

Science, Art, Economics & Assemblages of Care

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The matters of science and art, and their interrelationships are as well trodden as they are open to new interpretations. The long history between both disciplines suggest an endurance, and dedication to constantly changing and evolving relationships. Over the past few decades, a significant number of international artists have emerged whose work engages with science in diverse and varied ways. These artists have responded critically, politically, and aesthetically to new insights, new techniques, and new methodologies that have emerged, revolutionising our understanding of the human condition. In the early 60's the informal artist in residence program at Bell Laboratories brought artists into contact with engineers and computer scientists, and encouraged experimentation with computing technology. With access to both facilities and staff, artists such as John Cage, Robert Rauschenberg, Lillian Schwartz, and Nam June Paik explored and expanded (in collaboration with engineers and scientists) new creative potentials in sound, animation, video, stereoscopic vision — producing new artwork and inspiring creative innovation around the development of computing.

During this time Billy Klüver, an electric engineer, founded EAT (Experiments in Art and Technology) with the ambition to “make technology more human” [1]. Moreover, he created an institutional infrastructure to facilitate and enable communication and collaboration between artists and engineers at a time when practitioners in these disciplines had little or no access to one another either socially or professionally. The experimental research of the group lead not only to significant advancements in computer vision, broadcasting and recording but also lay the foundation for artistic practices that intersected with technological innovations. As a consequence a number of programmes emerged, pairing contemporary artists with high-tech corporations including the Art and Technology Program at LACMA, the Artists Placement Group, NASA's Jet Propulsion Lab and the artists in residence programme at IBM. The outcomes of which have influenced cultural changes and allowed for the emergence of institutional formations that facilitate or promote interdisciplinary collaboration between artists, scientists and engineers.

In the past four decades there has been a number of initiatives that have been established at the intersection of science and art, acting as intermediaries between these communities and their diverging interests including: the Arctic Artists Residency; CERN; the ESA; and the Wellcome Trust. These initiatives facilitate questions of interpretation and evaluation of the hybrid products, the individuals and teams that create them, and the sustainability of research that lies outside of traditional disciplinary boundaries. The long history of the institutional frameworks that emerged in the 1960s continues today with these initiatives, whose aims are to join together humanistic methods of interpretation with social science methods of analysis. Simultaneously, these programmes create a unique space for artistic work to emerge from, and open both scientific and artistic research to possible interpretations for further analysis. However, while the philosophies of collaborative investigation has continued, the conditions under which they comes about have altered drastically in the past few years.

Recently, corporate artist residencies have surged in popularity, and in the past 3 years programmes have been established by Facebook, Adobe, Autodesk, Amtrack, and Planet Labs. Given the current economic conditions for artistic practice, these industry programmes provide an alternative source to limited public funding for artists working with technology. Through this opportunities artists have direct access to and participation in the development of emerging technologies. At the Pier 9 residency at Autodesk in San Francisco artists have access to state of the art fabrication workshop, materials, and software. In addition artists stipulate the direction of their work, and retain intellectual property. Residents are engaged in speculative work that expand on the potential of 3D printing , pushing the boundaries for the future direction of the tech. Earlier this year Amy Karle grew a hand design in live bone from human stem cells on the surface of a bio-friendly, biodegradable 3D printed lattice. The artwork explores potentialities for enhancing our human body, and simultaneously is redefining the potential of 3D printing for biomedical applications. The outcomes of this residency varies from biotechnology, to innovation in materials, to new production techniques for fashion garments. Furthermore, it highlights how artists working with specific skill sets in industry contexts can lead innovation for multiple domains. However, Shaken [2] argues despite their largesse, it is naive to think that industry partners invite artists into their labs or provide funding for the sole purpose of research. While on one hand these companies offer new spaces for artists to occupy and make work, he argues we must also question the motivations and expectations of these corporate entities. In contrast to Autodesk, the Facebook artists in residency programme serves more to enhance the public image of the company, and well-being of their employees. Drew Hemmet of Facebook states the mission of their artists in residence programme is to create a “corporate environment rich in art” and the outcomes are directed toward “positively impacting the work experience of employees.” The artists are permitted to converse with staff but do not co-create or engage in collaboration. In addition, Facebook owns the work that is produced during the residency.

The residency frameworks discussed here highlight the complexities currently surrounding artistic practice as it increasingly becomes intertwined and subject to the values of the market. While on one hand these opportunities may offer an imperfect solution to dwindling public funding, they are also subject to conditions imposed that result in a limited number of outcomes. Despite these imperfections it is nevertheless naive to speculate that within our current capitalist society there exists a “pure” place where artists can practice that is autonomous from economics. Rather than further debating these entanglements (instead see Shanken [2], Scott [5], Will [6]) we should instead consider how the outcomes from these corporate frameworks represent a more specific kind of engagement with art, technology, science, and economics. The ubiquity of technological infrastructure, digital information, mobile devices, and networks has had significant impact on the political and social circumstances of our everyday lives. Today, any artist whose practice engages with technology as medium, or tool, or aesthetic must also consider the wider political and social infrastructures within which they are embedded. In a world of driven by globalisation and technological change, artists are faced with a contemporary moment of messy, complex, indistinct human, and nonhuman ecologies. The convergence

between human and machine is as blurry and opaque as the economic infrastructure that encapsulates them.

Herein lies a challenge for the artist: to articulate our current state of precarity, the technological integration in everyday life, and the opaque economics that benefit from our interactions with interfaces, devices, and one another. Often or not speculations at these intersections often lead to the construction of simplified utopian and dystopian scenes — either the machine challenging and surpassing the human or that of the human transgressing "natural" limits. These speculations do little to lift the dialogue about the complexities that we currently face. Nor do they formulate propositions, predictions, and projections that make succinct demands on the present. But how, in our current times, can we confront technological-human-economic assemblages, and move toward a more balanced outlook of these emergent hybridities? What is omitted from these speculations that both innovates technologies beyond contexts, boundaries, and imaginations, and creates critical perspectives from the embracement of interdisciplinary ways of working?

When considering how to tackle such matters of complex entanglements, Haraway offers us the potential to explicitly reimagine our critical interventions as acts of care that may open up new possibilities [7, 8, 9]. For Haraway, the world and networks we occupy are hybrid — part human, part machine; complex hybrids of meat and metal that do away with the boundaries between them. These cyborgs surround us, incorporate us, and involve us in their active reconfiguration and constructions. These assemblages are continuously shifting political, social, and physical boundaries to create new connections, fragile junctions, and speculative meanings. Haraway argues, that at this junctures emerges images and narratives that *know* something about both science and society. Furthermore, she states that these experiments, processes, and outcomes necessitate care as they are most at risk from economic logic and markets. However, for Haraway care is not limited to supporting these critical inquiries but rather is a vital part *of* critique itself. Haraway notes, "caring means becoming subject to the unsettling obligation of curiosity, which requires knowing more at the end of the day than at the beginning" [10]. It is only through practical acts of care that we can draw others into a sense of curiosity and concern for our changing world. The kind of curiosities that Haraway has in mind seek to be expansive and ripple out into our world. She strives to make connections between, and across disciplines, and relentlessly pushes public dialogue into uncomfortable spaces that open up careful idiosyncrasies that unfold in the world around us. In placing care at the centre of their critical work, artists may imagine and speculate about their practices, how they engage with the world while, grounded in a dialogue that go beyond conventional definitions and risk new possibilities.

When encountering the work of Hopkins in the Galway Museum late 2015, I am met with an array of semiotic objects, stories, figures, images, and analyses of the scientific knowledge and processes she encountered during her residency at CÚRAM in the National University of Ireland, Galway. Both artworks embody layered, parallel arguments that fuse and mutate a visual grammar of feminism, science and technology, and have at their core an affective and ethically engaged critique. In "Connections" the work combines electric current that flows through our bodies with a computer programme and video

projection. The objects used are specially primed materials created in CURAM lab by scientists Catlaina Valejo Giraldo and Eugenia Pugluiese from their research for Parkinsons disease. The artwork comprising of these conductive material, requires the labour of two or more people to hold hands simultaneously touching the conductive material in order to activate the video to play. Through this performative framework Hopkins explores how empathy is increased through human touch. She invites her audience to be curious, to act, to participate and to care. Once engaged in this act of holding hands, she contributes to the aims of the scientists by demonstrating how they are operating at a cellular level of care, manifesting itself as providing aid, and potentially even a cure. But in this exhibit, we see too the other side — a speculation about where empathy may only be left to a machine. “The Empathy Machine” is a self care booth that is administrated by a digital therapist. Upon entering the booth, the audience is greeted and asked to respond to a line of questioning. These interactions continue between the therapist and human but eventually the therapist glitches, and begins to interrupt and perform ineffectively. In this work Hopkins does not shy away from the anxieties and criticisms raised in concern of automation. Rather she embraces them and places them at the centre of a speculative narrative for a potential technological future. Her matters of concern in this work is to critique the binary of man and machine, and argues against this. Instead she recognises the importance of the human and nonhuman assemblages and how they allow to live together. She recognises the vitality of such an assemblage and how they must be networked to others.

Hopkins is one of an increasing number of artists who are attempting to know something about both science and society. Her work is replete with narrative speculations about worlds at stake, worlds with need for care and response, worlds full of the unsettling and oddly familiar. Her work requires curiosity, emotional engagement and investigation, but yet they do not yield to clean judgements. Instead, they occupy a complex messy world of potential technological futures, and reveal nodes of action where many actors, human and nonhuman, meet. She plays with webs of speculative fabulation [11], speculative feminism, science fiction, and science fact to reveal tensions, entanglements, and important truths about our world. Furthermore, Hopkins insists on questioning and maintaining the critical edge of technology and argues for combining a yearning for knowledges and discourses that promote and enable some other ways of life. In a world where our interactions both social and political are encapsulated in multiple economic infrastructures, Hopkins remains insistent about what is at stake, and her work challenges us and requires us to rethink what taking care of society might mean.

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