

The Umwelts of Art and Science

Complexity, Collaboration, and Community Inquiry in the Works
of Meredith Tromble, Patricia Olynyk, and Christine Davis

by Hannah Star Rogers

Umwelt, a three-artist exhibition at BioBAT Art Space, takes the concept of collaboration to new heights and complications. It exposes the multilayered work of artists who engage with the sciences while offering visitors a nuanced view of what science both is and can be. Meredith Tromble, Patricia Olynyk, and Christine Davis are established artists who approach science as material for art. They have individually worked directly with scientists: as residents in their labs, as observers of scientific proceedings, as interviewers treating scientists as informants, and as direct co-creators of artworks. This collaborative presentation offers the opportunity to think about the different approaches that artists are taking to work with science in the new wave of art-science interactions and collaborations that is now well underway.

The location of *Umwelt* situates the exhibition squarely in the center of the expanding field of art-science work. This gallery, which is housed within the Brooklyn Army Terminal, is sponsored by BioBAT, a not-for-profit research and manufacturing center that supports the advancement of the life science industry in New York City. Through their works in digital media, installation, sculpture, and photography, Tromble, Olynyk, and Davis orient viewers to a playfully provocative and imaginative world of questioning. The artists open science and scientific “knowledge” up to interrogation and critique, but also to aesthetic experience and appreciation of the forms, images, and sounds that have been coded as science but are the exclusive domain of no particular knowledge system. In doing so, the artists invite viewers to escape easy divisions



Christine Davis: *Tlön, or How I held in my hands a vast methodical fragment of our planet's entire history*, 2019

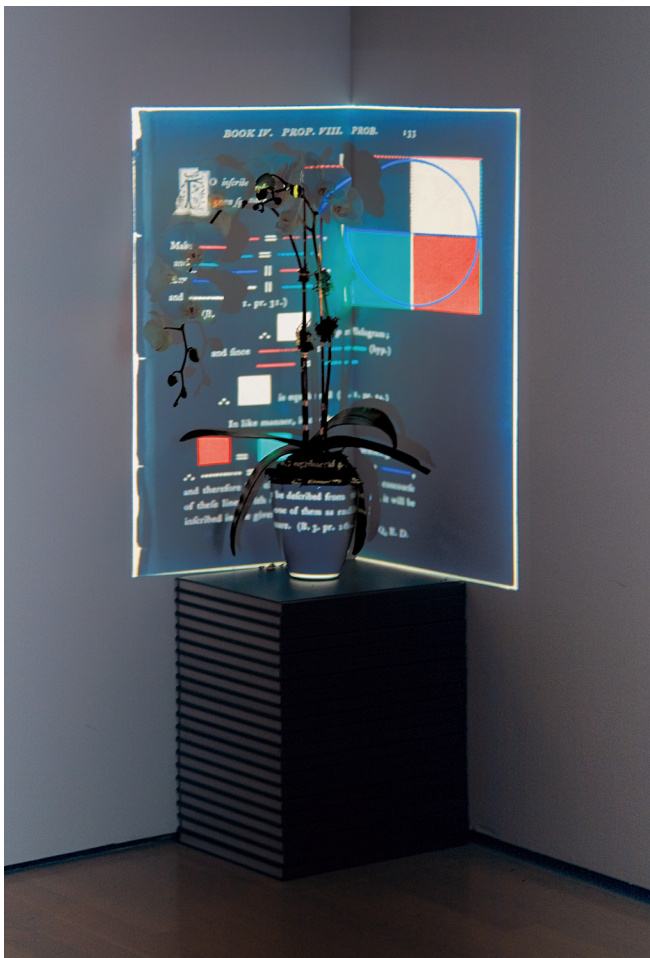
between art and science, to move away from, as the artists put it, “polarized and binary ways of thinking about the world.”

The complexities of science that these artists are investigating are reflected in the title of the exhibition. The concept of “*umwelt*,” as described in the semiotic theories of Jakob von Uexküll and interpreted by Thomas A. Sebeok (1976), is the world as it is experienced by a particular organism. As such, *umwelt* evokes more than environment; it emphasizes an organism’s ability to sense—a condition for the existence of shared signs. These signs offer meanings about the world, albeit of divergent sorts, to different types of organisms or even individual beings. *Umwelt* also calls attention to the specific senses that different organisms use to make meaning from their environments, including signs made by other organisms.

This conjuncture of signs and senses is brought forward in Davis's *Euclid/Orchid* (2009). This piece is an investigation of what Euclid's deductive mathematical treatise, *Elements*, might signal to an orchid when the text is projected onto it. The plant's *umwelt* makes the light emitted from the projector into a primary signifier. Through Davis's projection, the orchid encounters *Elements* in a disruptive sense: the light it receives is interrupted by the text. This direct relationship is further magnified to ecosystem scale in Davis's *World Without Sun* (2012). Titled after Jacques Cousteau and Louis Malle's 1964 underwater documentary on oceanaut habitat experiments, Davis offers images of a present-day ocean drawing on the perceptual frame potential of *umwelt*. In this case, Davis expands the theory to go beyond organisms in order to consider the

lifeworld (activities, experiences, and identity) of the ocean. The piece reflects on the ocean's modes of perception and the effects of other entities that enter the ocean's perceptual systems, including "propeller planes, environmental protest, and views of the solar system." In doing so, the work invites viewers to extend this thinking to other ecosystems and realms of the "natural" world in order to grapple with the radical interdependencies of life on earth.

What makes *umwelt* interesting in the context of this exhibition are the signs that communicate shared and divergent messages to different viewers. These shared signs might be thought of as corresponding to philosopher of science Bruno Latour's *immutable mobiles* (1986), to which Olynyk's *The Mutable Archive* (2015–ongoing) relates, or sociologists



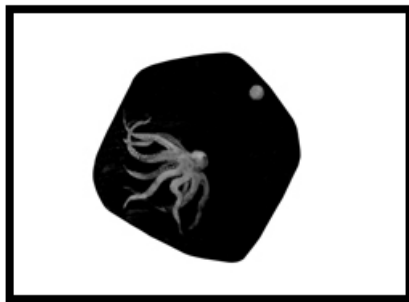
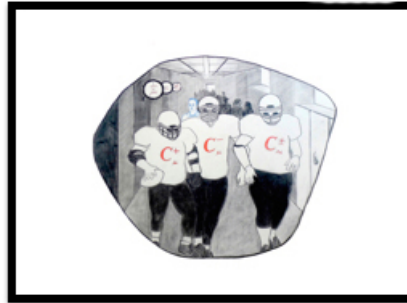
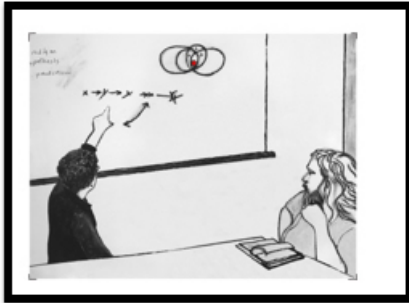
Christine Davis: *Euclid/Orchid*, 2009



Christine Davis: *World Without Sun*, 2012



Patricia Olynyk: *The Mutable Archive*, 2015



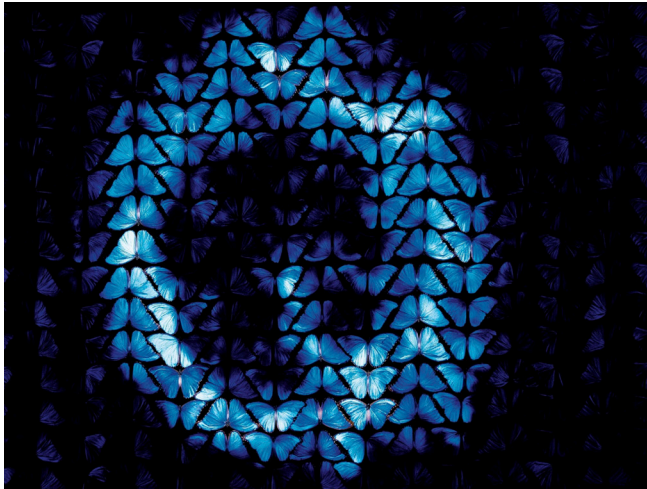
Meredith Tromble: *Dream Vortex: Lab Meeting* from the series *Dream Vortex 8.2*, 2011–2019

Leigh Starr and James Griesemer’s boundary objects (1989). These material instantiations of an idea are plastic enough to be interpreted differently across communities, but with enough “immutable” content to maintain their integrity to be recognized as knowable, potentially in both the aesthetic experiential sense and in the scientific sense.

The artworks in *Umwelt* also raise questions about the intersections of art and science in productive yet difficult ways. Tromble’s *Dream Vortex 8.2* (2011–2019) asks: how does the subjectivity of scientists co-exist with the objectivity in their research? Davis’s *Euclid/Orchid* asks: how can the technology of the projector be used to help us think about the metaphor of projecting? And Olynyk’s *The Mutable*

Archive asks: how can the new stories we tell about historical scientific artifacts reveal the social constructions that underlie scientific inquiry? These investigations are conducted through interviews with scientists, invitations to tell stories, and laboratory observations, but also through a play of images, forms, and metaphors.

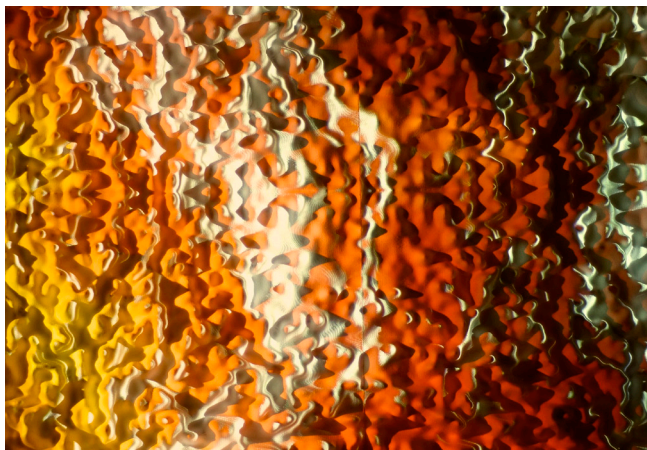
The artists use a great variety of media to address science as a source of both ideas and materials: as a subject, as a muse, and as an object of critique. This mixture of modes invites visual and conceptual dialogue between the pieces and between the artists. Davis’s projections onto butterflies in *Tlön, or How I held in my hands a vast methodical fragment of an unknown planet’s entire history* (2003–2019)



Christine Davis: *Tlön, or How I held in my hands a vast methodical fragment of an unknown planet's entire history, 2003-2019*



Patricia Olynyk: *Oculus, 2018*



Patricia Olynyk: *Dark Skies, 2012*

compare with the orchids she projects mathematical text onto as part of the metaphorical photosynthesis experiment that is *Euclid/Orchid*. In her works using projectors, Davis also explores the idea that scientists project interpretations onto artifacts and organisms. Similarly, Olynyk's *The Mutable Archive* metaphorically addresses and complicates the issue through the different interpretations participants offered of historical scientific objects and human subjects. This overlay of meaning happens again, this time in static form, in Tromble's mixed images of scientist's dreams and work *Dream Vortex 8.2: Lab Meeting* (2011-19) and Davis's *Full Fathom Five* (2019), a selfie overlaid on an x-ray of a chambered nautilus.

In *Oculus* (2018), Olynyk emphasizes the importance of observation as an exhibit theme by fabricating a light sculpture, which references the structure of a drone and the form of a drosophila's eye. The fruit fly is a favorite model organism of biologists who engage in an immense variety of observations of these insects. Observation is again treated in Tromble's documentation of *Anti-Pandora* (2009-2013), a guerilla action by a persona who is a watcher. *Anti-Pandora* observes and intervenes but she herself is observable only by evidence and is thus unwatchable, except by those who happen to be present during her actions. The fact that observation is a crucial idea across the *Umwelt* show is perhaps an expected effect of the working processes of the artists.

When artists work in laboratory spaces, they see not only the subject of the laboratory research with experimental equipment, protocols, and lenses of previous articles trained on it. They also tend to recognize, particularly in the cases of the artists in this exhibition, that scientists are people with personal research histories, a shared community of curiosity, and cultural interests and biases. In short, these artists focus on the context of science, as well as its objects of interest. The artists in *Umwelt* are working in broad, interdisciplinary terms spanning art and science. But they are also



Meredith Tromble: *Anti-Pandora*, 2009–2013

engaging humanities traditions from Art, Science, and Technology Studies (ASTS) by observing the work of scientists in laboratories and creating participatory relationships through social science interviews and oral histories.

The artworks in *Umwelt* draw on the traditions of installation and filmic art, but also on participatory and public art methods. Olynyk's *The Mutable Archive* consists of video performances of individuals reading narratives they wrote based on human skulls in Josef Hyrtl's collection of skulls at the Mütter Museum and the Narrenturm in Vienna. This collaborative work commissioned writers, scholars, historians, medical ethicists, philosophers, and a spiritual medium to write and performatively read a speculative biography for their chosen object. The work is a fascinating

depiction of the complexities of interpreting subjects and objects in the fraught history of the science of human taxonomy.

In combination with Tromble's *Dream Vortex* series, created with the scientist Dawn Sumner, *The Mutable Archive* yields new possibilities for understanding potential relationships between art and science. Tromble's *Dream Vortex 8.2: Lab Meeting* consists of drawings that illustrate the dreams of scientists that they described to her and observational drawings of the scientists at work. In a central drawing, these dichotomized worlds collide in the artists' speculative understanding of the meeting of ideas and practice in the lives of scientists: dream imagery meets work imagery. What has been parsed is now reunited as we know it to be in the human mind.

In light of Tromble's piece, Olynyk's work takes on new dimensions of individual reflection. This happens in the way that experiences and biases toward scientific subjects affect interpretations in specific contexts. But it also gestures outward: toward how these individual interpretations become part of how our society makes meaning from the material world. This process begins with ideas shared from individual minds, which in turn are valued differently by societies. Tromble and Olynyk's works, which actively involved communities of practice, reflect new ideas about what public art can do in society.

In her review of the history of public art, visual artist and theorist Suzanne Lacy (1995) identifies some of the factors that lead to artists' involvement in community outreach art as part of the move away from top-down non-participatory public art (Lacy 1995, Rogers 2011). Lacy's analysis of how bringing art to the public has changed intertwines interestingly with issues facing the scientific community around public engagement. Lacy describes the 1960s movement to put art into public places to be viewed and enjoyed by the masses. The impetus for this kind of art education via informal art experience maps easily onto deficit models of the public understanding

of science. In this model, the imagined public needs to be informed about science in order to give their (assumed) consent for its work: a person who does not agree with or assent to science's ideas is assumed to lack the adequate science education to do so.

Similar to the idea of the deficit model of science education, art funding agencies and community art centers worked under the assumption that the public needed more exposure to art and that if people could only be exposed to more art, they would understand and appreciate it. Some artists reacted to these directives and opportunities with concern about presenting themselves as authorities or singularly able to provide art experiences. In response, a variety of methods were developed by artists to move away from this top-down approach, often associated with art as commerce or art as an extension of a capitalist mode of interpreting

aesthetic possibilities. Instead, these artists wanted to involve the community in the creation, rather than simply the consumption, of art. In trying to include more groups in art, community artists began to blur the boundary between the artist and the audience.

In Umwelt, Olynyk's *The Mutable Archive* and Tromble's *Dream Vortex* works were created by the artists providing methods for communal artmaking. The artists devised situations for participation by others; the pathways for involvement included participants' writings about objects, which were then converted by the artist into a film performance, and scientists' narrating their dreams, which the artist then converted into drawings. Similarly, Davis's *Standard Candle (for Henrietta Swan Leavitt)* (2019) also raises questions about originating authorship and the many individuals who together produce a community of knowledge.



Christine Davis: *Standard Candle (for Henrietta Swan Leavitt)*, Detail, 2019, produced with Centre for Integrative Bio-Engineering Research



Meredith Tromble with Dawn Sumner: *Still from Dream Vortex*, 2011–ongoing

Thus, the art in *Umwelt* is representative of a new form of public art-science. These communal works point to the extensive scientific and artistic communities required to produce science and art. They also point to the potential value of the work of those outside these respective communities to shape the ideas produced within them. Tromble has called this outsider the “demon-artist,” after Maxwell’s heat-sorting demon from his 1867 thought experiment. Tromble suggests that a “demon-artist” might be able to join groups including scientific labs. By occupying the liminal space of having knowledge of a group but also an outsider status, this figure would have both pattern detecting and sorting capabilities. This might then allow for new kinds of observations and interventions. The wish to be both an observer and a participant is a pattern across the

Umwelt exhibit: artists gain a great deal from work in scientific labs and conversations with science-minded people, but they also have a great deal to offer as interlocutors and as outsiders with new ideas and practices. Ultimately, *Umwelt* demonstrates that community imagination is a precursor to collective knowledge. This is the knowledge that the concept of *Umwelt* offered all along: the realization that complete lifeworlds exist beyond our own.

Hannah Star Rogers
August 13, 2019

Bibliography

Lacy, Suzanne. (1995). "Metaphoric Landscapes and Cultural Journeys." Mapping the Terrain: New Genre Public Art, ed. Suzanne Lacy (Seattle, Wash.: Bay Press), 18-47.

Latour, Bruno. (2017). "Visualization And Cognition: Drawing Things Together." Philosophical Literary Journal Logos 27 (2): 95-151.

Rogers, Hannah Star. (2011.) "Amateur Knowledge: Public Art And Citizen Science." Configurations 19 (1): 101-115.

Sebeok, Thomas A. (1976). Contributions to the Doctrine of Signs (reprinted with new front matter but unchanged pagination; Lanham, MD: University Press of America, 1985).

—(1977). Neglected figures in the history of semiotic inquiry: Jakob von Uexküll. Reprinted in The Sign & Its Masters (reprinted with new front matter but unchanged pagination, 1989), 187–207. Lanham, MD: University Press of America.

Star, Susan and Griesemer, James. (1989). "Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39". Social Studies of Science. 19 (3): 387–420.

Tromble, Meredith. (2017). "Entangling Art & Biology: Knot Two – The Dream Vortex and the Demon Artist". Interalia Magazine. September, 2017. <https://www.interaliomag.org/articles/entangling-art-biology-knot-two-dream-vortex-demon-artist/>

Uexküll, Jakob von 1899–1940. Kompositionslehre der Natur. Biologie als undogmatische Naturwissenschaft, selected writings edited and with an introduction by T. von Uexküll (Frankfurt a. M.: Ullstein).

—(1934). Streifzüge durch die Umwelten von Tieren und Menschen (Berlin), trans. by Claire H. Schiller as 'A Stroll through the Worlds of Animals and Men' in Instinctive Behavior: The Development of a Modern Concept, ed. by Claire H. Schiller (New York: International Universities Press, Inc., 1957), 5–80.

Christine Davis

Christine Davis is a Canadian artist born in Vancouver. She currently lives and works in New York City. Moving between photography, sculpture, film and collage, Davis' artistic practice resists categorization, maintaining a consistent methodology and exploratory material process. Modes of seeing, classifying and producing both scientific and cultural knowledge, often tied to the feminine and the natural world, underpin many projects. Through a cosmological impulse Davis' installations seem to propose that meanings from disparate historical and pedagogical contexts overlap and are released slowly over long periods of time. In her work "Tlön, or How I held in my hands a vast methodical fragment of an unknown planet's entire history" (exhibited at the Musée de Beaux Arts de Montreal) documentation of the heavens and classification of wildlife are overlaid in a system of ordering and symmetry that is at once mystical and sadistic, absurd and universal.

As film scholar Olivier Asselin notes, "Davis' work establishes a link between artistic abstraction and scientific abstraction – between formal abstraction and conceptual abstraction. [F]orm is chaotic; it is one of those complex phenomena, like climate change and liquid turbulence, which are determinate, but non-linear, and, as a result, remain largely unpredictable. As such, it prompts an epistemological reflection on the complexity of the sensible and the limits of the concept... from this perspective, her work is archaeological."



Exhibiting since 1987 Her work is held in numerous collections including the National Gallery of Canada, Le Muse d'Art Contemporain de Montréal, Collection Helga de Alvear and the Yvon Lambert Collection Avignon. Publications on her work include monographs published by CREDAC (Paris), MACM (Montreal), AGO (Toronto) and Presentation House (Vancouver).

Patricia Olynyk



Patricia Olynyk is a multimedia artist, scholar and educator whose work explores art, science and technology related themes that range from the mind-brain to interspecies communication and the environment. Her prints, photographs, and video installations investigate the ways in which social systems and institutional structures shape our understanding of science, human life, and the natural world. Working across disciplines to develop “third culture” projects, she frequently collaborates with scientists, humanists, and technology specialists. Her multimedia environments call upon the viewer to expand their awareness of the worlds they inhabit—whether those worlds are their own bodies or the spaces that surround them.

Olynyk is the recipient of numerous awards and distinctions, including a Helmut S. Stern Fellowship at the Institute for the Humanities, University of Michigan and a Francis C. Wood Fellowship at the College of Physicians, Philadelphia. She has held residencies at UCLA’s Design Media Arts Department, the Banff Center for the Arts, Villa Montalvo in California, and the University of Applied Arts, Vienna. Her work has been featured in Venice Design 2018 at Palazzo Michiel, Venice; the Los Angeles International Biennial; the Saitama Modern Art Museum, Japan; Museo del Corso in Rome; and the National Academy of Sciences in Washington. Olynyk is Chair of the Graduate School of Art and Florence and Frank Bush Professor of Art at Washington University and co-director of the Leonardo/ISAST NY LASER program in New York. Her writing is featured in publications that include Public Journal, the Routledge Companion to Biology in Art and Architecture, Technoetic Arts, and Leonardo Journal.

Meredith Tromble

Meredith Tromble is an Oakland-based intermedia artist and writer whose curiosity about links between imagination and knowledge led her to form collaborations with scientists in addition to making installations, drawings, and performances. A central theme in her work is circulation: between ideas and materials, through collaborative creative process, from psychological impulses through images and texts. Her work asserts the continuity between the physical and virtual worlds. She has made drawings, installations and performances for venues ranging from the Yerba Buena Center for the Arts and Southern Exposure in San Francisco, to the National Academy of Sciences in Washington, D.C. and the Glasgow School of Art in the UK.

She has been artist-in-residence at the Complexity Sciences Center at the University of California, Davis (UCD), since 2011 in active collaboration with UCD geobiologist Dawn Sumner. Their interactive 3-D digital art installation Dream Vortex has been widely presented in various iterations at ISEA2015, Vancouver, and Creativity & Cognition, Glasgow School of Art, and at more than a dozen American universities ranging from Stanford University in Palo Alto to Brown University in Providence. Dream Vortex was chosen as an “Exemplar Project” of interdisciplinary research by the Association for the Arts in Research Universities (a2ru) in 2015. A related performance project, The Vortex, in collaboration with Donna Sternberg and Dancers



of Los Angeles, had weekend runs in Los Angeles in 2016 and 2018. Tromble’s other recent projects include an art installation developed with a neuroscientist at Gazzaley Lab, University of California San Francisco, and performance/lectures by “Madame Entropy.” Her 2012 blog “Art and Shadows,” on contemporary art and science, was supported by the Art Writers Initiative of the Andy Warhol Foundation. From 2000-2010 she was a core member of the artist collective Stretcher; and made flash “guerrilla” performances using a mechanism based on the research of biologist Larry Rome to generate electricity from the motion of her body.