charm and be truly autonomous. I didn't want to fake it. This meant I had to really understand what was going on at a deep level and design on that level. I set myself the task of

designing and building the whole thing from the ground up. I spent six months developing custom ultrasonic sensor circuitry – functionality you can now buy for $5 as an Arduino plugin.

Unlike today, there were no sophisticated hobby robotics components easily available on, for example, Amazon. Amazon didn't exist, the web didn't exist and robotics hardly existed. The great payoff of making it all yourself is that you are less likely to be sabotaged by assumptions buried in the device you are working with that are antithetical to your goals. Working with digital commodities today, one accepts choices that other people have made for you, based on spurious or irrelevant criteria. The ongoing commodification of hardware and software means that what you buy is designed based on mass market criteria of what will sell, what the market wants. I've never wanted what the market wants. To work with such 'stitched-up' commodities would be to make what the focus group had already decided you wanted to make. Digital paint-by-numbers! 'Normative art' seems to be a self-dismantling concept. To reverse-engineer such artefacts just got to be too much trouble, which is a major reason why I chose to stop working in the field in the mid-2000s.

As digital arts discourses developed, most of the voices talking about interactivity – in the art world and in the computer/culture world generally – were talking about sitting at a desk, poking at a keyboard while staring at a screen. To me, such work failed to critique or even acknowledge this highly constrained context for art: a business machine set in a bureaucratic work environment, a disciplined body, unable to move or even adjust focal length, an interface that reduced the enormous diversity of human action to poking 30 buttons. I saw the whole scenario as a laughable parody, and this informed my ongoing critique of computer culture. All my interactive work strenuously emphasized the material, the spatial and bodily dynamics, and staunchly avoided any use of keyboards or screens, or desks and chairs.

In building Petit Mal, I struggled in my attempts to build systems that attended to bodily affect. At first, I put this down to simple ignorance, but having become, by dint of hard work, a decent amateur hardware engineer, I chased 'bugs' – errors in technical realization. Increasingly, I realized that that the problems I was encountering were problems in principle: all computing hardware and software were built according to the assumption axiomatic to the discipline: it explicitly or implicitly endorsed a dualist separation of (dumb) matter and (immaterial) information. These hidden commitments were undermining my attempts to create dynamic affective experiences. I was committed to an integration of structures, mechanisms, electromechanical processes, analogue electronic processes and computational processes, which together – as an integrated system – were acting, were 'intelligent'. I was, intuitively, rejecting the Cartesian dualism that structured computer science, artificial intelligence (and conventional cognitive science of the reigning 'cognitivist' school). The kind of dynamic embodied knowing that I wanted to create was antithetical to the reification of disembodied information that is axiomatic in computing. As I've remarked since, the software–hardware dualism is the mind–body dualism. All my subsequent work – while on the surface an exploration of the potential for an aesthetics of interaction – was driven by an active critique of the rhetoric and the assumptions of AI and computer culture. I wanted to build machines that, as object lessons, actively contradicted, or at least critiqued, computational dogma. For me,

computing offered, above all, potential for exploring the possibility of an aesthetics of embodied interactivity. It was some time before I understood that this new aesthetic modality profoundly destabilizes the subject–object dualism that structures the traditional artwork–viewer relationship, because part of the art experience is the participant's awareness of their own behaviour, they are no longer a passive external viewer.

As I became more deeply immersed in the culture of computing, I was drawn more deeply into a study of the philosophical lineage of computing culture, and into generally held assumptions about human cognition. As with my work in robotics, this inquiry brought me into contact with cognition researchers who were, in different ways, rejecting Cartesian/internalist perspectives. This research (classed variously as situated, distributed, embodied, enactive and extended) – along with ethology, neuroscience, anthropology and science and technology studies – provided me with a set of arguments that I've amalgamated to address the schism I sensed in working with computer/robotic systems: computational rhetoric was antagonistic to a holistic sense of embodied experience, the epitome of which, from my perspective, is found in the arts, broadly construed. This was the subject of my book *Making Sense* (Penny 2017).

My critique of the internalist dualism of computer science has been driven by my experience of making practices. This brought me full circle to focus on (the cognitive dimensions of) embodied making. Along with the concepts of 'know-how' (Ryle 1949) and 'tacit knowledge' (Polanyi 1966), I have found the work of Tim Ingold insightful: *the skilled handling of tools is anything but automatic, but is rather rhythmically responsive to ever changing environmental conditions. In this responsiveness, there lies a form of awareness that does not so much retreat as grow in intensity with the fluency of action. This is not the awareness of a mind that holds itself aloof from the messy hands-on business of work. It is rather immanent in practical, perceptual activity, reaching out into its surroundings along multiple pathways of sensory participation.* (Ingold 2006)

I have become increasingly invested in understanding the nature of skilled bodily practices and in the process have come to see the distinction between intelligence and skill as yet another version of the mind–body hierarchy that privileges the (presumably) 'pure' abstract, over the materially engaged. This, in my opinion, is a pernicious fiction that has served to reinforce hierarchies in the academy, as in culture at large. No! We are bodies that grew brains in order to more adeptly engage with the world we live in. Awareness, judgement, experience is the exercise of intelligence that humans evolved to enact. Mental abstractions and manipulations of symbols are charming pastimes, but in terms of understanding the cognitive dimensions of human experience, they are red-herrings. I am with the machinist at the lathe, with the apiarist with their arms in the hive, with the stonemason and the shipwright and the sailor – I feel the texture of the brass as it is cut with a fine steel tip, I finesse the lifting of the frames as bees swarm about, my mind is at the tip of the chisel as it bites into the grain of the rock, and in my bicep as I swing the maul. I know the strengths and weaknesses of the grain of a specific timber and can design and work with it accordingly. I pilot my craft, deftly improvising a dance, moment by moment, with the buffeting waves and the invisible wind I sense in the follicles of the hairs on my face, constantly attuning the tiller and the sails.

Currently, I have three major research projects, all of which reflect my ongoing focus on embodied skill. The Orthogonal project is, like all my projects, multifaceted: over five years, I have built a radical 10 m (32 feet) sailcraft of my own design, loosely based on the principles of traditional Micronesian boat building. I hope soon to launch and test it. This project is nested inside a long interest in indigenous pacific navigation and seafaring, and activism to save these traditions before they are completely eradicated. I am designing and building a series of novel steam engines – this is the Greensteam project – sustainable steam-power for the C21st. Most recently, I am engaged, with Tom Fisher at Nottingham Trent University (and others), in study of the embodied skills of the "industrial crafts". We see these as historically and cognitively novel because these practices involve the offloading of cognition (as well as labor) onto externally powered and semi-automated machines. They therefore stand as the missing middle term in the transition from traditional artisanal crafts to human–computer interaction (HCI).

Simon Penny, Los Angeles, June 2020

References

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Notes

1.   Today, I work in an American liberal arts research university. I see students shuttled from class to class, calculating their expected grades to the second decimal point. I find this pitiable, and it leads me to question the value of the modern mass-campus educational model. Students (even in the art school) are given little opportunity to reflect on their own vision and mission, without which, it seems to me, developing an artistic practice, or even becoming a self-determining citizen, is impossible.

2.   See my Desire for Virtual Space for an overview of that exciting time: http://simonpenny.net/2010Writings/desireforvirtualspace.pdf.

3.   See http://simonpenny.net/works/petitmal.html.