Issues in Cultural Theory 12

Center for Art, Design, and Visual Culture UMBC

Cultural Programs of the National Academy of Sciences

VISUAL CULTURE AND BIOSCIENCE

AN ONLINE SYMPOSIUM

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— *Biofictions and Biofacts: Staking a Claim in the Biocultural Bank*

— At once archly antagonistic, reeking with envy, at once estranged bedfellows, yet intimate collaborators, at once trepid and at other times trendoid, the domains of art and science continue to be enlocked in a family romance. As with adolescents relishing in their self-abandoned freedom or the fantastical dream of mysterious discovery, each discipline traverses the cultural landscape, determined to penetrate its vault. Peer review panels, funding sources and their lure of major capital are inevitably associated with these shape-shifting enterprises. Add to this dicey mix the ever-increasing archive of technological re-mixes, special effects, and laboratory feats of sheer awe, and we find ourselves in a time where interactivity in all its guises is the central character of the play. But under the rubric of interdisciplinary cross-pollination, what does this intermix bring to the skeptic's investigatory gaze? And at a time when new media criss-cross a uniformed geography of the global, to what means and ends do art and science collaborations justify formal linking?

— Eminent art historian Leo Steinberg in his essay "Art and Science: Do They Need to Be Yoked?" makes reference to art and science's on-and-off-and-on-again relationship. He exemplifies the gifts of Leonardo's cultural offerings as a case in point. For Steinberg, "unlike his surpassed scientific work, Leonardo's artistic creation is unrepeatable, like the life of a man."[4] Unicity and rarity become keywords specially woven into the intertwined tapestry of artist and creation. Is it true that neither by measurement nor repetition nor observation alone do works of art attain their status? Or by what happenstance do nonverifiable additions to knowledge production continue to confound our consciousness? And as product-driven methodologies, what do they so ardently demonstrate? Nevertheless, under present parlance, Steinberg's skepticism of the links between science and art may, in fact, be newly up-ended.

— Discourses concerning the "in-between-ness" of categories have circulated within the corridors of visual and critical studies for decades. From Rosalind Krauss to Julia Kristeva to Donna Haraway and W.J.T. Mitchell, expanded intellectual frameworks have been useful in analyzing contemporary hybrid practices in the visual arts. Most currently, German philosopher Nicole Karafyllis investigates the resultant forms of hybridization concerning living forms and biotechnological interventions. Coining the term "biofacts" as a neologism combining biology and artifact, she discusses this cojoining as "a hermeneutic concept which allows to ask for

the differences between 'nature' and 'technology' in the area of the living."[5] She questions whether the classical distinction between *De anima* and *techne* "still holds true today in light of recent advances in biological and biomedical technologies." For example, to what taxongenomic order does Onco or Rhino mouse belong? As living mouse models, fabricated within the stainless steel and glass laboratory, these sentient creatures come into being by slicing, dicing, "knocking out," or otherwise redistributing their hereditary material. These "biofacts" are the products of a nature/culture transfusion. Although Karafyllis maintains that distinctions between "life" and "technology" still presently hold true, she also continues to think that such distinctions "are much more hidden than before, through the design of living objects in the laboratory."[6]

The yoking of art and science has produced both novel forms of art and has added an aesthetic dimension to science. Artists are engaging in creative research within scientific laboratories while science institutions employ highly skilled design teams to create visually compelling imagery. However, what significance do these connections, in fact, yield? Is it accurate to speculate that more recently we are finding an ever-growing cast of players within both the sciences and the arts who are embarking on the intersection of this hybrid discourse? Yet a few are yielding unexpected results. Mark Dion's recent exhibition at the Natural History Museum in London, *Systema Metropolis,* curated by Bergit Arends, as part of the museum's contemporary arts program, is a case in point. Dion's investigative techniques involve both scientific and archeological characteristics, yet are singular methods in and of themselves. Uncovering specimens through "archeological" digs, the artist's "laboratory" practice has unearthed several new organisms. One particularly nontraditional insect collecting method consisted of attaching adhesive paper to the roof of his automobile and driving at high speeds down a London promenade. The flypaper was subsequently sent to the lab to be analyzed, employing all the relevant state-of-the-art scientific techniques. And to the amazement of the skeptical scientists at the museum, several new species were verified, hence catalogued, into scientific nomenclature.

Since the "Visual Culture and Bioscience" symposium, various exhibitions, events, and experimental projects have transpired. Perhaps most strategically relevant is the exhibition at the Museum of Modern Art *Design and The Elastic Mind.* Curated by Paola Antonelli, this elegantly compacted exhibition parces some of the subjects suggested in the symposium. Revolving around science and design, Antonelli cites "elasticity as a by-product of adaptability and acceleration," a dynamic force required to engage an increasingly complex

technological world. Revisiting many of the classical themes of this intersection, such as the means by which the invisible can be rendered accessible, form's relation to function, and issues of scale, particularly micro-scale, current technologies have re-opened contemporary discourses on these subjects to other ends. For example, Elio Caccavale's *MY Bio* (2005) is a collection of toys that introduces children to the ways in which emergent biotechnologies can interface with the future of life. Like the symposium's foray into toys as chimeras and viruses, Caccavale creates a series of human dolls that undergo transplant surgery or cows that produce pharmaceutical drugs. Joris Laarman's *Bone Chair* (2006) employs 3-D optimization software to create a chair that, in this case, is based on the ways in which bones actually grow, thus emphasizing nature's structural competency.[7]

— At present, streams of unique projects, processes, and collaborations underlie exploratory and investigatory models for innovation inextricably bounded by intersections between art, science, and technology. Possibility abounds in the pursuit of inquiry which operates in degrees encompassing complexity and ambiguity. Entities that are clearly neither science nor art exclusively but an intricate mix of aspects or divisible ratios between the two are beyond the glitter of neophillia. However, the epistemological underpinnings of knowing and being in the world within these practices are pointing the way towards an arena bounded by the diaphanous. Scientists refer to their spectacular color images as art, and the visual artist's conceptual free zone has added tangible facts to the scientific community. Even though all disciplines possess cultural dimensions that are embedded in society's DNA, it is within the matrix of intersecting epistemologies that other strands of knowledge are being produced. Whether by proximity, serendipity, chance, or egotistical tenaciousness, unexpected convergences are taking form. However, "art-sci" collaborations in and of themselves do not necessarily produce significant work no matter how the coordinates are spinned. While many projects produced under this guise could be considered naïve or without significant merit, there are always a few that break the template.

— What is "sci-art"? Or shall I say "art-sci"? As a contraction in its contemporary usage, what is its origin? One place to start is to examine the projects in this area funded by the Wellcome Trust in the UK. Currently under the direction of Dr. Ken Arnold, Head of Public Programs, the Trust's mission is manifested by engaging the public understanding and appreciation of science "through the collections and facilities within the Wellcome Building," completed in 2006. The building also is the site for the "Wellcome Library, two

permanent galleries, a temporary exhibition space, as well as auditorium and 'forum' spaces, which accommodate scientific debates, seminars, and drama productions." As a pioneering foundation serving both the scientific and artistic communities, the Wellcome Trust program serves as an initiator of collaborative projects between artists, scientists, and institutions aimed towards innovative ideas in this area.[8]

— Alternatively, Sian Ede, as Arts Director of The Calouste Gulbenkian Foundation in London, funds projects in this mix. Reversing the conjunction of contracted words from "sci-art" to "art-sci," the positions of firstness are reordered. In this sense, it is art that assumes primary role. Sian Ede explains the role of the foundation, which has been funding projects for over ten years. "While we are primarily interested in supporting artists to develop their thinking and practice in order to make new work," she states, "we have also sought to encourage scientists to understand the unusual and imaginative response to the world that artists take, with a view to giving greater credibility to other ways of thinking intelligently (visually, dramatically, kinetically), beyond the cerebral."

— A more recent addition to this junction is David Edwards's *ARTSCIENCE: Creativity in the Post-Google Generation*,[9] a text reinforcing and expanding the mission of the fusion between art and science. As a guest on NPR's *Weekend Edition* segment on Arts and Culture,[10] David Edwards talks about *Le Laboratoire*, a hybrid art-science space he established in Paris in 2007. He envisions this experimental space as a way to bring into the public domain what he calls "innovative intelligence." For Edwards, a middle ground that is "at once aesthetic and scientific—intuitive and deductive, sensual and analytical —is the goal of his concept."[11] Recently at le Laboratoire, a collaboration between Michelin chef Thierry Marx and physicist Jerome Bibette explores the state of matter known as a colloid. Coined by Scottish chemist Thomas Graham in the nineteenth century, a colloid is defined as a type of physical property in which "nondiffusable particles are suspended in a surrounding medium of a different substance." Neither a mixture nor a conglomerate, this state of matter, as a type of emulsion, produces particular textures in food and has other unique properties. "Gastronomie moléculaires" is a foray into the science of microparticles, which, when bursting in one's mouth, reveals the full flavors of haute cuisine.

— Another example of the growing platform within this arena is the exhibition *sk-interfaces: Exploding Borders —Creating Membranes in Art, Technology, and Society*, curated by Jens Hauser for FACT (Foundation for Art and Creative Technologies) in Liverpool, U.K. The works in the exhibition "propose a 'skinless society,'" in which skin becomes a

metaphorical membrane of osmosis between inside and outside, or a territory with no fixed limits. Bringing into view the work of an international array of artists, this exhibition and its theoretical bent can be virtually revisited by paging through its outstanding catalogue. The catalogue is itself encased within an interactive skin, a cadmium orange, padded, vinyl-like cover that is receptive to touch. Indices of fingermarks and handprints become visible as they collide with the sk-interface surface.[12]

— BRAINWAVE, a New York City-wide art, lecture, and performance series, from January to June of 2008, brought together the Rubin Museum of Art, Exit Art, Science and the Arts at the Graduate Center of the City University of New York, the Philoctetes Center for the Multidisciplinary Study of the Imagination, the School of Visual Arts, and the American Museum of Natural History to showcase the cultural dimensions of the neurosciences. Experts in differing fields ranging from visual artists and scientists to musicians, monks, and magicians engaged in unusual pairings. Tim McHenry of the Rubin Museum of Art sees this collaboration as a platform stimulating "creative synapses firing as cross-disciplinary insights."

— Exit Art, a NYC nonprofit institution, presented *Common Senses,* an exhibition of works of visual art consisting of painting, sculpture, video installation, and recorded fMRIs. From robotic behavior to cellular automata to abandoned photographs of psychiatric patients, the exhibition formed a backdrop for neuroscientist Joseph Le Doux and his band, The Amygdaloids, to perform a rock concert. The band's name is a pun on the word amygdala, a section of the brain whose anatomical structure is connected to behavior that is largely emotionally driven. *Common Senses* is the latest foray of Exit Art into a series of exhibitions, Unknown Territories, which explore the visual arts in relation to science and technology.[13]

— Many new texts have appeared and numbers of symposia continue their calls for papers. From Barbara Maria Stafford's *Echo Objects: The Cognitive Work of Images* (M.I.T. Press, 2007) to Oliver Grau's *New Media Art Histories* (M.I.T. Press, 2007) to Eduardo Kac's collaboration with Avital Ronell, *Life Extreme* (Dis Voir, 2007), an expanded literature on this subject is greeting the reader from myriad directions. And as a further update, artist Steve Kurtz of the Critical Art Ensemble has been exonerated of federal charges against him for the illegal transport of bio-substances via the United States postal service. And at the University of Western Australia,

Perth, a graduate degree in the Biological Arts is being offered. Open to applicants with an undergraduate degree in the sciences or the arts, this program aims to focus on "creative bio-research."

— For Leo Steinberg, the yoking of art and science remains a skeptical pairing. However, in the accelerating age of pixels, bits, and bytes, images are both computational output and aesthetic barometers. As the partaking of dual identities, images, installations, and laboratory life forges ahead into concepts concerning liminality, ambiguity, and new representational spaces, the epistemological underpinnings of the ways in which visual culture and the bio-sciences form "poly-disciplines" are questions requiring innovative, if not radical perspectives.

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