PLYMOUTH COLLEGE of ART

Making Futures

The Campanologists Teacup: A Creative Collaboration of Technology and Making

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Introduction - Objects of Collaboration

Material arts, craft based practices and technological constructs influence, support and affect each other in multiple possible ways, each with their own historical lineage and associated aspirations or concerns. As two artists, Ingrid Murphy and Jon Pigott, who have both worked with technology as a core concern within our separate practices, we were excited by an opportunity to collaborate on a commission for an exhibition titled the Sensorial Object, which first opened in Cardiff's Craft in the Bay gallery in early 2015. The ambition of the exhibition to uncover new 'apertures of perception within and beneath our familiar daily experience' (Sensorial Object 2015) through materiality and objects of a domestic scale fitted well to our own common interests in developing a technologically enabled augmented and kinetic object based installation that would surprise and intrigue an audience. Murphy's work is broadly recognised as a ceramics practice, but one that for some years has been firmly engaged with digital technologies in its production, augmentation and conception. Pigott's work can be thought of as object based sound sculpture, using electro mechanics, kinetics and handmade electronics in its production. Prior to the invitation to collaborate for the Sensorial Object we had already identified commonalties in our modes of practice through teaching together on the BA Hons Maker programme at Cardiff Metropolitan University where we seek to represent equally both the traditional and technological sides of making.

Fig. 1. The Campanologist's Tea Cup. Image: I. Murphy

The Campanologist's Tea Cup was the title we chose for our collaborative piece shown in figure 1. An initial inspiration for the work came from the common practice of tapping or pinging a piece of ceramics and listening to the resulting sound in order to ascertain the inherent quality, value and material integrity of the object. This very practical application of the relationship between sound and material led to the idea of expanding and augmenting the moment of the ping into a real time kinetic sounding sequence of events, drawing attention to the inherent connection between material, form, sound and process, four themes already distributed equally across each of our individual practices. As can be seen in figure 1 and in the film documentation (The Campanologist's Teacup 2015), this relationship between ceramic material and sound is explored in the piece through five ceramic gramophone horn forms on plinths, each with a rubber ball suspended inside its throat. Positioned on a sixth plinth is a small bone china teacup that the audience are invited to tap or ping. With this simple, single interaction the five suspended rubber balls start to rotate eccentrically, driven by five small DC motors from which they are hung. With this eccentric rotating motion the balls bounce around the inside of the ceramic horns causing them to ring at a pitch which is defined by their thickness, their surface glaze and the temperature at which they were fired during production. There is a non-linearity to the nature of movement of the balls as they swing and bounce off the surface of the horns, and hence the tonal percussive sounds that are produced build a complex relational sonic arrangement across the five plinths. The overall sound is a soothing almost wind chime-like or bell-like effect that is entirely recognisable as being borne of a ceramic form. These sounds are also subtly amplified by contact microphones attached to each of the horns and through secluded speakers inside each of the end two plinths.

The narrow end of each of the ceramic horns culminates in a human ear form. This is a 3D scan that Murphy made of Pigott's ear, printed, slip cast and spliced onto each of the forms. This bodily appendage to the familiar form of the gramophone horn further develops the themes of the Sensorial Object in a surreal and uncanny way, posing questions around who or what is listening? and where does listening happen in a technologically mediated environment? For us The Campanologist's Teacup is a successful merging of our practices and it has so far proved an enduring and engaging piece for audiences of all ages through its technologically mediated and interactive nature as well as its material and formal presence.

We were pleased to partake in two further opportunities for exhibiting the piece following the Sensorial Object exhibition during 2015, including one at the British Ceramics Biennial (BCB) (British Ceramics Biennial 2015) in the disused Spode ceramics factory in Stoke on Trent. Here the piece took on another dimension as the ghostly sounds of chiming ceramics resonated around the reverberant disused industrial ceramics factory building (see figure 2).

Figure 2. The British Ceramics Bienniel Award show at the Spode Factory. Image : S.Dileu

Under the Skin – Electromechanical Systems as Craft Practice

The interactive and kinetic elements of The Campanologist's Teacup are enabled by a bespoke handmade electromechanical system based around the Arduino microprocessor board. This open source, programmable electronic device is a stalwart of the current maker scene allowing artists and designers to develop work that uses simple technological interactions and events through the support of a community of enthusiastic technologists making projects, information and advice available on the web. In The Campanologists Teacup the Arduino board senses the pinging of the teacup through a piezo electric contact microphone attached to the bottom of the cup.

The ping is recognised by the Arduino as a trigger signal to begin a short on / off switching sequence to the DC motors from which the rubber balls are suspended. The sound of the ceramic horns themselves is then a slightly separate concern of amplifying a further five contact microphones (also piezo electric transducers, one attached to each horn) through a small mixer (hidden inside the central plinth) and out to two loudspeakers hidden inside each of the outer two plinths. This simple and straightforward interactive electromechanical system, which runs on relatively lo-tech, nevertheless embodies a good deal of technical concerns. From the most simply observed problems such as how to prevent the rubber balls bouncing out of the gramophone horns, through to solutions for electronic noise suppression in the audio channels and electronic compensation for the sensitivities of different motors, this apparently simple system needed shaping, supporting, coaxing and crafting into effective operation.

One identifiable lineage of working directly with hand assembled electronic and electromechanical technologies within art practice, comes form the world of music and experimental composition. During the mid 1960s composers such as David Tudor and Gordon Mumma took up the hand building of electronic devices in order to explore possibilities in sound and music. This mode of practice, which can be viewed as merging the worlds of art, music and craft, happened from within a broader cultural context of artists like Robert Rauschenberg and John Cage working closely with systems engineers at a time of burgeoning computer power and emerging digital technology. Others working in a direct and hands on way with electronics at this time, as well as earlier in the twentieth century, include Robert Moog, Raymond Scott and Leon Theremin all of whom could be viewed as having a craft like relationship with electronic technologies, through a concern with sound. This type of relationship is in contrast to a 'hands off' model of technological consumption, non-user serviceability (or any type of serviceability), and enforced upgrade and disposal, which is common in today's technological landscape. As identified through the open source communities of Arduino however, the internet does provide a useful platform for maintaining and supporting a craft practice of electronics for those interested to partake.

Figure 3. The electromechanical innards of the plinth. Image : I. Murphy

A related example of somebody working equally across the fields of sound, music, art and craft is composer Harry Parch who since the 1950s turned to the forming of materials into unique sculptural musical instruments in order to realise his particular compositional aims, which involved unusual tuning systems. This marks a shift, similar to that identified with Tudor and Mumma, from conceptual composer artist writing scores to be performed on musical instruments made by craftspeople, to material artist engaged in the crafting of sounding objects. With Parch, the relationship between sound and material is important as explored in his 'corporeality of music' (see Keylin 2015). This kind of direct forming of resonant materials into sounding objects identified in Parch's approach may be readily recognisable as a kind of craft practice as it can be viewed as sitting within a long history of musical instrument making by skilled craftspeople. This territory can be further aligned with the more technologically inclined makers such as Tudor and Mumma when electronics are considered in terms of the kind of 'media materiality' described by Jussi Parikka. Parikka highlights the inherently material nature of the electronically and digitally mediated world when he identifies that 'media history is one big story of experimenting with different materials from glass plates to chemicals, from selenium to coltan, from dilute suphuric acid to shellac silk and gutta percha' (Parikka 2011: 3).

This sensibility to the materiality of what is under the skin of everyday technologies is present in the work of Tudor and others' creative endeavors through the form and arrangement of components, through the molten solder, the conductive copper, the tiny bits of silicon, carbon, tantalum, the heat and the general processes of making assembling and imagining electronic technologies. This material awareness is also increasingly within current public consciousness in regards to environmental and ecological concerns in relation to electronic waste and the mining of the raw materials for the production of electronic goods. Identifying electronics as a material practice in this way helps to connect the activities of Parch and traditional musical instrument making with the activities of Tudor, Mumma and other technologists working with sound.

In relation to his theory of 'carpentry' as a creative act of making in order to explore ideas and critical thinking, Ian Bogost observes that '[w]hether it is a cabinet, a software program or a motorcycle, getting something to work at the most basic level is nearly impossible' (Bogost 2012: 92). Bogost's broad and inclusive range of activities of making within 'carpentry' is reflective of Richard Sennett's discussion of craft practice as encompassing open source software development, laboratory work and musical conducting among other things. In this expansive view of craft, Sennett also rails against the historical divisions inherent in creative practice describing problematic 'fault lines dividing practice and theory, technique and expression, craftsman and artist, maker and user' (Sennett 2008: 20). As makers of The Campanologist's Teacup we regularly encountered Bogost's 'nearly impossible' task of encouraging materials to bend and behave in a manner conducive to our intended outcome. Whether through the unexpected behaviour of clay and glaze at high temperature or through the lively nature of electricity and resonant materials, we partook in a careful process of listening to and shaping the material world through a collaborative art and craft based practice that involved crossing various historic fault lines.

Meta-making with Materials - Exploring Technological Constructs in Craft

As a ceramic artist, Murphy's knowledge of traditional making process and materiality were obviously important to our project. They enabled us to use the long established and ancient relationship and trust that humans have with ceramic objects in domestic form to inform the initial themes for the piece. But The Campanologist's Tea Cup offered the opportunity to not only exploit the physical characteristics of clay for it aural properties but also to augment our perception of a domestic ceramic object. This approach had also been a key factor in Murphy's practice for some years before our collaboration. Working with a bricolage of what is perceived to be 'hi-tech' and 'low-craft' processes, other examples of Murphy's work evoke a similar experience as viewers are invited to engage with physical objects and digital content simultaneously. Murphy has used technology such as Augmented Reality (AR) to give static objects a voice, renegotiating and re-claiming the basic, primal concerns that are inherent in ceramics and object making through our deep connection to haptic activity and sensory experience. Embedding digital data onto crafted objects has enabled them to become palimpsests of their own making, revealing their provenance and determining their future by changing how they are perceived and experienced as well as how they may by conceived and produced.

In an earlier piece by Murphy, Things Men Have Made with Wakened Hands, inspired by the eponymous D H Lawrence poem, AR interaction was used to reflect the sentiment of the verse, which conjures evocative images of handmade objects 'awake through years of transferred touch …warm still with the life of forgotten men who made them.' (Lawrence 1929). Here a gold lustred replica of an old thrown jug triggers a live film projection when handled. The film replays material of the hands of skilled makers handling the jug such that the audience's hands holding the replica are visually replaced with the maker's hands holding the original artefact. The nature of the film projected reflects the notion of a maker's 'intelligent touch', neatly summarised by Juhani Pallasmaa when he observes that 'the knowledge and skills of traditional societies reside directly in the sense and muscles, in the knowing and intelligent hands' (Pallasmaa 2009: 101).

As touch is the sense integral to both the creation and appreciation of ceramics, it is important that the viewer handles the work to gain both a visual and sensory experience, while the gold lustre records this transference of touch in its ever growing tarnish. It is noteworthy that the viewers tend to modify their handling of the replica once the embedded film is triggered, following the movements of the maker's hands, exploring the object as would an expert. In this work AR enables the viewer to experience object, live feed, and embedded feed simultaneously, blurring the boundaries between immediacy, hypermediacy and remediacy, creating a new phenomenological experience of a once familiar object. The piece has been described elsewhere:

This many layered work quietly reveals complexity in its resonance and reverberations, elicited through the juxtaposition of the handmade with digital technology. Here, the self, the replica jug, the live projection and the film mingle to 'transform' an everyday ceramic object into a nucleus for expanded empirical and existential perception. (Roche 2013)

For us this earlier piece by Murphy and The Campanologist's Teacup benefit equally from a sense of heritage and tradition, and of forward facing possibility and departure through their hybrid physical and technologically augmented forms. In this way we find ideas emerging from fields such as meta-modernity resonate with some of the themes that emerge in our work. Timothies Vermuleun and Robin van Der Akker's description of their meta-modernist position describes a field which is moving, oscillating between current and historic influence, affected by 'estimations of the past, imbued by experiences of the present, yet also inspired by expectations of the future' (Vermuleun and van Der Akker 2010). This oscillation is also reflective in general terms of a new breed of makers who move seamlessly between the screen and the workbench, with physicality and materiality at the heart of their making but with extensive technologies at their fingertips. The all-pervasive and open access nature of the digital technologies of today means that makers are not only engaging in new processes but also bringing their traditional sense of materiality and process to bear on those technologies as means of expression.

One such example is ceramicists Michael Eden for whom 3D modelling and printing technologies bring renewed creative potential to historical ceramic form. For Eden the attraction is 'that these technologies allow previously impossible objects to be made' (Eden 2014). For Eden as with Murphy's previous work and our collaboration, all technologies, be they digital or physical are considered non-hierarchical, subsumed into a practice that takes in both traditional and emergent methods. There are no historical fault lines here, the wall between the real and the virtual, the possible and impossible has become permeable. As curator Hans Ulrich Obrist notes:

This celebration of the physical is not a rejection of the digital, it's an integral part of the new digital movement… It's about renegotiating the resources that we have at hand, rather then trying to add new resources to the situation. There's a kind of porosity of boundaries for many of these artists and designers, moving freely between disciplines as they do between media formats (Obrist 2015)

Conclusions

The creative collaboration involved in the production of The Campanologists Teacup offered us a great insight into each other's practice and context. We found a particular synergy in the fact that Pigott approached the project as a technologist practicing on the arc of making, and Murphy as a maker practicing on the arc of technology. The nexus of these arcs informed much of the project's development as a technologically augmented and enabled, interactive ceramic installation. On closer consideration and reflection we realise the relative differences that each of our current creative relationships with technology entails, where Murphy is working with new digital methods in a traditional area of making and Pigott is applying craft sensibilities and approaches to the making of electromechanical systems. It was fortuitous for us that we found a commonality in our creative intentions and this was in part afforded by the curatorial intention of the Sensorial Object exhibition.

One common theme that emerged for us was that of facture - the evidence of a production process in the appearance and reception of an object. The sound of the ceramic horns of The Campanologist's Teacup is determined by their thickness during slip casting, their firing temperature and their surface glaze, among a myriad of other events in their making process. It is also a direct result of the real time bouncing of the ball, driven by the motor, triggered by the pinging of the teacup, a process defined by the work's electromechanical system, some of which is clearly exposed. Both the making process of the ceramic pieces and the electromechanical process of the kinetic interaction are evidenced through the sound of the piece alongside the objects themselves describing both an immediacy and remediacy of making and the made object. A catalogue essay for the Sensorial Object exhibition by researcher Dot Young (Young 2015: 16) discusses the aurality of objects in this way, and also in relation to the aural waste expended during the fabrication process. For us these themes link the work directly back to the initial ping of the teacup that inspired it.

Fig. 4

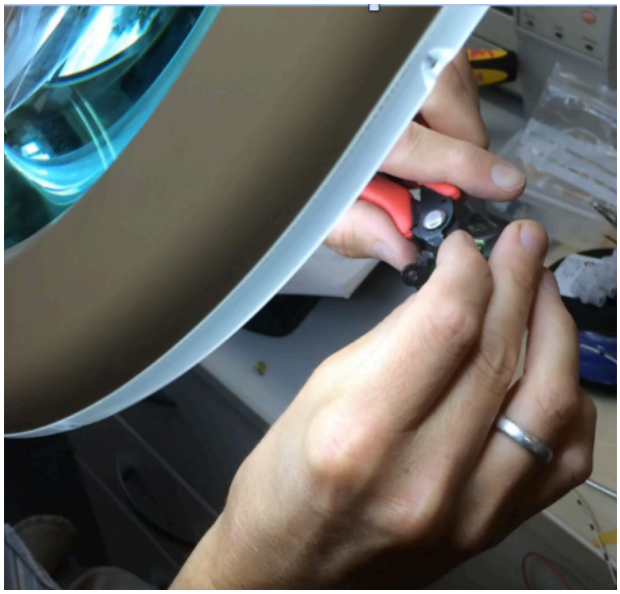

Fig. 4 & 5. The artist creating the work.

While it can be said there are distinct differences in our skills base and knowledge, it became apparent once the making began in earnest that there was little notable difference in our approach to hands on labour. While Murphy cast and fettled the horns in the studio, Pigott armed with a soldering iron and a jeweller's lamp painstakingly soldered circuitry and assembled mechanics at the workbench, both fluently engaged in the vernacular of our particular craft. Each of those crafts enjoys its own heritage and its own particular lineage of technological engagement and influence and each has come to bear equally on The Campanologist's Teacup.

Bibliography

Bogost, I. (2012) Alien Phenomenology or What it's Like to be a Thing. London: University of Minnesota Press.

British Ceramics Biennial (2015) [online] Available at http://britishceramicsbiennial.com [accessed January 2016]

The Campanologist's Teacup (2015). Film documentation [online] Available at https://vimeo.com/123617368 [accessed January 2016]

Eden, M. 2014. 'The New Ways- Digital craft Skills and the New Industrial Revolution', in Borda-Pedreira, J. Jones, A. and Steinsvåg, G. (eds) Materiality Matters, Oslo: Norwegian Crafts 2014 pp47.

Keylin, V. (2015) 'Corporeality of Music and Sound Sculpture', Organised Sound 20(2), pp182–190.

Lawrence, D.H. (1929) 'Things Men Have Made', Pinto, VS. and Roberts, W. (eds). 1954. The Complete Works of D H Lawrence Vol 2. London: Heinnemann.

Obrist, H. (2015) Quoted in Openshaw, J. 2015 , 'The Craftmakers Ahead of the Digital Curve'. Financial Times. June 16th 2015.

Pallasmaa, J. (2009) The Thinking Hand : Existential and Embodied Wisdom in Architecture. Chichester: Wiley and Sons Ltd.

Parikka, J. (2011) 'New Materialism as Media Theory: Media Natures and Dirty Matter' Communication and Critical / Cultural Studies DOI:10, pp1-6.

Roche, C. (2013) 'Ingrid Murphy - Augmented Reality and the Sensory Resonance of Ceramic Objects', Ceramics Art & Perception 2013 Issue 94.

Sennett, R. (2008) The Craftsman. London, Penguin.

Sensorial Object (2015) [online] Available at https://thesensorialobject.wordpress.com [accessed January 2016]

Vermeulen. T., Van den Akker, R. (2010) [online] 'Notes on Metamodernism' Available at http://www.metamodernism.com/2010/10/14/what-meta-means-and-does-not-mean/ [accessed January 2016]

Young, D. (2015) 'Aurality of Objects', The Sensorial Object exhibition catalogue. Also [online] Available at https://thesensorialobject.wordpress.com/dot-young/ [accessed January 2016].