

**INNOVATIVE TEXTILE APPLICATIONS:  
Digital and Traditional: Industry and Academia**

Patricia Belford  
University of Ulster  
School of Art and Design  
Belfast  
Northern Ireland

Ruth Morrow  
Professor of Architecture  
University of Ulster  
School of Art and Design  
Belfast  
Northern Ireland

**ABSTRACT**

Innovative print techniques are a specialist area for Belford. Having originated Belford Prints (1986) a small unique textile Print Company based in the UK. Pre digital, bonding, flocking shrinking and devore were just a few of the process used to create tactile textiles. The introduction of digital printing (1999) into the business, brought new scope and demands and although a great new way forward for print, had a feeling of flatness, and for Belford a creative distance from the process. In 2004 relocation back to Belfast working at a new research centre for art technologies and design (Interface, University of Ulster) gave Belford the opportunity to peruse innovative print techniques. TurnbullThompson (Thailand based print company) consult with Belford, in the quest for new innovative commercial applications for fashion and interior textiles. This paper will chart some of the methodologies applied from a Research centre in academia into a large commercial application. In particular the development of digitally printing a silk or linen warp, and inserting the weft using the craft of hand weaving. The hybrid processing of traditional and digital bringing depth and tactility into digital translation. Continually interested in the quest and challenges of Industry and academia embracing each other the second part of the paper will chart the progress of Girli Concrete a project crossing disciplines (architecture and textiles) Working between the interfaces of industry and academia, practice and theory, exposes the prejudices of both, and their miss-match. This paper will illustrate that not one particular discipline sits on its own but can weave between territories and continents.

**Keywords:** digital print, weave, innovation, hybrid materials, textiles, concrete, building products.

**1.BACKGROUND**

Belford originated from Northern Ireland but during her early career set up Belford Prints in 1986, this small unique business developed many prints for the high end fashion industry, working with designers in there early careers such as Vivienne Westwood,

Jasper Conran, Helen Storey, Neisha Crosland and Designers Guild. Her main interest was always to look at the original and twist with technique. This feature has remained in tact throughout her career moving from Industry to Academia. The business was successful but in 2004 looking for more creative challenges Belford relocated back to Northern Ireland to take up post as Senior research fellow with INTERFACE: Located in Northern Ireland, a region of renowned textile tradition, the Fabric Forward Strand of Interface engages in collaboration at regional, national and international levels. Initiating new projects and investigations into new methodologies, processes and textile practices. conventional and traditional methodologies are challenged with in-depth investigation to develop innovative products with unique aesthetic and tactile properties. Extensive high tech resources facilitate this research on the 7<sup>th</sup> floor of the new Interface building in Belfast. The following resources are available to enable cross discipline and new methods of working: Mimaki Textile Jet TX3-1600 fabric digital printer, Mimaki UJF-605C hard surface printer, Mimaki JV22 Digital printer, Laser Cutter and engraver, Flat bed Transfer Press, Hand print table, Digital Stitch Toyata ESP x 3heads, Gammil Long arm quilter.

The brief Belford set herself on taking up this post was to try and integrate through 'real' projects a connection with innovative techniques and industry, this has been implemented through various projects and two of these will be used as case studies to illustrate the developments and in some part the frustrations of trying to work across sectors of academia, industry and reality. A common thread running through the case studies of connection between each body of research.

## **2. TURNBULL THOMPSON, JIM THOMPSON AND THAILAND**

Acting as print technique consultant to Turnbull Thompson, Belford made several trips to Turnbull Thompson in Thailand and during one of these trips casually witnessed an intriguing print and weave process aimed at the global furnishing market, innovatively combining high and low technology. This hybrid processing was being practised daily as if it was normal. In retrospect it is important to understand some of the background relating to this organisation.

### **2.1 The Jim Thompson organisation**

<sup>1</sup>Thompson's Thai storey began a few days after the close of World War 11, when he arrived in Bangkok as part of an advance team of the OSS, progenitor of the CIA. Thompson had trained and practised as an architect in New York, and had an eye for art and antiques. He quickly noticed the outstanding qualities of Thai Silk-its handsome texture and patterns and vibrant colour. Even at this time machine-made textiles from Europe, United States and Japan were crushing local hand weaving. Thompson looking for a project took up the revival of this craft as an interesting social cause, hoping to find profit both for himself and neighbourhood weavers. He formed a Company in 1948 organising the local weavers into networks, upgrading manual looms, and replacing natural dyes with colourfast chemical dyes. Thompson was a good American salesman, well connected, and skilled in the art of product placement.

---

<sup>1</sup> Brian Mertens

The mystery of Jim Thompson's disappearance in 1967 remains unsolved. But one thing is clear: the American is still doing what he always did best-selling silk. Now it's the legend that sells, helping The Thai Silk Co, grow far beyond Thompson's dreams. Thompson's firm has become more modern and more traditional, making more hand-woven silk than ever before operating some 570 hand-loom most based at the resort like campus in the north-eastern province of Korat (1980) The firm has grown rapidly, the top executives being there for many decades; William Booth since he arrived in Bangkok in 1964. There are no MBSs at the firm, and only three Westerners. William's son Eric Bunnag Booth, runs the international marketing, focusing on premier textiles. He also helps guide the James HW Thompson's Foundation's support for Bangkok's thriving cultural scene.

## **2.2 Turnbull's**

<sup>2</sup>Turnbull and Stockdale began printing in 1881 combining commission printing with an ambitious range of its own furnishing textiles during the early years employing Lewis F. Day as design director. In 1936, Turnbull's had fifteen roller printing machines, but were becoming renowned for its preservation of hand-block printing skills. Revived in the 1970's as Edward Turnbull and Sons, and more recently Turnbull Thompson, the firm still enjoys a worldwide reputation for commission printing of fine furnishing fabrics. Only a few years ago Belford and Turnbull and Co were located in the North West of England, Belford and Turnbull shared clients and from a distance respected each other's business. With the onset of overseas competition it was only natural for Turnbull to look overseas to relocate. Ironically Belford is working in collaboration with Turnbull in Thailand when a few years ago they would have been considered competitors.

## **2.3 Turnbull Thompson**

In 2005, Jim Thompson formed a joint venture with the venerable UK firm Edward Turnbull & Co, to keep the company's elite hand-printed upholstery textiles in production While many of its UK and European counterparts were disappearing Turnbull survived as the only firm in the world still undertaking commercial production using blocks hand-carved from wood, joining up with the Thai Silk Co, kept the unique craft alive, plus bringing a wider dimension to the Thai workforce. Now Thai's are conserving Arts and Craft legacies like the Tree of Life block print design created by English designer Harry Wearne in 1923. The joint venture will also create new designs that use Art's and Crafts production methods. New wood blocks patterns will be innovated in a joint effort between a team of English and Thai printers. As for becoming more modern, this has been done selectively where it can improve quality, save human toil and invest in innovative techniques.

Perhaps the most interesting new process is the digital warp printing. Its evolution in essence is simple - combine digital print and weaving, however its development has been complex, on the one hand utilising the hand weaving processes, in combination with Thai

---

<sup>2</sup> Dr Philip Sykas, Research Associate at Manchester Metropolitan University investigated and reported on the archives of Turnbull and Stockdale and latterly Edward Turnbull and Co Ltd.

processes. The Thais are very considerate and diligent and with new encouragement there are exciting developments being made. The entrepreneurial vision for change in the print industry recognised by Paul Turnbull and a keen desire to work with Thai skills and culture have given rise to a new and exciting era for the global print Industry.

The commercial arrival of digital print in 1996 was at the time a huge boost for the print industry, in that it created a revival in print and opened doors to almost anyone who wanted to print without the added cost of time and screens. The other side of the coin is that it somehow lost the skills of the creative textile printer. Anyone could buy a digital printer and run it from their front room. In parallel the handloom was losing pace as it was slow, requiring high labour input and struggling against the power and digital looms. For the creative textile printer, digital printing is limited in explorative processes in that fabrics are limited, and the results can often be flat lacking depth. At Turnbull Thompson two completely different disciplines have created a beautiful unique textile fabric. The warp is specially prepared and fed through the digital printer. Several modifications were required; this took a considerable amount of patience, time and translation. The advantage of digital is that any number of colours can be used and repeat length is not an issue. Once the warp is printed the beam is removed and placed on a handloom. The warp or weft can be a variety of yarns giving rise to print burn out possibilities after processing. The full processing is protected and hence it is not possible to divulge the solving of issues such as coating and cloth movement. With the possibility of being able to introduce wefts from any source the diversification is open, to a wide reaching creative perspective. The final product is a multi coloured softer print that lends itself to furnishing and fashion fabrics.

Belford is currently in discussion with The King Mongkut's Institute of Technology Ladkrabang. Textile Design & Industrial Design Department under the Faculty of Architecture. The intention would be to build a project based around the commercial facilities at Turnbull Thompson with a weave group at The University in Bangkok and a development group at Interface. The department under the guidance of Jarupatcha Achavasmit, is currently working on a weave project with Turnbull Thompson, and it is the intention to tie this in further in working with the University of Ulster.

### **3.INTERFACE AND DIGITAL WEAVE FOR SMITHSONIAN**

In 2007 Interface was invited to participate in The Smithsonian festival in Washington USA. A part of this work was developed around the digital warp printing processes being utilised in Thailand. Having visited the factory in Korat and understanding the people and processes, CAD work was developed at Interface and digitally translated onto a silk warp in Thailand. Varying linen weft threads were selected, fabric was printed and woven in Thailand returned to Belfast to be further processed and manipulated using the textile resources at Interface:- digital stitch, devore, laser cutting, UV printing and bonding.

Digital processes are facilitating the revival rather than the survival of the 'handmade' process. Some of the processes being carried out at Turnbull Thompson and in collaboration with Interface go further than using digital technology to mimic the traditional but look at the soul of the handcraft to create new exciting hybrid textiles.

## **4.GIRLI CONCRETE**

### **A Research and Business Project within Academia**

#### **4.1 Background**

'Girli Concrete' a collaboration between a textile designer (Trish Belford) and an architect (Ruth Morrow) conceptually it sets the utopian challenge of bringing together hard and soft materials, and the technologies of two diverse but traditional Northern Irish Industries: construction and textiles. Practically, the project has secured funding from Higher Education Innovation Funding, Arts and Humanities Research Council Funding, Arts Council of Northern Ireland Funding, Private Commissions, Integrated Art and Design Commissions (Big Lottery) and more recently the project has received significant matched funding from the University of Ulster's Technology and Knowledge Transfer Company to begin a spin out company. A leading producer of concrete products technically supports the project and descriptive details about the process and the products of Girli Concrete can be found on the project blog (<http://girliconcrete.blogspot.com>). Whilst the list of financial and technical support implies 'success', it is also a project that has raised questions about the wider context of working in this way in academia.

#### **4.2 Intellectual Framework**

Although this is new territory for both project partners, they naturally bring experiences, skills and some unresolved ideas from previous work. In Practice there is typically more drive to progress projects as quickly as possible but in Academia there is an obligation to reveal and examine the context for activity, not least because with a background in architectural pedagogy Morrow has a longstanding commitment to the interrelationship between creativity and representation. So, as the practical elements of the project have evolved so too has representation and contextualization of the work, revealing new conjunctions of knowledge and principles of practice.

Such Intellectual Frameworks lead us to advance Girli Concrete as a project that aims to mainstream tactility in the built environment. Whilst it may sound utopian it helps guide and formulate the project even within the scope of a business plan.

#### **4.3 Hands-on Influence.**

Belford has over 20 years experience in industry, successfully designing textiles for the fashion industry. She brings to the project:

- A sense of expediency when it comes to product development in order to track or where possible lead market trends
- The need to be Hands-On and in control of the technical development of the aesthetic; trialing, testing and ultimately crafting each technical move.
- An understanding of tactility as the result of appropriate technology.

Overall such working methods/ skills offer a challenge to contemporary architectural practice, but if we focus on the issue of tactility, we can reflect on Architecture's (particularly in UK culture) expression and celebration of technology to the point where it can and often does dominate, becoming the first and the last interface that the user has with the building. In contrast, interacting with a textile is a personal and unique *cosy, cuddly, slippy, scratchy, warm* encounter. Simultaneously, one experiences an intimate physical and aesthetic reaction. Behind this emotive experience of textiles lies a world of technical expertise. It is an achievement of textile designers to take 'hard-core' technologies and transform them into something that evokes such responses. The Girli Concrete project learns from this and finds resonance in the words of Peter Rice, "*..make real the presence of the material in use in the building, so that people warm to them, want to touch them, feel a sense of the material itself and of the people who made and designed it.*" (Rice [1994])

#### **4.4 Hybrid Processes and Opportunities**

Although it is utopian and theoretically situated, Girli Concrete is neither an art nor an applied art project. It is also not traditional product development, since an identifiable market nor an existing problem neither drives it. Pragmatists struggle with the practicalities of it, questioning why one would deliberately place soft, delicate substances into a harsh alkaline environment. But the project persists, driven mostly through a strong sense of fun, a set of principles and a process of visual and theoretical critique. The project moves forward by a process of play, research, craft, and real life deadlines. PLAY to generate unlikely outcomes; RESEARCH to solve technical issues, define the territory and identify supportive partnerships; CRAFT to trial, rework, perfect and humanize the product and process; and REAL WORLD DEADLINES to inject Pace and Meaning (in an academic context!). The project works across a range of networking and funding opportunities within and beyond the university. It is understood as research, experimental design practice and entrepreneurial activity and is presented across a range of platforms such as exhibitions, craft events, business forums etc. Such hybrid opportunities would seem to map against many design based activities situated within academia.

Girli Concrete was successful in securing a small AHRC grant to develop a fabric that would be specifically designed to embrace the skin of concrete. In the end this aim was achieved with a linen and steel woven fabric, that once devored or lasered to remove selected parts of the linen revealed pattern that would work in the concrete. Aside from the achieved result there were several spin out results: The fabric in its own right was beautiful and innovative, a result probably not achieved if only looking for an interesting weave construction. John England a high-end market and local Company would be interested in being able to produce this. At this point TurnbullThompson would be the perfect vehicle to weave the production having being shown the process. This exemplifies the hybrid nature of working processes initially within a research and academia context, with the ultimate aim to produce in collaboration with industry.

#### **REFLECTION**

Hybridity however challenges the language and culture of most disciplines and requires a high degree of flexibility and persistence. Working between the interfaces of industry and

academia, practice and theory, exposes the prejudices of both and their miss-match. Universities talk about practice-led research but have simultaneously degraded their technical provision and dis-enfranchised the associated technical staff. Administrative mechanisms do little to match external time/ cost lines and accountability procedures overload small, fast-moving projects in ways that are simply unsustainable. Despite that, as academics we are in a privileged position. We do not have to, nor indeed should we, replicate traditional practices / processes. We have time (it's relative!) and intellectual space to work in creative and challenging hybrid arenas; we are able to access a wide range of advice, funding and resources to support such activities and we can do so at no personal financial risk. None of these conditions (especially the latter) should be underestimated.

**References:**

Mertens, B *Bangkok design Thai Ideas in Textiles and Furniture*. Marshall Cavendish Editions, Singapore 2006

Garcia, M. *Architextiles\_AD*; Wiley Publication Nov 2006

*Textile: The Journal of Cloth and Culture*; special Issue Shaping Space: textiles and Architecture Vo, 4 Issue 3 Fall 06

Rice P. *An Engineer Imagines*. Artemis, Zurich 1994

**Acknowledgements:**

Ruth Morrow Professor of Architecture, University of Ulster