

Impact case study (REF3b)

Institution: UNIVERSITY OF THE ARTS LONDON
Unit of Assessment: 34
Title of case study: Science/Art collaborations by Professor Helen Storey
<p>1. Summary of the impact</p> <p>This case study focuses on three Science/Art collaborations <i>Primitive Streak</i>, <i>Wonderland</i> and <i>Catalytic Clothing (CatClo)</i> undertaken since 1997 by Professor Helen Storey. Storey's work is genuinely collaborative, spanning arts, sciences and new technology fields, and produces projects which illuminate aspects of science and well-being in ways that engage with the public, communicate complicated concepts, and demonstrate the potential of science in an innovative and accessible manner. The projects have reached huge audiences and have made a significant contribution to raising public awareness of science and issues faced by society.</p>
<p>2. Underpinning research</p> <p>Professor Helen Storey began working within University of the Arts London (UAL) in 1997 on the development of <i>Primitive Streak</i>, shortly followed by her appointment as a Visiting Professor (1998) and then employment as a Research Fellow (2000). Since 2009 Storey has been Professor of Fashion and Science at UAL. Through innovative collaborative partnerships, Storey has developed a design language and methodology that successfully captures and evokes scientific process.</p> <p><i>Primitive Streak</i> (1997) was one of the first six grant recipients in the Wellcome Trust's Sciart scheme, and was produced by Storey in collaboration with her sister Professor Kate Storey (a developmental biologist), with staff and students at UAL. It utilised design and hybrid materials to create 27 pieces of textiles and dress, which elucidated eleven key events in human embryonic development during the first 1000 hours of human life, supported by explanations of the scientific observations that inspired each piece. Over a decade later the Wellcome Trust provided additional funding for the project, and further biological and materials research was undertaken; new pieces created elucidating lung development and a film <i>Breathe</i> produced; as well a new website which furthered married up each design with the science, providing new images, and chronicling the development of the project (2011).</p> <p><i>Wonderland</i> began as an investigation starting in 2005 into the possibilities of intelligent packaging by Storey and Professor Tony Ryan (University of Sheffield). Funded by an EPSRC grant the collaboration developed to apply creative and innovative thinking to environmental issues, resulting in the development, design and production of a series of <i>Disappearing Dresses</i>. Produced with textile designer Trish Belford (University of Ulster) the dresses were made from textiles that dissolved in contact with water. Hung from scaffolds and gradually lowered into water, each dress produced different reactions as it dissolved. The installation provided a central metaphor for the themes of <i>Wonderland</i>, questioning the environmental sustainability of our current fashion industry and what happens to used clothing. The original enquiry into intelligent packaging resulted in <i>Dissolving Bottles</i>, which, when placed under hot water, formed a gel in which seeds could be grown. A further outcome of the project <i>Say Goodbye</i> (2010) was commissioned and exhibited by the Royal Academy in the exhibition <i>Aware: Art Fashion Identity</i>.</p> <p>For <i>Catalytic Clothing</i> (2010-), Storey and Ryan combined textiles with a catalyst in the form of nano-particles of titanium dioxide, an existing technology already in use in concrete, paints, sunscreen and toothpaste. Initially funded by an EPSRC Collaborative Grant the project's innovation was in the application and use of this substance in clothing and textiles, producing wearable items capable of removing oxides of nitrogen from the air, a pollutant commonly produced by motor vehicles. The large surface area of the textile fibres means that one person wearing treated clothes could potentially remove up to 5 grams of nitrogen dioxide from the air in the course of a day (roughly equivalent to the amount produced per day by an average family car). Applied during the laundry process, the catalyst particles attach to the textile fibres, and on</p>

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encountering them, the nitrogen dioxides oxidize to form nitrate salts. The neutralized end product is harmless and is removed when the item is next washed. The technology relies on mass participation; a treated garment is only able to remove a small proportion of the airborne pollutants. A large number of individuals, all acting together, are required to make a noticeable reduction in the level of pollution, and here the idea of 'fashion' becomes central. The concept has been widely disseminated through a viral campaign, exhibitions, films, lectures and talks.

3. References to the research

Key outputs and related awards are listed below:

1. Storey, H. and Storey, K. (1997–2011) *Primitive Streak*. Phase 1: 27 textile and fashion pieces first exhibited at ICA, London (1997) then venues including: Quartier 206, Berlin (1998); Hayward Gallery (1999); World Financial Center, New York (1999); Oksnehallen, Copenhagen (2000) and Textile and Costume Museum of Barcelona (2005). Phase 2: Two new *Lung Dresses* and pieces from *Primitive Streak* shown at venues including: The Winter Garden, Sheffield (2011); Centre for Life, Newcastle (2011); Newcastle City Library (2011); and *White Lung Dress*, Wellcome Trust's 75th anniversary celebrations (2011). Phase 1 available from UAL on request. Phase 2 *White Lung Dress: Primitive Streak* listed in REF2.
 2. Storey, H. and Ryan, A. (2008 –2010) *Wonderland*. Textile installations. *Disappearing Dresses*, London College of Fashion (2008); *Disappearing Dresses* and *Dissolving Bottles*, Sheffield city-wide event: Meadowhall; Botanical Gardens; Millennium Gallery, Arundel Gate; and University of Sheffield (2008). *Disappearing Dresses* and *Dissolving Bottles*; Ormeau Baths Gallery, Belfast (2008); *Disappearing Dresses*, Sainsbury's HQ, London (2008); *Say Goodbye*, Royal Academy, *Aware: Fashion, Art, Identity* (2010); Futurotextiles3 (February 2011 –May 2012). *Wonderland* project available from UAL on request. *Say Goodbye* listed in REF2.
 3. Storey, H. and Ryan, A. (2010-) *Catalytic Clothing* outputs include: *Herself* (2010), textile sculpture, first shown in Howard Street, Sheffield in conjunction with University of Sheffield and Sheffield City Council; *Field of Jeans* (2011), textile installation, first shown at Newcastle University as part of Newcastle ScienceFest. Listed in REF2.
- Storey, H. and Storey K.G. (1997) *Primitive Streak: A fashion collection chronicling human embryonic development*. (1997) £25,000. SciArt Award Scheme Wellcome Trust and *Primitive Streak* Extension (2011) Wellcome Trust. £30,000.
 - University of Sheffield/UAL/University of Ulster, PI: Ryan, Professor A. (01/2009–04/2011) *Extreme Collaboration Delivering Solutions for a Failing World*. £201,598. EPSRC.
 - University of Sheffield, PI: Ryan, Professor A. Col: Jones, R. (01/2006-06/2007). *Where art meets science – introducing new materials paradigms through high fashion*. £184,811. EPSRC.

4. Details of the impact

Created through sustained collaborative research, Storey's work bridges the gap between science and the public. In an essay commissioned for the Wellcome Trust's 75th Anniversary and commenting on Storey's overall body of work, Marek Kohn writes 'by showing that an individual can make designs without just being a designer, create art without really being an artist, and engage with science without being a scientist, she [Storey] shows that weaving it all together is an art that can be mastered'. Reach and significance of impact is evidenced by the numerous exhibitions, funding attracted, educational outreach activities, wide coverage by broadcast, print and new media, and external recognition. The ability of the projects' creative outcomes to communicate and engage with diverse audiences is further demonstrated by invitations to participate in major science festivals, and through partnership with scientific organisations.

An indication of *Primitive Streak*'s significance and longevity is that it received a second Wellcome Trust award over a decade after its initiation, resulting in an expansion of the research, the creation of new pieces (*Lung Dresses*) and a film (*Breathe*), the development of a website, and a new tour. *Primitive Streak* featured prominently in the Wellcome Trust's 75th Anniversary celebrations in

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2011. In addition to the commissioned essay referred to above (one of a series of 14 featuring people who have been significant in the Trust's history), *White Lung Dress* and *Breathe* were exhibited at the Wellcome Collection; and an overview of *Primitive Streak* was given to preface the debate *Because we're worth it: in an age of austerity we ask how best to nurture art and science* (chaired by Sir John Tusa). *Primitive Streak* also featured in the exhibition *Henry's Legacy*, highlighting some of the Trust's major achievements. In March 2011 Helen and Kate Storey were invited to discuss *Primitive Streak* on Radio 4's Woman's Hour (average of 3.8 million listeners). *Primitive Streak* has had a powerful influence in the field of Science/Art collaborations with Ken Arnold, Head of Public Programmes at the Wellcome Collection stating; *'this project has become something of an emblem of just what can be achieved in this area – extraordinary work, high educational value and enormous international coverage. I can think of no project that we have been involved with that more clearly illustrates how great research can with skill and imagination go on to have profound public impact – not only with the specific topic it focuses upon but in terms of the whole practice of bringing arts and sciences together. Our very positive experience of funding that initial project [...] helped encourage us to carry on in this innovative funding area and to base some of our programming in Wellcome Collection on that interdisciplinary premise.'*

Wonderland opened as an installation at the London College of Fashion, UAL, later touring to Sheffield where it appeared at four different sites across the city, then continuing to Ormeau Baths Gallery, Belfast (2008). *Say Goodbye* featured in *Aware: Art Fashion Identity*, Royal Academy (2010), later exhibited as part of *Futurotextiles3* touring to six European venues. A core aim of *Wonderland* was that it should suggest educational projects and events that explored cross-disciplinary working. Activities included a CPD days for educationalists and teachers (2008); *Mystical Tour of Wonderland* (2008) with school children touring the Sheffield exhibition sites; *Wonderland: The Science Behind the Story* (2008) where 85 children participated in a full day of activities at the University of Sheffield; and events in Belfast including *Interface Masterclass* (2008) demonstrating processes involved in creating the *Disappearing Dresses*. The project had a dedicated education micro-site illustrating *Wonderland's* educational activities, giving lesson plans and related information on events and workshops. Broadcast and media highlights for *Wonderland* during 2008 included: *My Chemical Romance* article by Storey, *Vogue*; *Triggering the future*, i-D Magazine; *Environment Weekly Podcast*, *The Guardian*; and *Material World*, BBC Radio 4. An indicator of the significance of the work is given by external support extended to the project, with *Wonderland* receiving sponsorship from Sainsbury's and support from Arts Council England, Arts Council Northern Ireland, Sheffield City Council, and Arts and Business. Nick Knight and *SHOWstudio* created film and a series of images for *Wonderland* and the project is now archived on *SHOWstudio.com* where it is described as a *'ground-breaking collaboration'*.

Catalytic Clothing's creative outputs, in the form of fashion and textile installations and films, have provided a successful vehicle for public engagement. The project's viral campaign gives evidence of its global reach. A film, directed with Adam Mufti, featuring Erin O'Connor and with a soundtrack by Radiohead, was developed as part of the project. On June 8 2011 a short teaser was distributed to a network of bloggers, trade forecasters and design networks. A week later the full version of the film was released and spread via the web and media across outlets with a potential audience of 300 million. A new media/digital tool, *Living Map*, was created to visually illustrate *CatClo*-related communications on social media, blog, editorial and broadcast media (<http://www.catalytic-clothing.org/livingmap.html>). The project has received widespread media coverage including: BBC Radio 4 *Material World* and *Costing the Earth* reaching an estimated 2.5 million listeners; AFP (Agence France-Presse) and AP (Associated Press) producing films screened on China TV and Euronews; BBC Radio One *Newsbeat* (potential audience of more than 11 million); and Daily Mail online (4.3 million unique visitors daily). Additional examples include: BBC Breakfast – *Blue jeans to help the environment?*; CBBC Newsround – *Washing powder helps jeans to clean air*, *The Independent* – *Does my bum look big in my catalytic converter?*; and Discovery News – *Rinse cycle turns clothing into pollution busters*. After taking *Catalytic Clothing* to Moscow in 2011, interviews with Storey and Ryan and the *Catalytic Clothing* film, were shown on three major television networks (potential audience of 173 million).

A comprehensive public programme has seen *Catalytic Clothing* showcased at numerous events,

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with installations and films being vital in engaging the public with the technology. As well as the Erin O'Connor film, an animated feature, *The Catalytic Clothing Story*, was produced supported by the Department of Culture, Media and Sport, aimed at a non-scientific general audience. An indicator of significance is given by *Catalytic Clothing* featuring within the programming of prestigious science festivals including: London Science Festival (2011), Manchester Science Festival (2012), Newcastle and Durham Science Festival (2012), and Edinburgh International Science Festival (2012). The Deputy Director of the Edinburgh Science Festival describes Storey and Ryan as 'a rare example of a genuine Art/Science collaboration'. The London Science Festival *Field of Jeans* was supported by The Royal Society of Chemistry (RSC), which also publicizes *Catalytic Clothing* on their website. Overseas events include: *Catalytic Clothing* in *Hello Materials* at the Danish Design Centre, Copenhagen (2012); at the *World Environment Day Festival*, Queensland (2012); and aspects of *Catalytic Clothing* touring Europe as part of the *Futurotextiles3* (2012/2013). Additional indicators of significance include *Catalytic Clothing* as joint winner of the Condé Nast Traveller Innovation & Design Award 2012 (Sustainability) alongside Vivienne Westwood's Cool Earth project, and Storey's selection for *The Telegraph's* Amazing 15 (15 people who represent Britain's most exciting talent), based on her contribution to *Catalytic Clothing*.

The project has brought the potential of the technology to the attention of industry. Ecover have given valuable financial investment in both the science and cultural side of the project and on its website states: 'Every so often, we hear about a pioneering project that really gets us excited. *Catalytic Clothing* is one of those projects [...] we've been working together to discover ways in which Ecover can utilize the catalytic compound.' The *Catalytic Clothing* concept is now with the R&D department of one of the world's largest laundry product producers, who are considering how air purification technology might be brought to market.

5. Sources to corroborate the impact

Impact on Science/Art collaborations/projects:

1. Wellcome Trust essay *Helen and Kate Storey: science and art engaging the public: Writer and researcher Marek Kohn looks at Helen and Kate Storey, science and art collaborators.* <http://www.wellcome.ac.uk/About-us/75th-anniversary/Stories/index.htm>
2. Statement from Head of Public Programmes, Wellcome Collection. UAL on request.

Utilisation to promote public engagement:

3. Statement from External Promotion Manager, Royal Society of Chemistry. UAL on request.
4. Statement from Deputy Director, Edinburgh International Science Festival. UAL on request.
5. *Primitive Streak* as part of Wellcome Trust's 75th Anniversary celebrations <http://www.wellcomecollection.org/whats-on/exhibitions/white-lung-dress.aspx>
6. Reports on *Wonderland* Sheffield educational activity http://www.wonderland-sheffield.co.uk/education/downloads/Kamina_Walton_Report.pdf and http://www.wonderland-sheffield.co.uk/education/downloads/formby_high_school_report.pdf

Catalytic Clothing media coverage:

7. *Catalytic Clothing* Media Report – detailed information on media coverage (06/2011–09/2011). UAL on request.
8. Examples of broadcast media and print coverage. <http://www.bbc.co.uk/news/uk-20120004>; <http://www.independent.co.uk/environment/climate-change/does-my-bum-look-big-in-my-catalytic-converter-8219567.html>

External recognition:

9. <http://www.cntraveller.com/magazine/innovation-and-design/innovation--design-awards-winners-2012/sustainability-winner-catalytic-clothing>
10. *Wonderland* at SHOWstudio <http://showstudio.com/project/wonderland>