

SEMI-LIVING: TISSUE CULTURE & ART PROJECT'S CHALLENGE TO NEW  
MUSEUM THEORY

by

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## ABSTRACT

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With the rising visibility of modern innovations in biotechnology that have been defining factors in the turn into the twenty-first century, it is not surprising that artists would engage and critique the implications of these scientific advancements. One artistic partnership working to raise awareness through the critique of biotechnological progressions in their work is the collaboration Tissue Culture & Art Project (TC&A) comprised of artists Oron Catts and Ionat Zurr. Working to bridge the gap between the fields of arts and sciences, TC&A employ living and growing cells as the foundation for their semi-living sculptures and manipulate and coach the tissues into specific shapes. Through the display of their semi-living sculptures in exhibitions, TC&A present the museum-going public with biotechnological advancements and hopefully instigate conversations about future implications of scientific development. In the contemplation of these works, viewers also consider their living quality and its relationship to their own. In evaluating the building blocks of life and the characteristics that define it, observers begin to form relationships with the objects based on the added value they place on these living beings.

In this thesis, I examine the exhibition of three Tissue Culture & Art Project works, *Pig Wings*, *Tissue Culture & Art(ificial) Wombs*, and *Victimless Leather*, and the ways their living qualities interrupt the museum environment. I explore the required changes to the roles and expectations of the artists, curators, and visitors based on the sculptures' semi-subjectivity. I argue that the alterations made based on the work's demands reveal the limits of the new museum theory framework and necessitate a new approach to displaying TC&A's semi-living works.

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## INTRODUCTION

Scientific progress has advanced rapidly in the last sixty years. The discovery of DNA, mapping of the Human Genome, proliferation of in vitro fertilization, use of stem cells in organ growth outside the body, exploitation of genetically modified organisms, and the possibility of creating a synthetic human being have been defining factors in the turn into the twenty-first century. With the rising visibility of these modern innovations, it is not surprising that artists would engage and critique the implications of these scientific advancements.

As a recent contemporary art movement employing current biotechnological progressions, bioart has received ongoing attention from both science and art scholarship for its innovative themes and controversial practices. Tissue Culture & Art Project (TC&A), the collaboration of artists Oron Catts and Ionat Zurr, work within this movement. Employing living and growing cells as the foundation for their semi-living sculptures, the artists manipulate and coach the tissues into specific shapes. TC&A emphasize themes of raising awareness and educating the public on the advancing technologies used in the biological sciences. Through their art-making practices and resulting works, Catts and Zurr hope to elucidate these previously obscured scientific procedures. In utilizing these processes as the basis for their artwork, they bridge the gap between the art and science fields. Through the display of their semi-living sculptures in exhibitions, TC&A present the museum-going public with biotechnological advancements and hopefully instigate conversations about future implications of scientific development.

In addition to exposing scientific processes to the public, TC&A's works raise questions about relationships between living systems on this planet. A human viewer of a semi-living sculpture will identify the living qualities of the object and therefore contemplate the characteristics that qualify life. An onlooker will also evaluate the work's place among other known living entities, including herself. Through the consideration of an unfamiliar form of life, the viewer discovers that there are inconsistencies in the way humans place other beings in arbitrary hierarchies. In addition to examining the sculpture's position in the web of living systems, the observer also begins to form a relationship with the work and analyze the potential impacts that the bond may have on both parties. These are the kinds of questions and problems Tissue Culture & Art Project's works provoke in the minds of their viewers.

The core issues that the semi-living sculptures illuminate are only effective when on display and available for public engagement. Because bioart has living components, it demands a heightened level of engagement from the players involved. The roles of the artist, curator, and visitor are transformed by the sculptures' need to be cared for and its subjective nature. Ritual practices of feeding and killing permeate the science lab-gallery and though they provide the guise of interactivity, ultimately fail to permit viewers to engage with and impact the sculptures according to their expectations. The relationships that are fostered between the sculptures and the artists, curators, and exhibition attendees alter the museum experience and disrupt the new museum theory approach to interacting with art.

In this thesis, I explore bioart and its living qualities in order to examine the ways it upsets the museum. Three works by Tissue Culture & Art Project, *Pig Wings*, *Tissue*

*Culture & Art(ificial) Wombs*, and *Victimless Leather* (figs 1-3), serve as case studies for examining bioart in the gallery space and the way it alters the roles and expectations of the artists, curators, and visitors involved in the works' display. I argue that through the display of these pieces, the players are propelled to relate to them because of their living quality and that over time they form a bond and anticipate a mutual interaction. It is only through the termination of the artwork that the true nature of the sculptures' semi-subjectivity is revealed and that the need for a new framework within which to approach the artforms arises.

In the first chapter, I examine trends in the arts that have led to the contemporary movement known as bioart. This genre is not the first in which biological materials (living or dead) have been used as the medium for artistic exploration of scientific advancements. From this historical background, I offer two scholarly interpretations of the bioart movement as a way of focusing on the niche corner in which Tissue Culture & Art Project work. In exploring the tissue engineering and manipulation tactics TC&A use, I present the goals of the artist collaborative as well as their reading of "semi-living." Finally, three of the semi-living sculptures, *Pig Wings*, *Tissue Culture & Art(ificial) Wombs*, and *Victimless Leather*, are introduced to form the foundation for my analysis of their display in the museum.

The second chapter explores the method of new museum theory through the lens of one Tissue Culture & Art Project work, *Pig Wings*. After a brief introduction to the ideas of the new museology, I examine the ways in which the first installation of the piece can be contextualized through the themes of industry and process transparency and collaboration that drive the museum industry today. In considering the first exhibition of

*Pig Wings*, I argue that the wing set fixed in gold and displayed “dead” can be read through new museum theory, but that the wings that were presented live change the roles and expectations of the players involved and therefore break away from the theoretical framework. Through this first example of *Pig Wings* on view, I begin to uncover the inadequacies of using the new museum theory approach to frame Tissue Culture & Art Project’s semi-living works.

The third chapter exposes the limitations of new museum theory through the study of two other TC&A works on display. The exhibition of a semi-living sculpture, *Tissue Culture & Art(ificial)Wombs* provides another example of an installation that reveals the changes required of the artist, curator, and visitor. The role of the object’s caretaker tests the anticipated responsibilities of both the artist and the curator. I contend that the relationships the sculptures demand from the players involved and the time required to form them highlight the impact of the live quality of the works. The boundary of the new museum theory framework surfaces at the end of the exhibition when the viewer’s expectations of interaction with the sculpture are left unrealized. Finally, I consider two installations of *Victimless Leather* in order to examine the effect of the sculpture’s unexpected actions on the roles of artist, curator, and visitor. I argue that the unforeseen developments of the sculpture cause a faster and deeper impact on the participants and ultimately expedite the exposure of the inadequacy of the new museum theory framework for these semi-living works.

Through these case studies, I argue that the museum industry has not transformed enough to accommodate emerging contemporary art works like the bioart pieces of Tissue Culture & Art Project. I argue that the semi-living quality of *Pig Wings*, *Tissue*

*Culture & Art(ificial) Wombs*, and *Victimless Leather* and the demands it makes of the museum participants interrupt a framing through the new museum theory approach. The display of these works requires changes to the roles and expectations of the artists, curators, and visitors that defy contemporary museum theory. It becomes clear in considering their exhibition that TC&A's semi-living sculptures can no longer be read through this lens because they possess characteristics at the crossroads between art and science, natural and synthetic, subject and object, and living and dead. I contend that the semi-living quality that make these objects distinct is the very one that disrupts the museum in unexpected ways and therefore breaks the themes and advancements associated with new museum theory.

## CHAPTER 1: TISSUE CULTURE & ART PROJECT

Manipulating organisms is not a new phenomenon in human history, neither in the science field nor that of the arts. For centuries humans have coached animals and plants through cross-breeding and hybridization. Historically, cross-breeding has been used with the hope of creating a stronger specimen by crossing two breeds of an animal that both have excellent, but differing, characteristics. This has often been done with farm or work animals like cattle and horses. Hybridized plants have been a significant part of human history, as well, to produce food and flowers. Whether for consumption or aesthetic purposes, humans have been manipulating non-human organisms throughout modern history.

In tandem with scientific progress in coaching animals and plants, artists have also been experimenting with biotechnological advancements in their own way. Many artists employing these practices aim to promote awareness of the potential implications of these developments on the public. In creating works that educate society in scientific processes, these artists hope to create a well-informed public and begin conversations about these changes. One artistic collaboration whose goals align with advancing awareness and instigating public discussion is the Tissue Culture & Art Project. This partnership of Oron Catts and Ionat Zurr employ tissue engineering practices as the medium for their sculptures. The display of these semi-living works in the gallery poses new challenges to museum theory and the institution itself. Before analyzing this significant team of artists and the ways their pieces impact the museum, it is first important to understand their place within the bioart movement.

## HISTORY OF BIOART

Arguably the first artist to manipulate non-human life for aesthetic purposes and exhibit them as objects of artistic manipulation was Edward Steichen. In 1936, Steichen utilized genetics as an artistic technique and created new organisms, mainly flowers, through traditional and artificial methods.<sup>1</sup> Through hybridization and chemicals that encourage mutation, the artist was able to publically exhibit altered biology, enforcing it as a possible medium for artistic expression. Rolande Dorgelès, an artist working slightly earlier in 1910, was one of the first to use a living animal to create his work, using a donkey with a paintbrush attached to its tail to produce paintings. The reception of several other artists working with living organisms in the first few decades of the twentieth century was mixed. Leo Malet in 1938 was restricted from exhibiting live fish in a bowl placed within the stomach of a mannequin, while in the same exhibition, Salvador Dali's *Rainy Taxi* presented mannequins with snails and vines.<sup>2</sup>

In the following decades, artists began experimenting with bodily fluids within their works, for example, Marcel Duchamps's *Paysage fautif* of 1946, otherwise known as "sperm drawing." Continuing into the 1960s, artists used biological fluids and living animals to break with traditional art practices and test new media in contemporary art. Examples include Andy Warhol's "Oxidation Paintings," Carolee Schneeman's *Interior Scroll*, and Jannis Kounellis's *Horses*, where live horses were tethered in the gallery installation. Artists in the 1960s and 1970s also engaged with ecological art incorporating microorganisms as well as the natural environment into their works. Even Steichen's

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<sup>1</sup> Eduardo Kac, "Introduction: Art that Looks You in the Eye: Hybrids, Clones, Mutants, Synthetics, and Transgenics," in *Signs of Life*, ed. by Eduardo Kac (Cambridge, MA / London: The MIT Press, 2007), 10.

<sup>2</sup> Both were a part of the International Exposition of Surrealism at the Gallerie Beaux Arts in Paris, France, *Ibid.*, 11.

original ideas on hybridizing flowers as artwork resurfaced in George Gessert's hybridized irises.<sup>3</sup>

These are some of the artists that present a burgeoning trend over the last century towards the use of biological material as a medium for artistic expression. Bioart did not simply appear based on one artist-scientist genius; it derives from a long history of artists commenting on the emerging progressions in science for the purpose of revealing them to the greater public. Artists assume the role of revealer and commentator on possible futures for society based on contemporary advancements in several fields including biotechnology.

“BIOART IS *IN VIVO*”<sup>4</sup>

Bioart is the contemporary art trend that comes out of this historical progression of artists responding to transformations in technology and science. The new movement is complex and the term is often used to describe any art that incorporates elements from the sciences, resulting in a wide-ranging grouping of artists and their works. The fluid nature of the definition leads to several interpretations. In order to better understand where Tissue Culture & Art Project fits within bioart, I will present a few different scholarly readings of the contemporary movement.

Beginning with an example of a broad definition, Suzanne Anker states bioart “became a term referring to intersecting domains that comprise advances in the biological sciences and their incorporation into the plastic arts. Of particular importance in the works of Bio Art is to summon awareness of the ways in which the accelerating

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<sup>3</sup> It is still possible to purchase genetic flowers based on Steichen's work, *Ibid.*, 11.

<sup>4</sup> *Ibid.*, 19.

biomedical sciences alter social, ethical and cultural values in society.”<sup>5</sup> The goal of this science-art integration is to bring awareness to the impacts of advancing technology, especially when it comes to biological sciences and their connection to humanity’s future. This is a critical theme in compelling bioart works.

Anker’s understanding of the term breaks down into three subgenres to offer a more nuanced interpretation of the various outcomes of this broad definition. The first subcategory of bioart, according to Anker, consists of artists who use traditional media (e.g., painting, sculpture, print) to depict twenty and twenty-first century advancements in science. These artists often reproduce elements that were collected through scientific imagery methods; a print depicting images of chromosomes captured using an atomic force microscope, for example. In the second subgenre, artists rely on new media and digital sculpture to present investigations of biotechnological advancements in evolution, artificial life, and robotics. These projects often utilize computer imaging and modeling software to realize the depiction of these developments. In this subgenre, as in the first, artists are using scientific progressions as the subject matter for their mimetic work. In Anker’s third sub-category of bioart, artists incorporate wet biological practices like tissue engineering, plant breeding, and transgenics, into their creation process. In manipulating biological material as the medium for their art pieces, artists imbue a “live” quality into their work.

In Anker’s interpretation, the third subgenre is the only one in which biological matter itself is employed as the medium rather than imitating it using other more traditional artistic materials. In this subsection of the movement, artists are taking on the

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<sup>5</sup> Suzanne Anker, “Bio Art,” *Oxford Art Online*, accessed August 4, 2014, <http://www.oxfordartonline.com:80/subscriber/article/grove/art/T2088795>.

most responsibilities and tasks of the scientist by appropriating the advancing scientific processes to make commentaries on the very practices they employ in making their works. This is the richest of the three subgenres because artists engaging in wet biological procedures reveal the most about the previously shrouded scientific field. By employing and exposing the very methods that form the foundation for contemporary scientific advancement, artists not only take on the role of the scientist but also educator of the public. Without the bioartists and the works that comprise this niche, recent expansions in biotechnology would remain hidden and mysterious to the majority of the public, delaying a much needed dialogue concerning the future implications of these innovations.

Though informative and descriptive, Anker's three subgenres are still too broad. They can fit into other contemporary art categories like New Media Art, and therefore her interpretation of the movement is not a narrowed enough concentration to interpret bioart pieces specifically. It is, therefore, necessary to examine a different reading to find a more nuanced explanation of bioart. Eduardo Kac's limited bioart analysis begins its focus on the third subgenre offered by Anker. For Kac, the main theme that classifies a work as bioart is the manipulation of biological materials. By stressing this characteristic, he eliminates the potential inclusion of artwork that could be classified in other contemporary art movements, further focusing his interpretation of these works of art.

Kac states that bioart "manipulates the processes of life" and "employs one or more of the following approaches: (1) the coaching of biomaterials into specific inert shapes or behaviors; (2) the unusual or subversive use of biotech tools and processes; (3) the invention or transformation of living organisms with or without social or

environmental integration.”<sup>6</sup> Kac believes the richest bioart pieces incorporate more than one of these methods, and, especially, engage with the third. Here, in contrast to Anker, Kac highlights the use and manipulation of living material as the medium for bioart pieces.

In agreement with Kac’s definition of bioart, I contend that the most important element, and one that identifies the most compelling bioart works, is the use of living biological materials. I argue that it is only once an artist incorporates wet biological practices into their work, that they begin to open up the previously segregated scientific field to the public. By revealing these practices to society, bioartists can fulfill Anker’s postulation that bioart can bring awareness of the impact of these biotechnological advancements to the public.

#### TC&A

Tissue Culture & Art Project’s (TC&A) work aligns with these interpretations of bioart in many ways, but also reveals their inadequacies, further complicating the movement’s definition and revealing the richness and complexity of this artist collaborative’s work. Though not aligning themselves with Anker or Kac’s interpretation of bioart as a movement, TC&A focus on manipulation, coaching, and invention of biological materials in hopes of bringing awareness of biotechnological advancements to the public. By engaging in these processes and working toward this goal, TC&A fulfill elements of Anker and Kac’s definitions of bioart, but in numerous ways the artist collaborative pushes beyond these inadequate classifiers.

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<sup>6</sup> Eduardo Kac, “Introduction: Art that Looks You in the Eye: Hybrids, Clones, Mutants, Synthetics, and Transgenics,” in *Signs of Life*, ed. by Eduardo Kac (Cambridge, MA / London: The MIT Press, 2007), 18.

TC&A are based at the University of Western Australia at Perth within the artist-scientist lab SymbioticA, The Center of Excellence in Biological Arts School of Anatomy and Human Biology. Founded in 1996, the project focuses on research and development of the use of tissue technologies as a medium for artistic expression.<sup>7</sup> In the creation of semi-living bioart pieces through the use of biotechnology, TC&A explore human relationships with other life systems and the inconsistencies of those connections. I contend this is the critical area in which TC&A break away from the readings of both Suzanne Anker and Eduardo Kac. Rather than focusing solely on the cells or tissues being manipulated and their visual reception by museum visitors, TC&A are more concerned with the interaction of artists, scientists, museum visitors, and the general public with these entities.

Catts and Zurr are interested in the ways that humans interact with other living things and through their artwork they hope to bring awareness not only to advancing technologies but also to the inconsistencies in the way we treat those beings. TC&A's works prompt viewers to analyze the difference between animal and human cells within one work. When inevitably we are shocked that the cells are indistinguishable, the artists encourage us to ask ourselves why we assumed they would be so visually different. In a similar vein, other works propel viewers to question the inconsistencies associated with victims. Why do we see it as "acceptable" to victimize certain biological entities over others? What difference is there that legitimizes that thinking? By creating these new biological entities, the artists construct semi-living subjects that call attention to the inconsistencies with which humans treat other living beings on the planet. By impelling

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<sup>7</sup> "About the TC&A Project," *The Tissue Culture & Art Project*, accessed August 15, 2013, <http://tcaproject.org/about/>.

the viewer to desire and cultivate a connection with these sculptures, the objects are elevated above other living entities and added into the hierarchical chain of meaningless superiority. This is only uncovered once the entity is killed, at which time the viewer feels remorse and sadness at the loss of this living being. This remorse is quickly re-evaluated and the true complexity of the work is revealed when Catts explains that more living matter is killed while brushing your teeth than when killing the sculpture.<sup>8</sup> Why do we prioritize this semi-living sculpture over the matter living inside of us? This is the core of TC&A's work, and where it defies other interpretations of "what bioart is" as well as how it challenges traditional display techniques.

Catts's interest in tissue manipulation was founded in research completed during a fellowship at the Tissue Engineering and Organ Fabrication Laboratory at Harvard Medical School in Cambridge, Massachusetts.<sup>9</sup> From this project, Catts and Zurr searched for a collaborating science lab interested in partnering to further research in the biological arts. They found this partner in Miranda D Grounds, Professor of Anatomy, at the University of Western Australia, along with polymer scientist Professor Traian Chirila and neuroscientist Doctor Stuart Bunt. Supported by a grant from the Perth Institute of Contemporary Arts, the collaboration between scientists and artists began with the establishment of SymbioticA in 2000.<sup>10</sup> In this partnership, the artists Catts and Zurr furthered their understanding of biotechnology processes and tools and created an environment in which artists and researchers could gain hands-on wet biology

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<sup>8</sup> Jennifer Johung, "Vital Maintenance: TC&A," in *Bio Art: Life in the Anthropocene*, ed. by Stephanie Britton, *Artlink* 34, no. 3 (September 2014), 47.

<sup>9</sup> "Oron Catts," *The Tissue Culture & Art Project*, accessed August 15, 2013, <http://tcaproject.org/oron-catts/>.

<sup>10</sup> Oron Catts and Ionat Zurr, "Semi-Living Art," *Signs of Life*, ed. by Eduardo Kac (Cambridge, MA / London: The MIT Press, 2007), 234.

experience. Several integral aspects to the goals of SymbioticA, as stated in their mission, are experimentation and exploration: “SymbioticA encourages better understanding and articulation of cultural ideas around scientific knowledge and informed critique of the ethical and cultural issues of life manipulation.”<sup>11</sup> The institute has grown in the last fifteen years to include numerous visiting artists and researchers working in several areas of study including tissue engineering, bioethics, neuroscience, sleep science, art and biology, and art and ecology.<sup>12</sup>

A founding artist group working at SymbioticA is Tissue Culture & Art Project. TC&A, as their name suggests, focus mainly on tissue engineering as the basis for their art pieces. The term refers to both the process used to create, as well as define, the resulting product.<sup>13</sup> Tissue engineering is a process that involves the creation or manipulation of tissue, or groupings of living and growing cells based on a specific support structure.<sup>14</sup> The foundation of these works is an artificial support on which cells will grow and can be directed into specific shapes. Though there are numerous uses for tissue engineering and coaching of cells, one application could be to replace or repair an injured body part or organ. The types of cells seeded onto the artificial structure determine the shape, rate of growth, and ultimate function of the tissue.

Because tissues are comprised of communities of cells, they exist in a space between the building blocks of life, genes and cells, and the whole organism. In the spectrum of scale, these groupings of cells fall in the middle--neither the smallest DNA,

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<sup>11</sup> “SymbioticA Home,” *SymbioticA*, accessed August 15, 2013, <http://www.symbiotica.uwa.edu.au/>.

<sup>12</sup> “Symbiotica Research,” *Symbiotica*, accessed August 15, 2013, <http://www.symbiotica.uwa.edu.au/>.

<sup>13</sup> Oron Catts, “The Art of the Semi-Living,” in *Live: Art and Performance*, ed. by Adrian Heathfield, (London: Tate Publishing, 2004), 153.

<sup>14</sup> The artist collaboration acquires the tissues through humane pathways, relying mostly on harvesting from organisms recently killed in the name of science, taking live cultures from living entities, or acquiring cell lines from cell and tissue banks, Oron Catts and Ionat Zurr, “Growing Semi-Living Sculptures: The Tissue Culture & Art Project,” *Leonardo* 35, no. 4 (August 2002), 366.

nor the largest whole organism. As such, the identification of the body from which these tissues came is very difficult, nearly impossible; mouse endothelial cell lines look exceptionally similar to human endothelial cell lines.<sup>15</sup> The unidentifiability of the tissues as human or non-human and the fear of their mixture within one structure, adds another layer of complication to these art pieces.

Additionally, the ability to engage visually with the object without the need for advanced magnifying equipment allows the viewer to relate to the artwork more personally without the obstruction of another layer of technology. In these works, the visual emphasis is on the pieces, the tissue or cell communities, not the whole. Those visualized bits strengthen the understanding of this subject as a part of the body, not the body itself. The complex idea that the tissues are one element of the whole, yet are living outside that body, is integral in the term used to describe TC&A's art pieces: semi-living.

Oron Catts and Ionat Zurr coined the term "semi-living" when describing their tissue engineered works to emphasize the liminal space they occupy between living and non-living, part and whole, subject and object, and their existence as new, semi-autonomous living systems. The term semi-living refers to both the organic and inorganic, living and artificial elements of the sculpture, and also speaks to its animate and inanimate qualities. Because the sculptures are made of live tissues, living cell communities, and biopolymer structures, and require a bioreactor to sustain that living quality, these bioart pieces do not qualify completely as living, nor as non-living, neither fully organic, nor in-organic. Because the tissues grow and appear to have agency in that growth, they cannot be defined as inanimate, but the bioreactor and support are not

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<sup>15</sup> The nearly identical appearance of cell lines helped attribute to the confusion over the McCoy Cell Lines originally derived from humans but were, at some point, contaminated with mouse endothelial cells and must now be considered animal rather than human cells, *Ibid.*, 368.

animate to the same degree as the tissues itself. The sculptures require care and aid in their survival and therefore are semi-autonomous in their reliance on an external support to maintain a livable environment. The separation from a body, the whole, and the dependence on a life-support system further highlights these same themes: a semi-autonomous, living part, requiring inorganic, inanimate, non-living sustainment. The semi-living subjects blur the boundary between grown and manufactured, science and nature.<sup>16</sup>

When displayed, the semi-living sculptures are sustained inside a bioreactor that is made specifically for that work, depending on its size and nutrient needs. The support simulates a livable environment by maintaining constant temperature, pH balance, gas, nutrient flow, sterility, and removing waste. Without the bioreactor, the sculptures would not survive as a “part” outside of the “whole.” Therefore, this structure takes on the role of the body in maintaining the necessary environment for the piece to survive. Yet this bioreactor cannot sustain itself without the care of a human to change the nutrient feed, antibiotics, and clean the waste. A chain of responsibilities is formed in the caring of these bioart pieces.

TC&A work primarily with tissues because their goal is to explore human relationships with other living systems and to expose inconsistencies in the way differing systems are treated. Tissue Culture & Art Project create new biological entities and place them in exhibitions to present them to the public. In the exhibition, most of their works are displayed living in bioreactors which help highlight their live-ness and stress one of the many connections to the humans that observe them. Questions arise in the visitor about her own place in the system of living beings based on her relation to this new entity

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<sup>16</sup> Ibid., 366.

and the importance and placement of this living thing in relation to other known entities in the hierarchy as well. It is through this visceral connection between viewer and semi-living subject, the actual display of these art objects as living entities, that the true power of the artwork is revealed. It is, therefore, crucial that the exhibition of these objects is analyzed.

## SEMI-LIVING SCULPTURES

An early piece created by the collaborative that reflects integration of biotechnology into art is the 2001 work *Pig Wings* (fig 1). Developed during Catts and Zurr's residency in The Tissue Engineering and Organ Fabrication Laboratory in Massachusetts General Hospital at Harvard Medical School, the idea behind this work centers on the public assumption (and fear) that advancements in biotechnology and biotech processes will "render the living body as a malleable mass."<sup>17</sup> There is a sense that, in time, biotechnology can fix or produce anything, even wings to make a pig fly. The artists, together with collaborating scientists, created three sets of tissue engineered wings: one bird-like wing represented an association with the "good" and "angelic," a second, bat-like wing was designed in opposition and aligned with the "evil" and "satanic," while the third is based on the pterosaurs and is mostly free of good/evil connotation.<sup>18</sup> The three wings were made with biopolymer structures as the basis for each set's wing shape and seeded with pig mesenchymal cells.<sup>19</sup> The wings were cultured

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<sup>17</sup> "Pig Wings," *The Tissue Culture & Art Project*, accessed August 15, 2013, <http://tcaproject.org/pig-wings/>.

<sup>18</sup> Oron Catts and Ionat Zurr, "Semi-Living Art," *Signs of Life* ed. by Eduardo Kac (Cambridge, MA / London: The MIT Press, 2007), 239.

<sup>19</sup> Bone marrow stem cells, "Pig Wings," *The Tissue Culture & Art Project*, accessed August 15, 2013, <http://tcaproject.org/pig-wings/>.

for nine months in a bioreactor. The foundation of the biopolymer structure dissolved as the cells grew to 4cm x 2cm x .5cm in size. This process of using living cells and a biopolymer structure to set the design of the art object is a core element for the artist collaborative in order to manage and coach the growth of their works.

The display of *Pig Wings* marked an early turning point in the display of TC&A's works and is therefore an important moment in the impact these pieces had on the public. Though the art object was alive and growing during its incubation period, it was not displayed in this living state for the entirety of the exhibition. The first set of wings was preserved, coated in gold, and exhibited alongside a second set of wings that was cultured for five months before the show and displayed living for only ten days.<sup>20</sup> Showing these works together amplified the difference between engaging with the semi-living sculpture and its inanimate "dead" counterpart. However, because the vast majority of exhibition visitors were unable to experience this living-dead installation, the impact of this semi-living sculpture was not as strong as the *Tissue Culture & Art(ificial) Wombs* exhibited one year earlier. The new technique of presenting semi-living bioart pieces, even if only for part of the exhibition, is one element that defies traditional artwork display and sets this artist collaborative apart.

The first TC&A tissue engineered work to be exhibited live was *Tissue Culture & Art(ificial) Wombs* (fig 2) created and displayed in 2000 at the Ars Electronica Festival in Linz, Austria. Seven genderless dolls were created in the tradition of the Guatemalan worry dolls given to children. The idea is that children receive a box of six dolls and at the end of the day one worry can be whispered to each before bed. Overnight the dolls

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<sup>20</sup> Oron Catts and Ionat Zurr, "Semi-Living Art," *Signs of Life*, ed. by Eduardo Kac (Cambridge, MA / London: The MIT Press, 2007), 239.

dissolve the worries and the cycle can continue the following night. It follows, then, that a child may only have six worries each day.<sup>21</sup> Because adults have more worries than children, the artists made one more doll than the traditional six.

The concept associated with the living version is the same as the traditional Guatemalan one, share your worries with the dolls and they will dissolve them for you. In this artwork, Catts and Zurr assigned one of their cultural worries to each of the seven dolls as follows:

“Doll A: stands for the worry about Absolute Truths and people who think they hold them.

Doll B: represents the worry of Biotechnology and the forces that drive it (see Doll C).

Doll C: stands for Capitalism, Corporations.

Doll D: stands for Demagogy and possible Destruction.

Doll E: stands for Eugenics and the people who think that they are superior enough to practice it.

Doll F: the fear of Fear itself.

Doll G: not a discrete doll, as Genes are present in all semi-living dolls.

Doll H: symbolizes our fear of Hope.”<sup>22</sup>

This is not intended to limit the worries that can be told to the dolls, but to represent the worries of the artists in relation to the project as a whole.

The first version of the semi-living dolls was made of biodegradable/bioabsorbable polymers and surgical sutures. The supports were sterilized

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<sup>21</sup> Oron Catts and Ionat Zurr, “Growing Semi-Living Sculptures: The Tissue Culture & Art Project,” *Leonardo* 35, no. 4 (August 2002), 368.

<sup>22</sup> *Ibid.*, 368.

and then seeded with McCoy Cell Lines and cultured for two to three weeks before being put into a rotating bioreactor in which the dolls were exhibited.<sup>23</sup> The biopolymer structure guides the growth of the cell lines in the shape of the doll and dissolves as the tissue expands.

In a similar way to *Pig Wings*, the *Tissue Culture & Art(ificial) Wombs* were a result of artist and scientist collaboration and were living materials that were designed and coached into the shape of semi-living dolls. Both of these elements align with common themes of bioart, but also push beyond those presented in *Pig Wings*. Here, the sculptures were displayed living for the entirety of the exhibition, rather than only part of it. This allowed visitors to have the visceral experience of co-existing with a living piece of art and the transformation of these works from object to subject. This was a major breakthrough for Tissue Culture & Art Project and the reception and interpretation of their work. By presenting the piece living for the length of the show, more visitors were able to experience the work in its intended state and, as a result, there was a broader, and in many instances, deeper impact.

In the first exhibition of this work, the dolls were displayed living in a bioreactor and all but one survived the duration of the show. One doll was placed in a separate bioreactor system attached to an inverted microscope and photographed every five minutes to create a time-lapse of the growth for five days. Visitors could view the living sculptures in their structures but were also able to view time-lapse videos of the growth of one of the dolls online. This allowed a visitor to not only visually experience the living

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<sup>23</sup> McCoy Cell Lines, used in virology studies, were originally derived from humans but were contaminated at some point and are now classified as mouse endothelial cells (endothelial cells come from the inner surface of blood vessels and form the space between blood cells and lymph cells in the vessel walls), *Ibid.*, 368.

qualities of the sculpture through growth, but also to have a similar semblance of spending time with the piece. Relationships and bonds between living systems are built up through interaction over time. Therefore, viewers who experienced the passage of time with the work, and the mutual growth that occurred during it, strengthened their connection to the semi-living sculpture. This bond or sense of relationship to the work is a critical element to the challenge these works pose to new museum theory.

Reported visitor reactions varied from intense curiosity regarding the processes and materials used to create the object, to aversion and anger at the exploitation of human cells and the harmful impacts semi-livings have on the traditional Judeo-Christian view of human whole-ness and superiority. Critical viewers believed that the artist-scientists were challenging the authority of God in the creation of all things by manipulating living material to create new biological matter. Many believe that the power to create, manipulate, and take life is one that solely rests with God and those that attempt to take that power for themselves are violating His authority. To some, the use of both animal and human cells together violates the presumption of superiority of humans over animals. By mixing the two types of cells to the point where a visitor (or the scientist, artist, or artist-scientist) cannot visually distinguish them, it shows that they are one and the same which breaks down the common view that animals are somehow fundamentally (on the molecular level) inferior to humans. The display of living biological material prompts a highly emotional response in many viewers because of its visceral quality and its inimitability.

A goal of exhibiting semi-living sculptures is to initiate a public conversation about the advancements and future implications of biotechnology. For TC&A's work

specifically, they hope to also instigate an awareness of the inconsistencies in the relations we have with other living entities. For those who engaged with *Tissue Culture and Art(ificial) Wombs*, they could begin contemplating the liminal space between living and non-living, human relationships with other living systems and the problems therein, as well as being confronted with the worries associated with advancing biotechnology and the impact on society.

Since this first iteration, the project has been repeated and exhibited several times under another name, *Semi-Living Worry Dolls*. In the later renderings, computers and an online forum were added to anonymously share worries with the dolls. Additionally, in one installation, visitors were given the opportunity to whisper their worries through a microphone that was projected directly into the bioreactor to the dolls. These developments in exhibition techniques reflect the visitor interest in engaging directly with the semi-living sculpture and forming a personal connection. This reveals a striking difference from *Pig Wings* in that the *Tissue Culture & Art(ificial) Wombs* better displayed their living quality which impacted the viewer in a different and profound way. Because the piece was displayed living for the whole run of the exhibition, it impacted more visitors than the living *Pig Wings* installation. These changes in display and impact begin to reflect a trend toward a stronger connection to the art objects (or subjects) themselves made over time.

A third significant piece in TC&A's *oeuvre* that reveals the challenges that these semi-living sculptures pose to the viewer and the museum is *Victimless Leather* (fig 3), initially realized in 2004. The sculpture is comprised of a thin layer of immortalized cell lines, a combination of human and mouse cells, that are cultured and grown on a support

in the shape of a simple coat that designs or coaches the shape of the object.<sup>24</sup> The support biodegrades as the cells grow into a leather-like substance following the shape of the coat structure.

According to the artists, *Victimless Leather* is interpreted as a reflection of society's need to cover oneself with clothing, and plays with the controversies that arise when the elite convey status through fashion made from animal products. Catts and Zurr, hope that "This artistic grown garment will confront people with the moral implications of wearing parts of dead animals for protective and aesthetic reasons and will further confront notions of relationships with living systems manipulated or otherwise. An actualized possibility of wearing 'leather' without killing an animal is offered as a starting point for cultural discussion."<sup>25</sup> In this vein, Catts and Zurr are not aiming to make a useable product, but are raising questions and provoking a discussion about the issues surrounding the appropriation of animal products for aesthetic purposes. An ironic twist with the work is that the hope for a "victimless" leather is subverted by the use of fetal bovine serum in the nutrients fed to the sculpture each day. More significant for this discussion is how Catts and Zurr begin a dialogue about how attendees of an art museum interact with other living systems in the gallery space. This intersection of human and non-human and the conversation that comes out of it are integral to concepts associated with bioart.

Through the display of *Victimless Leather*, similar to *Tissue Culture & Art(ificial) Wombs* and *Pig Wings*, the work reveals its inception in a collaborative environment, its engineered nature, as well as its living display. Though differing from the other two

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<sup>24</sup> "Victimless Leather," *Tissue Culture & Art Project*, accessed August 15, 2013, <http://tcaproject.org/vl/>.

<sup>25</sup> Ibid.

works, *Victimless Leather* has further challenged traditional display techniques in profoundly new ways. In asserting its living characteristics it not only impacts the visitors, but also challenges the traditional power systems of the curator, artist, and artwork.

While each of these sculptures has its own interpretation, there are larger themes that each addresses. While they align with bioart themes of raising awareness of biotechnological advancements and practices of designing and manipulating biological material are clearly present, there is something more complex about Tissue Culture & Art Project's works. The exploration and critique of human relationships with other entities is a critical component to these pieces. Though, this element is not fully present until the living work is presented for visitors to interact with. Through this engagement, viewers explore human's relationship to other living systems and consider how that relationship changes arbitrarily from being to being.

## CHAPTER 2: MUSEUM ADAPTABILITY

Once displayed in a museum environment, TC&A's semi-living sculptures reveal their complex nature as subjects, not just objects, and challenge the museum in new ways. Three works, *Pig Wings*, *Tissue Culture & Art(ificial) Wombs*, and *Victimless Leather*, present not only a heightened awareness to the implications of biotechnological advancements but also a new understanding of the relationships humans have with other living systems and the inconsistencies associated with those connections. These are crucial components to the reception of the pieces, but how are these ideas relayed? What display theories and techniques are used to convey these complex notions?

A critical theory used to interpret and contextualize work within the contemporary art institution is new museum theory. These ideas reflect changes that have transpired in the last fifty years and have propelled the institution to transform itself and the roles of those players within it. In this chapter, I explore the approach of new museum theory to frame the display of the Tissue Culture & Art Project piece *Pig Wings* (fig 1). I examine the changes expected of the visitor, artist, and curator as well as the transformations that must occur in the exhibition space within the institution. I have selected *Pig Wings* as the entry into this discussion because its first exhibition included both a semi-living and a "dead" component to the installation. This offers my argument a point of contrast between curating "dead" art objects and semi-living pieces examined further in chapter three. Through this juxtaposition, I highlight the challenges that arise in framing the semi-living TC&A works in new museum theory.

### NEW MUSEUM THEORY

New museum theory is an approach to interacting with artwork on display in an art museum. The concepts associated with it have been constructed to help bring the museum into the contemporary age. In order to respond and accommodate modern demands of the public and the actors within the industry itself, the museum has needed to modify its practices to remain a relevant social institution. Shifts in the industry revolve around an increasing self-awareness and self-criticism in order to prepare the museum, as well as museum-goers, for the contemporary art exhibit.

Three major characteristics illustrate the new museology and drive specific actions by the participants. The first is for the institution to break down its own external guise of authority. The second feature is to openly discuss issues of framing and construction to be more transparent in its practices. The third point is for the museum to collaborate with all the players involved in and outside of the institution.<sup>26</sup> Through these three transformations, the museum can deconstruct the notion that it is a neutral, authoritative institution, void of public discourse and critique.

New museum theory derives from several factors driven both by the public and by the museum itself. In the last fifty years growing wealth and disposable income has pushed society to find more modes of entertainment. The museum has become one of those outlets. However, with the rise of the amusement industry, public expectations of attractions and leisure have increased as well. Higher hopes of pleasure and fun have urged the museum industry to augment art collection displays with more “attractions” like restaurants, late night events, as well as more high profile exhibitions to bring in

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<sup>26</sup> Janet Marstine, “Preface,” in *New Museum Theory and Practice: An Introduction*, ed. by Janet Marstine (Blackwell Publishing: Malden, MA / Oxford, 2006), x.

more visitors.<sup>27</sup> These new types of events help to break down the stereotype that the museum is a neutral site of learning and can be a social site of interaction and cultural engagement.

As public funding of these institutions decreases, museums search for ways to bring in the necessary funds to ensure their own survival. As museums are forced to cater to higher expectations of a pleasure-seeking public to ensure visitor attendance and money, they begin to focus more attention on the desires of the public and less on the goals of the institution and the exhibition of artwork. Additionally, exhibitions with attendee participation and opportunities for audience input and feedback are on the rise to ensure visitors find value, as well as entertainment, in their experience. This engagement with the community and listening to their interests in the museum has led to institutions making their practices more transparent. The museum's openness regarding their procedures has encouraged a dialogue with the very people the organization serves. In many ways, the public has helped prompt transformations to make the museum more collaborative, transparent, and less authoritarian.

The institution itself has made changes that have added to the framework of new museum theory as well. As museums strive to be entertainment centers as well as money-makers, they need professionals who can guide the institution in achieving these goals. As a result, more museum specialists are emerging to take on the roles of catering to the public and bringing in money.<sup>28</sup> Experts in the industry create standards and goals to mark achievement which then are transferred from museum to museum elevating the

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<sup>27</sup> Kenneth Hudson, "The Museum Refuses to Stand Still," in *Museum Studies: An Anthology of Contexts*, ed. by Bettina Messias Carbonell (Malden, MA/Oxford/Victoria, Australia: Blackwell Publishing, 2004), 87-89.

<sup>28</sup> Hudson uses the term professionalism in referring to the advances in the museum field like employees earning higher level degrees before entering the workforce, *Ibid.*, 87.

industry as a whole. Not only are museums now adjusting to increasing expectations of the public, but they are also responding to their own rising benchmarks for success.

A major component to these industry standards is an element of self-criticism. Museum professionals and critics have identified areas in which the industry can improve and in an effort to do so, curators and directors have opened up their daily processes to the public to be more transparent, a critical component associated with new museum theory. In order to break down the common misconception that the museum is a neutral, authoritative institution solely relaying absolute truths, museum professionals have deemed it necessary to be very open about the design, construction, framing, installation, and display of exhibitions. By revealing their practices, museum professionals identify that there are many decisions that are made throughout the process that reflect the opinions of a small group of individuals. The increasing self-criticism of the museum industry is the core theme of new museum theory and is instigated from within the museum industry itself.

The shifting museum asks more of the visitor in order to appropriately approach the context of new museum theory. As the institution identifies areas that need to be transformed, it asks the visitor to be the one to ensure those changes are being carried out. New museum theory calls the visitor to actively engage with the institution, particularly its exhibitions, as a critic of the organization's projects. Awareness and inquisition are essential characteristics in a critical museum visitor.<sup>29</sup> A museum-goer that takes note of the ways an exhibition is designed from the architecture, to the installation layout, to the constructed message, down to the wall and text color is one that is assuming an active

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<sup>29</sup> Margaret Lindauer, "The Critical Museum Visitor," in *New Museum Theory and Practice: An Introduction*, ed. by Janet Marstine (Blackwell Publishing: Malden, MA / Oxford, 2006), 223.

role in her museum experience. No longer a passive and accepting viewer, the engaged visitor is critical of every element of which she takes note. By remaining connected to the elements that make up the exhibition, the critical museum visitor can find and learn the exposed museum practices, design techniques, and collaborative efforts. Taking these framing elements into consideration, she can begin to break down the misconception of the “all-knowing” museum. The display institution can only provide the framework of new museum theory if there are actively engaged visitors who critically analyze each component of an exhibition and require the museum to be open and transparent with its practices. In addition to being a driving force behind the rise of new museum theory, the public is required to take part in its implementation as well.

I contend that a final factor in the rise of new museum theory is the impact of the artists and artworks themselves. A common trend in modern artwork is the critique of society or the arts industry. Nineteenth century French Impressionists chose to defy the Académie and portray scenes of everyday modern Paris, critiquing the new modern society. The Dada and Surrealists of the early twentieth century rejected classifications of art and deemed ordinary objects as “art” simply based on the idea that it was. Continuing the trend well into the mid-twentieth century with performance art and beyond with environmental art and new media art, contemporary art movements challenge the notions of what art is as well as the ways to display it. These changing ideas of art have impelled the museum to adapt its common display techniques to accommodate new artforms. Whether it is the incorporation of different technology, the arrangement of space for a performance piece, or the expansion of the museum outside the institution’s walls, new trends in the art world have required the museum to change.

I argue that it is the flux in artforms that has propelled the most change with new museum theory because these new pieces require different attention from curators and visitors alike, based on the artist's vision. Bioart is another movement of contemporary art that challenges museum display techniques because of the changes in medium, content, and message. Performance art, environmental art, and new media art all require the museum to alter its operations to accommodate live, living, or moving artwork as well as the accompanying technologies necessary to keep the work in its intended display state. Works of bioart require museums to make similar changes to accommodate unusual displays and techniques, but do so in a different, foreign way. While performance art needs different installations and interactions with the museum-going public, the living beings take care of themselves and are a living system that is part of society's everyday life. The living entities involved in environmental art may be different than what some people interact with on a daily basis, but, in general, are familiar biological beings. Also, technologies associated with new media art are becoming much more common in day-to-day operations in museums as projections and computers are increasingly a part of video installations and educational films.

However, a living entity that requires care and specific equipment that has previously only been used in a science lab is something entirely new for the exhibition setting. TC&A's works necessitate new adaptations that have not previously been required for art display because they are semi-living. Do the theories that have been adapted to frame these other forms of artwork also apply for bioart? I argue that in some ways a bioart piece like Tissue Culture & Art Project's *Pig Wings* can be contextualized through new museology in theory because they can be displayed with the conventions of

new museum theory. Yet in practice, the live quality of the works challenges these themes and requires different actions from the players involved in their exhibition.

### *PIG WINGS ON VIEW*

The initial presentation of *Pig Wings* (fig 1) in 2002 was at the Adelaide Biennial of Australian Art in the exhibition titled *conVerge: Where Art and Science Meet*. In this show, Tissue Culture & Art Project displayed the original work “fixed” and coated in gold. In other words, the first iteration of the piece was “dead” or not living. For the first ten days of the exhibition, a second set of wings that had been cultured for five months (as opposed to the nine of the initial set) were displayed “live” alongside the first set of “dead” wings.<sup>30</sup> The installation purposefully played with the live-dead dichotomy highlighting the living quality of the second set on view.

Each step of the process of this installation and exhibition can be framed through several themes of new museum theory but also hint at its limitations. Beginning with the gallery space itself, the display of the “dead” set of wings did not pose a specific or new challenge to the institution or new museum theory. The three wings were displayed in simple boxes, similar to many other small and delicate art objects and did not require extensive installation alterations. The semi-living set of wings, however, did necessitate changes to be made that demanded collaboration with the artist. Elements of the science lab needed to be brought into the gallery space in order for the piece to be kept alive for the first ten days of the exhibition. Because the equipment is new to the museum environment, the artists’ involvement is crucial in order for it to be installed properly. In

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<sup>30</sup> Oron Catts and Ionat Zurr, “Semi-Living Art,” in *Signs of Life: Bio Art and Beyond*, ed. by Eduardo Kac, (Cambridge, MA / London: MIT Press, 2007), 239.

addition to collaboration between the artist and the institution, a critical context of new museum theory, the introduction of the science lab into the museum changes the display setting and therefore the framing of the object. This shift draws attention to the new elements in the installation and therefore highlights the altered lens through which the viewer experiences the work. By emphasizing that which keeps this work alive, the bioreactor equipment not only stresses the semi-living quality of the second set of wings, but also draws attention to the display and therefore the context of the installation. The presentation alone highlights new museum theory techniques of museum practice transparency as well as identifying and exposing the presentation of the objects. The live-dead display challenges the new museum theory context by transplanting completely new equipment from the sciences into the museum setting.

The presentation of *Pig Wings* required collaboration between the artists and the curators of the exhibition to ensure the work was appropriately displayed. Beginning with the installation, proper functioning, and de-installation of the bioreactor, the artists took on an active role in the presentation of the piece. With both the semi-living and “dead” components to the exhibition, the artists were involved in the design and display of each element.<sup>31</sup> In doing so, TC&A helped expose museum practices making the workings of the Adelaide Biennial more transparent to the public, but, also, the artist collaborative aided in breaking down the authority of the institution simply by assuming a more active role in the exhibition of their work.

The curator’s position also transformed within the context of new museum theory. In this installation, the curators Linda Cooper and Amanda McDonald Crowley were

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<sup>31</sup> Ibid., 239.

required to collaborate, discuss framing techniques, and reveal museum practices.<sup>32</sup> Collaboration is necessary with the artists, not only with the installation of the living wings' bioreactor, but also in designing the exhibition content and theme. In the *Pig Wings* display, the artists had the appropriate information to construct the show, knowledge that the curator did not have. Therefore, the curators had to admit that they were not the authority figure in relation to the bioreactor installation, and, likely, the full extent of the bioart piece. Here, the curators had to assume the role of middleman and translator between the artists and artwork, and the public. In this role, the curators had to reveal their daily practices and relinquish several tasks they previously tended to themselves over to the artists. These duties included designing the installation, framing the art object, and constructing the content. The curators, as opposed to being the sole designers, became partners in these responsibilities.

These curatorial role shifts apply both for the semi-living and the "dead" works within the exhibition, but an additional change was required for the living component. The artist-curator partnership was pushed further in the installation of the semi-living *Pig Wings* because the artists possessed the necessary skills to ensure the work's safety and protection. The curators, Cooper and Crowley, had to allow the artists to manage the entire live display. This stretched the expectations of collaboration because Catts and Zurr retained the power and control of the object. Rather than partnering with the curators and sharing their knowledge, the artist team worked alone.

One instance where TC&A retained complete control in the exhibition was the life cycle of the live installation. Rather than share the care-taking responsibilities with

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<sup>32</sup> Cooper and Crowley were the co-chairs of a working curatorial team including Jenny Fraser, Victoria Lynn, Karl Tefler, Sarah Thomas, Lynette Wallworth, and Angharad Wynne-Jones, "conVerge," *Adelaide Biennale*, accessed August 15, 2013, <http://adelaidebiennial.com/>.

curators, Cooper and Crowley, Catts and Zurr created what they term the Killing Ritual. After the first ten days of the show, the amount of time the artists were present at the exhibition, Catts and Zurr exposed the semi-living set of *Pig Wings* to the air and their touch, thus killing them through contamination. By choosing to terminate the piece rather than transferring their role as caretaker to the curators, the artists not only stretched their artist-curator partnership, but also kept their own procedures secret. Rather than collaborating with museum workers and framing their work through the new museum theory themes of process transparency and collaboration, the artists shrouded their processes in secrecy. The choice for the artists to maintain care-taking control of the semi-living sculpture is one way the display of TC&A's works challenge new museum theory.

In addition to the changes required of the gallery space, artist, and curator, the installation of *Pig Wings* necessitated transformations in the role of the visitor as well. These shifts for the viewer also fit into the new museum theory framework. The Adelaide Biennial exhibition, particularly the first ten days, called for the visitor to take an active role in observing and analyzing each component of the semi-living installation. The full effect of the piece, when read in the context of new museum theory, was only experienced when the visitor connected with both the semi-living and dead iterations of the wings. In assuming an engaged role, the critical viewer would take note of the bioreactor versus the display box calling immediate attention to the framing. By emphasizing the installation components the critical museum visitor would think of the constructed voice behind the exhibition and also about the museum practices that are revealed through this piece.

In viewing the double installation, the bioreactor, not only calls attention to its role as a framing tool, but it also highlights the living quality of the second set of wings. In stressing the live-ness of the *Pig Wings* the critical museum visitor is drawn to its presence and similarity to her own existence. Live-ness demands relationships and as such the semi-living sculpture demands the viewer to create a relationship because of its presence. The artists' aim is to instigate an inner (and hopefully outward) examination of the museum-goer's link to this semi-living entity and how it reflects the arbitrary classifications humans use in determining value of other living beings.

In addition to a contemplative connection with the living work the critical visitor, who is familiar with new museum theory and is working within its framework, expects to engage with the work. She has learned through other relational works to connect with the piece and that the give and take of that relationship is how she should experience the artwork. But with the semi-living installation of *Pig Wings*, the visitor receives nothing back, she finds herself in a one way relationship and her expectations are disrupted. She desires participation in the exhibition. The observer wishes to interact with the sculpture itself and to have an impact on it. The visitor is left dissatisfied with this installation because it is the artists who interact directly with the piece, even though their main interaction with *Pig Wings* is to kill it. The break of the viewer's expectations and the reality of an unfulfilled connection with the semi-living sculpture is also an interruption of new museum theory, but one that was only present during the first ten days of the exhibition.

The installation of *Pig Wings* at the Adelaide Biennial in several ways can be framed through the context of new museum theory. The sculpture's display required

collaboration between artists and curators, introduced elements that called attention to the placement and construction of the exhibition, and engaged visitors in a critical way. The “dead” wings posed no issues that could not be framed by the new museology. However, the semi-living wings that were displayed for the first ten days of the exhibition did raise issues that disrupted the themes of new museum theory. The technology and care required to sustain the piece brought new equipment and procedures into the museum environment. Because of these new conditions, the artists chose not to share the responsibilities with the curators and violated the expectation of collaboration. The greatest breach of new museum theory however was the disruption of the visitor’s anticipated interaction with the work itself, which is tied closely to the living nature of the sculpture. This is the critical element of TC&A’s works and the component, as we will see with both *Tissue Culture & Art(ificial) Wombs* and *Victimless Leather*, that affects the museum the most.

### CHAPTER 3: DEFYING NEW MUSEUM THEORY

The most powerful displays of Tissue Culture & Art Project's work are the ones in which the piece is presented live for the entirety of the exhibition because the objects themselves are given a chance to grow and change. By doing this, the artist collaborative provides access for more visitors to view and interact with the piece and also to experience surprising transformations of the sculpture further stressing its live-ness. The effect of spending time with the work and experiencing its development is an element that is new to the museum environment and requires additional alterations beyond new museum theory. The exhibition of two TC&A pieces, *Tissue Culture & Art(ificial) Wombs* and *Victimless Leather* present the disruptions to and inadequacies of new museum theory because their live quality demands more of the artists, curators, and visitors who interact with them. It is once the object has a chance to exert its own affective power, and become a subject, that the work can no longer successfully be contextualized through new museum theory.

In this chapter, I will first examine *Tissue Culture & Art(ificial) Wombs* (fig 2) as an example of a TC&A work that was presented living for the duration of the exhibition at Ars Electronica in 2000 in Linz, Austria. As it was the first piece to be presented live in the gallery, it provides a solid initial example for the complications that arise in exhibiting semi-living sculptures. In examining this installation, I will explore the ways that the gallery space changes and the roles and expectations of curator, artist, and visitor are challenged because of the increased demands from the semi-living work. As the second case study in the exhibition of Tissue Culture & Art Project's semi-living sculptures, I will analyze two different installations of *Victimless Leather* (fig 3), one at

the Museum of Modern Art in New York in the exhibition *Design and the Elastic Mind* in 2008 and the Mori Art Museum in Tokyo in *Medicine and Art: Imagining a Future for Life and Love*. These exhibition installations will serve as instances where the art object transformed in new and unexpected ways. I contend that it is in these occurrences that the semi-living works pose the greatest challenges to new museum theory. I argue that the semi-living nature of Tissue Culture & Art Project's pieces affect the museum environment in unusual and novel ways because they demand more of the players involved. They require care, demand relationships, and perform similarly to other relational works, but ultimately they disrupt the expectations of artist, curator, and visitor by not providing a mutual exchange and by defying the attempted control over it by growing unexpectedly. The semi-subject nature of these sculptures is critical because it allows the players to formulate the same anticipated outcomes of other living works framed through new museum theory. But, as I will show with the exhibitions of both *Tissue Culture & Art(ificial) Wombs* and *Victimless Leather*, the pieces defy those predictions as they are only semi-living, semi-subject, semi-whole. They cannot perform as whole bodies, no matter how much we presume them to do so. The interruption of an expected interaction with *Tissue Culture & Art(ificial) Wombs* or *Victimless Leather* is only revealed through their display.

### *TISSUE CULTURE & ART(IFICIAL) WOMBS*

For the first display of their semi-living sculptures in 2000 in *Next Sex: Sex in the Age of its Procreative Superfluosity*, TC&A exhibited *Tissue Culture & Art(ificial) Wombs* (fig 2) at Ars Electronica in Linz, Austria. Ars Electronica is a cultural institute

engaged in presenting the cross-roads of art, technology, and science through new media art. The annual festival honors and displays pieces by artists working in these fields. For their ground-breaking installation, TC&A chose to transplant a wet biology lab into the museum.<sup>33</sup> The dolls were first cultured in a science lab off-site for two to three weeks. Once they were of the proper size and strength each doll was transplanted into its own bioreactor tube and moved into the gallery wet-lab for protection and proper care. By transforming the museum space into a science lab, the artist collaborative created their own distinct framing for the work. In a similar way to the bioreactor, though on a much larger and more imposing scale, the lab called attention to the framing of the work as well as the living quality of the sculptures and care it required.

Through the large imposition of the wet-lab into the museum, the installation changed the display environment. Rather than maintaining the gallery's architectural framing and using that to ground the object in the art environment, the wet-lab installation created a scientific setting. The shift away from an artistic framework toward a scientific one is new within the museum. Though the collaboration and transition in framing requires a new museum theory approach to its display, the extent to which this happened in the *Tissue Culture & Art(ificial) Wombs* installation was beyond new museology bounds. Here, the art gallery was supplanted by the wet-lab and therefore took precedence in its prominence. By doing so, the focus became science and the objects became scientific specimens rather than art. While this installation did expand the concept of what art can be, it does so through a scientific framing, as opposed to one of

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<sup>33</sup> TC&A commissioned specialty architects to design and construct the in-gallery wet lab for the exhibition. In addition to collaborating with the exhibition designers and curators, the artist team also worked with these architects in engineering the wet-lab display environment to their specifications, Oron Catts, "The Art of the Semi-Living," in *Live: Art and Performance*, ed. by Adrian Heathfield, (London: Tate Publishing, 2004), 157.

art. This required changes not only of the space itself but also the design of the exhibition by curators and the artists as well as the reception of it by visitors. The changes in gallery context necessitate a differing approach to the work, one that cannot be found in new museum theory.

In addition to the protection the piece needed in the wet lab, *Tissue Culture & Art(ificial) Wombs* also required regular care, as all living entities do. Though in contrast with other living art objects, the semi-living sculpture cannot care for itself; it necessitates an outside caretaker. The artists Catts and Zurr assumed this role for the installation at Ars Electronica as they did for the first ten days at the Adelaide Biennial for the living *Pig Wings* display. In this particular presentation of *Tissue Culture & Art(ificial) Wombs* a new process needed to be incorporated into daily museum processes. Because the sculptures were kept alive for the entire exhibition length, rather than just for the first ten days, it was necessary to feed the dolls by changing the nutrient solution. This was incorporated through the Feeding Ritual. In this process, the artists would enter the lab donned in appropriate scientific gear (e.g., lab coats, gloves) (fig 4), more to protect the artwork than themselves, and proceeded to change the nutrient feed that sustained the dolls. Through this process, the artists, once again, reinforced the living quality of the dolls by caring for them and emphasizing their need to eat and be nurtured. Like visitors watching a feeding ritual at a zoo, museum-goers could view the daily process through the windows of the wet-lab, creating distance, wonder, and heightened awareness to the living nature of the work as well as the framing of it as such (fig 5). Additionally, the Feeding Ritual heightens the realization of the semi-living sculpture's dependence on the artists to survive while also reinforcing the scientific context of the

work. This distinct caretaking process for the objects is new to the museum and impacts the players involved in the exhibition as well as the display space itself.

In examining the participants engaged in the installation of *Tissue Culture & Art(ificial) Wombs*, the curators, Gerfried Stocker and Christine Schöpf, were required to collaborate with the artists, similar to the *Pig Wings* exhibition. In the partnership between the curators and artists, the curators needed to share tasks associated with the daily operations of the museum and installation. Though, similar to the *Pig Wings* installation, the artists retained much of the power and control as caretakers of the semi-living dolls and did not share those responsibilities and processes with the curators. The expectation of the curators to collaborate with the artists throughout the construction of the exhibition was disrupted by the needs of the sculptures and the caretaking responsibilities maintained by the artists.

In the first display of *Tissue Culture & Art(ificial) Wombs*, the living quality of the art object affected the artists' role more than that of the curators because TC&A took on the responsibility of caring for the work. As opposed to being done with their part of the exhibition design with the de-installation and killing of the living pig wings, the artists took an active role in the daily exhibit operations in the feeding and caring rituals. By being engaged and visible participants within the framing of the wet lab, the artists assumed the role of caretaker and scientist. While collaboration and transparency of exhibition processes and framing is part of the themes of new museum theory, there is something different about the role of caretaker to the object. The living component of *Tissue Culture & Art(ificial) Wombs* stretched the role of artist. Here rather than remaining just the creators of pieces, Catts and Zurr arguably assumed a parental role to

the dolls in addition to their active participation in the exhibition design. In being constant elements in the installation, the artists became part of the living components in the work, providing points of comparison to the semi-living dolls. A performance of sustaining life became part of the role of the artist-caretaker, with the wet lab as the stage on which it occurred.

In acting as the caretakers to the sculptures, the artists spent significant time with the dolls, creating a relationship. Not only the kind of connection in which Catts is contemplating his own live-ness in comparison to the doll or the placement of the sculpture in the arbitrary hierarchy of living systems, but the kind of link that happens through co-presence of life. As the sculpture grows and develops, the outcomes of its live-ness are experienced more strongly because of this specific passing of time. This connection is furthered with the contemplation of one's own evolution during that same time period, and not just for the artist, but for anyone who engages with the piece.

Relationships are fostered over time. It follows that the more time the artist, visitor, or curator spends with the subject, the stronger the bond becomes. As the time passes and the link intensifies the observer places a greater value on the semi-living sculpture because of the connection and its significance. This is the critical element on which TC&A's interest in exploring relationships between living systems rests.

Associated with the bond between living beings is an expectation of mutual impact, the idea that each party will influence or interact with the other in a significant way and gain something from the relationship. The anticipation for exchange is disrupted when the sculptures are killed at the exhibition's conclusion and nothing is left to show for the

connection except a blob of ooze and some memories. Time is a critical component to the impact TC&A's works have on curators, visitors, and themselves as the artists.

Similarly to the *Pig Wings* installation, the worry dolls exhibition required a more engaged and critical visitor. It is not only that the attendee was likely unfamiliar with the basic process of tissue engineering, and therefore, uneducated in *Tissue Culture & Art(ificial) Wombs* in particular, but also unprepared to experience a living piece of artwork. Because of the presence the piece possesses and its unusual living nature, a visitor must engage with it in a different way. Comparable to the artists, viewers of this work formed relationships with the sculptures through the contemplation of life. Those who spent more time with the subjects strengthened their bond and added an arbitrary value to the semi-living tissue. The relationship's increased significance instigated expectations of the connection's mutual impact which, in the end, was disrupted when the exchange was not achieved.

For *Tissue Culture & Art(ificial) Wombs*, in particular, viewers were asked to whisper their worries to the dolls with the understanding that they will dissolve those concerns overnight, similar to the Guatemalan worry dolls that they are modeled after. This physical interaction with the work is one way the visitor could be an active participant in the exhibition. Another was through the engagement with the living qualities of the piece. Catts and Zurr hoped that engagement with the semi-living sculptures elicited reflections of what life is and its basic components and relationships between entities that share those same elements. Visitors who spent time with the dolls and shared their worries experienced those living qualities through a shared growth and development. Over time observers were able to begin creating emotional connections

with the dolls as the understanding of their subjectivity, and therefore the perceived ability to develop in a relationship, intensified. The visitor's desire for a reciprocal impact with the sculpture drove her to engage with the dolls in the same way she interacts with other humans and living beings.

The aspiration for a mutual exchange with the *Tissue Culture & Art(ificial) Wombs* was not only motivated by the impulse to relate to the living qualities of the dolls but it was also encouraged by the framework of new museum theory. Museum attendees have learned through the new museology approach to artwork and contemporary museum exhibitions that they can affect or interact with relational living artwork. The observer's expectation of mutual exchange or influence was disrupted at the close of the *Tissue Culture & Art(ificial) Wombs* installation when the dolls were taken from their bioreactor cells and killed. The visitor was reminded of the semi-living qualities of the sculptures when, in the end, there was no real impact either direction. She was unable to truly care for the sculptures, that role was taken by the artists, and she was prevented from saving the dolls as they were killed despite her connection to them. The visitor was left with nothing but intangible, indescribable feelings and a pile of tissue ooze. Her expectations of a reciprocal relationship from the work's live qualities and from her experience of the new museum theory framework of other contemporary pieces were broken by the very characteristic that makes it seem possible. *Tissue Culture & Art(ificial) Wombs* are semi-living and therefore cannot be experienced in the same way as other live works.

*VICTIMLESS LEATHER*

The growing and changing nature of the semi-living sculpture also requires significant transformations in the museum and poses challenges to being read through new museum theory. In the installations of *Victimless Leather* at the MoMA and at the Mori Art Museum, the sculpture itself changed unexpectedly and necessitated new actions from players in the museum that were unprecedented. The unpredictable nature of these TC&A sculptures compellingly confronts the new museology framework.

In many ways this display of *Victimless Leather* at the MoMA in 2008 was similar to the Ars Electronica presentation of the worry dolls and therefore complicates the framing of new museum theory equally. The work was displayed in its own self-contained bioreactor, which removed the visual structure of the in-gallery wet lab that was an important element in the exhibition of *Tissue Culture & Art(ificial) Wombs*. A similar scientific framing remained, though, in the equipment used. This scientific context stressed the sculpture as both art object and science specimen. The piece was displayed inside a bioreactor which not only emphasized its living nature, but also allowed it to be fed daily with nutrient solution and to impact visitors as a semi-living presence for them to connect with. What was significant about this installation was that the artwork developed unexpectedly which further identified the limitations of the museum and the new museology approach through its own assertion of live-ness.

In *Design and the Elastic Mind* at the Museum of Modern Art, *Victimless Leather* was installed by the artists and cared for by the curator, Paola Antonelli, once Catts and Zurr returned to Perth. Five weeks into the exhibition, the cells grew out of control and nearly clogged the reactor. The tissue grew so quickly that the bioreactor could not sustain the sculpture as crucial pathways for the nutrient solution were blocked by the

multiplying cells. This surge of cell growth was an unexpected action by the artwork, one that had not occurred in other installations of TC&A's semi-living sculptures and took Antonelli by surprise. In transferring the caretaker role to the curator, the artists had also handed over the abortive power associated with the creator/parent title. So when the cells grew out of control and threatened to clog the bioreactor, it was Antonelli's decision to end the life of the sculpture, which she ultimately decided to do.<sup>34</sup> Though she consulted with the artists, who were thrilled by the unpredicted growth, which they felt further highlighted the sculpture's living quality, the final decision to terminate the nutrient supply to the piece was her own. The responsibility of taking care of the art object as well as deciding its fate is one way that *Victimless Leather* disrupts the roles and expectations of the new museum theory framework.

A second example in which the artwork acted unexpectedly and confronted the museum in new ways was another installation of *Victimless Leather* at the Mori Art Museum in Tokyo in the 2009 show, *Medicine and Art: Imagining a Future for Life and Love*. In this exhibition, the little tissue jacket was installed in the bioreactor similar to previous displays. Even though the work was fed the same nutrient solution that included antibiotics, weeks into the show a fungus grew on the jacket, changing the aesthetic of the piece (fig 8). The curator, Hirose Mami, as caretaker and parent, had to decide the fate of the work. Similar to the installation at the MoMA, Catts and Zurr were pleased with the unplanned growth, that, once again, stressed the sculpture's living quality. Rather than ending the exhibition with the death of the jacket, the curator, in

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<sup>34</sup> Though Antonelli was unable to personally end the life of the sculpture and had a science colleague from Columbia University pull the nutrient solution flow ending the life of the sculpture for her, Carolina A. Miranda, "Weird Science: Biotechnology as Art Form," *Art News*, published March 18, 2013, <http://www.artnews.com/2013/03/18/biotechnology-as-art-form/>.

collaboration with the artists, decided to have the jacket re-grown and replaced to maintain the aesthetic of a “clean” jacket. Hideo Iwasaki, a collaborator of Catts and Zurr’s, re-grew and replaced the jacket on two separate occasions during this exhibition per the request of the curator. In both instances the jacket on display was terminated.

As is evident by Antonelli’s and Hirose’s decisions to abort the “victimless” jackets, the role of the curator in these installations was transformed more than that of the artist. Here, the themes of process transparency and collaboration were pushed to new extremes as the exhibition designer assumes the new role of caretaker and parent to the living artform. Feeding the work each day, watching it grow, and interacting with it on a daily basis reinforces in the caretaker its presence and its live-ness. Through these new curatorial tasks and spending time with the sculpture the curator fosters a relationship with the work to the point that strong emotions are formed and a value is added to its existence. Antonelli states “It generated reactions you wouldn’t think you’d have rationally...I really had to think about whether this little coat was alive.”<sup>35</sup> Though many curators form personal connections with the artforms they exhibit, there is something very different about a semi-living work that impacts several aspects of the job and one that, in the end, the curator has to kill. It is the unexpected qualities of the sculpture and the relationship that is formed over time that have the most affective power on the curator’s role.

Though another term for curator is “keeper,” the idea of preserving and protecting artworks is very different from feeding and nurturing a semi-living sculpture. Becoming the jacket’s caretaker and guardian changes the way the exhibition designer interacts with the piece. As the parent of a living entity that cannot make decisions for itself, the curator

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<sup>35</sup> Ibid.

assumes the responsibility of deciding the sculpture's fate. Here, rather than making decisions about the removal of flaking paint or re-hanging a crooked frame, the curator must choose to end the life of another living being. While still in the realm of maintaining the aesthetic of the piece, the stakes of those decisions are much higher with curating a semi-living work. This task, on the one hand, adds a different level to the contemplation of life deeply ingrained in the object, while, on the other, challenges the expectations of the curator as she manages the life of the sculpture.

The role of the visitor was also affected by these two exhibitions of *Victimless Leather* in that attendees were visually struck with the unexpected power of the sculptures. As with the display of *Tissue Culture & Art(ificial) Wombs*, museum-goers engaged with the living sculptures and over time created significant connections and a sense of value based on a co-presence with the jacket. The relationships that visitors forged lead to expectations of a reciprocal influence and interaction that was unrealized. The unfulfilled impact lead to a disruption in the attendee's reading of the work through new museum theory. The significant difference in the installations of *Victimless Leather* is the speed at which these interruptions took place.

Rather than needing to spend significant amounts of time with the sculpture or return to the museum multiple times to experience the transformation of the work, visitors who witnessed the rapid cell growth at the MoMA or the fungus development at the Mori Art Museum were struck with its living qualities immediately. The product of the sculpture's live-ness was evident through the aesthetic anomalies in the tissue overwhelming the interior of the bioreactor or the presence of an extra growth. In witnessing these unexpected actions, museum-goers could forgo the experience of a

shared sense of time and development and reach the same emotional effects in a moment. As a result of the accelerated understanding of co-presence, visitors were able to create a bond with the subject in that same moment. The expectations of exchange and interaction with the jacket surfaced in that instant as well. The strength of the relationship became an unanticipated outcome to the visit because of the speed at which it was formed.

Unfortunately, the intensity of the connection and the anticipation of the mutual impact were struck down that much more quickly also. Because *Victimless Leather's* actions were unforeseen and sudden, its imminent termination was likewise unpredicted. The swift and finite choice to kill the jacket brought the quick realization of the sculpture's semi-living quality and its inability to fulfill the visitor's hope of a reciprocal connection. Because the museum-goer's emotional experience of the work was expedited, the bond was formed and broken that much more quickly resulting in a deeper encounter that the approach of new museum theory cannot successfully frame.

These iterations of exhibiting Tissue Culture & Art Project sculptures expose the limitations of collaboration and process transparency linked with new museum theory. The unexpected actions of the works also stretch the boundaries of framing. They are alive after all! This ability to grow in unpredicted ways is the core component that disrupts the museum. By requiring the artist or curator to take on the role of caretaker, and therefore assume abortive power, the semi-living sculptures challenge new museum theory concepts by asking more of the participants. In the assertion of their live-ness, the sculptures engage curators, artists, and visitors with their presence and impact them on a deeper level.

In examining the installations of *Tissue Culture & Art(ificial) Wombs* and *Victimless Leather* it is clear that the semi-living quality of the works makes the greatest impact on the people involved in their display. Their need for caretaking challenges the expected roles of the curator and artist and their semi-subjectivity confront the visitor's relationship and anticipated exchange. In the display of *Tissue Culture & Art(ificial) Wombs*, the transformations that the sculptures cause are dependent on time. The more time spent together, the stronger the connection becomes and the greater the disruption to the bonds between participants and sculptures. The the presentations of *Victimless Leather* reveal that an unexpected change or action on the part of the sculpture can expedite the time necessary to upset the roles and hopes of the artist, curator, and visitor. The unforeseen actions and impacts of *Victimless Leather* are the moments that truly expose the inadequacy of the framework of new museum theory for TC&A's semi-living work.

## CONCLUSION

Tissue Culture & Art Project's semi-living sculptures are distinct artforms that behave differently than other art objects. They are made of the same basic elements as we are, communities of cells and tissues, and as such they draw out specific reactions in viewers. Because of their foreign nature, they prompt questions surrounding the meaning and make-up of life as well as their placement, and our own, among known living systems. The contemplation of what constitutes life and the relationships between living beings is only exposed once the works are on display and open to public viewing.

In the museum setting, TC&A's semi-living works can be framed through contemporary trends in museum theory but also reveal its limitations. Requiring collaboration between the institution and the artist, the exhibition of *Pig Wings* reveals the artwork's ability to help break down stereotypes of the museum as a neutral site for education. In changing the gallery environment to include visible scientific framing, the piece also exposes museum practices and can be read through themes of self-criticism and process transparency. The dual installation of semi-living and dead wings calls attention to the live quality of the sculpture through the Killing Ritual as well as the presence felt by visitors. It is this live-ness that requires changes in the roles of artist, curator, and visitor and demands relationships that pose challenges to the new museum theory framework.

The initial display of *Tissue Culture & Art(ificial) Wombs*, the first of the artist collaborative's semi-living installations, pushes the boundaries of what is expected in the gallery space as well as the roles of artist, curator, and visitor. The incorporation of the wet lab into the display environment exposes new framing techniques but also takes over

the space and shifts from an artistic lens to a scientific one. In nurturing the work, the artist becomes the caretaker of the piece and fosters a deeper connection with its living qualities through the time spent with the subject. The visitor is likewise affected by the live-ness of *Tissue Culture & Art(ificial) Wombs*. Over time the visitor is struck by the work's presence and propelled to make a connection with the dolls. Expectations of the reciprocal impact of the relationship are broken once the dolls are killed because there is no evidence of mutual impact to show for the experience. The visitor and artist are affected by the display of the sculptures in the museum setting when the approach of new museum theory is broken and they are reminded of these artforms' semi-living and semi-subject qualities.

In the installations of *Victimless Leather* the role of caretaker was turned over to the curator and therefore the full effect of the display of live art were felt in the museum and the limitations of new museum theory were exposed. The unexpected growth and assertion of the sculpture's live-ness required new and different action to be taken by the caretaker. Assuming this role, the curator, similar to the artists in the *Tissue Culture & Art(ificial) Wombs* display, created a significant connection with the sculpture. Outside the bounds of new museum theory's themes of collaboration and industry and process transparency, the curator's role was challenged by this new responsibility. Additionally, the visitor was affected by the unexpected actions of the tissue jacket. The viewer's expectation to form a connection with the sculpture was realized but in a much faster time frame because of the visibility of *Victimless Leather*'s living quality. Likewise, the anticipation of a reciprocal impact and interaction between exhibition attendee and artform was disrupted more quickly as the sculpture's termination was expedited as a

result of its unforeseen growth. The reminder of the jacket's *semi*-living nature is reinforced through its execution and the unfulfilled mutual exchange with the exhibition participants. It is the interruption of the artists', curators', and visitors' expectations that reveals the limits of new museum theory in framing Tissue Culture & Art Project's semi-living sculptures.

Though the approach of new museum theory includes the artist and visitor, the core subject of these themes is the institution itself. It is not surprising then that the strongest effects of the living sculptures are felt when they are displayed in the museum environment and the responsibilities of their care are turned over to the institution professionals. In order for the museum to maintain the trend of self-criticism and development, it is important to continue to exhibit artwork like those of Tissue Culture & Art Project. In exploring the limitations of the new museology through the exhibition of these pieces, new areas can be identified for improvement and transformations can be made to create a new theoretical framework for exhibiting semi-living works. In consistently re-evaluating and re-configuring display theories, the museum can remain a relevant cultural institution ready to display the next wave of contemporary art works.

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