COLLABORATIVE DIGITAL AND WIDE FORMAT PRINTING: METHODS AND CONSIDERATIONS FOR THE ARTIST AND MASTER PRINTER

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ABSTRACT

Collaborative digital and wide format printing: methods and considerations for the artist and Master Printer

This thesis investigates the collaborative production of fine art digital prints for artists, a process which is used by many contemporary practitioners including Richard Hamilton and Damien Hirst. Digital print as a fine art process has emerged over the last twenty years, and as yet, there is no in depth evidence on the collaborative endeavour and production process which is central to the digital Master Printer's role.

The investigation first establishes the historical context and significance of the Master Printer in traditional printmaking, and the more recent development of the digital print studio and the digital print pioneers of the 1990s. A series of seven artists' case studies in the context of the collaborative digital print studio are then offered to demonstrate the working process. The analysis of these proposes a best practice model for Master Printers working with contemporary artists to produce high quality, fine art, wide format inkjet digital prints.

The study also compares production methods at the cutting-edge digital facility of the Rijksakademie in The Netherlands, to assess the validity of the practices proposed through a facility closest to the study's research base at the CFPR's digital studio. The comparative study also explored the expanding digital production process and the role of the Master Printer. Evolving production processes are also considered in this study as a response to the advancement of digital print technology alongside a practical exploration of what actually constitutes a digital print in this rapidly expanding field of fine art printmaking.

This study aims to reveal the inner workings of the digital collaborative process between the artist and Master Printer, and appraise the digital Master Printer's role. It offers a set of best practice methods for the digital Master Printer developed from this research. The study also considers how the digital print, and the digital print studio may evolve in line with current and future developments in new technologies.

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I   Author Declaration

I declare that during my registration I was not registered for any other degree.

Material for this thesis has not been used by me for another academic award.

II   Acknowledgements

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1.0 Chapter One: Introduction

This thesis examines the introduction of digital technology within fine art printmaking practice. It focuses on the collaborative production of images where an artist works with a technological mediator and interpreter of ideas - historically identified as a Master Printer - to produce editioned, printed artworks. Throughout the text, where a technical term or abbreviation is used when referring to print or studio techniques, the following symbol (g) indicates that an explanation can be found in the glossary.

The artist and Master Printer Leonard Lehrer, (Founding Trustee of the International Print Center New York (IPCNY), and currently Visiting Professor and Director, Printmaking Convergence Program, College of Fine Arts and Department of Art & Art History, The University of Texas at Austin, USA), who was presented with a *Lifetime Achievement Award in Printmaking* from the Southern Graphics Council International in 2009; described the Master Printer as needing to have: "immense skill with diplomacy and endurance, patience with knowledge; they set the tone of the project, maintain its rhythm, and are expected to have answers for everything…" (Weisberg, 1986: 56). Aldo Crommelynck, a renowned Master Printer who died in December 2009, and who during his lifetime collaborated on over 700 prints with Picasso alone, was commended for his "self-effacing style and virtuosic command of traditional techniques [which] coaxed the best out of European artists including Picasso, Braque and Matisse, and later helped younger American artists like Jim Dine and Jasper Johns express their visions on paper" (McNay, 2009: 41). This research seeks to examine the conventions of the collaborative tradition as a means to locate and test whether - and to what extent - this tradition of the Master Printer is valid in the digital age.

Chapter one describes both the initial development of digital print technology at the Centre for Fine Print Research (CFPR) and how the progression of my researcher's role became a focal part of CFPR research activity in wide format digital print. Further developments at the CFPR include the formulation of industrial partnerships with Hewlett Packard prior to the centre receiving an AHRC grant that then provided the parameters and outline for this PhD study.

1.1 Development of The Research

Questions about the role of the Master Printer have come about through my experiential insights as a researcher and artist at the CFPR. Through working with artists across a series of different projects, I have needed to address facilitation strategies for the varying needs of individual artists, and the organisation of a print facility that considers the practicalities of using digital technology within a fine art print context. These practices have been important to establish benchmarks and standards as part of the traditional collaborative print atelier system, and as a baseline for assessing the introduction, and impact of digital technology within fine art printmaking.

The amount of available critical literature on traditional collaborative print studio practice is relatively scarce. Some of the seminal, traditional print studio outputs have been documented including: *Kelpra Studio Artists' Prints 1961 – 1980* (1981), *Landfall Press: Twenty-five Years of Printmaking,* (1996) *Graphicstudio* (1991), *Ken Tyler Master Printer* (1986) and *Print Matters: the Kenneth E Tyler Gift* (2004) for example. Information concerning these studios predominantly includes historical lineage, print processes, techniques, materials, artists' prints and collaborative

philosophies. Although there are descriptions of collaborative undertakings in traditional print as described above, there is little in-depth documentation concerning actual collaborative studio activity; evidence that describes the physical act of making, during the collaborative venture - and how decision-making during studio activity relates to processes, techniques, materials and collaborative philosophies.

The absence of this type of evidence is even more the case within literature on emerging collaborative digital print studio practice from the period of the late 1980s onwards. The most relevant PhD thesis I found from this period was that of Dr John Phillips of londonprintstudio, which does not focus on the role of the Master Printer in the digital age, but disseminates the development of the londonprintstudio model into a successful public, non-profit printmaking workshop and gallery.[i]

The development of fine art digital printmaking as a creative practice is integrally related to industrially-designed products and a consumer-orientated marketplace. Since the dawn of the digital age in the 1980s, the advancement of digital technology has developed rapidly, superseding and integrating many previous mechanical and electrical tools of the developed world. Digital technologies have also had a democratic effect through their relative ease of use, affordability and ubiquitous presence within consumer-orientated markets. Together with the Internet as a platform for obtaining and circulating information, these technological tools have essentially created a much more level playing field for users of new technologies. Similarly, creative individuals can now (more easily) access and produce artworks that may have previously only

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[i] Dr John Phillips' PhD thesis, University of Brighton, 2005: *Transforming Print: An Exposition of Key Issues Affecting the Development of londonprintstudio*. Phillips has generously made this available on CD which can be obtained via: http://www.worldprintmakers.com/english/phillips/thesis.htm

been possible with specialist tools and knowledge in disciplines such as film,

photography and printmaking.

As will be discussed in this thesis, within the field of fine art printmaking, the impact

of the digital era brought into question further specialist associations with the

production of fine art digital prints and the role of the Master Printer. The relatively

rapid change from mechanical to digital technology raised concerns with previously

established practices in traditional printmaking. As Mac Holbert of Nash Editions -

one of the digital ateliers discussed in the 'Digital Print Pioneers' section of this thesis

- explains:

> With the emergence of digital technology in the late 1980s, the art world
> was confronted with new tools and processes that, like photography a century
> and a half earlier, created great controversy. At that time, painters, as well as
> lithographers and printers, were concerned about this new technology that
> threatened to supplant their livelihood and threaten their artistic sensibilities.
> …The early 1990s marked a period of conflict between digital printmaking
> and existing fine-art printing technologies. … It wasn't hard to understand the
> threat that on-demand, high-quality color presented to the traditional fine-art
> printmaking world. … The upfront costs of traditional fine-art printing precluded
> many artists from printing small editions. Digital was the answer. For a relatively
> small initial fee, the artist could print images as they sold. It was no longer
> necessary to tie up large amounts of capital in print inventory.
> (Holbert, 2006: 2)

These concerns largely stem from the inherent qualities of digital technology when

considering its relative ease of reproduction, simulation and transmission towards the

seal of originality in a limited edition print. What actually constitutes an original print

has not been specifically defined in the digital age, much of the terminology still

relates to, or has been adapted from traditional printmaking mediums. In the UK,

the term 'original print' was first included in the Oxford English Dictionary in 1978

defined by Pat Gilmour as: "a print made directly from a master image on wood, stone,

metal etc., which is executed by the artist himself, printed by him, or under his supervision and, in recent times, usually signed by him." (OED, 1978: 2648).

Earlier terms such as "l'estampe originale" were already in use in 19th Century France – describing editioned prints; Stanley William Hayter devoted Chapter Eleven of his book *About Prints* in 1962, to describing the "five degrees of originality in prints", and the Print Council of America published its recommended principles in 1961, edited by Joshua Binion Cahn, which was extended by Carl Zigrosser and Christa Gaehde in 1965 (USA) and 1966 (UK) as the publication *A Guide to the Collecting and Care of Original Prints*. Much of the discussion around 'originality' is undertaken for the purpose of the art market and collectors. As Hayter stated in his chapter *How to Distinguish the Original Print from a Reproduction*: 'One of the nightmares haunting even experienced connoisseurs of prints is the fear of being fooled by one of the methods of reproduction which so perfectly resembles the effect of original work that it is extremely difficult to distinguish." (Hayter, 1962: 136). It is still, essentially, the signature of the artist that gives authenticity and value to any print, whether traditionally or digitally produced.

In their book *A Guide to the Collecting and Care of Original Prints,* Carl Zigrosser - Print Curator of the Philadelphia Museum of Art, and Crista M. Gaehde - Print Conservationist for the Guggenheim and MoMA, New York, included the Draft Resolution adopted by the Third International Congress of Plastic Arts, Vienna, September 1960, which states that a print is considered 'original' when: "the artist made the original plate, cut the woodblock, worked on the stone *or on any other material*." (Zigrosser & Gaehde, 1966: 28). I emphasise 'any other material' here, in

consideration of the contemporary artist creating an original file for digital output. Here the learned physical manipulation of materials, as part of the traditional Master Printer's association with craft skills has been removed through digital automation, and the sequential pushing of buttons. Collectively, the transition between mechanical and digital printmaking practices has left us questioning what an artist is actually accessing by working collaboratively with a Master Printer in the digital age. What is the role of the Master Printer? Is it even necessary? And if so, how might we define the specialist qualities that have been associated with the role?

1.2 The Background of Digital Printing in a Fine Art Context

Digital printing is still a relatively new addition to the field of the artist's print. Although the technology was initially designed for industrial applications, its rapid development outside industrial markets soon generated interest across a range of creative disciplines including photography and printmaking. Initially, the adoption of the technology within these established fields of practice did receive some criticism from print traditionalists as mentioned by Holbert on page 19, but many of the obstacles to its acceptance have been removed in recent years. Artists can now access a wealth of specially prepared fine art papers from manufacturers or paper suppliers, which can accept highly lightfast, pigmented inks - essential elements, which provide a high quality baseline.[ii]

The introduction of pigment-based inks in 1997 by Hewlett Packard for the DesignJet 2500 and 3500 inkjet printers vastly increased the longevity of inkjet prints up to 200 years, as tested by Henry Wilhelm of Wilhelm Imaging Research Inc. in the USA,

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[ii] See Wang, H. & Parraman, C. *The Application of Colour Management Systems to Improve the Quality of Inkjet Printing on Fine Art Paper*, 2003.

which conducts extensive research for print permanence ratings for all available inkjet printers, dye-based or pigment-based. Henry Wilhelm of Wilhelm Imaging Research Inc., published some of their extensive findings in 2000 for Members of the Association of Fine Art Digital Printmakers, which includes data sets from trials of Wide-format Inkjet printers and art papers.[iii] For further discussion of permanence see section 3.3.4 *Archival Standards*. With these technical and archival standards in place the development of digital print facilities as open access workshops for artists has grown.

In keeping with previous fine art print studio practices, the digital print studio has adopted many of the traditional, collaborative print workshop methods for facilitating the production of printed artworks. This has included working directly with the artist in the studio, assigning edition distinctions and in some cases marking an edition with the studio's chop mark (g). For example, Tyler's Gemini prints always bear the Gemini 'chop' whether printed or embossed, next to the artist's signature, and *Duganne Ateliers* digital artists' editions are always embossed with the atelier's chop.

1.3 The Collaborative Process in Printmaking Studios

Although the act of collaboration is readily transferable across creative disciplines, historically the print studio's preoccupation with collaboration is rooted in the artist and artisan relationship, Marjorie Devon, Director of the Tamarind Institute, stated in her Keynote Address, for *Unique Reproduction - Definitions of Original Printmaking*

[iii] See: Wilhelm, Henry. 2000. *With New Pigmented Inks, Dye-based Inks and Inkjet Papers, An Unprecedented New Era Has Begun in Color Photography.* A paper for Members of the Association of Fine Art Digital Printmakers. 20th June, 2000.

in a Digital Age: "Collaboration allows artists who don't have the skills, equipment, or inclination to print their own work, to speak another 'language'." (Devon, 2010: 9) Here the collaborative act is forged through the artist's need to access specialist assistance through process-led activities associated with craft and technical dexterity. Therefore a core component of the traditional, collaborative print studio has been in the printer's affinity for mechanical process, as frequently suggested, and the acute sensibilities that are needed to transcribe accurately the artist's intentions.

The introduction of digital technology to a mechanical print practice begins to raise questions around how appropriate mechanical sensibilities may be when considering the inherent qualities, craft skills and possibilities in relation to digital technology.

1.4 Background to the Centre for Fine Print Research (CFPR) and my Role Within the Research Group

The main focus of research at the CFPR stems from the close relationships that exist between technology, ideas and making in the arts and crafts - particularly in the area of digitally-assisted print and its many offshoots. Founded in 1993 and formally established as a research centre in 1999, the CFPR has built an international reputation for its investigation and dissemination of processes, techniques and standards associated with the production of original fine art print.

The aims of this research have been generated through a need to work with artists to facilitate the production of high-quality, digitally generated or mediated fine art prints. My role as a facilitator has come about as a member of a research group that has been conducting research activity into digital print technology from a fine art print / photographic perspective.

Before commencing my role as a researcher at the CFPR in 2001, my association with printmaking came from my arts education. Between 1995 and 2000 I studied at undergraduate and postgraduate levels in Illustration and Printmaking. These two disciplines covered a wealth of graphic image-making processes such as drawing, photography and mechanical printmaking.

At the time, digital image-making was still relatively new within arts education and had only a peripheral inclusion alongside more established, taught graphic mediums. My introduction to the digital image-making process was perhaps, a pragmatic decision after completing an MA in Printmaking. Print is a process-led medium that often requires the use of, or access to, specialist tools and equipment. These resources are predominantly housed within a dedicated printmaking studio and often facilitated through a technician. As a recent art graduate without printmaking resources to hand, working digitally offered the possibility of creating artwork by pooling image-making resources within the confines of a computer.

This engagement with digital technology was predominantly from a software perspective, using Adobe Photoshop™, Illustrator™ or InDesign™.
The considerations needed for rendering digital imagery as printed artefacts began during my initial employment as a Research Assistant at the CFPR. The development of my research into producing digital prints for artists evolved over stages of my employment at the CFPR, with the PhD study running alongside and overlapping my research role; simultaneously developing my skills as a researcher whilst running and developing the CFPR digital print studio.

The initial research inquiry for this study emerged out of a need to develop a sympathetic approach in the production of high quality fine art digital prints for artists. The emergence of the problem for the research enquiry came out of the fact that there was no blueprint for working with artists using digital print technology and as such, the practice was open to interpretation. With no specific literature available at the time, or any accessible digital print practitioners, the investigation began out of experiential insights through studio activity, together with reading around the subject of the artist's print. The initiation of the research question occurred during the CFPR's early engagement with emerging digital print technology in 2000 from a fine art perspective, as an addition to mechanical print processes in the field of printmaking.

The work on early digital print projects at the CFPR, such as the wide format print bureau facility (2000) and the *International Digital Miniature Print Portfolio* (2001) were the first indications for the CFPR that digital printing had caught the attention of many artists and students working in the field of fine art printmaking. Despite this interest, the technical requirements and access to the technology proved to be a stumbling block for many individuals wanting to realise artworks using digital print technology.

The Wide Format Print Bureau Facility (2000)

The wide format digital print bureau facility addressed this situation by providing artists and students with the opportunity to have their digital files printed for them. As with a high street photographic bureau, students would leave their digital file with the bureau before returning the following day to receive the printed image. This essentially freed an individual from the technical print processes involved. Some initial

facilitation tactics were developed primarily to optimise the facility's running costs whilst developing an understanding for the production of printed artworks rather than reproductive works. The core piece of the facility equipment was an "ENCAD Nova Jet Pro 600 42e 42" inkjet printer[iv], that had been purchased by the CFPR in 1999 to begin exploring the potential of wide format digital printing technologies within a fine art context. The Nova Jet presented artists and students with the opportunity to produce large-scale photographic quality prints, using a dye-based ink-set that could produce vivid colours on a range of different papers.

As part of the inkjet system, the Nova Jet required an additional print server software device[v] that functioned between the computer and the printer. The print server translated the digital image information to a halftone tone pattern that could then be rendered as a printed image. The server also negotiated the colour conversion from the digital image to the printed image by allowing the operator to assign a pre-defined paper profile that corresponded to the loaded paper in the printer. The colour of the digital image on paper was predominantly subject to the accuracy of the server's paper profiles. By following the procedures for using the server, any alterations to the image colour were assigned in the server RIP (Raster Image Processor). The RIP adjustments were limited to colour saturation levels and could only be applied globally to the image. The adjustment system also meant that colour changes had to be performed intuitively, as the system provided no 'on screen' simulation of the adjustments effects upon the image. Before sending images through the RIP, the relationship between

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[iv] The specifications for the printer: Novajet pro 600 42e 42" wide colour Inkjet printer c/w 32 Mb RAM, integral stand and feeder/ take-up mechanism, integral high capacity (500ml per colour) continuous flow ink system using a CMYK inkset, 600dpi, cut sheet/roll feed, media cutter, user guide, built-in print drier. (system price £10,995)

[v] The specifications for the server: Vivid Image 225 hardware network print server with 225Mhz Alpha RISC microprocessor for RIPing up to 60MB per minute, 64 Mb RAM installed (max 256 MB) and 3.2 GB hard drive for spooling.

screen and printed image created a further level of mediation. This discrepancy between screen and printed image was initially due to registering the differences of how colour is received between additive (screen) and subtractive (paper) light sources and prior to employing any screen calibration. In retrospect, the production process was susceptible to a number of variables that affected the printed results, and the expectations of the digital process from individuals wanting to realise printed artworks through the process.

Methods toward managing the print facility for artists.
Located within the UWE printmaking department, the bureau system and inkjet process could be compared directly with traditional printmaking practices and standards. The comparison raised a number of issues concerning the process of producing inkjet prints within a contemporary printmaking context. In terms of quality and archival standards for traditional printed artworks, the Nova Jet used a dye-based ink set that lacked the longevity of traditional print processes that use pigment-based inks. The archival precedents of traditional printmaking processes are one of the key components that go toward the validation of an original fine art print.

From a practitioner's perspective, direct contact with materials and processes, together with time for experimentation has been a fundamental component for developing ideas in traditional printmaking practice. Within a digital print context the physical relationship with layering ink on paper and mixing colour - for example in a pot or on the plate - has been exchanged for a virtual palette of pre-defined colour values that simulate the appearance of printed colour. In addition, these colour values are represented through the light of a computer monitor, before being interpreted through

an automated system (that previously lacked any of the colour management technology that exists today) that essentially removes and conceals these physical operations.

To begin managing both the printing workflow and the expectations of the students, a set of parameters was designed, before any individual accessed the bureau facility. This was addressed in two ways. The first involved the formulation of a text guide that explained briefly how the bureau process worked. This included what ink and materials the facility used, and how to supply digital files for the print process, encompassing file type, colour mode, image resolution and print scale. The second guide was an exemplar method using a single digital file (containing text and an image) that had been digitally printed across a limited range of substrates stocked by the bureau facility. The substrate guide displayed different qualitative print possibilities that could be achieved by the bureau using the guide procedure.

For this facility to function economically, individuals were restricted when working directly with the print process. Any requests that deviated from the procedure such as adjustment of image colours, or the use of a paper not supplied by the bureau were tentatively attempted, although as a bureau there would be a limited amount of time for any extensive proofing.

Defining these procedures essentially created a closed-loop system for the service to function effectively. It informed individuals of the logistics of the digital print process and addressed issues of managing expectation levels. Requests that could not be fully realised by the bureau method highlighted how the printer and digital print facility might begin to develop the facilitation methods for producing prints for artists.

Collaboration with Hewlett Packard

The print procedures and facilitation insights gained through the development of the bureau method were taken a stage further between 2000 and 2001 during the *International Digital Miniature Print Portfolio* (2000-2001) project organised by Dr Carinna Parraman. The portfolio was conceived as part of a new collaboration with Hewlett Packard which had previously invited the centre to be part of their European Art and Science Philanthropy Project (1999) - a European network of museums and universities. The invitation emerged from discussions between the two groups in 1996 after the Hewlett Packard Labs (Bristol) had visited the CFPR. These initial discussions were developed from the CFPR's research activity concerning digitally-mediated photomechanical print processes, including the production of the *Digital Portfolio* (1996) published by Permaprint London and later Dr Paul Thirkell's PhD thesis 'The integration of digitally mediated imaging techniques with 19th Century continuous tone printing processes' (UWE, Bristol, 2000).

Both projects addressed the digital reproductive print processes through concerns associated with fine art print production such as longevity and image quality. These qualitative possibilities were used as a benchmark to begin addressing potential collaborations with Hewlett Packard and the development of their inkjet technology concerning the use of alternative colour sets and half tone patterns for digital printing.[vi] Progress from these initial discussions did not resume until 1999 due to the practical application of these ideas in relation to the level of the technology in the mid 1990s.

[vi] Parraman. C. 'Links with industry: developing a dialogue with Hewlett Packard', PhD Thesis, 'The Development of Alternative Colour Systems for Inkjet Printing,' UWE, Bristol, 2010, p 22

International Digital Miniature Print Portfolio (2000-2001)

The HP Science Philanthropy Project developed through a series of symposia that addressed concerns with digital print workflows from initial image capture to the final printed output. As part of the research project, HP provided equipment and materials of archival standards, in line with traditional benchmarks in fine art print. The affiliation with HP, whilst using archival digital printing procedures, placed the CFPR in a unique position as pioneers within an institutional context.

As part of the facilitation process, the *International Digital Miniature Print Portfolio* project incorporated a proofing option for each artist in addition to the image preparation guide (previously developed for the bureau method). Unlike the occasional proofing for an artist in the bureau facility, the portfolio's proofing requests were done through remote correspondence only. This raised a number of issues about the parameters of the technology and the relationship between artist and printer during the production of a fine art digital print.

Print Parameters and Proofing

Although each artist followed the file preparation guide for the project, the resulting proofs did not always meet with every artist's expectations for their printed image. Through e-mail correspondence it became apparent that some artists were using their own desktop printer and paper to produce a satisfactory print that could then be used as a benchmark for the CFPR printed proof. Other artists adopted a similar comparative strategy by examining the image on their computer monitor with a view that it would match the printed proof. The negotiation of these strategies for further proofing proved to be problematic. Both tactics raised issues about how expectations were being formed

and how they could be managed because of the different renderings of the digital image across various substrates, computer screens and printer devices. The amendment procedure not only had to negotiate the technologically-informed expectations of each artist, but also the interpretation of these qualitative influences through the artist's written language.

Summary

These early projects highlighted a wealth of variables that existed outside of the previously established bureau system. The technological expectations in the project emphasised how external devices, software and materials affect the proofing procedure, and to some degree restricted the artists' possibilities for experimentation. The type of communication and understanding that exists between artist and printer was limited to e-mail correspondence. These dialogues were often broad in description and subject to the artists' grasp of the technical process and their written instructions with little or no previous background knowledge of the artists or their working practice.

To begin addressing these issues, a more expansive understanding of digital software, devices and materials was needed to better understand the relationships between each stage of the digital print process, whilst engaging with the varying facilitation methods for different artists during the production process.

The digital workflow strategies concerning each stage of the production process were addressed through a number of (then ongoing) quantitative and qualitative print tests at the CFPR. Unlike the self-sufficient print testing in the studio, the facilitation methods

required the presence of artists as part of the production process. To begin engaging with the specific discipline of producing digital prints for artists, the CFPR had embarked on an AHRC-funded research project entitled *Methodologies for the integration of fine art practice and wide format digital printing.* As part of the research enquiry, the project incorporated an artists' residency programme *The Perpetual Portfolio* (see section 4.1) that would provide the testing ground for the facilitation methods.

The Perpetual Portfolio residency highlighted the diverse production methods required to accommodate a range of different artists concerns for the production of a digital print, and those concerns contributed to the initial generation of the research question for this PhD study. As a result of the research inquiry, my facilitation role that had been adopted for the residency (and previous activity at the CFPR) evolved beyond the practical studio exercises towards a more research-orientated perspective. The adoption of particular methods and approaches prompted the need for a more reflective role and a deeper critical understanding of the printmaking field.

These research-driven lines of enquiry into the historical precedents of printmaking presented commonalities emerging between my facilitation role and the traditional role of the Master Printer. This distinction provided the historical baseline for the research as part of a comparative study investigating the introduction of digital technology to a mechanically-defined fine art practice. Within this context the research is practice-led, in that it is the processes that make the art, which then provide the inquiry and evidence for reflection.

The CFPR's research activities are concentrated on two key areas of pure research: 3D printing technologies and their relationship both to the designer and industry, and the application of colour for creatives in digital environments. The following strands of applied research - related to arts-based practice - also form part of CFPR's focus: artists' books; wide format printing; laser-cutting technologies, and the reappraisal of traditional print methods.

This PhD research can be seen as an investigation into these related fields of research at the CFPR. Therefore the PhD is posited within the arts and crafts, uses digitally-assisted printmaking as a means to gather information, and forms a comparative study which uses reappraisal as a means to assess the introduction of digital technology to traditional autographic and photomechanical print processes and collaborative practice established prior to digital technologies.

The primary function of the digital print studio at the CFPR is to conduct research activity, although the CFPR's research studios are based on a business model that requires an economic return from the prints produced with artists in the studio. The Centre's relationship with artists and the production of artwork within an educational environment leans towards the research potential of the work. This occurs in a number of different ways:

- An artist is included in a research bid to produce a printed artwork as part of a practice-led research project. In most cases the production of the work is recorded as a case study and the final artefact is used as a result of the production process. Examples of this method at the CFPR have been used from *The Perpetual Portfolio*.

- An artist may be invited to produce a work that relates to an ongoing research project or a particular area of investigation. This may take the form of an artist's residency or award. An example of this method at the CFPR has been with Printmaker John Risseeuw from the School of Art, Arizona State University, as part of a sustainable printmaking project relating to art materials and practice: *Is Art Making Sustainable?* (Sept -Nov 2008).

- An artist may be invited to print an edition or artwork as an investment that has potential future market value. This method was adopted for artist Carolyn Bunt in the production of a series of inkjet prints for the Zoo Art Fair in London (23 - 24 Feb 2009) and a solo show *This is not an Exit* at Room Gallery London (25 - 26 Jan 2010). Recent prints produced by Carolyn Bunt in residence at the CFPR, including *And when I had looked up it had gone 1* were selected for inclusion in *Jerwood Encounters: Surface Noise* (19 Jan – 27 Feb 2011) London, curated by Gill Saunders, Senior Curator of prints at the V&A and John Mackechnie, Director of Glasgow Print Studio.

Carolyn Bunt: *And when I had looked up it had gone 1.*
Image Dimensions: W 54cm x H 40cm. Paper Dimensions: W 76cm x H 61cm
Medium: Pigmented Inkjet Print

- The CFPR accepts proposals from artists to produce printed works that demonstrate possible research potential. This proposal method has been used for Elephant and Castle Artist-in-Residence Rueben Powell. Using a Roland eco-solvent printer for the production of a series of large-scale works on metal (20 - 30 Sept. 2010).

- Artists also access the facilities through workshop demonstrations and Continual Professional Development (CPD) courses that can run between one and five days. Some of the demonstrations and CPD courses have included *Digital Print and Laser Cutting* (21 - 22 June 2010), CFPR, UWE Bristol, led by Paul Laidler and Tom Sowden; *Wide Format Print Demonstration for fine art print production & documentation*, (18– 19 Sep 2009), Impact Conference, CFPR, UWE Bristol, led by Paul Laidler; *Inkjet printing on different surfaces* (5 June 2009), CFPR, UWE Bristol, led by Paul Laidler, Carinna Parraman, Melissa Olen and Peter McCallion.

- The CFPR also runs a bureau service for professional artists who access the facility to produce printed artefacts to specific requirements. An example of this method was adopted for the photographer Charlie Errington on his commission for Islington Library, in the production of a five-metre long print (22nd Nov 2004).

- The CFPR undertakes a specific research method and invites a range of artists to test the method through the production of an artwork where they may have little involvement in the actual printing process. For example, part of an AHRC funded project entitled, *The Fabrication of Three Dimensional Art and Craft Artefacts through Virtual Digital Construction and Output,* (Jan 2007 - Dec 2009), where artists presented ideas for the production of 3D printed artworks using rapid prototyping technologies.

In most cases, the artists' prints created within the CFPR are normally produced in editions. Prior to an artist collaborating on a print project at the CFPR, an edition size is agreed between the two parties. As part of the CFPR's commitment to disseminating its research activity, any print edition should include a studio proof for the Centre's print archive to use for educational purposes.

1.5 Aims and Objectives

The aims of this research study are:

- *To use the collaborative printmaking model to test the introduction of digital technologies to fine art print.*

- *To survey and reflect upon the role of the Master Printer.*

- To present a series case studies that identify strategies and methods for facilitating fine art, digital printmaking.

- To consider the development of the digital print atelier and the digitally printed artefact

The objectives of the research study are:

To survey and discuss the development of the digital atelier

To undertake a series of case studies with artists using different approaches to inkjet printing.

To produce artefacts as examples of the possibilities of emerging digital technologies

1.6 The Investigation

The research methods for this study are central to the making of fine art prints within the collaborative print studio environment. The use of case studies is pivotal to the research as a means to provide insight into the introduction of digital technology within the traditionally defined practice of collaborative printmaking.

As part of the CFPR's commitment to producing fine art prints for artists, this PhD research project draws upon a series of digital prints produced in the centre's digital print studio. The collaborative production of digital fine art prints for artists that are undertaken at the CFPR are a mixture of invitation, residencies, bureau service, and AHRC funded projects that include the creation of fine art prints as part of the outcomes.

1.7 Empirical with Action Research Methods Approach for the Case Studies

Selected examples from the wide-ranging collaborations undertaken with artists have been used to generate a series of case studies to identify how the change in technology has affected traditional, collaborative, print-related facilitation strategies in the production of fine art digital prints. The data-gathering activity during the case studies included artists' statements, studio photographs, screen grabs, e-mail correspondence and documentation tables as a means to illustrate empirically the production process of each artist.

In order to fulfil the objectives, the research applies both empirical and action-research methods as a means to test initially the mechanically-defined printmaking precedents within a digital print context. Secondly, by actively participating in the research I was able to directly experience the facilitation role in question, and later reflect upon a multitude of facets associated with problem-solving, and the analysis of the collaborative Master Printer's role.

In his 1993 paper[vii] Sir Christopher Frayling (Rector of the Royal College of Art 1993-2009) described three types of research in art and design - derived from Herbert Read's *Education Through Art* from 1958. These were *research into art*, *research through art* and *research for art*. Based upon the prevailing pragmatic situation of this research project, the most relevant approach was Frayling's *research through art* described as:

> Action research, where a research diary tells, in a step-by-step way, of a practical experiment in the studios, and the resulting report aims to contextualise it. Both the diary and the report are there to communicate the results, which is what separates research from the gathering of reference materials. (Frayling, 1993: 5)

[vii] Frayling, Christopher. 1993. *Research in Art & Design,* Royal College of Art Research Papers, Vol 1 Number 1, p 5

In the same publication, Frayling discusses Kenneth Agnew's comments concerning the lack of any fundamental documentation in the design process when comprehending the final artefact. Agnew began his essay 'The Spitfire: Legend or History? An Argument for a New Research Culture in Design', by stating: "Too often, at best, the only evidence is the object itself, and even that evidence is surprisingly ephemeral. Where a good sample of the original product can be found, it often proves to be enigmatic." (Agnew, 1993: 1).

The artist Richard Hamilton used empirical analysis in the introduction to his 2006 *Painting by Numbers* exhibition catalogue, as a means to prompt questions around the appearance of reality and the process that renders it visible. The adoption of this method for the catalogue was considered partly in response to a client's misinterpretation of Hamilton's *The Annunciation* digital print (2005). Hamilton explained that by examining the procedures and motivation in the work, the process helped him to understand what he was trying to achieve (Hamilton, 2006: 5). Hamilton's validation of this direct evidencing method, and more specifically the motivation behind the procedures, indicates the need for similar evidencing concerning collaborative digital print production.

Given the multitude of production methods for a particular problem, the reasoning of 'how' and 'why' one method of production might be chosen over another will provide insight into how studios work with technology and with artists. During the review of literature on the subject of print workshops collaborating with artists, it became evident that there was little documentary evidence of actual studio activity in relation to digital print. In most cases any empirical evidence of the collaborative act tended to be a

description of production stages with little or no discussion around the 'how' and 'why' of the realisation process.

By using action research as "research through art" (Frayling, 1993: 5) this study aims:

- To develop a documentary procedure specific to the field of digital print as a best practice method in the facilitation of collaborative print studio practice.

- To document the methods, reasoning and solutions during the collaborative production process

The strategy of using case studies for this research question has been employed for a number of different reasons; firstly as a comparative study, the research will assess some of the previous elements of collaborative printmaking highlighted in the historical survey. Secondly, due to the empirical nature of the study, the first series of participants on the residency programme highlighted some recurring themes that have been used to examine the field of study. These early observations have been employed as primary, exploratory case studies.

Although Frayling refers to "action research" as part of the practice-led research method, the nature of the case studies that generate the report in this research are not as rigid as the action research definition: *Plan > Act > Observe > Reflect > Revise Plan > Act > Observe >* and so on. This is because each artist had different needs and understanding of the technical process and therefore, a strategy for one artist would not necessarily be applicable to another.

The case studies have been documented using both qualitative and quantitative methods of data gathering. In *The Art of The Case Study,* Robert E. Stake summaries the characteristics of qualitative study as: holistic, empirical, interpretive, and empathetic.[viii] These qualitative characteristics are central to the research question and context of the study in that a holistic overview of collaborative printmaking and digital print technology is considered, in order to understand the complexity of the field, prior to observing and forming the case study. The study is empirical, being studio-based, where experiments and observations inform procedures; a practice reflected during the proofing of prints. The interpretive characteristic develops from the unknown aspects of artists' residencies, where intuition informs any criteria that are not specified from the outset. Each case study is empathic, in that the study is inclusive of the artist's needs and therefore responsive within the design of the case study, although somewhat defined by the parameters of the residency.

The qualitative method is also utilised as a method of inquiry that foregrounds the understanding of a role - that of a digital Master Printer – rather than an explanation of it. "The designation of a qualitative research method can be found in the type of research question that is being asked" (Stake, 1995: 41)

The exploratory case study method was initially used to gain a comprehensive view of the type of data gathering that would prove to be most useful during the production process. The primary, exploratory case studies also highlighted the need to balance the recording of data for a case study, whilst working alongside artists to help them produce their work. The formulation of data-entry documents improved the speed of

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[viii] Stake, Robert E. 1995 *Interpretation as Method,* Chapter 3 *The Nature of Qualitative Research,* in *The Art of Case Study Research,* Sage Publications pp 47 - 48

the data recording process and provided instant access to specific file alterations that

could be forgotten during the many proofing stages.

1.8 The Need to Document the Creation Process of an Original Fine Art Digital Print

With particular reference to originality and digital print, the Canadian Council for

Printmaking published its updated code for original prints in 2000, stating that:

> Original prints…arise from the creative thinking of artists… Artists can execute all phases of production alone, but may call upon specialists for printing, and to execute certain procedures. Artists must however, make all technical and aesthetic decisions for their work to be considered original.
>
> … For reproductions, the intention lies in the area of dissemination, not creativity … [of] works of art produced in another medium, and to do this, mechanical techniques are used to achieve the closest possible resemblance to the original work. No creative decisions come in to play… they are products derived from works of art. (Malenfant & Ste-Marie, 2000: 36)

In her keynote address: *Making our Mark in the Digital Age,* Ulster, June 2010,

Marjorie Devon, Director of the Tamarind Institute, discussed originality in print:

"Take the word "original" "fine art" "limited edition" "museum quality" for example.

Apparently they <u>can</u> mean many different things." (Devon, 2010: 1)

One example offered by Devon, was of an Agnes Martin lithograph published by *Pace*

Editions. Devon's curiosity was piqued when she received a card from the Whitney

Museum of Art, announcing via *Whitney Museum of American Art Editions*, a limited

edition of 50 lithograph prints by the artist in 1997. Martin had told Devon previously

that she saw no reason to produce prints, as painting was the medium that suited her

best. Devon had also never encountered the Gilclear Light paper upon which the

lithograph had been printed. Having called the museum and printer for documentation

(which was not available), Devon finally called the publisher *Pace Editions* which could answer her question about authenticity. The print was an *offset* litho, reproduced from one of Martin's paintings and offered for sale at $5000 per print. As the artist had agreed to the reproduction, the publishers described it as 'original'. Devon found this to be "misleading at best". Devon went on to say that: "limited" implies rarity, and in turn justifies supply and demand economics; "original" implies authenticity; and "museum quality" gives it a stamp of authority and sophistication." (Devon, 2010: 4). It is unlikely that the printer and publisher would have wanted to provide a proper set of data describing the creative production process, as they would have been unable to market the print as 'original' due to the fact that the original was actually the painting that was photographed to produce the digital file.

Devon's further discussion of 'originality' asked how and why do we need to define it, and "what is the problem with defining it? … In the end, the critical factor in originality is the intent, resulting in the creative act…" Susan Tallman, in her book, *The Contemporary Print: From Pre-Pop to Postmodern (1996*) refers to the "intense engagement of the artist with materials and ideas". (Tallman, 1996: 5)

The best practice documentation proposed in this research study attempts to address some of the issues of confusion over originality and reproduction that still prevail amongst the art-dealing and art-buying public in relation to digital print. If we make it our duty as print studios to provide documentation that is made available to dealers, curators, collectors and historians, it would clarify the process and practice of production for authenticating and preserving printed artefacts. Devon goes on to say that: "our challenge [as publishers, printmakers, editioning studios] is to sharpen the

distinction [between original and reproduction] so that the unwitting are not deceived."
(Devon, 2010: 6)

For this research, the documentation of the process to designation of proofs for digitally produced artefacts is intended as a response to the needs of the researcher, collector and historian in the digital era, much as Tamarind's documentation of their traditional process has been since the 1960s.

1.8.1 *An Appropriate Time for an Appraisal of Rapidly Advancing Technology*
Wide format inkjet printing within a fine art context has been in existence for a period of around twenty-two years (Nash Editions was established as the first fine art digital print studio in 1990). The technology's development during the first ten to twelve years, overcame a series of obstacles for its integration into the fine art market through a number of seminal developments. These included increased image resolution, expanded ink sets and colour gamuts (g) and the development of archivally stable materials. The acceptance of the inkjet process within the historical development of digital print technology has seen less distinctive advancements since 2004, compared to the rapid advances over 1990-2002. The more recent emergence of rapid prototyping and 3D printing within the field of printmaking will ultimately broaden the definition of what constitutes a digital print, bringing with it a shift of interest in digital print technologies. This has to some degree already created a plateau effect upon inkjet printing that provides a timely situation with which to appraise a previously rapidly advancing technology.

1.9 Summary of Following Chapters

Chapter Two begins with the historical precedents of collaboration in art, leading towards the adoption and development of the collaborative endeavour within the field of fine art printmaking. The chapter reflects upon the collaborative print studio and the role of the studio's Master Printer as a key contributor to the collaborative print process. By discussing the varying degrees of facilitation that have existed between different Master Printers, an overview of practices can be considered in relation to the introduction of digital technology within the field of printmaking. As a baseline for this research, the historical lineage within the chapter highlights both the context for this study within the field of fine art printmaking, and the adoption of the Master Printer model as a means to facilitate the production of digital prints with a view to testing the validity of the traditionally defined role within the digital age.

Chapter Three focuses upon a number of seminal moments that relate to the specific development of digital printmaking. These developments include seminal, technological developments towards the field of digital printmaking, digital print pioneers and digital print facilities. The chapter includes a sampling of artists' relationships with early digital technology, and examines Richard Hamilton's *Five Tyres Remoulded*, as an example of an early development of 'computer art' within the field of fine art printmaking. Hamilton was one of the first well-known printmakers to utilise the computer's processing speed to configure and map a complex series of points to produce a fine art print.

The seminal moments of the desktop publishing era of the 1980s are included to highlight the relative infancy of digital printmaking, particularly when considered in

relation to the historical development of traditional printmaking. As a comparative study, this highlights the difference between mechanical and digital print which - given the rapid development with which a technology becomes obsolete, (unlike the traditional field of fine art printmaking) - demands a constant revision of skills and knowledge. The chapter then discusses the qualities that are unique to digital print and how these can be utilised in the production of art.

Chapter Four introduces the case studies that illustrate the development of methods and strategies used when facilitating the production of fine art digital print. The empirical with action research case studies are taken primarily from *The Perpetual Portfolio* artist residency project. Artists were selected according to four categories of methods that would explore the different stages of image production. For example:

- An artist using a single image source and then printing

- An artist using multiple image recordings for montage and print method

- The computer generated image and print method

- The hybrid print method.

From the twenty-two artists contributing to *The Perpetual Portfolio,* three were selected to summarise the different categories of methods used by the artists and the various facilitation strategies needed to manage the production of the work. The three *Perpetual Portfolio* artists include Siobán Piercy - an artist using a single image source with hybrid printing; Jack Youngblood - an artist using multiple image recording for montage and hybrid printing, and Hugh Sanders - an artist creating an image source and then printing. Chapter Four's analysis of these case studies forms the blueprint for the Print Parameter Document.

Chapter Five, the case study of Richard Hamilton's *Typo-Topography of Marcel Duchamp's Large Glass* is seminal because it proved the need for developing methods for documenting the production process, and is used to explore the computer-generated image and print approach. Richard Hamilton approached the CFPR in 2003 to print the digital file *Typo-Topography of Marcel Duchamp's Large Glass,* that he had been working on with his son Rod Hamilton since 2001, and is now part of Tate Britain's permanent collection. Between 2001 and 2003, Hamilton had twice attempted, with no success, to print the image at two studios in the UK.

The set of Quantitative & Qualitative data artist case studies from the *Committed to Print* project in Chapter Six continue to explore artists' approaches to the technology, as part of the study's aims to reveal the scope of production available from inkjet printing. These case studies reflect upon the previous action research approach and initial methodologies developed from the first set of case studies. The facilitation of the projects for Neeta Madahar and Jo Lansley included digitisation of analogue photography for wide format printing, Charlotte Hodes' project combined both inkjet and laser cutting in a hybrid print approach, and Susan Collins used a single image source and then printing.

Chapter Seven is a comparative study of a digital atelier within an institution that has the closest relationship to this study's studio model. This explores the working practice of the Master Printer system at the Rijksakademie, The Netherlands, as primary source material towards my research. This includes my own experience in a role reversal from facilitator to artist, to produce artworks through the workshop collaboration model that is specific to the Rijksakademie. The report on the production of the artworks can be

found in the Appendix: *Testing the notion of the Contract Workshop model through a collaborative print production at the Rijksakademie's Digital Print facility: 'Vanitas'.*

The last two chapters speculate upon the future of digital technology in relation to the printed artefact, discuss the findings from this research study, and reflect upon the role of the Master Printer in the digital age. Chapter Eight discusses the exploratory artwork developed from elements of this study that encounter the themes of printmaking, collaboration, craft, process, originality and digitally-mediated print. The resulting artworks were realised by myself as a practitioner reflecting upon the introduction of digital technology within the sphere of contemporary print (as opposed to a practice-led researcher predominantly creating exemplary artefacts of a particular process).

Chapter Nine, the conclusion of this research study, discusses the creative print documentation process, the role of the digital Master Printer, some strategies developed for best practice methods within the context of the collaborative digital print workshop and the holistic practice of facilitating the fine art digital print. The facilitation strategies presented, highlight how a printer may best serve any given project arising from the artist's needs for the production of a fine art print within the digital age using wide format inkjet printing technology. This chapter also posits some areas for further research and offers some considerations towards the dematerialisation of the object and the transitions between virtual and real space in contemporary printmaking.

The Appendices include four sections that support discussions in this thesis, provide external application of methods, and document expansive explanations of case study evidence. The case studies contained in Chapters Four, Five and Six, are edited

versions of larger, routine-based case study descriptions. The *Neeta Madahar -*

Unabridged Case Study is included to demonstrate the breadth of information

generated during a single print production. Similarly, the report that forms Chapter 7

includes supporting evidence from the *Rijksakademie* visit of practice-based work

produced in conjunction with the studio assessment. *Printing a Photographic Portfolio*

edition by Inkjet supports facilitation philosophies that are discussed in Chapter Four,

in an interview with Dr Anne Hammond. The *Dycem Ltd* document provides

consultation evidence for the application of print studio management methods that

have been generated from the research for this doctorate.

2.0   Chapter Two: *A Historical Baseline: Conventions and Achievements of Print, Master Printers and Their Influence on Fine Art Print*
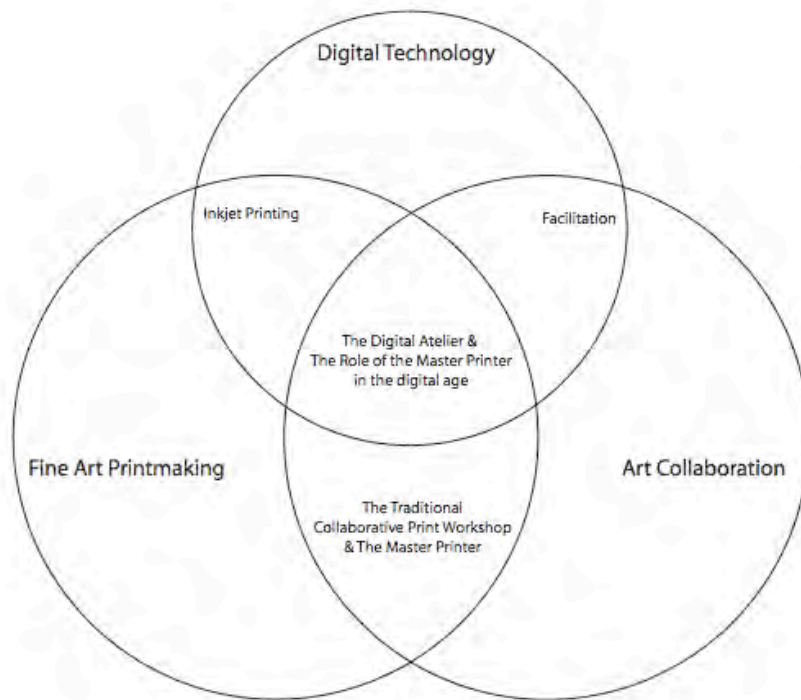
With reference to the above Venn diagram, I have plotted the relative areas of enquiry for this thesis as a means to highlight the key themes for the research and how each overlap to form the context. For example in each of the circles the three headings in bold, *Digital Technology*, *Fine Art Printmaking* and *Art Collaboration* form the key themes of the research. The interlocking sections of these circles that contain *Inkjet Printing*, *Facilitation* and *The Traditional Collaborative Print Workshop & The Master Printer* describe the relational contexts for the key themes. The central section of the three circles locates the core area of contribution for the thesis. This chapter will address the lower two circles, discussing the key themes of *Fine art Printmaking* and *Art Collaboration* within the context of *The Traditional Collaborative Print Workshop & The Master Printer*. Chapter 3, 4, 5, 6, and 7 address the key theme of *Digital*

Technology in relation to *Inkjet Printing* and *Facilitation* whilst Chapters 8 and 9 conclude the thesis and its contribution to *The Digital Atelier & The Role of the Master Printer in the digital age.*

2.1 The Concept of the Master Printer

Prints have long been a means of creating and disseminating artists' images in multiple. The production of fine art prints by artists also has a longstanding relationship with the collaborative print studio - defined as a studio where artists work together with Master Printers to realise and produce printed artworks. Seminal American studios founded in the 1960s included 'ULAE' (Universal Limited Art Editions) and 'Tyler Graphics', a British example was 'Kelpra' founded by Chris Prater. Although the creation of artwork is often assumed to be a solitary activity, the nature of creating prints requires an artist to access the use of specialist facilities, equipment and materials. Subsequently the artist is forced to seek the assistance of another individual, not only to gain access to a process, but in the logistics of creating work through that process, for example Rauschenberg's or Rosenquist's large scale print works at Tyler Graphics (see: 2.11 *Ken Tyler - Tyler Graphics Limited*). The collaborative undertaking between an artist and print studio has predominantly been one of facilitation when working with artists, although the process of facilitation; what it involves and what the relationships are, has varied between print studios or more specifically, between each studio's Master Printers.

The Master Printer has been a constant figure within print history, and in particular over the 19th-20th Centuries, notably Master Printers Roger Lacourière (1892-1966) Fernand Mourlot (1895 - 1988) and Aldo Crommelynck (1931-2008). Traditionally the

Master Printer was someone who attained a high degree of technical proficiency in interpreting, by hand, the work of artists through various graphic conventions dictated by techniques such as engraving, etching, lithography or screenprint. Deborah Wye, in *A Picasso portfolio: prints from the Museum of Modern Art*, extols Picasso's relationship with Lacourière, who: "became an active collaborator, giving Picasso a new understanding of the intaglio process… the result was a new level of ambition in Picasso's prints" (Wye, 2010: 47). In an interview with Susie Hennessy, Jim Dine discusses working with Aldo Crommelynck (trained by Lacourière), Master Printer to artists including Picasso, Miró, Le Corbusier, Giacometti and Braque, and throughout a long career, a later generation of British and American artists including Jim Dine, Richard Hamilton, David Hockney, Howard Hodgkin, and Jasper Johns:

> My relationship with Aldo Crommelynck has been a little different [to Donald Saff and Paul Cornwall-Jones] in that he really teaches technique more than anyone else… it is the training that Crommelynck had with Lacourière and his experience in printing for Picasso that makes him unique. He showed me how he made reproductions of Picasso paintings, for instance, that Picasso later signed. In that way, he taught himself etching technique so he has a vast vocabulary of the *process*… I sit with Crommelynck and the collaboration is where he teaches me technique. (Hennessy 1980: 168)

Dine was a great admirer of Aldo Crommelynck, so much so that in 2007 he held a tribute exhibition at the Bibliothèque Nationale in Paris *Aldo et Moi*, donating a set of the 115 etchings Dine and Crommelynck had produced together from 1975-1997.[ix] On hearing of Crommelynck's death in December 2008, Dine stated in *The Times*' obituary for him (7 February, 2009) "I've been working in Paris with Aldo Crommelynck for 35 years. He is an extraordinary man. In Japan, he would be declared a living national treasure. In France, he is simply a Master Printmaker."

It is also documented that the Master Printer's skills often extended beyond just technical proficiency and, given the holistic nature of collaborating, should also

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[ix] The gift is documented in the catalogue *Jim Dine: Aldo et moi*. Dine & Crommelynck 2007.

encompass diplomacy and patience: Kathan Brown (Director of Crown Point Press) describes "what I think are four keys to being a good printer: to be present and competent without being intrusive, without putting out constrictions; to feel honestly that doing this work is an adventure; to waste, if necessary, materials and time; and, most important, *not* to waste the artist's momentum, concentration, and pleasure in the work." (Brown, 1980: 178).

Not only has the Master Printer played a pivotal role in the creation of fine art prints, but the experiential knowledge gained by the printer has provided a rich vein of information for historians and archivists researching the field of fine art print.
For example, Pat Gilmour writing in *Ken Tyler Master Printer, and the American Print Renaissance* (1986) discusses Tyler's development and influence due to his skill and innovation in printmaking at the Tamarind Lithography Workshop in Los Angeles. Tyler progressed from understudy to Technical Director from 1963-1965; and established his own studio *Gemini Ltd* in Los Angeles in 1965, and *Gemini G.E.L.* in 1966. He worked with numerous artists such as Andy Warhol, Claes Oldenburg, Jasper Johns, David Hockney and Edward Ruscha until his retirement in 2000.[x]

2.2 Collaboration in Art

Artists work in many forms: individually, in co-operation with others, or as collaborators on a project. Collaboration can take many forms in itself, from joint artistic endeavours, to an artist directing a project that is produced remotely by others; or in the studio under the supervision of the artist. For the purpose of this study, "collaboration" is defined here as an ability "to work together, especially in a joint

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[x] Tyler's *Gemini G.E.L. Catalogue Raisonné 1966 - 1996*, can be viewed online at the National Gallery of Art, Washington. http://www.nga.gov/gemini

intellectual effort".[xi] What actually constitutes the 'intellectual effort' may differ between individuals, given the subjective nature of words and their changing meanings across different cultures and contexts. Within fine art practice the word collaboration has shared a close relationship with assistance or towards a division of labour.

In her essay *Collaboration in American Printmaking Before 1960*, Dr Joann Moser; Senior Curator of Graphic Arts at the Smithsonian American Art Museum, describes the distinction between the artist and the artisan, originating in the Renaissance period, as one of the main obstacles to collaboration. It was here that the artist's liberation from the restrictive guild system helped form what became the Romantic notion of the individual 'genius' and of 'originality' in art. Moser states:

> Collaboration in the fine arts has been overlooked, de-emphasised, and often denigrated by those who subscribe to the notion of the centrality of the individual artist and the unique masterpiece as the highest expression of originality and quality in art. (Moser, 1995: 10)

However, collaboration in the fine arts has been utilised by artists for a multitude of reasons. Through both conceptual dialogues and pragmatic strategies, artists have been mindful of the collaborative act's benefits for their work, as in Jim Dine's working relationship with Aldo Crommelynck or Picasso's with Lacourière.

Unlike other industries such as film for example, which is perceived publicly as highly collaborative - with status applied to cinematographers, writers, directors, producers and actors, all of whom are credited - the collaborative method in fine arts has, to some degree been de-emphasised due to its developmental origins within the traditional arts and crafts guild system and art's association with originality and authenticity.

[xi] As defined in the *Collins Concise English Dictionary*, seventh edition, 2008.

Although this notion of the individual and originality has less influence in the Post-modern era, it has no doubt hindered the growth of collaboration in the fine arts field. In fact, it is in more recent times that alternate perspectives of art history and artistic creation have been posited. Joann Moser in her aforementioned essay describes some of the most recent prominent influences as: Marxist, Poststructuralist, Feminist and Pluralist theories. It is in the Pluralist theory of critic David Shapiro (Moser, 1995: 10-11) that Moser highlights the main opposition to the individual 'genius' theory. Shapiro suggests that art is collaborative in nature, citing the communal relationships within the movements of Modernism. Here Shapiro de-emphasises the Romantic notion of the isolated genius by offering how we could possibly:

> …begin to have a van Gogh without Gauguin, a Cezanne who does not sign himself student of Pissarro, an Orphism without the marriage of Sonia and Robert Delaunay and collaborating poets, Dadaism without the pacifistic friendship involved throughout, Abstract Expressionism without the collaboration of Gorky and de Kooning, earthworks without the fierce alliance of Serra, Holt and Smithson…' (Moser, 1995: 10)

Moser suggests how Shapiro's perspective invites us to reconsider the collaborative role in other movements in art, where it has assumed a pivotal position. Using Shapiro's focus of interaction between artists, Moser highlights the particular collaborative exchange; where an artist relies on the hands of another to execute the work. This particular type of collaboration has been the most prominent method within the printmaking studio, for example Ken Tyler's collaborations with Robert Rauschenberg for *Booster* -1967, and James Rosenquist's *Time Dust* - 1992 (see 2.11 Ken Tyler).

2.3 Reasons for Artists to Collaborate

Collaboration in the fine arts may be prompted by a variety of reasons with a host of

individuals from various disciplines and backgrounds. Given the endless conceptual

and co-creational permutations that can exist within the collaborative venture it is

important, first of all, to understand why an artist may seek to collaborate with others.

In *The role of the evolving artefact in creative collaboration,*[xii] Nancy de Freitas

considers the creation of an artwork as central to the function and dynamic of a

collaborative group. The evolving artefact dictates shifting roles and responsibilities,

creating a collaboration where shared goals become overlapped rather than achieved

independently from the offset of a project. De Freitas describes three key reasons why

artists may choose to collaborate with each other or others:

> Based on needs that are perceived in relation to the project or on the artist's
> desire for a change in habitual practice. Artists may be looking for:
>
> 1. Support for a philosophical position through the validation that comes with
> agreement about concepts and consensus in relation to method.
>
> 2. Creative or practical contributions to the work that artists are unable to
> provide themselves.
>
> 3. Simple conversations that open up the kind of intellectual exchange or
> dialogue that leads to the refinement of ideas. (de Freitas, 2004: 1)

The medium of printmaking is predominantly a technically led process, and

historically the majority of working collaborations have been initiated through

independent artists needs. Although the collaborative print process is rooted in this

relationship, the overlapping of shared goals has been postulated by Master Printers

such as Ken Tyler (see 2.8 Master Printer Models in Europe and the USA).

[xii] de Freitas, Nancy. 2004. *The role of the evolving artefact in creative collaboration*, Paper, Research into Practice Conference, Hertfordshire University, [accessed 05/06/2008] http://sitem.herts.ac.uk/artdes_research/papers/wpades/vol3/ndfabs.html

Within de Freitas' scheme, we can define the second and third examples in the context of the collaborative print undertaking as:

-The practical contributions of the Master Printer are associated with skill, craftsmanship, and an affinity for materials that the artist maybe unable to provide themselves.

- The refinement of ideas through simple conversations is where the Master Printer's process knowledge can resolve the realisation of an artist's idea in print.

Collaboration in the printmaking field is predominantly from a pragmatic perspective where the artist is able to access specialist equipment and technical expertise with the tools, materials and operations of a particular print studio. The facilitator role within printmaking studios is referred to as the Master Printer. "We think of ourselves [Master Printers] as guides, or perhaps teachers... We provide support, skills, sensitivity, intelligence, interest in ideas – but the ideas themselves are the artist's territory." (Brown, 1980: 178)

The most generic description of the Master Printer could be that of someone with a high standard of technical ability, who could interpret - by hand - the work of a range of artists using the graphic conventions of a medium such as etching, lithography or screenprint. In *Wasting and Wasting Not: How (and Why) Artists Work at Crown Point Press*, Kathan Brown, Director, discusses her views that the studio's printers consider the artists' intentions:

> People often ask me how I choose printers. I don't like to hire people who have experience in other print shops. We can teach skills to quick learners; the more important skills cannot be taught. I look for people who are interested and interesting. They must, above all, be sure enough in themselves so that they don't need to be overbearing or bossy... if the printer is too authoritative at the beginning, the artist might tend to retire,

let the printer lead. And we don't want that. That is what causes the common complaint that all the prints coming out of a particular press look somewhat the same – if they look the same, it is because the same *printer* made them. Our printers avoid this. We want the prints to look as if the *artist* made them. (Brown, 1980: 178)

2.4 Collaborative Printmaking

From the print medium's early preoccupation with commercial reproduction, through to its creative adoption by artists, printmaking has perhaps been a medium that most consistently adopted the collaborative method. Yet, unlike creative collaborations where all contributory parties are acknowledged such as film or music, printmaking in the fine arts has been overlooked when articulating the extent of the collaborative venture during the creation process.

From the 16th Century to the late 19th Century, the predominant use of print in fine art was one of reproducing paintings through engraving techniques. Although the premise for the reproduction was often for disseminatory and / or financial reasons, the quality of execution was still dependent upon original source material, the skill of the engraver and the techniques developed over the years to transcribe accurately and replicate. During the Victorian era, large-scale engravings were highly popular forms of art produced by engravers, with skills in mezzotint and aquatint creating an avid collector's market. Basil Hunnisett's *Engraved on Steel: The History of Picture Production Using Steel Plates* (1998) provides an informative overview of the engravers, their dealers and audience of that time.

The technical development of the print process concerning 'the exact repeatable pictorial or visual statement' is discussed and defined by William M. Ivins in his

Prints & Visual Communication, 1969[xiii]. Ivins' description of the printed image -

as a culturally influential carrier of information and ideas - highlights the historical

impact of transcription methods. Ivins' articulation of the varying levels within the

reproduction process explains the different visual qualities attainable from a single

source image. One of these distinctions can be attributed to the artisan, or Master

Printer involved in the production and the accurate execution at each stage of the

process, as discussed in *Printmaking in America* (Hansen, Mickenberg, Moser, Walker,

1995: 13) which I have formatted into a diagram below to demonstrate the individual

responsibilities which make up the whole production process of a studio's business

model.

The team of individuals:

Production role	Latin term	Latin Translation
Designer or Inventor	*Invenit*	*He designed*
Painter	*Pinxit*	*He painted*
Marker of the matrix	*Delineavit*	*He drew*
Engraver	*Sculpsit*	*He engraved*
Creator	*Facit*	*He made*
Printer	*Impressit*	*He printed*
Publisher	*Iexecudit*	*He issued or published*

[xiii] William M. Ivins (1881 – 1961) was curator of the Department of Prints at the Metropolitan Museum of Art, New York, 1916 -1946. He published numerous critical writings on the subject of prints, including: *Prints and Visual Communication*. The MIT Press, USA, 1969.

2.5 Art and Reproduction

The acknowledgement of the engraver's work around the mid 19th Century meant that print reproductions of well-known paintings became highly collectable within the new Victorian middle class, as discussed in Basil Hunnisett's *Engraved on Steel* (1998) which documents the development of engraving on metal from the UK into mainland Europe and America during the 19th Century. The popularity of these prints amongst critics and collectors enabled a school of engravers to become Royal Academy members, whilst many artist etchers were still rejected. This predicament within the Academy came under scrutiny as the arguments of Haden (1818 - 1910) Whistler (1834 -1903) and von Herkomer (1849 - 1914), began to re-address established assertions and traditions within the Fine Arts, and within the Society of Painter-Etchers (as documented in *No Day without a Line: The History of the Royal Society of Painter-printmakers 1880-1999*). An example of the provocations against the reign of the reproductive Royal Academy engravers came from the artist Seymour Haden. Haden, along with his brother-in-law Whistler, was a strong advocate of Rembrandt - who drew his own plates and produced his own prints. Haden's remonstration in his 1883 address to the society of printer etchers was presented as 'The Relevant Claims of Etching and Engraving to Rank as Fine Art' (Gilmour, 1970:10). The famous address appeared to refer to the soulless application with which the reproductive engravers created prints, somewhat removed from modern attitudes on individualism and the preference towards what was "real" over what was subjective. Hayden's vehement rejection of this formula in the fine arts led him to produce his own limited editions. By producing these, Hayden highlighted the extra inclusion of the artist's hand within the printing of the plate and the artist's specific intention through each part of the image's production.

Hayden's philosophical stand was to have a direct effect upon the classification of the fine art printmaker and the subsequent association with the artisan. By insisting that a work of art could only be conceived by the artist and produced by the artist's own hand. This philosophy resonated with the individual 'genius' theory of the Renaissance, when the distinction between artist and artisan was established.

2.6 Rationale and Requirements for Print Collaboration: Redefining the Master Printer's role

As the fine art print distanced itself from reproduction in the artist's hand, the very nature of interacting with the production process unearthed further creative possibilities that the artist could draw upon. Artists who were masters of painting and drawing of the Impressionist period, such as; Degas who excelled in etching, drypoint and aquatint and Cassatt who experimented with drypoint and colour aquatints. Post Impressionists including Lautrec, and later, Matisse and Picasso were attracted to similar qualities in the print processes of lithography (Matisse's *Chinoise aux Cheveux Flous,* 1945) and etching (Picasso's *Suite Vollard 63,* 1933) respectively. Artists who enjoyed working directly with print processes began to uncover qualities that were unique to print. Matisse was said to have commented upon the unique qualities of lithography "as a new way of drawing", (Gilmour, 1970: 20) by helping to elevate the status of print as a medium in its own right alongside the established mediums of painting and sculpture.

In some instances balancing both the technical and creative aspirations for a print limited the artist's range of creative development with the medium. The realisation of these factors led some artists to seek the skills and practicalities of working with a Master Printer. The re-emergence of the artisan's role in the creation of the fine art print, under the now technically proficient eye of the artist, developed a more pragmatic and insightful direction for the new relationship.

A keen advocate of this collaborative relationship was Picasso, who, as an artist with a prolific output realised it was impossible for an artist to acquire simultaneously, all the necessary skills of a process and work creatively with them. The diverse relationships that Picasso had with Master Printers such as Roger Lacourière, Aldo Crommelynck and Fernand Mourlot, led to significant advancements and discoveries with the print process, which also elevated the status of the Master Printer. These were testament to the progression of the collaborative roles established by the artist's aspirations for the medium, over extreme views on originality.

In the article *Some Thoughts about Printmaking and Print Collaborations,* Garo Antreasian, writer and Master Printer at the Tamarind Lithography Workshop and University of New Mexico, discusses the historical rise of print from the 19th Century, citing the artist's autographic mark as the distinction between what was considered reproductive print and fine art print. As previously discussed, this historical distinction had previously split artists during the late 19th and early 20th Centuries, between collaboration with a Master Printer, or themselves being the sole creator of their prints. An exception to the argument was John Constable (1776 -1837), who had a sympathetic working relationship with the mezzotint artist David Lucas (which will be discussed in 2.5.1).

Garo Antreasian describes the experiences of four artists: Albert Sterner (1863 - 1946), George Bellows (1882 - 1925), John Sloan (1871 - 1951) and Joseph Pennell (1857 - 1926), who become interested in using the lithographic process to create their own prints based on early 20th Century ideologies of what constituted an original print. Due to their lack of experience with the process, the printed results proved less than favourable, and eventually the technicalities of the process became too difficult for Sterner. Instead Sterner sought the assistance of a Master Printer, George C. Miller (of George C. Miller & Son lithographic studio, New York) who would continue to assist other artist acquaintances of Sterner, except for Pennell. Pennell held firm to his Modernist beliefs, claiming that the printer knows nothing of the artist's endeavour and ultimately the artist is restricted to the method of the printer: "The professional lithographer as a rule knows nothing about the art of etching and can't be taught; he usually has his method - the shop method - and by that he stands or falls - and the artist does too, if he depends on the professional." (Antreasian, 1980: 182). Interestingly in this instance, Pennell's observation about the Master Printer having one printing method for all artists had some truth in it, as Miller was an advocate of the "dependable technical approaches that would assure a predictable outcome for the finished print" (Antreasian, 1980: 182). Together with Miller's dependable, collaborative method it was said that he excelled in the particular lithographic process of crayonstone printing. The observation of a printer's excellence in a particular process or facet of the collaborative undertaking is often referred to as the printers 'special skill' (or tacit knowledge). Although Miller's production methods were not considered very flexible from the perspective of the experimental artist, his studio in New York during the

period between World War I and II was considered the "principal centre for professionally printed lithograph" in the USA (Antreasian, 1980: 182).

Antreasian discusses similar collaborative workings through the studios of Mourlot (*Imprimerie Mourlot*, Paris) and Stanley William Hayter (1901-1988) of *Atelier 17*, Paris and New York. Imprimerie Mourlot produced high quality lithographs for Braque, Bonnard, Miró and Picasso. Hayter founded Atelier 17 in Paris in 1927, and later in New York in 1940. The Paris Atelier is still in existence, renamed as *Atelier Contrepoint* after his death in 1988 (www.ateliercontrepoint.com). The two studios had very opposing systems of collaboration, yet both were equally successful. The influence of these two studio philosophies was to become more apparent in the American studios during the Print Renaissance era in the USA (mid 1940s - late 1950s)[xiv]. Antreasian goes on to describe the difference between these two collaborative models as 'altruistic' and 'catalytic' approaches. It is the altruistic method that is the more interesting for this research study of the collaborative model; one where the Master Printer is allowed to contribute to the production of the artwork through a sympathetic understanding of the artist's intentions, and an ability to experiment with the medium.

2.6.1 The Altruistic Method (The Sympathetic Transcription)

The altruistic approach is often associated with individuals who have a sympathetic nature. The sympathetic printer often takes a more holistic view of the artist's needs

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[xiv] For further information on Hayter's involvement in the American Print Renaissance, see an online essay by Samantha Rippner, Department of Drawings and Prints, The Metropolitan Museum of Art: *The Postwar Print Renaissance in America,* which provides an overview of studios of the period: http://www.metmuseum.org/toah/hd/post/hd_post.htm

whilst sharing the artist's vision towards the translation of their work in print. In terms

of early reproductive printing, Joann Moser in *Printmaking in America* refers to

sympathetic traits as "a literary analogy, where literal translations of novels fall short

of translations...that convey the mood and eloquence of the original vocabulary and

syntax" (Moser, 1995: 15). This special trait required a high standard of technical

skills, but more importantly, the sympathetic transcriber should also be an avid listener

and articulate translator, who is able to be inventive with processes rather than being

defined by them. The artist Richard Hamilton, who worked with the Master Printer

Aldo Crommelynck amongst others, and who uses a multi-disciplinary approach to

printmaking explains the need for the Master Printer's expertise:

> Gaining the wide range of technical skills required in many different print
> media would be absurdly time-consuming, if not impossible. My habit is
> to go to the craftsmen who can best serve the requirements of any given
> project.
>
> In the course of a search for great technicians, I noticed that the most
> admirable print craftsmen were those who had been involved in some
> reproductive endeavour. Examples of Prater, Dietz and Crommelynck…
> These extraordinary labours confirmed my conviction that the great
> inventor-craftsmen in the print world, polish their genius on the mundane
> tasks of translating between media. (Coppel, Hamilton, & Lullin, 2004: 273)

The English Master Printer Hugh Stoneman (1947 - 2005) perfected many print

processes and produced unique collaborations with national and international artists

through print, including Patrick Heron, Terry Frost, Hamish Fulton and Ian McKeever,

to contemporary artists including Gary Hume and Grayson Perry. Stoneman was

unique and well known for his technical range; etching, gravure, woodcut, linocut,

letterpress and lithography. Adam Lowe (founder of *Permaprint*, London and later

Factum Arte) was among those who became involved in printmaking as a result of

Stoneman. The critical point in Stoneman's early career arose when he joined William

Hayter's Paris studio, *Atelier 17*, in 1970. He returned to London to found his own

studio in 1979, before relocating to Cornwall in 1995 where he founded *Stoneman Graphics*. Michael Tooby's obituary for Stoneman in the *Guardian* (3 February 2006) discusses his career and relocation to Cornwall, with the support of Charles Booth-Clibborn's *Paragon Press.* Booth-Clibborn commissioned a series of large-scale woodcuts for the artist Terry Frost - with whom Stoneman had worked since 1989- and further print commissions for publishers Alan Cristea and *Flowers Graphics*. Stoneman continued to produce work for many 'blue chip' artists. The artist Ian McKeever commented on working with Stoneman in the *Guardian* obituary:

> To watch Hugh Stoneman inking up and then wiping clean a large etching plate was a beautiful sight. He seemed to know instinctively the density of ink required for each proof and how cleanly it should be wiped to find the right print. Standing next to him, one could feel the intimacy and love he had for the activity. He knew when to be emphatic and when to caress, when to leave in or take out with a single kiss. (McKeever, 2006: 43)

In *Artists in Print,* Pat Gilmour provides an example of the sympathetic transcription between the British landscape painter John Constable and a mezzotint artist David Lucas (Gilmour, 1981: 115). Shortly after the death of Constable's wife Maria in 1828, Constable began collaborating closely with mezzotint artist David Lucas in 1829 on the publication of his edition of prints *English Landscape Scenery*. The mezzotint process lent itself to Constable's interest in light in nature, and a series of prints were undertaken - of which his 1826 oil painting *The Cornfield* was one subject.

What is interesting about the publication of the prints (c. 1830 -1832) is how Constable's mental state during this time of loss was transferred gradually to Lucas through each of the proofing states, so much so that the prints became very different from the original paintings.

The communication during the proofing was often by letter, whereby Constable exclaimed "…the constant revisions of the engraver became like poems translated into another tongue with the assistance of the original executant…" (Gilmour, 1981: 115). During this collaboration, Lucas would end up darkening the landscape, interpreting Constable's sombre frame of mind in his letters, as part of any directions toward plate corrections, see *Weymouth Bay* (1830, Tate Collection) for example.

2.6.2 The Symbiotic Relationship (The catalytic method)

The opposite facilitation method to the altruistic approach is the catalytic, a method that was central to the practice of Master Printer Ken Tyler (b. 1931) until his retirement in 2000. In all artist and artisan collaborations, Tyler believed that "the quality of production is testament to the artist's aspirations". He also stated that most artists did not know what they were doing technically and consequently relied heavily upon the advice of the Master Printer (Gilmour, 1986: 32). For Tyler, the collaborative model had developed from the two distinct roles of 'artist' and 'artisan', to form what he called a 'symbiotic' relationship: "Where you can't tell whether the suggestion came from the printer on the press or that it was the artist's idea." (Gilmour, 1986: 32). Tyler's approach was the antithesis of Kathan Brown's earlier assertion that "if the printer is too authoritative at the beginning, the artist might tend to retire, let the printer lead…. That is what causes the common complaint that all the prints coming out of a particular press look somewhat the same… Our printers avoid this. We want the prints to look as if the *artist* made them." (Brown, 1980: 178)

In some cases, Tyler observed that the distinction between "conception and execution was inseparable, and when this happened it was magic." (Gilmour, 1986: 32). When

collaborations of this manner took place, they brought about unique relationships and highlighted the personal chemistry between artist and Master Printer during their working time in the studio. The main difference between the two collaborative approaches of altruistic and catalytic is, under the catalytic process the presence of a studio's house style or the aesthetic influence of a Master Printer can be detected in the work produced. The altruistic process is the opposite of this approach in that there is no visual evidence of any studio house style or influence of the Master Printer.

2.7 The Collaborative Print Studio Process

In *Collaboration and Colour Management in Fine Art Printmaking*, the photographer Thomas P. Ashe lists a series of beneficial reasons for artists and printers to consider when collaborating towards the production of a fine art printed edition. Ashe defines the benefits for the artists collaborating as: "aesthetic, labour-saving, catalytic, conceptual, educative and economic." The printer's benefits include: "technical challenges, stimulation, acceptance of technology, professional identity and financial gain." (Ashe, 2001: 9-10).

Today, artists can access a number of different types of print workshops that produce fine art prints using a variety of processes and methods of print production. Silvie Turner's *About Prints: a guide for artist printmakers* explains that: "all workshops are set up to meet the needs of the owners." (Turner, 1994: 76), whether these are the privately owned workshops of an artist, or open access workshops for the public. This means that artists have a number of decisions to make when choosing to work with one workshop over another.

Within the definitions of *Types of print workshops,* Turner describes two workshops that are set up specifically for the artist and printer collaboration. Turner differentiates between the two workshops as *Contract Workshops* that are run: "by Master Printers who offer collaborative skills at all stages of plate-making and proofing up to the production of the B.A.T." (g) (Turner, 1994: 76) and *Contract Editioning Houses* that mainly offer editioning facilities focusing on the collaborative stage of proofing and often specialise in a particular print process. Turner's *Other types of print workshops* are "accessible to artists, although the collaborative production of fine art prints is not the primary function of these workshops". Amongst the list of community-based and privately owned workshops is higher education. Educational facilities in colleges and universities are often well equipped for the running of printmaking courses, evening classes or short courses. Turner points out that these facilities are "occasionally open for editioning prints" (Turner, 1994: 76).

From Turner's workshop definitions the *Contract Workshops, Contract Editioning Houses and educational facilities* are the most closely matched to the situation and parameters of this research project. For the purposes of this research, even though it was developed through a print bureau service initially, the CFPR atelier works collaboratively with artists and this is the focal point for the study. For this reason, bureau services, print on demand facilities and open access studios have been excluded as they operate on financial and/or community-based principles, for example artists' community-based enterprises such as londonprintstudio, Edinburgh Printmakers, or the Frans Masereel Centrum in Belgium. The CFPR atelier is part of a research centre where the focus is on producing art for artists, with the same ethos as the Rijksakademie in The Netherlands which served as the comparative model for the study in chapter six.

2.8 Master Printer Workshops in Europe and the USA

During America's Great Depression of the 1930s, President Roosevelt launched the

Works Progress Administration (WPA) programme to send millions of unemployed

Americans back to work, including more than 5,000 artists. Under the WPA, the

Federal Art Project assigned artists into three divisions: Mural, Easel and Graphic Arts.

Artists assigned to the Graphic Arts Division created over 200,000 prints for public

buildings such as courthouses and libraries.

> The printmaking workshops brought together artists of various backgrounds
> and fostered professional growth through collaboration and experimentation
> with new printmaking techniques. Many artists who have since become
> famous were part of FAP. Philip Guston, Moses Soyer, Jackson Pollock,
> Mark Rothko, Jacob Laurence, Ivan Albright, Marsden Hartley, Philip
> Evergood and Mark Tobey. (Davis, 1973: 249)

During the Second World War, most European studios in France and Spain stopped art

production, with a number of European artists fleeing to the USA. The influence and

experience of these émigrés on an affluent culture invigorated a new generation of

American artists. After the Second World War, the optimism for art production and

international travel soon sent American artists in turn to Europe, to work in the

environments that had produced those artists whose work they were now familiar with,

and the movements that cultivated them such as Surrealism and Dada.

Amongst some of these American visitors to Europe was the artist June Wayne.

A printmaker herself, Wayne was impressed by the whole philosophy of production by

Master Printers such as Marcel Durassier with whom she worked, and the intricacies

that had elevated the status of printmaking alongside other, more established

disciplines of the art world in Europe. In a 1997 interview with Margaret L. Brown in

Southwest Art Magazine, Wayne explained her inspiration in the late 50s European

model:

Before Tamarind, lithography in the United States had not caught on with artists. We hadn't built up a reservoir of master printers accustomed to working with artists like that which existed in Europe. Today we take this artisan reservoir for granted - if you want to make a monumental bronze, you go to a foundry. If you want to create a lithograph, you go to a workshop. But in the first half of this century, these resources were not available. I wanted Tamarind to become a model for other workshops. By bringing artists into contact with printers in a protected environment, they could learn from one another. (Brown, 1997: 13)

2.9 The Tamarind Institute

In order for a ripe, contemporary US art market to engage with some of the unique qualities developed by European printmaking, Wayne opened the Tamarind Lithography Workshop, Inc. (TLW) on Tamarind Avenue in Los Angeles, in 1960. The Workshop's goal was to produce a school of Master Printers that would emulate the quality and standards of the European Masters, and adopt the artist-artisan relationship that they were founded upon. Unlike the background of Master Printers in Europe, most of the aspiring students of Tamarind were artists themselves or had recently graduated with an arts degree. Part of their training was to work alongside invited artists and develop a collaborative relationship that would, in the words of the Tamarind maxim, "detect the true spirit of the work and give it life, while at the same time avoiding any act which might tend to impose his own aesthetic upon that of the artist" (Gilmour, 1986: 30). The psychology of working well with artists came quite naturally to students with an artistic background, as they themselves had experienced the highs and lows of making art. These circumstances were deemed to make the art students more sympathetic to the artists' concerns with the process. However, the maxim's association with the individual 'genius' theory left little manoeuvrability for any variation of the role that may have developed during the collaboration.

In more recent years, the maxim seems to have relaxed somewhat. Marjorie Devon,

Director of the Tamarind Institute, in her keynote address: *Making our Mark in the*

Digital Age (Ulster, June 2010) discusses working with the artist Jim Dine[xv], who has:

> been a frequent visitor since he made a print with us in 1991. Although he brings his long years of experience in the medium to his work at Tamarind and often revisits earlier imagery which he has explored since the beginning of his career, he is always open to suggestions and often engages playfully with the printers. Once he left some drawn stones to be proofed and instead of giving him explicit directions, he said to Bill [Lagattuta], "surprise me!"[xvi]

Tamarind Lithography Workshop became a professional lithographic Institute

affiliated with the University of New Mexico in 1970, when it relocated from Los

Angeles to Albuquerque. Founding director June Wayne, Associate Director Clinton

Adams and Technical Director Garo Antreasian, established multiple long-range goals:

> To create a pool of master artisan-printers in the United States by training apprentices.
>
> To develop a group of American artists of diverse styles into masters of this medium.
>
> To habituate each artist and artisan to intimate collaboration so that each becomes responsive and stimulating to the other in the work situation encouraging both to experiment widely and extend the expressive potential of the medium.
>
> To stimulate new markets for the lithograph.
>
> To plan a format to guide the artisan in earning his living outside of subsidy or total dependence on the artist's pocket.
>
> To restore the prestige of lithography by actually creating a collection of extraordinary prints. [xvii]

[xv] All of Jim Dine's lithographs produced at Tamarind can be viewed in the online *Catalogue Raisonné* at http://tamarind.unm.edu/editions/dine_img.html

[xvi] Marjorie Devon, Director of the Tamarind Institute, Keynote Address at the 2010 symposium: *Unique Reproduction - Definitions of Original Printmaking in a Digital Age*, The University of Ulster, Belfast Campus, 17th June 2010**.** http://www.seacourt-ni.org.uk/news/symposium_report.htm

[xvii] http://tamarind.unm.edu/aboutus.html#history [accessed 11/09/09]

Tamarind Institute continues as a leading lithography workshop, which includes an international programme of collaboration with artists, curating exhibitions and training printmakers from its base at the University of New Mexico - celebrating its 50th anniversary in August 2010 (http://tamarind.unm.edu).

The very nature of collaboration can produce an infinite amount of outcomes dependent upon a range of circumstances, and the variables that exist within them. The artist producing prints with a collaborative studio relinquish a certain amount of control during the production of their print, to an individual they may or may not know, using a process they may have never seen or used before. When artists worked with Master Printers they not only accessed the learned craft and technical skills but also the printers' collaborative philosophies.

The raising of the Master Printer's profile as spokesperson, inventor and publisher has proven to be an influential characteristic towards the development of collaborative printmaking during the 1960, 70's and 80's, as the following sections will discuss.

2.10 Tatyana Grosman - ULAE

The lithographic print studio Universal Limited Art Editions (ULAE) was founded by Tatyana Grosman (1904 – 1982) in West Islip, New York State, during the height of Abstract Expressionism in 1957, three years before June Wayne was to found Tamarind. Universal Limited Art Editions (ULAE) still operates as a studio today, producing limited editions of prints.

Grosman initially struggled to attract any high-profile artists, so instead looked towards the up-and-coming, or less-established artists of the period. In doing so, she persuaded

two young artists, Jasper Johns and Robert Rauschenberg, to work in her studio. Johns produced his lithographic edition *Target* at the studio in 1960, and two years later Rauschenberg produced seven lithographs in 1962: *License, Merger, Stunt Man I, Stunt Man II, Stunt Man III, Suburban*, and *Urban*. Rauschenberg has since produced 135 editions at ULAE, and Johns 120 editions.[xviii]

Johns and Rauschenberg's success paved the way for many more artists to use ULAE as Grosman began to build a high-profile client list off the back of her astute invitations to previous artists. Grosman's invitational policy was partly due to the size restriction of the studio, which was at that time located in her garage. Grosman also believed that the rapport between herself and the artist played a pivotal role in the success of printed work. This position meant that certain artists would be invited back to produce further works, but if she felt there had been "little or no rapport" with an artist during print production then the possibility of continuing with further collaborations was deemed to be "pointless" (Hansen et al. 1995: 72).

2.10.1 The Artist's Sanctuary

Grosman's fanaticism with both details and standards of the process was key to attracting so many artists. Her attention to the working environment was, in many cases, pivotal to the progression of a project. It was Grosman's empathy with her artists and their struggles to create their art that lead her to tailor the studio to the particular needs of each visiting artist. When working with the abstract painter Barnet Newman, Grosman ensured that all references to, or evidence of, other artists who had previously worked there would be removed so that the studio felt completely his own. This method encouraged Newman to work freely and without distraction, and to

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[xviii] A complete list of artists hosted and prints produced at ULAE can be seen found at: www.ulae.com

explore materials and process. An example is his *18 Cantos* produced at the studio during 1963-1964, Newman describes how lithography was not a process, but an instrument that needed to be mastered in order to play. Newman effusively thanked Grosman for her "devotion, encouragement and patience" in the production of *18 Cantos* and Master Printer Zigmunds Priede for his "sympathetic cooperation on the press" (Newman, 1992: 184). This tactic of Grosman's that allowed each artist to feel that the studio was solely for their use, was reflected in Newman's proposition that "Studio is Sanctuary" (Hansen et al. 1995: 74).

2.10.2 Signature

The style of the artist's work was always a principal concern of ULAE, and Grosman would go to extraordinary lengths to accommodate them, such as selecting the correct combinations of materials that she believed best suited a particular artist. However, the physical application of these materials during printing was not to be manipulated by her own hand. Grosman had no technical experience of the printmaking process this task was given to the studio's Master Printer, Bill Goldston. Grosman's talent lay in her sensitivity for the materials of printmaking, her intuitive relationship with the artist, and an insight into the craft of art making. By functioning as an intermediary between artist and Master Printer; transcribing the artist's intentions - Grosman was able to remove any possible technical persuasion that the printer may invoke. Maintaining this acute awareness with the production process meant Grosman's publications would be unique amongst other studios as there was no, or very little, house-style to be detected in the work. Grosman's collaborative strategy of firmly separating the distinct roles of artist and printer was central to ULAE's practice, and much in line with the Tamarind Institute's maxim regarding the printer detecting the true spirit of the work. Ironically

the antithesis of both ULAE and Tamarind's collaborative philosophies would come from one of the Tamarind Institutes graduates, the Master Printer, publisher and arts educator Kenneth E. Tyler.

2.11 Ken Tyler - Tyler Graphics Limited

Ken Tyler received a Ford Foundation Grant to study at the Tamarind Lithography Workshop in Los Angeles in 1963, where he worked under the Technical Director Irwin Hollander (and later under the French Master Printer Marcel Durassier, former Master Printer of Imprimerie Mourlot, Paris, who June Wayne had worked with on her inspirational trip to Paris in the 1950s). Tyler acquired a broad technical skills base through research and practice, and from 1964-5 was appointed Technical Director of the Workshop.

In 1965, an ambitious Tyler left to establish his own print studio; Gemini Ltd, in Los Angeles, and in 1966 Gemini Graphic Editions Ltd. (Gemini G.E.L.) producing prints and multiple editions. In 1973, after selling his collection of printer's proofs and drawings to the National Gallery of Australia, Tyler moved to New York and founded Tyler Workshop Ltd., which evolved into Tyler Graphics Ltd. in 1974, and was overseen by Tyler until he retired in 2000. Tyler Graphics ceased operations at this point, as Tyler spent two years assisting the founding of the Singapore Tyler Print Institute (http://www.stpi.com.sg/saw). From 1974 until his retirement in 2000, Tyler collaborated with numerous artists including: Josef Albers, Claes Oldenburg, Anthony Caro, Robert Motherwell, Richard Hamilton, David Hockney, Frank Stella and Roy Lichtenstein. During this time, Tyler would redefine both the artisan role and the studio ethos, extending what was possible in printmaking and what an artist could expect from a print studio. In an interview with Susie Hennessy in the *Art Journal* (1980) -

where Dine discussed his preference in recent years for working in etching rather than lithography - he added, in reference to the Tamarind ethos that Tyler had rebelled against:

> To work with great lithographers in America is to work with great prima donnas and pains-in-the-ass, and I don't like it. I don't like working with those Tamarind people – those overly trained, highly technical people. It's not necessary. They are all just too well-trained. Who the hell cares about that? It's never improved the image at all. If the artist isn't any good, what's the difference? (Hennessey, 1980: 169)[xix]

Tyler set no boundaries, insisting: "Here is a workshop, there are no rules, no restrictions, do what you want to do."[xx] Through innovative use of processes, mixed media possibilities and development of technology for individual projects, Tyler created an environment that excited artists, offering them endless possibilities in the production of fine art prints. Tyler became the epitome of June Wayne's initial vision for Tamarind and for America's contribution to the field of collaborative printmaking. Tyler's ascendance during this period, alongside a number of other studios in the USA including ULAE (New York), Landfall Press (Santa Fe), Crown Point Press (San Francisco) and Graphicstudio (Florida) benefited from the affluent art markets of the 1960's - 1980's. The work produced in these studios incorporated a range of artistic movements including, for example: Abstraction, Minimalism, Realism and Pop.

[xix] Despite these remarks Dine has continued his relationship with Tamarind Institute, collaborating with printers Bill Lagattuta, Brandon Gunn, Sharon Lee and Valpuri Kylmanen. As part of Tamarind's 50th Anniversary celebrations in August 2010, Dine produced "Double Dose of Color", two 38-colour lithographs printed on Arches (47 x 35 ¼ inches each panel) with master printer Bill Lagattuta. Dine was also awarded one of three 'Legacy in Lithography' Awards at Tamarind's 50th Anniversary party in September 2010.

[xx] In the documentary film *Reaching out – Ken Tyler, master printer,* directed by Lee Tirce and Sid Avery (Avery Tirce productions 1976), Tyler discusses his collaborations with artists Roy Lichtenstein, David Hockney and the writer Michael Crichton. A transcript of the film's audio can be read at: http://www.nga.gov.au/InternationalPrints/Tyler/Default.cfm?MnuID=8&vidmnu=1 [accessed 02/03/09]. See also Pat Gilmour's *Ken Tyler: Master Printer, and the American Print Renaissance*, 1986.

Although each of the studios would produce prints for various artists, the Master Printers would often become associated with particular styles or groups. This association was to some extent attributed to each Master Printer's own preference and influence on the production process.

In the case of Ken Tyler and Tyler Graphics, the studio was renowned for its highly-polished, industrial aesthetic, which at the time was very suited to the concerns of the Pop artists. Tyler's collaborations with Rauschenberg, for example on *Booster* 1967, and Lichtenstein for *Peace through chemistry 1970,* were astute publications that suited the aesthetic considerations of the artists and the production sensibilities of the studio. The house styles of Tyler's various workshops: Gemini Ltd and Gemini G.E.L. (Los Angeles) and Tyler Workshop and Tyler Graphics Ltd (Bedford and Mount Kisco) were important contributory factors for the premise of some his collaborations.

Tyler's association with house style and technical *tour de force* was not always the most prominent attraction for artists to his studio. For some artists such as Richard Hamilton, it was Tyler's early association with, and affinity for the lithographic process that attracted Hamilton to the studio. Hamilton worked with Tyler at Tyler Graphics in 1975 on the suite of four colour lithographs *Flower-piece B,* experimenting with two stones (as duotones) for each colour – cyan, magenta and yellow, and printing another layer of white.

Tyler referred to it as a ten-colour print, but for Hamilton, "it uses only three colours. It is a tripletone-trichromatic, plus white" (Lullin, 2003: 137). Prior to extending his technical repertoire, Tyler had learnt his trade as a Master Printer in lithography.

He often used a series of colour lithographic prints which he had helped produce for Josef Albers, *White line squares,* 1966 as "his calling card"[xxi] for enlisting prospective artists. Albers was the first major artist with whom Tyler collaborated and the success of the print enabled Tyler to establish his own studio. Hamilton was an advocate of enlisting printers or processes for any given project[xxii] and therefore selected printers for what he personally deemed to be their technical strengths rather than having ideas or processes imposed upon him.

Tyler's collaborative tactics were the opposite of Hamilton's; by examining the artist's work, Tyler would identify which artists would be best suited to a particular process. This could also include innovative or experimental productions that Tyler had in mind, where a range of processes may be combined, for example in Robert Rauschenberg's first print with Gemini G.E.L. *Booster,* from the series *Booster and 7 Studies,* 1967, using an experimental process of photo lithography and screenprint.

This particular mix of lithography and screenprint was to start a new trend for mixed media printing. "Tyler virtually redefined the possibilities of size and scale in contemporary print. Rauschenberg's *Booster* was publicised at the time as the largest hand-pulled lithograph ever made in America." (Gilmour, 1985: 48). In her essay *Robert Rauschenberg 1967–1978*, Jaklyn Babington - Curator of International Prints and Drawings at the National Gallery of Australia - discusses Rauschenberg's and Tyler's influence on experimental printmaking, from Rauschenberg's initial dismissal

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[xxi] Kinsman Jane, *The artists,* Kenneth Tyler Printmaking Collection (National Gallery of Australia) http://www.nga.gov.au/InternationalPrints/Tyler/Default.cfm?MnuID=6&Essay=TheArtists#_ednref2 [Accessed 16/03/09]

[xxii] See Richard Hamilton's *Endangered Species* (1990) reprinted in Coppel et al, 2004, p 273

of lithography as too old-fashioned, to his contribution to its popularity in the USA from the late 60s onwards:

> For *Booster*, Rauschenberg decided to use a life-sized x-ray portrait of himself combined with an astrological chart, magazine images of athletes, the image of a chair and the images of two power drills. Printer Kenneth Tyler was a masterful facilitator for Rauschenberg's ambitious project and the collaboration radically altered the aesthetic possibilities of planographic printmaking. Rauschenberg and Tyler pushed beyond what had previously been done by combining lithography and screenprinting in a new type of 'hybrid' print. The rules governing the size of lithographic printmaking were also ignored, and at the time of its creation *Booster* stood as the largest and most technically sophisticated print ever produced. Today, *Booster* remains one of the most significant prints of the twentieth century, a watershed that catapulted printmaking into a new era of experimentation.[xxiii]

Rauschenberg and Tyler's influence on the production of large-scale experimental prints forced studios to expand their facilities as other artist prints also began to increase in size. The largest of these was James Rosenquist's *Time Dust* 1992 - part of the *Welcome to the Water Planet* series, also printed by Tyler, who invited Rosenquist to Tyler Graphics Ltd at Mount Kisco, to explore printing and experimenting with paper pulp. This collaborative print activity had to be taken outside and produced in the studio's car park due to its immense combined scale, with each of the seven sheets measuring 217.8 x 152.4 cm. Tyler's innovative methods for the project - combining intaglio, stencil, relief, collage, embossing, paper pulp colour lithograph, screenprint, relief, etching, stamping and collage on seven sheets of coloured pressed paper pulp - also increased the studio's technical lure (g), offering creative possibilities that were only obtainable because of his foresight and ingenuity with the printmaking process.

Tyler's research and development of printmaking techniques was constant, and working with other high profile artists such as the painter and printmaker Frank Stella

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[xxiii] *Robert Rauschenberg 1967–1978*, Jaklyn Babington, Curator of International Prints and Drawings, National Gallery of Australia. http://nga.gov.au/Rauschenberg/ [Accessed 11/10/08]

resulted in Tyler investing in new and unorthodox printing machinery such as vacuum forming machines and hydraulic presses. As Pat Gilmour noted in *The Mechanised Image* "When necessary building presses, developing inks or custom making papers, Tyler documents his prints as 'collaboration between artist and staff'; he lives in a country that realises you do not get to the moon on your own." (Gilmour, 1978: 96).

3.0 Chapter Three: The Development of Fine Art Inkjet Printing and the Digital Print Studio

The aims of this research were generated through a need to work with artists to facilitate the production of high-quality, digitally generated or mediated fine art prints. During the formulation of these aims, digital image making was still relatively new within arts education and had only a peripheral inclusion alongside more established graphic mediums. Although the adoption of digital technology was increasing across established creative practices, there was little evidence to suggest how the technology had developed toward the specific concerns of a creative discipline. This chapter offers an overview of how digital technology has developed from a fine art printmaking perspective, focusing upon the emergence of the digital print studio.

3.1 A Background to Artists' Early Engagement with Digital Print

The beginnings of the digital age can be identified as far back as 1801 to Joseph Marie Jacquard's textile loom. The design and operation of Jacquard's loom was the precursor of much of today's digital image-processing systems such as repetitive production, automation and storage of information.[xxiv] Today, image-processing and data-storage tools are integrated across a whole host of different disciplines.

The tools and terminology are therefore cross-disciplinary, although the adoption of the technology becomes more 'user-concerned' within specific fields.

As part of this study, digital technology is described in relation to the physically printed artefact and within the fine art practice of printmaking. Digital technology's historical lineage will be predominantly considered from the desktop publishing era of

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[xxiv] See the chapter *A Brief History of an Idea: Fax Machines, Halftones, Video Cameras, and Computers* (Lipkin, 2005: 118)

the 1980s; a period when digital technology became more widely available to artists and printers alike. From the 1980's onwards, a sequence of technological 'milestones' regarding the qualitative concerns of the fine art print field will be highlighted. When combined, these seminal moments provided a level of acceptance within museum standards for prints, and provided artists and printers with the tools to produce high-resolution prints.

Artists making digitally-generated artworks - computer art - in the 60s including Frieder Nake, founder and chief researcher of the compArt[xxv] database at the University of Bremen, whose *Hommage à Paul Klee* (1965) was screenprinted from a computer-generated drawing, other artists Harold Cohen and Charles Csuri, produced work using mechanical computer plotters, on CRT displays (g) with light pens. These artists used computers to formulate mathematical equations that created curves, lines and dots, faster than the human mind could calculate - enhancing creative possibilities that would not ordinarily be possible with the artist's hand.

Probably one of the first noteworthy developments of 'computer art' within the field of fine art printmaking was Richard Hamilton's *Five Tyres Remoulded* (1971). Hamilton utilised the computer's processing speed to configure and map a complex series of points that would then be used to produce the *Five Tyres Remoulded* print.

[xxv] Frieder Nake is the founder and chief researcher of the compArt database at the University of Bremen. The collection focuses on early digital artworks created from a specialised period of 1950 to 1979, all of which can be viewed online at: http://dada.compart-bremen.de

3.2 Richard Hamilton's *Five Tyres Remoulded*

The computational process allowed Hamilton to resolve an earlier, hand-drawn

perspective work *Five Tyres Abandoned*. Hamilton had started work on a rigorous

perspective drawing of five car tyres and their treads in 1964, but it quickly became

apparent that this drawing method would be too time consuming, and possibly the end

result would not justify the effort. The work was printed in 1964 but was aptly entitled

Five Tyres Abandoned. In 1971, Hamilton realised the project could be revisited by the

aid of a computer using computer programming. Soon after, Hamilton sought a skilled

programmer who could assist him with this previously abandoned project. Hamilton's

search resulted in collaborating with a computer animation specialist, Sherill F. Martin

who was working in Silicone Valley, USA. With Martin's specifically-written CAD

programme to plot the remaining points of the tyre treads, Hamilton was able to realise

the final version of the print *Five Tyres Remoulded* with what he described as

"inhuman speed" (Coppel et al. 2004: 106). The ensuing years increased Hamilton's

fascination with the computer. In the 1980's IBM and Apple Macintosh developed and

produced the first home computers. This period, known as the 'desktop publishing' era

was to begin a technological proliferation of computing technology. A range of digital

products, previously only available to the commercial print industry became affordable

for the home user.

Since the 1970s Hamilton has worked with computer technology and printmaking,

adapting software to his own needs. In an essay on Hamilton in *Print Quarterly*

Richard Field stated that the computer is "a modern technology tailor-made for his

enterprise" (Field, 2005: 351). But it was his participation in the BBC series *Painting*

with Light that influenced his view of the computer as an artistic tool:

It was not until I was asked to participate in a series of programmes made in 1987 for the BBC that I saw the potential of using a computer to manipulate images. Six artists were invited to contribute to a series called *Painting with Light*. The 'Paintbox' computer, developed by the British company Quantel, was designed to be operated by an artist to draw and paint on a cathode ray tube as freely as with brush and pigment on paper. I owned and operated a Quantel Paintbox (1992–99) and a later model called Printbox. All the prints and paintings I made subsequently utilised, in a variety of ways, digital image processing equipment. (Hamilton, 2006: 7)

As with his previous *Five Tyres* project (where the computer was predominantly used for its speed and computational power), Hamilton utilised a skilled operator, Martin Holbrook, to help construct the digital file. This project allowed Hamilton to develop a virtual collage of source material, whilst seamlessly distorting scale and colour, to create a work for the programme: *The Apprentice Boy*. Although the work was not completed during filming of the series in 1987, Hamilton was fascinated by the technology and sought further assistance from Holbrook (over one week) to complete the file.

A year later, in 1988, to address his issues with ink stability, Hamilton identified a set of long-life colour inks which were suitable for editioning his ongoing series of prints on James Joyce's novel *Ulysses*. *The Heaventree of Stars* was the first of the series printed in inkjet, from Hamilton's photography, collage and drawing with Quantel™. Ian Cartwright printed the edition of 40 on Somerset paper (Hamilton, 1998: 35).

The advancement and democratisation of digital technology since the 1980s has increased artists' potential to produce digitally generated artwork. Although the software and computing equipment had become ubiquitous in the 1980s, the rendering of digital information as a high-resolution print would not have become accessible to

the public until the early 1990s. Similarly, the inception of the digital print studio would need to wait until the appropriation of the Iris printer as described in section 3.3.

3.3 Technological developments relevant to this research

The democratisation of digital technology from the desktop publishing era in the mid 1980s provided individuals with the opportunity to develop and experiment with consumer-orientated digital technologies. Many technological enthusiasts grasped the potential of digital imaging during this early period, and for artists, the potential of digital information as a high-quality print would propel the development of digital within the fine art printmaking field. When considering specific digital processes within the field of fine art printmaking, I have highlighted a series of technological developments relevant to this research.

3.3.1 (GUI) The Graphic User Interface

The Graphic User Interface helped facilitate the world of computing to a much larger audience. Previous visual, screen-based interaction with computers was through programming language and only accessible to a small audience of technically proficient individuals. The creation of the Graphic User Interface system essentially removed the programming language associated with computing and replaced it with a visually orientated and user-friendly screen interface. The WYSIWYG acronym: *What You See Is What You Get* (i.e. the user can see exactly how the information on screen will look when it is printed), provided a tangible marketing tool for computers' mass-audience appeal and paved the way for development with computer operating systems and software applications. The desktop publishing era in the early 1980s saw the first real industrial application for user-friendly interfaces, and the computer's

introduction to society in general. With an ever-increasing audience, accessibility and rapid technological developments, the computer attracted a range of creative disciplines and individuals. The Graphic User Interface played a vital role in attracting these largely visually literate communities to computers prior to the later development of digital print technologies.

3.3.2 The Iris Inkjet Printer

The Iris inkjet printer was produced and introduced in 1987 by IRIS Graphics in Massachusetts as the first high quality, continuous-tone, photographic, digital inkjet print device. The Iris printer was the device that sparked the initial interest from the emerging digital fine art print fields; bridging the gap between the digital image on screen and the digital file's high-resolution rendering as a printed image. The Iris printer could print digital images onto cotton-based papers making it appealing to both the printmaking and photographic disciplines. Prior to any fine art print interests, the Iris printer was originally developed and used as an industrial proofing machine in the commercial print industry. Because of its speed, by making amendments to a computer file that was linked to the Iris printer, proofs could be produced in quick succession, demonstrating to the client how the adjustments made compared to the previous printout.

By the end of the 1980s, and into the early 1990s, individuals such as David Adamson, Jon Cone, Graham Nash and Mac Holbert, who would go on to pioneer the development of digital fine art print (see section 3.5), began using the printer within a fine art print context. Nash Editions purchased their IRIS 3047 in 1989 from IRIS Graphics and used it until 2004. In 2005 Graham Nash donated the printer alongside

the first print created at Nash Editions, to the collection of the Smithsonian National

Museum of American History, where the museum's director stated that: "The IRIS

printer will stand as a symbol of change within the world of professional digital

photography."[xxvi] David Adamson of Adamson editions claimed that the:

> Iris printing process is essentially an accelerated version of lithography,
> requiring the same fluent communication between artist and printmaker that
> the traditional method demands. "One of the reasons artists like Chuck
> Close and Jim Dine are very comfortable working with me is because we're
> speaking on the same terms, they don't have to talk to me about color
> balancing, or magenta shifts. We're using printmaking vocabulary. The
> drawing matrix of lithography has been replaced by the matrix of the pixel.
> The printmaker or the artist pushes the pixels around. (Offman, 2004: 1).

For Mac Holbert, co-founder of Nash Editions:

> The IRIS was a standout compared to anything else available at the time.
> It excelled at resolution, color fidelity and, perhaps most exciting to us, its
> ability to print on various substrates…. The standard papers that the IRIS
> printed on were appropriate for proofing purposes, but left a lot to be
> desired for fine-art photography output. We wanted to try thick, watercolor
> paper. From the factory, the IRIS 3047 would not easily accept the heavier
> papers. We were so sure of the printer's capabilities that we voided the
> warranty on our $126,000 IRIS by hacksawing off the nozzles (I can still
> feel the adrenaline!) and repositioning them so that the printer would accept
> thicker substrates. (Holbert, 2004: 1).

From this experimental fine art perspective (and despite the $126,000 cost),

developments with new software and hardware adjustments were made by those

studios that could afford it, to meet the changing needs of the fine art printer.

These refinements in printmaking technology created a benchmark for artists to

begin producing Iris prints and the 'digital fine art print studio' was established.

[xxvi] *National Museum of American History Adds Nash Editions Digital Photography Equipment, Prints to Collections*. NMAH Press Release August 12, 2005:
http://americanhistory.si.edu/news/pressrelease.cfm?key=29&newskey=268

3.3.3 Colour Management - Adobe Photoshop 5™

In conversation with Craig Offman, David Adamson remarked that when using software to calibrate colour for fine art digital print: "The ability to match the colour in a print is probably the single greatest advance in [digital] printing."[xxvii]

Although the development of digital technology created a democratic platform for users, the development of hardware and software systems by different companies presented issues of digital compatibility. In 1993, the creation of a cross-platform format was standardised by the ICC (International Color Consortium) in the colour imaging technology sector. A group of 50 companies (including Adobe, Agfa, Apple, Kodak, Microsoft, Silicon Graphics, Sun Microsystems and Taligent) created a colour management method for transferring colour information through different software systems that would aid the accurate rendition of colour through a printing device. The application of this breakthrough was integrated into the most commercially-used graphic software package Adobe Photoshop™ in 1995.

3.3.4 Archival Standards

In 1992, Mac Holbert of Nash Editions compiled a Mission Statement, and a list of five concerns that the emerging field of fine art inkjet printing faced from his initial dealings with museums, galleries, and the general public:

1. *Resistance from competing, older technologies.*
2. *High cost of the tools and steep learning curve.*
3. *Ease of reproduction.*
4. *Permanence and associated issues.*
5. *Aesthetic resistance and technophobia.*
(Holbert, 2006:31)

[xxvii] Adamson David, in Offman, Craig. *The New Remasters: Artland.com's James Danziger and David Adamson aim to give high-end reprographics mass appeal.* Online article Wired Digital, Inc. / The Condé Nast Publications Inc.: http://www.wired.com/wired/archive/8.11/danziger_pr.html [accessed 14/03/09]

In the list, Holbert identifies '*Permanence and associated issues*,' where prints are fugitive and lack the longevity of traditionally printed photographs. Although these issues have been resolved and are no longer a problem today, Nash Editions founded their studio upon the development of the Iris printer that used dye-based inks. These inks produced vivid colours but initially lacked the permanence stability of museum archival standards. The development of improved stability with the dye-based ink by Jeff Ball, head of Lyson in the UK, and Michael Andreottola of American Inkjet in the USA, between 1991 and 2000, saw the longevity increase from 4 to 70 years (Holbert, 2006: 130). By 2000, the majority of longevity issues had been solved after the Iris prints reached 75 years, surpassing the previously set standards of 60 years for the Fuji Crystal Archive print.

The introduction of pigment-based inks in 1997 by Hewlett Packard for the DesignJet 2500 and 3500 inkjet printers vastly increased the longevity of inkjet prints up to 200 years, through accelerated lightfast testing as described by Wilhelm Imaging Research Inc. in *Permanence in the Evolution of Digital Fine Art Photography from 1991 to 2006.* Despite their increased longevity, these early, pigment-based inks had image quality and appearance issues – for example, a reduced colour gamut and bronzing (g) effects on certain papers. In 2002, Epson introduced the 9600 printer with its Epson UltraChrome pigmented-ink set and began to address some of these concerns; and, by 2006 Epson, Hewlett Packard and Canon had all converted to pigment-based inks for both the amateur and professional photography fine art market. By the end of 2004, Nash Editions had abandoned the Iris printer and converted their digital output to the new Epson printers.

3.3.5 The Epson 9000 Wide format inkjet printer

Epson was one of the first inkjet print manufacturers to develop and target specifically the fine art print market, and has since dominated most of this relatively small portion of the digital print industry through perceived quality advantages and good marketing.[xxviii] The production of their first archival inkjet system was launched in 2000 as part of a series of variable width printers with a 44-inch printer, the Stylus Pro 9500 having the largest width. In 2002, Epson further developed the 44 inch wide format printer that had been gaining the attention of advocates of the Iris printer including Master Printers: David Adamson (Atelier Adamson), R. Mac Holbert (Nash Editions Inc.) and Randy Green (Muse [X] editions). In the UK, Ian Cartwright and others used a range of Epson, Mimaki and Roland printers at this point.

Up until this point, the production of fine art digital prints had been limited to those individuals who could afford an Iris printer. In Bret Lortie's essay *Sounds like Mexican Chewing Gum... Giclée: The Short History of Inkjet Digital Printmaking,* he argues:

> According to R. Mac Holbert at Nash Editions, Inc., Epson has greater vision and commitment to the technology than Iris Graphics at the moment. Although the ink sets for the 9000 currently cannot stand up to Iris inks, initial test results look promising and studios will appreciate the Epson's self-cleaning feature and more efficient printing time. With conviction, Holbert states "If the 9000 is not the Iris killer, the next incarnation will be."[xxix]

The 'next incarnation' the Epson 9600, introduced in 2002, had an archival ink set and high-resolution output, but more significantly, it cost a tenth of the price of the Iris.

[xxviii] For example, see a review of the Epson Stylus Pro 7900, by Rick LePage, Printerville, March 28, 2010. http://www.printerville.net/2010/03/28/review-stylus-pro-7900/

[xxix] *Sounds like Mexican Chewing Gum… Giclée: The Short History of Inkjet Digital Printmaking*, essay: http://www.worldprintmakers.com/english/giclee.htm [Accessed 12/10/09]. For more information on Nash Editions' current digital editioning practice see: www.nasheditions.com

More recently the latest high-end wide format, inkjet printers have become available at a cost of around £4000; a substantial decrease considering that the equivalent inkjet device in 1990 would have cost about £80,000. Coupled with the fact that owning and operating a computer (the matrix device) is very much a common practice today, this removes many of the previous reasons for accessing the specialist equipment of a traditional print studio. However, despite the drop in cost of the ownership of large-format output devices, these printers can still be considered as a luxury item for the 'home studio'. With the development of the previously discussed user-friendly interfaces, sophisticated imaging software, high-resolution printing, affordability of equipment and museum approved archival standards; digital inkjet printing has rapidly assumed a level of acceptance within fine art print practices over the last 10 years.

Contrary to these achievements, the technology has also re-invigorated previous debates concerning originality and authenticity in the fine art print. For example, the technology has digitised the print matrix: by increasing the speed, amount and ease with which the digital matrix and its printed image can be reproduced it has become harder to keep track of the original and reproductions. The technology can be used to create positives for mechanical print processes, and can also accurately simulate the appearance of a range of different processes such as screenprint and photography. This has added to confusion with the distinction between one print process and another. These technological developments have brought into question previous traditional print standards associated with the 'cancellation of print matrixes' - the cancellation of the matrix by an artist or printer of the plate or screen that holds the image from which prints are made - would limit the size of a printed edition and the process distinction of a printed edition.

3.4 The Unique Qualities of Digital Print

Computation, speed, simulation, transfer, (ease of) reproduction

When we think of 'digital' as a process within art practice, associations with pixel manipulation, flatness, screen-based imagery, computation, speed, reproduction and simulation are brought to the fore. Digital technology has been borne out of the electronic age, and as part of its heritage the medium reflects its "transitory nature and its inherent non-object status"[xxx] when compared with traditional printmaking and mechanical art mediums. This removal of the physical was what initially hindered digital technology's acceptance within the printmaking and applied arts fields. Digital technology is a highly mutable and transferable medium that has infiltrated all areas of creative practice. The potential to produce physical artefacts from digital files using a range of output devices is growing. To give a brief example: George Whale and Naren Barfield in *Digital Printmaking* describe a list of "output technologies used in printmaking" (Whale & Barfield, 2001: 20 -21) that includes: engraving, cutting, milling and transfer methods, to name few - alongside the various inkjet and laser printing technologies, that are still the most accessible output devices to date.

3.5 The Role of the Master Printer in the Digital Age: Digital Print Pioneers

Within the field of fine art printmaking, the impact of the digital era brought into question further specialist associations with the production of fine art digital prints and the role of the Master Printer. The two following digital print pioneers came from different backgrounds; Graham Nash and Mac Holbert approached digital print from a photographic perspective, and Jon Cone quickly realised the potential of using both

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[xxx] Squier, Joseph. Goggin, Nan. Chmelewski, Kathleen. 1994. *The Machine Mediated Image*, New Perspectives: Art & Design in the Digital Age, Co-authored Conference Paper, CW:94, the online component of the *Tenth Annual Computers and Writing Conference*: http://theplace.walkerart.org/soapbox/digital_age/paper2.html [Accessed 18/01/10]

digital and traditional print. Given the rapid development with which the technology advances, Master Printers in the digital era need to keep up with a constant revision of skills and knowledge.

3.5.1 Graham Nash and Mac Holbert

Outside of the commercial print industry, the Iris printer's high resolution and colour range was quickly noticed by the American photographer and musician Graham Nash. In *Nash Editions: Fine Art Printing on the Digital Frontier*[xxxi] Garrett White describes the appropriation of the Iris printer by Graham Nash and Mac Holbert towards the production of the world's first portfolio series of all-digitally printed, photographic, fine art prints in 1990. The development of the digital inkjet print process began after Nash had become interested in the idea of getting his digitally scanned film negatives out of the computer. The possibility of producing large, high-resolution prints of Nash's digital images proved somewhat difficult during the 1980s as there were very limited options for producing high-quality prints at that time. Undeterred, both Nash and Holbert continued their search until Nash was given a sales brochure for the Iris printer. After inspecting the device the pair knew instantly that the print quality was what they had been looking for, and with a few software and hardware modifications, the Iris 3047 printer became the final part of their digital, fine art print workflow. Nash and Holbert were probably in a minority of artist printers who could afford to void a warranty on a brand new printer worth over 100,000 dollars. Holbert sawed off the previously mentioned print heads - and this radical approach could be one of the contributory factors to their success – to print Nash's final photographic images on

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[xxxi] White, Garrett. *Nash Editions: Fine Art Printing on the Digital Frontier*. Digital Journalist: http://digitaljournalist.org/issue0105/nash_intro.htm [Accessed 14/03/09]

thick Arches watercolour paper before sending the prints on a successful tour of Japan that launched at Parco Gallery, Tokyo in 1989.[xxxii]

The commandeering of the Iris printer by Nash and Holbert, the specific fine art print adjustments to the pre-press printing device, and the successful touring exhibition helped to pave the way for the specialist photographic digital printing studio. The official public opening of Nash Editions on July 1st 1991, and its further development of digital-imaging techniques, began to define the premise of a digital print studio. The following year Mac Holbert wrote *The Nash Editions Mission Statement*: "To provide digital services and digital prints to the fine-art community with an emphasis on photography. Our focus will be art whose original expression will be digital, as opposed to reproductions of existing artwork." (White, 2006: 11).

3.5.2 Jon Cone

Around the same time Nash and Holbert had been working towards the first all-digitally printed, photographic, fine art print portfolio, the printmaker Jon Cone was setting up his own digital print studio in East Topsham, Vermont, that would be dedicated to digital printmaking: The Cone Editions Press. Unlike Nash's introduction to digital print through photography, Cone had realised in the early 1980s, that the technology had potential as a tool for mixed-media and traditional printmaking.[xxxiii] Cone was experimenting with the output of digital files to negative and positive films, and then their reintroduction into traditional print techniques. Cone claims that his hybrid approach to printmaking made Cone Editions the world's first digital

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[xxxii] In 1989, Tokyo's Parco Gallery invited Nash to exhibit 35 photographs (34 × 46 inch prints), which subsequently toured to 19 other galleries in Japan. White, Garrett. *Nash Editions: Fine Art Printing on the Digital Frontier* http://digitaljournalist.org/issue0105/nash_intro.htm [Accessed 14/03/09]
[xxxiii] Jon Cone's website includes a biography of his related activities as an artist printmaker, developer of technology and educator http://www.piezography.com/PiezoPress/mystory/ [Accessed 17/01/10]

printmaking studio in 1990.[xxxiv] It established him as one of the first digital print pioneers alongside Nash and Holbert.

In 1990, Cone Editions acquired its first IRIS printer and began combining the new inkjet technology with screenprint. In 1991 Cone published *East Topsham Series* with Melissa Meyers, a series of 30 unique IRIS prints with additions in screenprint.
In 1996, Cone collaborated with Japanese printmakers Yoshi Segoshi and Yasumasa Morimura to produce the *Sharaku-Ga Suite* - a woodblock, zinc plate and IRIS inkjet combination print for example.

These multi-faceted printmaking approaches with Cone's understanding of software and ink technology created a platform from which Cone would become an advisor to many ink and printer manufacturers, and an educator as well as a printer. Cone also trains many staff for other US digital print studios including: David Adamson, Muse [X] Editions, Mike Hunter, Donald Saff's *SaffTech* and Robert Rauschenberg's *Untitled Press*. Cone has been compared to June Wayne of Tamarind Institute, by Margaret Miller, Director of the University of South Florida Contemporary Art Museum "because he's done so much with the training and adapting of this new medium for printmaking".[xxxv]

[xxxiv] Ibid.
[xxxv] See Margaret Miller at: http://www.cone-editions.com/ourhistory.html [Accessed 03/02/08]

3.6 The Digital Atelier

The use of the digital print facility term 'atelier' instead of 'studio' has been adopted by a number of fine art digital print facilities for its historical significance within the field of printmaking. For example *Pharos Editions* in Australia, explain their use of the term as:

> The concept of collaboration and craft, where artist and printmaker work together to produce the finest possible outcome, has been a feature of traditional printmaking for centuries, but has largely been lost in today's high technology environment. The French word for 'studio' is 'atelier', but in printmaking circles 'atelier' has come to mean a high quality custom art studio, as used by the great European and Japanese artists of the past.[xxxvi]

The phenomenon of the 'digital atelier' as a high-quality custom art studio is considered within this research as any digital print facility that embraces traditional practices and benchmarks associated with the 'atelier' term. Post Cone and Nash Editions, the development over the past fifteen years of 'digital ateliers' has led to a scattering of studios across the globe, including, for example: *Pharos Editions* in Australia, *Atelier Bordas* in France, *Factum Arte* in Spain, Brad Faine's *Coriander* and Ian Cartwright's *Print Room* in the UK, and Jack Duganne's *Duganne Ateliers* in the USA. The artists who work at these digital ateliers to access the specialist facilities, vary between established and emerging artists, in keeping with the 20th Century traditional print ateliers.

In the same manner as Cone Editions and Nash Editions, many of the ateliers' digital Master Printers have developed their technological skills from a variety of backgrounds and perspectives, (see 3.7 Atelier examples), although the majority either have a photography or printmaking specialism. Although these ateliers are primarily

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[xxxvi] As described by Pharos Editions in their explanation of their own practice of *The "Atelier" Approach*: http://www.pharoseditions.com.au/print_making.html

associated with fine art inkjet-print production, it is not uncommon for digital ateliers to integrate traditional print processes with inkjet-prints such as Brad Faine who combines inkjet with screenprint, or Franck Bordas who works with inkjet and lithography.

As well as the different backgrounds and methods of their printers, ateliers may also vary in the breadth of facilities available to an artist. Ateliers may also have a preference for particular print hardware devices, due to affiliation with or sponsorship from print manufacturers such as Epson or Hewlett Packard. The sponsorship of a print facility by a printer manufacturer requires that the print facility provide feedback on the performance of the manufacturer's printers before they are released on to the market - for example the CFPR's affiliation with Hewlett Packard. The print facility in receipt of such sponsorship is usually referred to as a 'beta test site' (g) such as CFPR has been for Hewlett-Packard and as Brad Faine's *Coriander* is for Epson.

Facilities and types of workshop

One of the main differences between digital ateliers is the production possibilities that are at the artist's disposal and the subsequent capabilities of image creation that can evolve in one studio. Here the division of digital ateliers ranges between Turner's *Contract Workshops* and the *Contract Editioning Houses* (see section 2.5 The Collaborative Print Studio process)**.** Best practice contemporary ateliers constantly extend the parameters of the digital fine art print, by embracing new digital technologies and their potential for rendering digital information as printed artefacts.

Below are some examples of how the digital print Contract Workshops and Contract Editioning Houses, differ with some examples of best practice that an artist might access at either of the two atelier systems.

The Digital Contract Editioning House:

- The printer generally receives digital files in a finished state - any adjustments to the image file or outputting of the file will be applied during the print proofing of the work.

- The printer will have a good understanding of the qualitative attributes of different inkjet printers. The printer will therefore be mindful of how an image may lend itself to a particular inkjet printer and paper combination.

- The printer mostly works within the parameters of the technology and knows how to get the best out of each inkjet device.

The Digital Contract Workshop:

- The workshop has the facilities to cater for each stage of the digital image-making process. This self-sufficiency is often referred to as 'in-house production' removing any external influence upon the image-making process. Within digital image production, the in-house processing and transfer of digital information is referred to as 'a closed loop system'. This allows the studio to isolate any problems during the generation of a digital print, or make specific refinements to the work at any stage of the image-making process.

- The facilities can also cater for hybrid print productions, utilising traditional print methods or a mixture of digital rendering processes. This may also include

altering existing technologies and materials to create new and bespoke printed artworks.

- The studio may also take a broader view of digital technology and how it can be integrated within printmaking practice. For example, exploring possibilities with 3D printing technologies, smart materials and programming.

- The influx of digital technologies within the print studio may include studio facilitators with a range of specialist backgrounds. For example, some print or photographic projects may require engineers or colour scientists to be involved.

3.7 Examples of Digital Ateliers

The following section describes a range of primary digital ateliers including examples of work undertaken and technical expertise.

3.7.1 Adam Lowe - *Factum Arte*

Location: Madrid, Spain; London UK and San Francisco, USA

Type: Contract Workshop

www.factum-arte.com

Factum Arte is mentioned here as a model of technological and digital best practice. Adam Lowe came from a background as an artist (painting and printmaking) before founding the London-based print studio *Permaprint*, specialising in pigment-based printing for artists, museums and galleries. Factum Arte was later founded in 2004 by Manuel Franquelo and Adam Lowe and is based in Madrid, London and San Francisco.

The atelier works with international contemporary artists such as Louise Bourgeois, Anish Kapooor and Marc Quinn, to produce physical, printed editions that utilise and push the boundaries of emerging technologies in the fine art field; technologies such as three-dimensional printed artefacts, 3D Capture, wide format digital flat bed printing, casting, 3D cement printing, and rapid prototyping. The term 'print' is used in its broadest sense when considering the editioned works produced at Factum Arte. Factum Arte also works on large-scale, experimental projects, for example Grayson Perry's *The Walthamstow Tapestry*, 2009, which was woven from digital files on a Jacquard loom.

As with *Nash Editions*, Factum Arte is a pioneering atelier that has been instrumental in developing and customising technology to suit the needs of the atelier's artists and Master Printers. Examples include: "the development of a flatbed scanning system to record colour used on Veronese's *Wedding at Cana*, a flat bed digital printer that can repeatedly overprint in perfect registration, a 3D printer that prints in cement from STL (Stereo Lithography) files and the development of a system to record fragile manuscripts and books when they are open at an angle of 90 degrees or less (used in the Biblioteca Nacional (Madrid) to record *El Beato Primero*)." [xxxvii] Lowe has stated that Factum Arte "was formed in response to an increasing demand from artists, institutions, conservation projects and museums, for a new type of mediator that transforms ideas into physical realities". Lowe goes on to state that:

> Basically, we mediate information. Some of that information is digital; some of it is to do with technology, and a lot of it is to do with physical, practical work processes. So we are actually trying to bring together the technology and the craft skills to result in very high-quality museum-based works.

[xxxvii] Factum Arte have detailed information of some of their technological achievements online, which can be viewed at: http://www.factum-arte.com/eng/tech_printing.asp [Accessed 23/10/09]

We don't aim to reinvent the wheel. We look at all the existing technologies that are out there, and we specify the bits that we want for our projects and then work with a number of specialist companies, and specialist individuals, who help us to actually tailor those computers, scanners, cameras, flat bed scanners, materials, casting materials, resins and everything else, for the requirements that we specifically have. This is done for a number of purposes. One is to often bypass the normal commercial constraints that make new technology very expensive, and the other is to actually give us the specific goods we want for the jobs at hand.[xxxviii]

3.7.2 David Adamson - *Adamson Editions*

Location: Washington, USA

Type: Contract Workshop

http://adamsongallery.jimdo.com/limited-editions

http://adamsongallery.jimdo.com/adamson_editions_atelier.php

In an interview with Harald Johnson - author of *Mastering Digital Printing* (2004), David Adamson stated: "I think my background in traditional techniques is extremely important. I speak the same language as the artists, and they relate to this. They trust my eye and my ideas. I think it is all about skill and comfort levels."[xxxix]

The following biographical background on David Adamson has been extracted from a published online conversation between Adamson and Harald Johnson.[xl]

Adamson went to art school at the Slade School of Fine Art, London before working as a stone lithography printer at Petersburg Press, London. During this period Adamson attended The Tamarind Institute of Lithography in New Mexico, which was his first introduction to the USA.

[xxxviii] Adam Lowe discussing Factum Arte's production methods at the Desert Valley Project's *The Tomb of Seti I* Conference, 17/07/02, Hunterian Institute, London. Adam Lowe, Director of Factum Arte "The methods used to achieve the conservation copies" http://www.mallarch.abel.co.uk/pps-lowe.html [accessed 13/08/08]

[xxxix] David Adamson interviewed by Harald Johnson for DP&I Featured Printmaker, *10 February 2004.* Online publication, http://www.dpandi.com/adamson/index.html [Accessed 11/02/09]

[xl] Ibid.

Adamson later returned to the USA in 1978 and set up a traditional printmaking workshop in Richmond, Virginia and later began teaching printmaking at the Corcoran School of Art in Washington DC. In the early 1980s Adamson became intrigued by the introduction of home computers, in particular the introduction of the Apple Mac in 1984. As a self-confessed "technically-orientated person"[xli], it did not take Adamson long to begin learning the programming side of computers whilst become increasingly interested in their processing possibilities for photographic imaging.

Despite the rapid developments in software at that time, there was still a need for an output device that could render high-quality, digital photographic images. With some further investigation Adamson came across the Iris printer, and after a few more years of research, Adamson purchased his first printer in 1993 and transferred Adamson Editions from a lithographic to digital print studio. Adamson's accreditation as a leading figure in the production of digital fine art prints can also be linked to his involvement with Iris reproductions, "Iris printing has become the Cadillac of digital reproduction" and in an interview with Craig Offman for *Wired*, he is referred to as "a whizz at making Iris reproductions."[xlii]

Adamson describes the process of digital print as being "75% automated colour management methods with the other 25% left to experience and interpretation". The intuitive part (the 25%) of the workflow is in the colour balancing, which Adamson describes as the place where "…there is still some judgement involved."[xliii]

[xli] Ibid.

[xlii] Offman, Craig. *The New Remasters: Artland.com's James Danziger and David Adamson aim to give high-end reprographics mass appeal.* Wired Digital Inc. / The Condé Nast Publications Inc. Published at: http://www.wired.com/wired/archive/8.11/danziger_pr.html [Accessed 15/11/08]

Here Adamson utilises his experience of Iris printing by selectively bringing out crucial nuances that can get lost in the translation from the 'digital matrix' (g) to the printed image. Echoing the previous statement by Richard Hamilton that "the best printer craftsmen polished their genius on the mundane tasks of translating between media." (Coppel, et al., 2004: 273). The atelier has worked with numerous artists including: Chuck Close, Jim Dine, Robert Rauschenberg, William Wegman, Adam Fuss, Annie Leibovitz, Victor Schrager, Jenny Holzer, Roni Horn, Robert Longo and Kiki Smith.[xliv]

Atelier Adamson specialises in digital inkjet printing using a variety of different inkjet printers, with five studio facilitators in total. The studio also provides high-resolution, digital recording devices offering artists a complete digital workflow.

Atelier Adamson is one of the few digital studios to publish publicly details of their facilities, which are included here as an example of the type of standard equipment used: *Capture* - Scitex Creo EverSmart Supreme scanner; Phase One FX 4X5 view camera (Schneider lenses). *Processing* - Mac and PC; Ergosoft PosterPrint RIP; Dell server (for archive files). *Rendering* - Epson 9880 and 11880; Canon and HP (models not specified); 2 x Iris 3047s; Mimaki JV4-160 (60 inch); IXIAs (varied inksets).

3.7.3 Franck Bordas - *Studio Franck Bordas*

Location: Paris, France

Type: Contract Workshop

[xliii] Ibid.

[xliv] For a full list of artists, see Adamson Atelier list: http://adamsongallery.jimdo.com/adamson_editions_atelier.php

www.atelierbordas.com

Studio Franck Bordas in Paris, is very much a traditional print studio, established in 1978, that specialises in processes such as lithography. The atelier also has a digital facility that was developed in response to the rise in the number of artists working with digital technologies. The studio believes that the introduction of digital has prompted renewed interest in contemporary fine art printing. In keeping with printmaking's tradition of mixing print processes, Bordas highlights the possibilities of combining digital and lithographic print at the atelier, boasting its graphic potential and identifying it as one of their techniques. This type of printmaking has come to be referred to as "tradigital" where traditional and digital techniques are combined to produce fine art prints.[xlv]

3.7.4 Dr Brian Gilkes - *Pharos Editions*

Location: Melbourne, Australia

Type: Contract Workshop

www.pharoseditions.com.au/about_us.html

Dr Brian Gilkes, founder and Master Printmaker of Pharos Editions (2004) in Australia utilises many of the traditional printmaking approaches for producing museum and conservation standard fine art digital prints, artists' books and folios. Gilkes believes that the traditional atelier system has been somewhat lost during printmaking's assimilation of digital technology. Furthermore, the access of digital print through the

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[xlv] The term 'Tradigital' has been used since the early 1990s, particularly with the digital art collective "Unique Editions", comprising: Helen Golden, Bonny Lhotka, Dorothy Krause and Judith Moncrieff, to describe this hybrid printmaking form, see Karen Whitehouse's "Making Connections," *IEEE Computer Graphics and Applications*, Vol. 16, No. 3, May 1996, pp 4-5. The UK printmaker Aine Scannell discusses *Tradigital Printmaking* with the use of inkjet print in combination with traditional techniques, on her website: http://hybriddigitaltraditionalprints.blogspot.com

laboratory service has limited many of the previous possibilities associated with the

atelier system; none more so than the intimate collaboration. Gilkes' vision for Pharos

Editions is to rekindle many of the previous methods associated with best practice and

innovation in fine art digital print. Pharos works with artists such as Tommaso

Durante, Silvina Glattauer, Andrea Innocent, Rik Lee, Michela Cardamone and Tim

Griffith. In his Mission Statement, Gilkes explains his view of digital collaborations

between artist and Master Printer as:

> This form of printmaking is often very intense and very rewarding.
> Initially, it is the artist that speaks, introducing the work, but as the printing
> progresses it is the images themselves that suggest what they need to
> optimise their story. Making the final edits that control local luminosity,
> acuity, contrast and colour is much more an art than a science.
> Ultimately, the challenge is to make the print come alive, to appear as
> if it could step into the room.[xlvi]

3.7.5 Brad Faine - *Coriander Studio*

Location: London, UK

Type: Contract Workshop

http://www.corianderstudio.com

Brad Faine studied fine art painting before starting to produce, commission and publish

prints by artists in 1975, and then founded Coriander Studio, in Greenford London, in

1976 to specialise in limited edition screenprints. Coriander now specialises in inkjet

and screen print, and Faine will often proof an image digitally before making screens

to produce a screenprint. A full list of artists that Coriander has worked with is on the

Coriander Studio website (www.corianderstudio.com). In relation to editioning digital

fine art prints, Faine states that:

[xlvi] Brian Gikes Master Printmaker of Pharos Editions statement at:
http://www.pharoseditions.com.au/print_making.html [Accessed 10/03/05]

> We see the computer and digital printer as a most exciting generative tool in its own right. Coriander only publishes the work of artists who take a fundamental interest and involvement in making their digital prints and for whom the print will ultimately be a finished artwork in its own right.[xlvii]

Artists work in the studio alongside the Master Printers. The emphasis is on small limited editions between 25-500. Once the edition has been printed "the digital artwork is destroyed. This safeguards the exclusive nature of the prints."[xlviii]

The adoption of digital print at Coriander

Brad Faine kindly agreed to meet with me for an interview at Coriander for this research study (13 November 2010), during which he described how, in early 1992, Coriander began work on a portfolio of prints for the publisher Charles Booth-Clibbon of the *Paragon Press*. The *London Group Portfolio*[xlix] was produced in an edition of 65 and included works by eleven London- based artists who were gaining national and international status at the time, often referred to as the YBAs - Young British Artists; such as Angus Fairhurst, Marc Quinn, Damien Hirst, Gavin Turk and Rachel Whiteread. Although the Portfolio was predominantly screenprints, a number of the artists were supplying their images as digital files that could be separated and rendered onto film for the screenprinting process.

It was at this time that Faine began to realise that there was a revolution coming as more artists including Tracey Emin, Sam Taylor Wood and Estelle Thompson arrived at his studio with imagery on Zip disks. In some cases the artists knew more about the technology than the studio staff, prompting Faine to invest more time into learning

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[xlvii] http://www.corianderstudio.com/page3.htm [Accessed 03/11/09]
[xlviii] Ibid.
[xlix] See *London Group Portfolio, Contemporary British Art in Print*. Published by the Trustees of the National Galleries of Scotland in association with The Paragon Press 1995

how to develop the digital print side of the facility. Although his studio was interested in the Iris printer in the late 1980s, it proved too expensive to begin using at that time. Coriander's early inroads into digital printing coincided with artists' adoption of digitally-formatted imagery in the early 90's. Faine also attributes Coriander's interest in the process as a means to produce continuous-tone prints. Faine recalls a conversation with Martin Johns of Epson in the mid 90s about the limitations of conventional half-tone printing patterns, and the strategies that Coriander had developed to become the first studio to produce what might be termed as 'continuous-tone screenprinting'. These initial conversations, together with Martin Johns' interest in the possibility of artists using Epson technology, subsequently led to Coriander being sponsored by Epson. This relationship enabled the studio to install the latest Epson printers without incurring any of the costs that had previously hindered the studio's interest in using digital print technology.

It was not until 2000 that Coriander began editioning inkjet prints alongside their existing screenprinting work for artists. In conjunction with producing prints in both processes, Coriander soon began to combine inkjet with screenprint. Faine described the consequences of this, after considering that inkjet is "a very disappointing medium, as it has no surface quality - unlike a screenprint". The combination of the two processes, through screenprinted glazes, and later, embossing, enhanced the surface potential of the inkjet, and more recently, manufacturers responded to this issue by including gloss cartridges as part of the ink-set.

Coriander has built a strong reputation for producing both screenprint and inkjet editions for a number of high-profile artists. This reputation has seen many artists such as Peter Blake and Storm Thorgerson return to the studio to access the facilities and

printing knowledge of Coriander's staff. One example of a sustained relationship since the introduction of digital printing at the Coriander Studio has been with the British artist Damien Hirst.

More recently Hirst's increased activity in limited edition fine art prints has led the artist to establish his own covert print studio next door to the Coriander Studio. The strategic location of Hirst's print facility allows the artist to continue employing the Coriander studio staff whilst increasing the print production possibilities of their facilities. Hirst's ambitious projects require equally grand printing devices both in terms of scale and cost. The most recent acquisition was a £250,000, 3.2 metre wide 'VUTEk UV-curable' inkjet printer that has been used to produce a number of large-scale works on canvas.

Above left: Vutek QS3200r Printer, Damien Hirst Print Studio, Greenford London, 2010
Above right: 12060 TPS Screenprinting System, Damien Hirst Print Studio, Greenford London, 2010

Diamond Skull Proof, printer on Vutek QS3200r, Damien Hirst Print Studio, Greenford London, 2010

Digital atelier summary

The diversity of fine art digital print production is evident throughout the different ateliers, incorporating photography, printmaking and reproduction as areas of specialist expertise. The majority of the digital ateliers have adopted the traditional Master Printer approach. Each of the studios has produced a substantial portfolio of high quality, fine art prints for artists, but little is known about the tactics the ateliers adopt with the artist. This is also true of the understanding of the ateliers specific methods for producing these works of art, and how these are measurable against traditional fine-art print practices. This can partly be due to the field of fine art, digital print production's infancy and the dissemination of the atelier portfolio and production methods.

3.8   Alternative Digital Print Facilities

As well as the established collaborative print studios discussed, there are other options available to artists which offer a degree of input from, and control of the output by the artist, from bureau services where the collaborative model is limited, or print on demand (POD) where files can be uploaded for print, to the educational facility where an artist can access facilities and expertise in exchange for part of their printed edition.

3.8.1 Bureau

The proliferation of digital technology and access to equipment has also seen the development and extension of many print bureaux into the field of fine art digital print production. By operating and using technology and media once considered exclusive to the digital atelier, the bureau has provided a further resource for accessing 'digital fine art output'.

Although there is nothing new about high-profile artists using unrecognised fine art facilities to publish their prints, such as Mark Titchner's *You hear a joke about yourself and join in the laughter,* 2004, (published by Book Works London, produced by the graphics display and exhibitions print company Omni Colour), artists are more constrained when working within the pre-set industrial standards of a high turnover bureau orientated practice, when compared to the freedom of experimentation and level of expertise offered by a specialist digital atelier.

3.8.2 POD: Print on Demand

The print on demand facility allows an artist to have their prints produced remotely. Using the online facility, an individual would upload a digital image file to a server

from which the image can be stored and downloaded. After downloading, the image

can then be digitally printed on to range of different media and at varying print

dimensions. For print on demand, DP&I - an online information resource for

photographers, digital and traditional artists and printmakers, using digital printing and

imaging - has a comprehensive directory of digital fine art printmaking studios, print

bureaux and print on demand facilities see the *print service providers directory*

(www.dpandi.com).

Although digital print technology may differ between POD facilities, there tends to be

an option for 'Giclée' or 'fine art' prints[l] that utilise the same archival print technology

as a collaborative digital fine art print facility. The server facility for print on demand

can hold a digital file indefinitely, offering the customer the potential to produce an

open edition that can be printed intermittently, hence print-on-demand. Similarly the

storage of digital images and production of archival digital fine art prints for POD

purposes has been utilised by artists and publishers selling prints online. Websites

including POD gallery (www.podgallery.com) and Artlexis (www.artlexis.com) for

example, produce both open, and limited edition prints by artists, where a single

artist's image may be purchased at varying scales and printed on different substrates.

The Fine Art Trade Guild offers the following standards for Giclée and print on

demand:

> Giclée prints are made using digital printing technology, usually inkjet.
> The technology enables users to produce small runs of prints. It also allows
> retailers to offer 'print on demand' services, where buyers select an image and
> it is printed out there and then. Digital print technology can be used by artists
> to create original prints, Giclées are not always reproductions.[li]

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[l] See: http://www.postersize-it.com/custom_art_printing.html

[li] http://www.fineart.co.uk/Public/Print_Info_Advice.aspx [Accessed 04/03/09]

It should be noted that the term Giclée is not popular amongst fine art print practitioners, who feel that the term disguises or gives pretension to the term inkjet, and is used more amongst editioning studios to add value to large editions of prints. The origin of the term is claimed by Jack Duganne of Duganne Ateliers[lii] and formerly of *Nash Editions,* where he first used it in 1991 to add value for collectors – in much the same way that 'serigraph' is used to describe 'screenprint'). It is however dismissed by Henry Wilhelm, of Wilhelm Imaging Research in his essay for Nash Editions - *Nash Editions: Photography and the Art of Digital Printing*: "It [Giclée] has been pointedly avoided by Nash Editions and other digital print providers catering to high-end artists and photographers – and is also shunned by most photographers." (White, 2006: 120)

3.8.3 University/Institute facility

The Royal College and Royal Academy use their print studio facilities to produce prints by invited guest artists, student graduates and faculty staff - all of which are sold to raise financial support for the students of the Royal College of Art, Printmaking Department. Professor Chris Orr, in his 2008 address at the exhibition: *New Prints from the Royal College of Art Selected by Chris Orr RA* (12 December 2008 - 17 March 2009) stated that:

> It has always been the belief at the Royal College that the ideas, techniques and skills to make successful prints are collaborative. The artist comes to the print studio (not always an expert in printmaking) to realise ideas through the medium with craftsmen. The results can be spectacular, as this publication demonstrates. My own phrase for this is "the realisation of poetry through mechanics".[liii]

[lii] As stated by Jack Duganne on his atelier's home page: www.duganne.com

[liii] On the occasion of the exhibition: New Prints from the Royal College of Art Selected by Chris Orr RA, 12 December 2008—17 March 2009, In the Sir Hugh Casson Room for Friends of the Royal Academy, London. http://www.royalacademy.org.uk/exhibitions/hugh-casson-room-for-friends/new-prints-from-the-royal-college-of-art,234,RAL.html [Accessed 11/01/09]

4.0   Chapter Four: Testing the Notion of the Collaborative Print Studio

The case study research has been undertaken as a means to establish and disseminate practice-led methods for facilitating the production of fine art prints for artists. The absence of published evidence of collaborative digital print production between artist and printer was a significant reason for initiating this research and therefore forms a core component towards the contribution of this PhD thesis. The contribution is formed out of the collaborative endeavour that generates digital print parameters towards the development of a documentation procedure. The resulting document then forms a blueprint that can reproduce accurately the approved printed proof with the possibility of completing the edition at a later date.

The practicalities of developing facilitation methods for a variety of artists and their differing concerns with the production process meant that empirical approaches were formulated to show an evolving process. The empirical method is in keeping with the exploratory nature of each case study and as such, presents individual narratives that inform the printer's procedures and facilitation tactics for a range of practitioners. The empirical method of the case studies includes written and printed evidence (the exhibition of prints supporting the thesis) that collectively contribute to the realisation of documenting the process of creating a digitally printed artwork in a way that would be otherwise impossible.

4.1 *The Perpetual Portfolio* Case Studies

As part of the CFPR's AHRC grant award for *The Methodologies for the integration of fine art practice and wide format digital printing,* an artist-residency programme was

created as a means to begin investigating artists' practice with wide format inkjet printing. The residency programme was titled *The Perpetual Portfolio*.

The selection panel for the first phase consisted of Professor Steve Hoskins, Director of CFPR and myself, in the role of the assigned Master Printer working with the artists. The criteria for selecting the initial group of artists for the residency project were based upon the need for the research to explore, document and assess a broad range of practices and working methods that could potentially be served by inkjet printing. The group selected for the first phase of the project included printmakers, sculptors, photographers and illustrators in an attempt to explore a variety of practices and scrutinise a diversity of knowledge applicable to digital print technology. The majority of artists selected for the second phase of the project in the Case study residencies, were practitioners in disciplines such as printmaking and photography. The artists brought a range of sensibilities and methods common to these disciplines, and with little in-depth experience of the digital process - with the exception of Jack Youngblood - the residency artists predominantly engaged with the technology from an 'outside' perspective.

The artists were selected to address four categories of method that would explore different stages of image production prior to seeking the assistance of a printer. These were: an artist using a single digital image and then printing; an artist using multiple image recording for a montage and print approach; the solely computer-generated image and print approach, and the hybrid print approach.

During the first phase of *The Perpetual Portfolio* project it became necessary to document each artist's working process and supply data for the research project in

order to manage the production process. This included, software types, methods of image creation, and crucially, which versions of software and hardware images were created in. Twenty-two artists were selected for first stage of the project, from in house, and through external calls online, and in journals such *Printmaking Today*. Each artist produced a printed edition with a maximum image size of 88.9 x 118.8 cm (for the paper that was provided for the portfolio).

Procedure and Production

As previously stated, the specific procedures and production methods for generating fine art digital prints are still relatively overlooked within current available literature in the field. The dissemination of traditional print productions by Master Printers has helped to articulate artists' and printers' concerns for those print processes, and demonstrate the variety of collaborative methods that facilitate the production of traditional print. However, there is little dissemination regarding these concerns in relation to digital print collaboration. *The Perpetual Portfolio* was to be used as a testing-ground to develop the technical insights gained through the development of the CFPR digital print bureau and the facilitation issues raised during the *International Digital Miniature Print Portfolio* project. The initial identification of both production and facilitation processes as pre-established areas of interest contributed towards the two aims for the case studies.

Aims of the case studies

- To highlight different facilitation strategies for specific projects and the needs of the artist.

- To demonstrate collaborative practices that are specific to the use of inkjet printing within the field of fine art printmaking.

The recording of these aims were considered under the two areas of participant involvement, and a step-by step production guide:

Participant involvement

Traditional engraving workshop practices, concerning the relationship between each production stage and the delineation of participant involvement is a good example of the inter-relationship that exists between process and participants. The production of a digital print shares similar stages of production to that of traditional print, such as capture, manipulation and rendering. The participant conversations and production methods highlight the concerns of, and strategies for digital technology as part of the field of fine art printmaking. Discussion at each stage of production is also necessary when reflecting upon the workings of collaborative relationships.

Step-by-step production guide

Instructions about how the print was created provide evidence of the collaborative process whilst formulating a quantitative procedure to assist the collaborative process further within the field of digital printmaking. The artist's decision-making process derived from the proofing procedure describes the artist's qualitative concerns with the printed image and the varying strategies that complement the holistic facilitation process.

Rationale for the order of the Perpetual Portfolio case studies

The order of the case studies runs from the date the first artist arrived at the CFPR.
The linear order of the case studies emphasises the empirical and incremental nature of
the research and the subsequent development of the facilitation strategies as the project
progressed.

The case studies have been written in a sequential format so that the image generation
and decision making process can be seen within the context of the project and studio
activity. Each case study introduces the artist's project before any studio activity,
followed by the adopted facilitation strategy and then a summary of the collaborative
undertaking.

4.2 Siobán Piercy – *Mollusc*
Traditional and Digital Printmaking 'Tradigital'

Siobán Piercy, *Mollusc*, 2004

Siobán Piercy's residency proposal was selected as a project that would illustrate the integration of digital print with traditional printmaking processes and methods commonly known as Tradigital Printmaking (see Studio Franck Bordas, p114). Piercy wished to utilise the scale of wide format print (having only used desktop size printers previously) as a means of combining digital techniques with her preferred way of working on a large scale with traditional print processes. Piercy's project proposal referred to her prints as having 'a particular character of their own' when combining screenprinting with the inkjet process. This method had been previously discussed at the CFPR but there had been little opportunity to explore the process in any great detail. Therefore Piercy's use of the process in her residency submission would offer the time to explore the combination whilst creating an exemplar artefact of the process.

Above left to right from the *Shroud* series 2000-03:
Siobán Piercy, *Self Reflection (Shroud IX),* 2000, screenprint, 77 x 40 cm
Siobán Piercy, *Shroud V – This one for you,* 2004, screenprint, 77 x 40 cm
Siobán Piercy, *Shroud VI,* 2004, screenprint, 77 x 40 cm
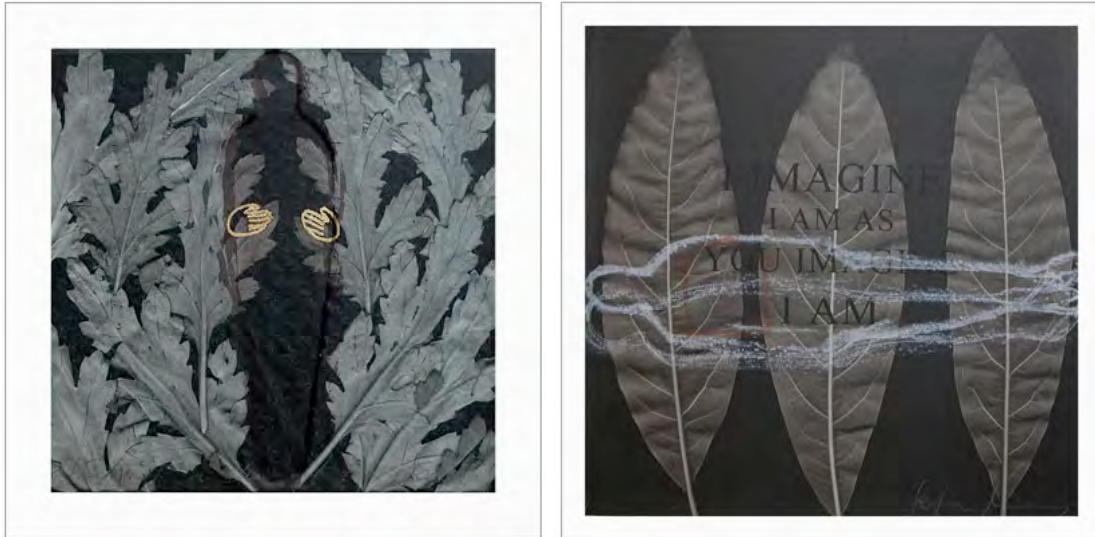
Above left to right from the *Shroud* series 2000-03:

Siobán Piercy, *Study of a Shroud (for Eve),* Inkjet, screenprint, embossing, gold leaf, 2003, 18 x 18cm

Siobán Piercy, *I reflect you,* 2004, inkjet print, 33 x 33cm

Siobán Piercy - source material

Piercy's proposal for the residency highlighted the opportunity for her to produce large-scale digital prints as a means to bring together elements of screenprint and digital print. Piercy's screenprinted work was often produced on a relatively large scale (*The Island without,* 2000-03, 77cm x 77cm) but her digital print works were confined to the size of her desktop printer. By making new work similar to the *Shroud* series 2000-03, bringing together scanned imagery from Piercy's previously printed inkjet prints; Piercy saw the scale potential of the wide format printer as a means to revisit the work rather than just increasing its size. Piercy believed the scale would dramatically change the impact of the piece and create a sense of presence because the space and scale of the image relate more directly to the actual size of the human figure. When discussing the other elements that would come together to make up the final work, it became evident that a large percentage of the production process was going to be based in screenprint. Piercy intended to screenprint layers of glaze over the inkjet

surface, which was a relatively new discovery in her work. This required a certain amount of experimentation due to the changes of paper, inks and image scale on the residency. The screenprinted components for the image were to be treated separately - split into three sections: coatings, text and drawn marks.

The previously scanned imagery was composed within a single file and digitally printed to be used as a base layer for the proceeding screenprinted layers.

Glaze tests on inkjet   Drawn stencil marks   Text colour tests on inkjet

The needs of the artist and the project

Other than the inkjet printed background layer and the digital rendering of text to be made in to a screenprint stencil, the focus of the studio activity revolved around the mixing of various consistencies of inks and glazes that best complemented and enhanced the inkjet-printed background layer. This was achieved by supplying Piercy with a large number of inkjet printed sections of the base image to use as test prints. Each screenprinted mix was documented on the back of each proof and left to dry for a day before reflecting on the success or failure of the inkjet and screenprint combination. This method continued for each screenprinted section until Piercy

selected the most successful combination prior to outputting the full-scale digital file for editioning the final work.

Piercy had mentioned in her proposal that she hoped to improve her knowledge of the digital process, although the project and its production requirements did not necessarily require any particular digital intervention. Instead, an alternative all-digital mark making strategy was discussed as an alternative method to the hand drawn marks that had been created for the screenprint stencils. Although the digitally simulated marks in the computer were not to be used in the work during the residency (due to time restrictions) Piercy made a series of notes about the process with the intention of employing them in future works.

Observations towards forming the collaborative strategy

Before arriving for the residency, Piercy had created a digital file that was to be used for the inkjet printed layer, allowing additional time to be dedicated to the screenprinted components of the work. The project followed the plan that Piercy had envisaged prior to starting the residency. My role was to make sure the plan ran smoothly by following the order that the printed layers had been constructed in. This included considerations of how the digital print element could best serve the screenprinted element of the work, for example paper weight considerations, producing test strips for screenprinted coating proofs, scanning hand-drawn marks at good reproduction quality, and creating digital texts to be made into stencils for screenprinting.

Some considerations for artists and printers from this project

The project required a range of non-digital materials, tools, facilities and methods.

As an example of Tradigital (g) art practice focusing on the qualitative integration

considerations of digital output with traditional methods, the project highlighted digital

print's cross-disciplinary potential, as well as the need for a digital Master Printer to

have a wide facilitation range and be able to step outside of the technology's

parameters. The Master Printer also needs to ensure that the structure the artist sets out

for the project is followed, yet also needs to be aware of and offer alternatives.

For example: methods demonstrated for producing digitally drawn marks using

Photoshop™ brushes and eraser tools.

The historical development of fine art digital print encapsulated the disciplines of

photography and printmaking - combining photography's potential for high-resolution

photographic output with printmaking's affinity for substrate and surface options.

In digital print technology, many of the tools used by the printmaker and photographer

have converged, narrowing the specialisation between previously separate disciplines.

Although the two fields share the same technology, the production concerns and

sensibilities of the photographer or printmaker are often present in the digitally-

mediated print, such as Siobán Piercy's *Mollusc*, and the Tradigital method.

The photography and printmaking persuasions are also reflected in studios' facilities,

although the digitisation of previous tools and processes are utilised by both

disciplines.

The development of this cross-disciplinary nature is broadening the definition of the

digital print studio. The development of 3D printing, rapid prototyping and laser

cutting technologies is expanding the rendering potential of digital information as printed artefacts; including programmers and colour scientists within the print facilitator role. The contributions and influences from this digital convergence within the field of fine art digital printmaking raises further questions concerning the qualities required in the role of the Master Printer in the digital age.

4.3 Jack Youngblood, *Spate*

Advancing Process

Jack Youngblood, *Spate*, 2003

During the review of residency submissions, Youngblood was highlighted as an artist who would advance our own knowledge and methods for generating digital images that were evident in the virtuoso qualities of his submitted work. Youngblood's practice was originally based in painting before developing over a number of years towards digital processes. Because of this incremental development, and his experience with digital technology, Youngblood's practice had now become based in digital technology whilst referring outwardly to other disciplines such as painting and photography. Youngblood was the only resident who we can refer to as a 'digital artist' and his residency would allow further insight of how artists were working with digital technology and what their concerns with the actual printing process might be.

Jack Youngblood - source material

Youngblood arrived with a CD containing a digital file that he had constructed over a number of months prior to starting the digital residency programme. The digital image created by Youngblood depicted a full torso self-portrait of Youngblood as an astronaut, entitled the *Exhausted Spaceman*. Youngblood's digital file had been developed using a mixture of sophisticated 'composite methods' and digital manipulation techniques. For the purpose of this particular research study, the second print collaboration with Youngblood, *Spate* is included here, which was also produced during the residency printing, after discussions with the artist about the logistics of printing this particular piece.

The initial discussions for the printing of the *Spate* image took place during the production of *The Exhausted Spaceman*. Having made relatively swift progress with the printing of *The Exhausted Spaceman* there were a few days of the residency

remaining for us to try proofing the *Spate* image. Prior to our work on the *Spate*

project, Youngblood had described his disappointment with the lack of tonal depth in

the darkest areas of the image in his previous attempts to print the digital file. This, I

believed, was partly due to using a cotton-based paper, although Youngblood was

insistent that this was the paper that was to be used for this image. The specific printed

realisation for the *Spate* image had been put on hold until the technology either

improved or a solution was found.

Youngblood's original image for *Spate* was based on a traditional oil painting by Jacob

van Ruisdael from c.1660, housed in the collection of Bristol City Museum and Art

Gallery.[liv] The elements that contribute to the composition of Youngblood's image are

comparable. The clouds are replaced by a black, star-filled sky, generated in

Photoshop™ with the aid of some celestial charts. The house in van Ruisdael's

painting has become the space module (downloaded from the Internet), which has been

integrated with a range of land details from photos of actual moon missions, in

particular Apollo 16.

The surrounding cliff profile was kept as close as possible to the original painting's

view, with the river and trees transformed into rock formations. Each of these

landscape elements was created in Bryce, a three-dimensional landscaping and

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[liv] Youngblood's fictional rendition of landscape in *Spate*, is shown here in comparison to 'the original' of van Ruisdael, yet in a coincidental find, Dr Susan Steer for the National Inventory Research Project (NIRP) based at the University of Glasgow, questions the authenticity of the original view of *A River in Spate*, painted by van Ruisdael in the inventory as follows: It is unknown whether this rocky landscape with a rapidly flowing river was based on a place that Jacob van Ruisdael visited. In the past it was assumed that Ruisdael must have travelled north to see such scenery, but no such trip is recorded. It has therefore been suggested that views such as this one may have been inspired by the drawings of the Amsterdam landscape painter Allart van Everdingen, who visited Scandinavia in 1644 and made studies of mountainous landscapes with torrents and waterfalls. http://www.nicepaintings.org/works/84316 [Accessed 11/12/10: 13.30]

animation programme. The software and its capabilities were best equipped to deal with the metamorphosis from one form to the other.

As with *The Exhausted Spaceman,* Youngblood had created a hugely complex image comprising of a mixture of imported files and generated components made within and outside the programme (see following selection of screen grabs from the process).
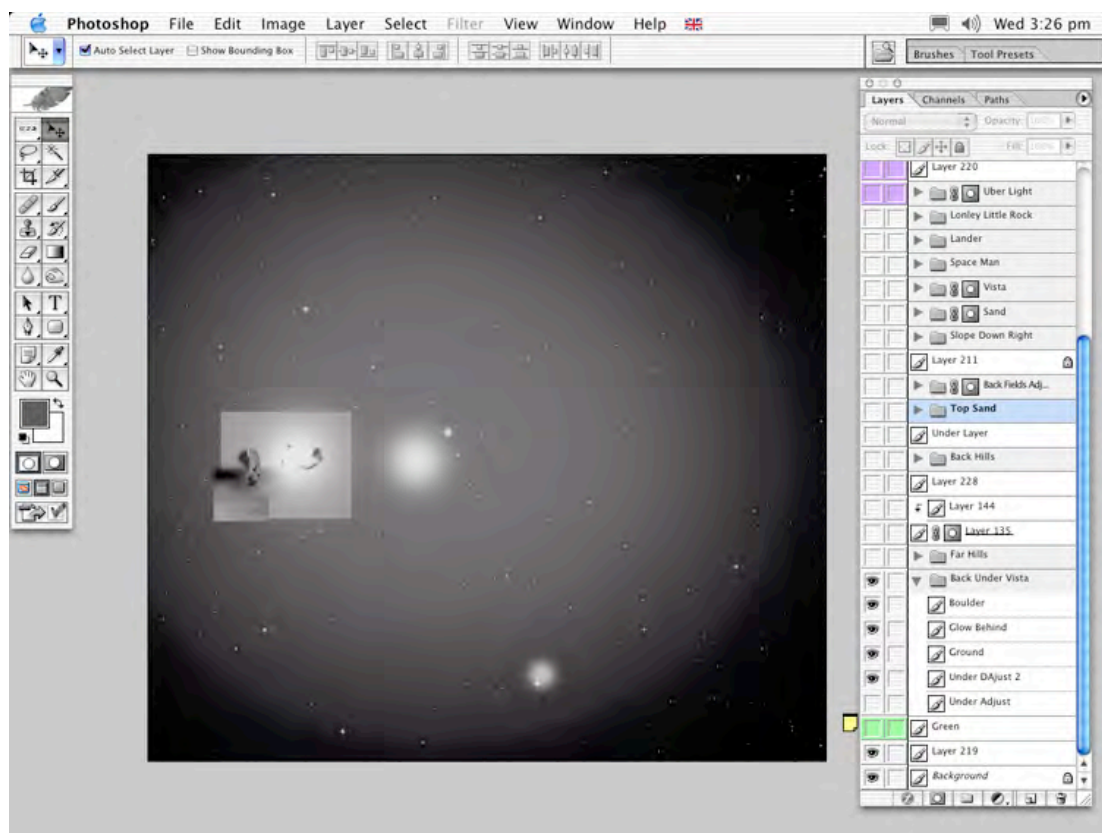
One of the 50 screen grabs from the process for Jack Youngblood's *Spate*, 2003
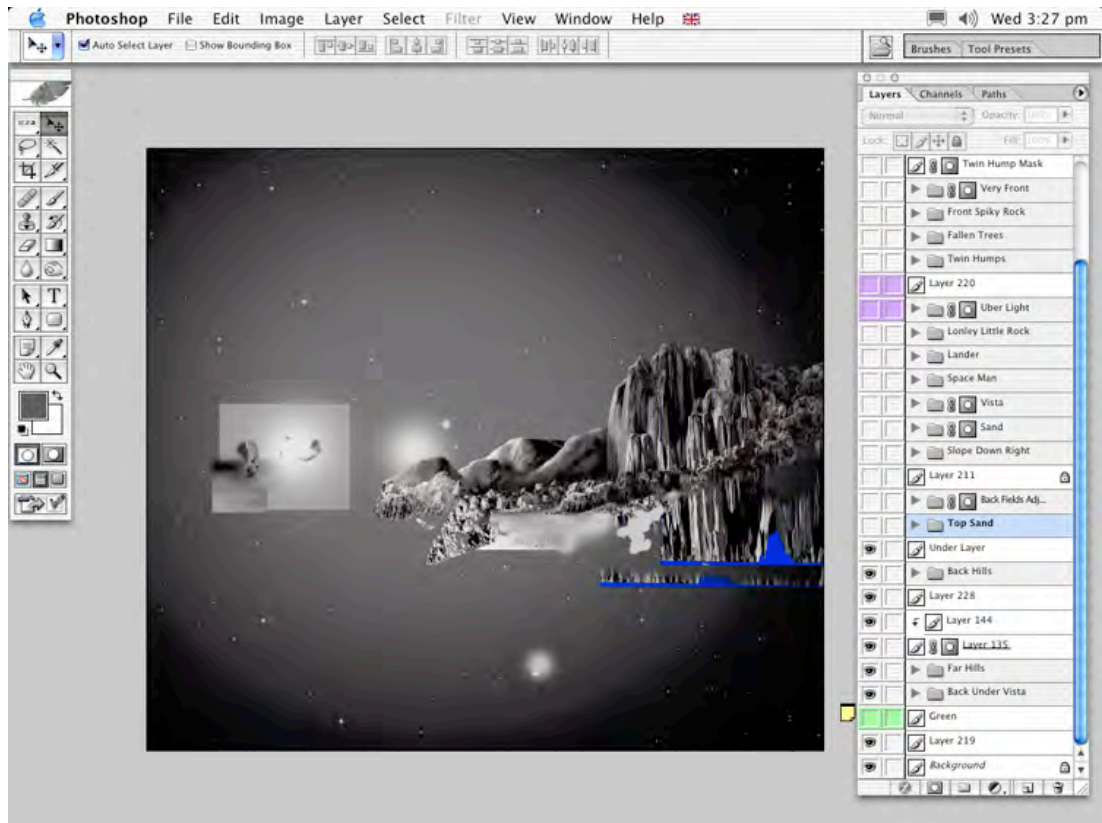
One of the 50 screen grabs from the process for Jack Youngblood's *Spate*, 2003
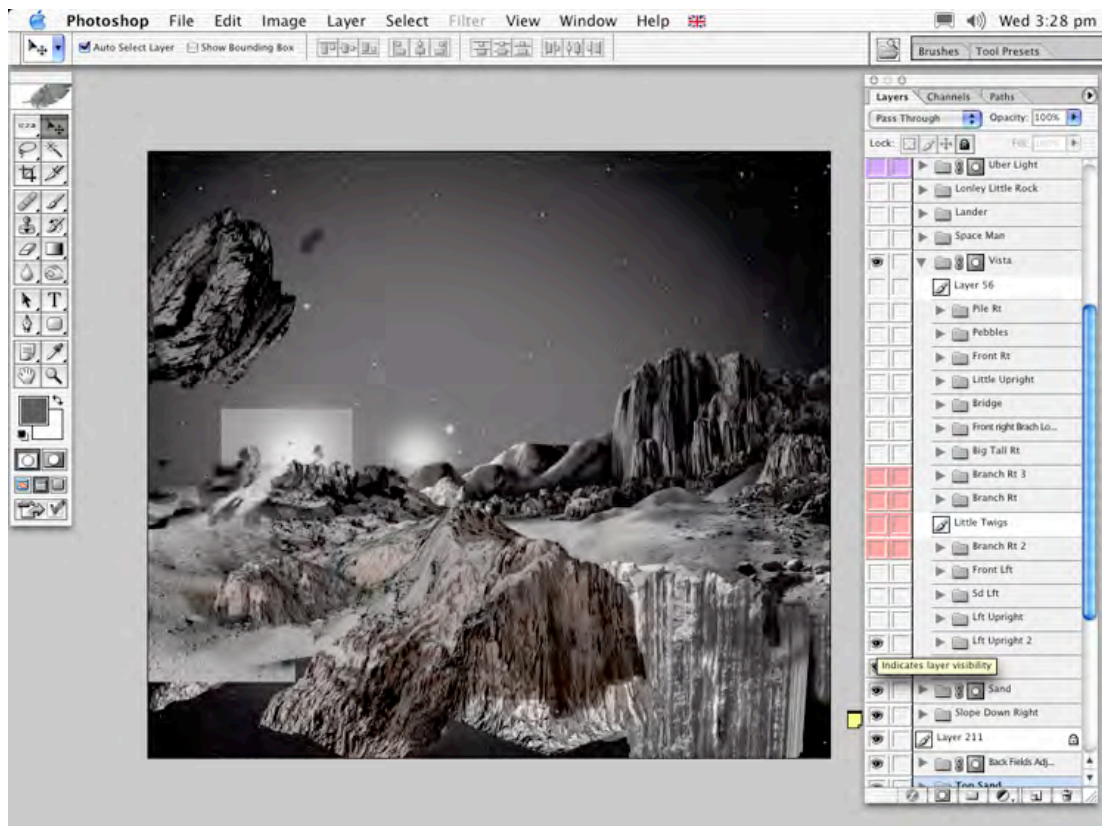
One of the 50 screen grabs from the process for Jack Youngblood's *Spate*, 2003
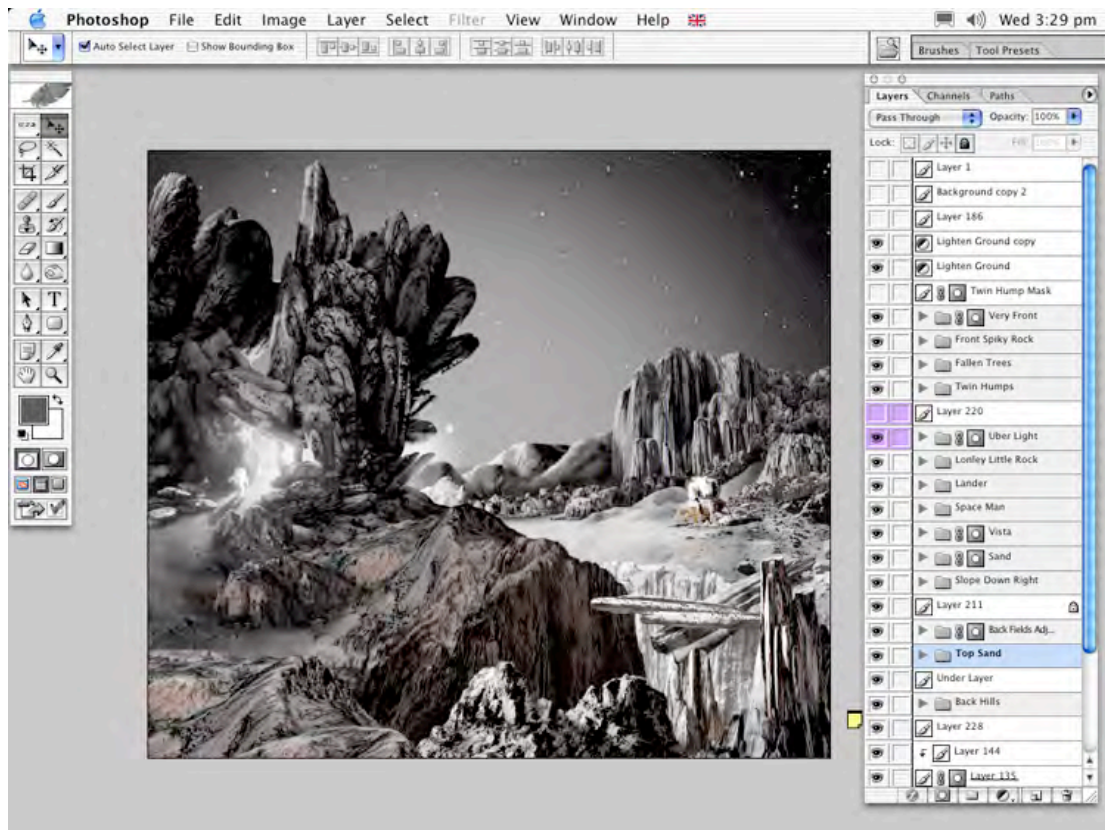
One of the 50 screen grabs from the process for Jack Youngblood's *Spate*, 2003

Prior to Youngblood's residency, the CFPR had been experimenting with the possibility of multi-pass printing on a wide format inkjet printer. This required mechanically adapting the printer's industrially designed function as a single pass printing device. The adaptation meant that the printer would be able to layer a succession of individually printed colours on top of one another, creating colours that could not ordinarily be achieved through the single pass process. The initial CFPR experiments concerned layering areas of flat colour on top of one another using a pin registration system (as used with traditional printmaking) that allowed for the specific placement of colour within the space of the paper. Although the multi-pass printing method had not been used for photographic imagery up until this point, I believed that the printing method would lend itself to solving the issues and concerns that Youngblood had with rendering his digital file for *Spate* as a printed artwork.

The needs of the artist and the project

The hybrid multi-pass method that was used for the *Spate* image added a further dimension to Youngblood's usual digital proofing strategy. The *Spate* print was created by separately printing two images with one image printed on top of the other. This method is similar to traditional printmaking techniques such as screenprint or lithography, where the separate layers do not work in isolation. The success of this process in digital print depends on the tonal and colour alterations made in Photoshop™- proofing through printing, and then subjectively assessing the quality of the work.

The final decision can only be made through the printing of both layers and the physical relationship that these layers have with one another. Proofing through looking at the image on a monitor does not offer enough information to make the final decision. The proofing of one image printed in this way was time consuming and required some ability to predict what one particular adjustment would produce once the second layer had been added.

Production of *Spate*, 2003

For the first proof, the same image was printed twice in order to obtain the strongest and deepest black. The light source from the central area of the picture in the first proof had completely disappeared, and the overall appearance produced a highly concentrated image where the blacks were too harsh compared to the lighter areas, and the mid-tones were lost.
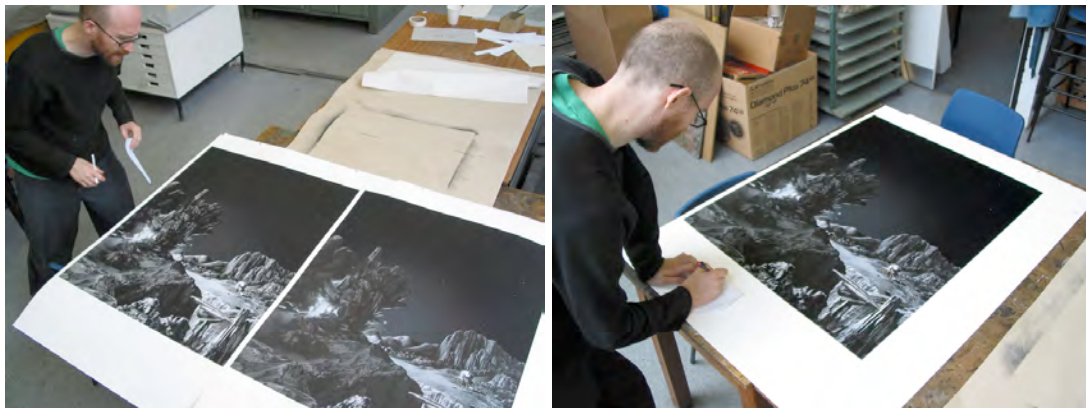
Above left: Production of *Spate*, printing in two separate layers, 2003
Above right: Production of *Spate*, 2003, the printed layers combined as a proof

For the second proof, corrections were only made to the first pass, to give a sense of how much adjustment would be needed once the second pass was printed on top. The tonal ranges were initially problematic when transcribed from the screen for the double pass method. To gain a new perspective of the second proof, the image was printed as two layers (see image above left), this gave a clearer insight into how the actual printed layers appeared before being combined as a proof (see image above right).
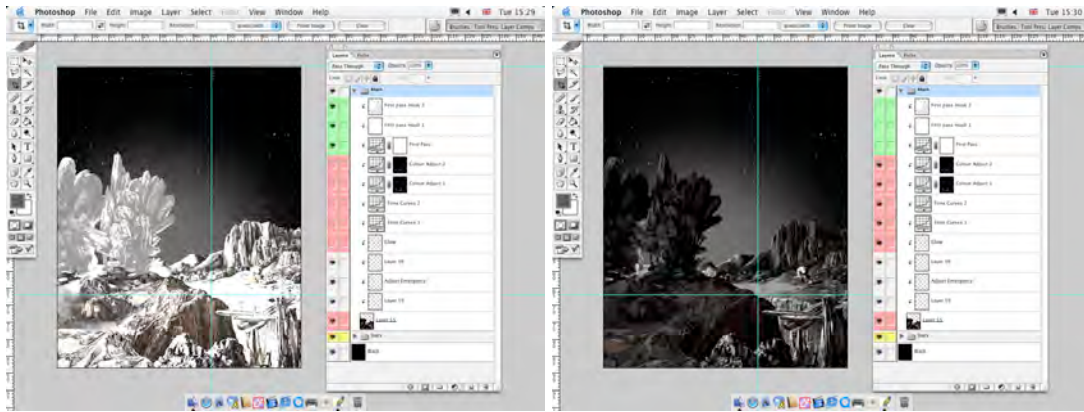
Corrections in Photoshop™ for *Spate*, 2003

The correction methods for the image were isolated through alterations within Photoshop™ (see above). The core alterations were based around applying adjustment curves that could be edited to enable subtle tonal gradations from the mid-tone areas. This would gradually build up the mid to dark tones without losing any important details. The method was repeated, and as Youngblood became more adept with the double print process, the adjustments became less problematic. The final part of the process produced adjustments in both layers before the final proof was printed. The level of adjustment between each layer which was needed to produce the *Spate* image can be seen in the 'Corrections in Photoshop™ for *Spate*, 2003' images.

Observations towards forming the collaborative strategy

Throughout the residency Youngblood worked intensely at the computer for long periods of time. This intensity was equally matched when revising the printed proofs, as Youngblood would produce sketches and notes of the digital alterations that were needed prior to returning to the image on the computer screen (see illustration overleaf). Overall, Youngblood required little technical assistance when printing the *Exhausted Spaceman* due to his comprehensive understanding of the digital print process.

Some considerations for artists and printers from this project

The production of *Spate* was by no means straightforward, as the process was essentially new territory for both the artist and the CFPR studio. The proofing of the image in this way was time consuming and required plenty of speculative thinking when pondering how an adjustment to one of the *Spate* files would render within the double-pass printed image.

During the production of the *Spate* print, Youngblood and I discussed how the physical layering of ink on paper would dictate Youngblood's adjustment methods and the successful blending of the two files as a printed image. For example, the order in which the files were printed, ink-drying time between printing, and airing of the paper prior to printing all played a significant role in ensuring that the two prints registered with one another.

The realisation of the *Spate* print was achieved through the assessment of Youngblood's aspirations for the work, the utilisation of a bespoke digital printing method and the collaborative development of the process for a specific image. The *Spate* print was a particular project that pushed the boundaries of the CFPR's knowledge and digital print methods, and was the closest to a collaboration of shared knowledge rather than a division of labour or simply technical assistance. The project started with a focus, a shared goal rather than pure experimentation. Observing Youngblood's image construction methods and proofing strategy provided a real opportunity to think of some ideas for my work with future artists in the studio, for example: constructing images in layers to make localised image adjustments, and making notes and sketches during proofing, prior to devising digital adjustment methods.
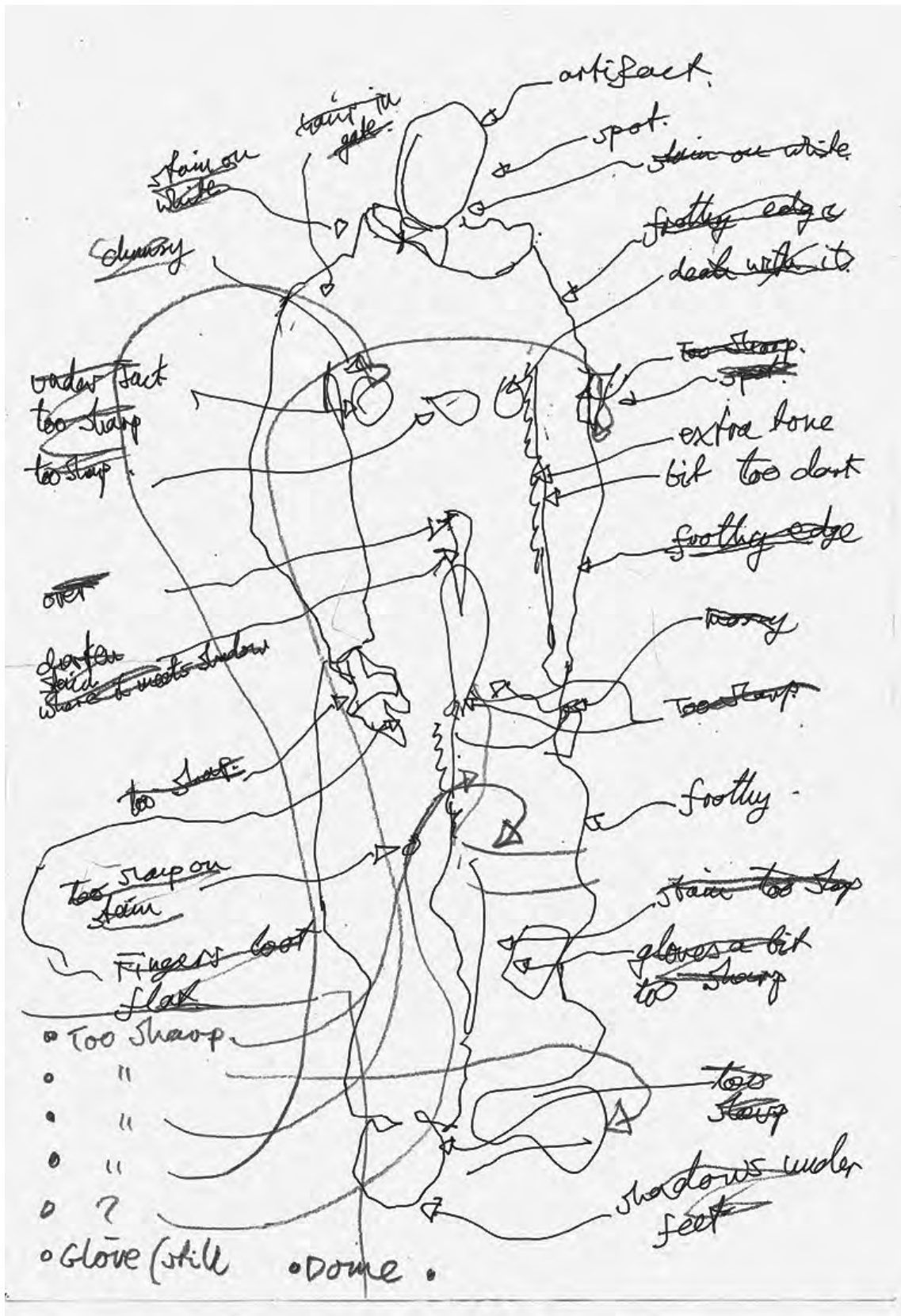
One of Youngblood's sketches and notes for the digital alterations of *The Exhausted Spaceman*, 2003

4.4 Hugh Sanders, *Delivery Entrance*

The complete workflow

Hugh Sanders, *Delivery Entrance,* 2005

Hugh Sanders' application to the *Perpetual Portfolio* located his interest in

photography and the qualities that are recorded through the printed image. Sanders'

previous photographs had been produced by commercial photography labs and in some

cases as large-scale prints utilising the Lambda (g) process. Lambda or LightJet

printing produces high quality, large format photographic prints on photographic paper or film from digital photographic files. This is a digital alternative to the traditional photographic print process.

The printing of previous photographic works by Sanders had been a process that remained out of his control when using commercial photography labs. Limiting the involvement in the printing and digital rendering of the photographs has therefore been a considered element of the work. Any enhancements made to the file are considered as modest alterations - which Sanders refers to as 'conventional retouching techniques'. Inkjet, in contrast to the Lambda process, as a wide format photographic output, has a greater choice when it comes to printing onto non-photographic papers.

Having trained as a printmaker, the influence of surface on a print allowed Sanders to re-evaluate his production methods and investigate the qualities of inkjet. The opportunity to influence this aspect of the photographic print within the parameters of the residency was a focal aim for Sanders, who used the residency as an opportunity to create a print through a complete workflow of each of the image generation processes: capture, image adjustment and image rendering.

Unlike the majority of artists on this residency programme, Sanders arrived without a digital file. Instead, Sanders had prepared for the residency by constructing a small-scale model of a loading bay. The model had been constructed from pieces of cardboard and wood that had then been painted to resemble an exterior wall surface for the scene.
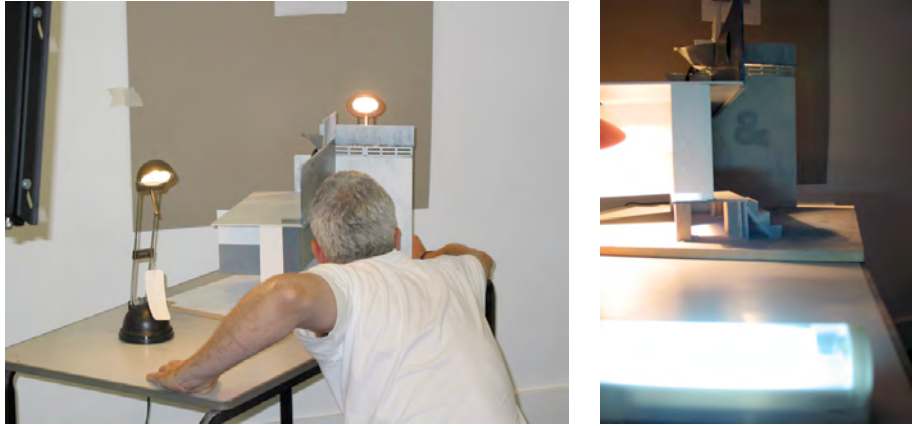
Above left and right: Assembling Hugh Sanders' model for *Delivery Entrance,* 2005

The three-dimensional model had been constructed for its digital interpretation as a two-dimensional image and therefore only one side of the model had been considered for the photographic recording. After the model had been assembled and positioned, Sanders lit the scene using torches and lamps having formalised some initial outlines for where the lighting sources would be positioned on the model, and from which perspective the image capture would be made.

The needs of the artist and the project

Sanders' concept was that the final image should, in some way conceal its origins as a model. The camera settings play a pivotal role in Sanders' images, and much of the ambiguity in the work is created through the codes of the camera, such as focus, angle and framing. In his project proposal for the residency, Sanders had described his interest in creating super-real imagery, and brought with him examples of works by the artists Thomas Demand, James Casebere and Mariele Neudecker, for us to refer to as visual guides for the effects he wanted to achieve with the recording of the loading bay model.

To create the necessary atmospheric conditions for the capture of the model, a series of recording scenarios were considered; these included lighting, camera angle, aperture size and framing for example. By previewing a combination of these capture considerations through the image's rendered recording on the computer screen, we were able to make informed judgements about how best to alter the environment or the camera set up in order to achieve Sanders' aspirations for the work most satisfactorily.

The image capture procedure was supplemented with the occasional proofing of the digital file, which provided a physical print context for the digital image alongside the screen-based version. Although the majority of formal considerations for the image were composed during the recording procedure, the physically printed image presented the appearance of scale that could not be envisaged on the computer screen alone. In keeping with Sanders' usual image production methods, an extensive amount of time and effort was spent during the capture phase of the project, with little or no requirement for digital adjustments to the file before printing.

Capturing and preparing the image file for *Delivery Entrance*, 2005

Sanders had stated in his project proposal that he looked forward to having the opportunity of considering the photographic image rendered upon the typical paper options associated with printmaking (something that had been denied to him through the Lambda (g) printing bureau service). After proofing some of the early recordings on different cotton-based papers, Sanders selected 'Hahnemuhle Photorag' paper as he believed that the resulting print remained consistent to its photographic origins whilst releasing the image from the confines of the gloss surface of the Lambda (g) process. Sanders essentially guided the project as opposed to leading it; his suggestions were often open-ended, leaving room for various interpretations.

Observations towards forming the collaborative strategy

The method of creating the printed work followed a similar sequence of events that Sanders had previously accessed when working with a commercial photo lab - in that he would create a photographic digital image and then leave the processing of that image to someone else. The exception in this instance was that Sanders would have access to high end capture technology and be present during the entire image generation process, and also have the time and opportunity to reflect and intervene at any stage.

With all these procedures in place Sanders guided the project, providing visual aids and offering suggestions (that were often posed as questions) which allowed collaborative practice to take place. Sanders' practice is often solitary but for the residency project he embraced the opportunity for a collaborative production process

that had more in common with the role of a conductor; orchestrating and suggesting adjustments during the production process rather than performing them.

The complete in-house production of a digital image from initial capture to final image generation also demonstrated how the physically printed image can inform earlier stages of the creation process.

4.5 Summary of *The Perpetual Portfolio* Case Studies

In order to best serve the artists' needs in a collaborative print studio, the *Perpetual Portfolio* case studies proved useful in gaining an initial understanding of what artists from a variety of backgrounds wanted to achieve, how they work and to what level they understand the technology involved in the production process. This allowed me to create a facilitation strategy that was specific to each individual rather than imposing a rigid formula on each project. In this sense, every collaborative project begins from an altruistic perspective - any deviation towards a more catalytic role is dictated by the logistical demands of the project that is formulated through the artist's needs. This facilitation strategy has not just been concluded from the *Perpetual Portfolio* but has been derived from working with artists on other projects and from feedback through digital print workshops run at the CFPR. The *Perpetual Portfolio* allowed a longer period of working with each of the artists used for these case studies in order to observe and reflect upon a series of predetermined projects, each requiring various strategies and flexible methods of approach to achieve the best results.

The culmination of the initial three understandings – one: the initial project plan, two: reaching the stage where the word 'acceptable' can be coaxed out of the artist through determining their needs, and three: the point of the artist's designation of the B.A.T. – (*bon à tirer* - good to pull) where they ready to produce the proof - allows the Master

Printer to begin the actual printing process for the artist. The printed proofs enable the conversation to concentrate on a physical artefact, which is essentially the result of the dialogue up until that point.

In *Printing a Photographic Portfolio edition by Inkjet,* a dialogue between myself and the Photographic Historian and Photographer Dr Anne Hammond (November 2009, see Appendices) we discuss achieving a level of 'acceptability' at the proofing stage. This is an important description for the printer to extract from an artist during the production process. The identification of an "acceptable" proof provides the first indication that the artist is able to consider all components of the image - colour, surface, scale etc. - in their entirety. Until this point, the artist may not realise how isolated image adjustments may affect other aspects of the whole image. "Acceptable" then creates a base line - an agreement of sorts - that the printer can visually measure other proofs against. Now the artist and printer's conversations become less susceptible to the misinterpretation of visual ideas through words, with the physical proof to hand, the conversation moves away from 'do you know what I mean?' towards 'do you see what I'm saying?'

Insights and refinements

The altruistic facilitation strategy that had naturally evolved as part of the role I had undertaken for *The Perpetual Portfolio* residency began to present similarities with the traditional Master Printer role. More specifically with Garo Antreasian's identification of catalytic and altruistic traditional Master Printer approaches (see page 64).

The production of Jack Youngblood's *Spate* print drew parallels with the experimental printing approaches of Ken Tyler (see page 76), with the production of *Spate* made

possible through the unique modification of a print device. This enabled a multi-pass method to be used in the realisation of a unique fine art print production.

As a testing-ground, *The Perpetual Portfolio* case studies highlighted the need to refine the production and facilitation recording procedures that were identified at the beginning of the residency. These refinement considerations were developed in order to better assist the complex job of interpreting and printing artists' work to a high standard.

The most prominent area of concern was the need to achieve consistent printed results over the duration of each residency. This required the monitoring of the various adjustments to the printing parameters of each proofing stage so that any previously produced proof could be revisited with further adjustments upon the artists request. The necessity of monitoring these print procedures was emphasised by the amount of proofs each artist produced and the logistical impossibility to recall by memory and observation, specifically how each printed proof had been produced. With this predicament in mind, and considering the amount of options that can be assigned to performing a single image adjustment (through hardware, software and substrate options) it became necessary to formulate a data archiving system to trace the production stages.

4.6 Case Studies Quantitative & Qualitative Data for the Development of the Blueprint for the Print Parameter Document

The recording of these cases studies has been considered in relation to the practicalities of producing fine art digital prints within a collaborative print studio context. As part

of the collaborative undertaking, the studio activity was orchestrated predominantly by the production process, whilst observing and interacting with artists towards the creation of the final printed edition. To begin managing both the logistics of working with artists whilst generating data for the case studies, the studio activity was considered under the two recording categories of qualitative and quantitative methods for gathering data.

The data gathering methods undertaken were specific to the parameters of *The Perpetual Portfolio* project (section 4.1), and were adopted to meet the immediate needs of managing the studio activity, whilst reflecting upon the emerging activities and the empirical nature of the collaborative process – in order to develop examples of best practice methods.

As a testing-ground for the research, each residency brought different insights into what should be recorded and why. From these early developments a number of recurring situations and production stages began to emerge across each of the residencies. The identification of these stages developed a series of categories that together formulated a documentation procedure for the collaborative production process.

The documenting of each case study highlighted some key desirable characteristics for a Master Printer in this field, when considering the relationship between the artist's decision-making process and the large number of options with which a single digital file can be output. Two of the most notable pragmatic insights of the documentation procedure revealed how problems can be quickly isolated to a particular part of the production process. And, by documenting all the hardware and software parameters

that contribute to the production of the artwork, it was possible to create a blueprint that could reproduce accurately a specific digital print.

Documenting the production process

The documentation procedure breaks down the prominent stages of the printing process into; image source and image generation, image file parameters, printer driver information, substrate, data storage and participants in production. These categories identify the predominantly unseen parameters that manage and contribute to the digital production of the final printed artwork.

Name	Neeta Madahar & Jo Lansley
Date	23 /04/07
Title	*Scape*
Documenter	Paul Laidler

Source		Additional information
Source of image	5x4 Colour Kodak colour ne.g 400 ISO	
If digital print (what was it printed with)?		

Recording Device & Image generation		Additional information
Type of image capture device & model	Drum Scanner	From Esprit Imaging Bristol
Generated with which programme	Photoshop	

Image File Parameters **(Studio Computer system)**		Additional information
Operating system	10.4.9 OSX	
Computer hardware	Apple Mac PowerPC G5 (dual 2 Ghz)	
Software	Photoshop CS2	
Working Space	Adobe RGB (1998)	

Assigned Image File Information		Additional information
Colour mode	RGB	Converted from CMYK scan
File type	TIFF	
File size / megabytes, physical scale	90 x 114.89 cm 10800 x 13787 pixels Resolution 120	Both images

Attached Profiles	None	The Scanned file did not come with an attached CMYK profile

Assigned Print Information (Computer software print driver)		Additional information
Method of scaling	Photoshop CS2	
Colour Handling	Let Photoshop determine Colours	
Print Document	Profile: Untagged RGB	
Print Profile	Photorag (271106) Paul	Made by P.Laidler on HPZ3100
Rendering Intent	Perceptual	No Black point compensation
Assigned Printer Driver Information (specific to Printer hardware)		
Printer device	**Design jet hp z3100**	44 inch printer
Printer firmware	TR12-RO_4.0.0.6	
Paper type	Fine Art Material – Thick Fine Art Paper (>250g/m2)	
Quality Option	Custom – Best – Max detail – More Passes	

Colour	No change	
Lightness and Hue	No change	
Lightness	0%	
Cyan - Red	0%	
Magenta - Green	0%	
Yellow - Blue	0%	
Grey Balance	No change	
Layout	No change	
Software (RIP)	None	

Substrate	**Technical information**	Additional information
Substrate	Hahnemühle Photorag	
Weight	310gsm	
Format	Roll	
Selected Media type in printer	Fine Art Material – Thick Fine Art Paper (>250g/m2)	

Data Storage	Technical information	Additional information
Device	DVD – R (Verbatim) & Studio G5 Hard drive	
Software	Roxi Toast 6 Titanium	

Participants & Production	Capture	Matrix (delineavit)	Proofing	Editioning
P. Thirkell P. Laidler N. Madahar	N. Madahar	P. Laidler N. Madahar	P. Laidler N. Madahar	P. Laidler

Print Parameter Documentation table generated for Neeta Madahar & Jo Lansley 2007

Technical documentation of print data

The documenting of data became an absolute necessity in order to record the huge array of variables that go into producing a digital print. An image can be modified at various intervals of the generation process; recording each variable is beneficial for a number of reasons:

- To isolate data conflicts in the output of the print.

- To reproduce accurately previous prints and print states.

- To produce the final edition after the B.A.T.

Each of the recordings includes all image-making devices, and the specific way they were used to transfer information to produce a particular image.

Outside of the Print Documentation

For the printer who interprets the aspirations of the artist during the production of a printed artwork, all technical considerations adhere to the artist's concerns for the rendering of formal qualities such as surface, scale and colour. The selection of hardware, software and substrate (that enables the realisation of these formal concerns as a digital print) can be seen as a combination of relational production stages.

As a sequential production process, each individual permutation or addition towards the realisation of the final printed image, refers to the initial concerns set by the artist at the beginning of the project.

Collaborative practicalities for Image source and generation

Through every instance of working with artists, in my experience I have found that there is no substitute for considering how the recording or generation of digital information will affect the output of the final printed artwork. At the beginning of a

collaborative project an artist will often visualise, or have some idea of what the final

print will look like. These ideas are often verbalised by the artist during the primary

stages of working together and can provide valuable information about the production

methods that could be used (or the pitfalls to avoid) to achieve the artist's aspirations

for the work.

Image generation

It is in the choice of hardware and software manufacturers that we often make our first

decision - how the digital data will be constructed in terms of a digital image on a

computer screen. As with most digital image generating technology (cameras,

scanners, graphic software programmes) a large percentage of operations take place

behind the scenes as a complex series of automated operations within the design of the

software systems. As soon as this process is initiated so is the task to begin managing

the journey of information between separate hardware and software devices. The

primary goal of managing the digital images' journey through different digital spaces

is one of software communication and data compatibility – predominantly referred to

as 'colour management'. Colour management works on the idea that a controllable and

integrated system can be applied so that a digital image's colour information remains

stable during the transfer from one devices colour space to another.

Managing digital information and colour management

This is the point at which the digital image begins the transition to the printed image.

The dedicated software and hardware tools used for generating the image up until this

point now essentially become redundant. The printer software and hardware tools optimise the digital file for the image's rendering as a physical print.

The key automated setting that a user will have to consider is the selection of a colour space. In most situations the colour space in a recording device is set to a universal default space of either Adobe RGB or sRGB (g) that are readily compatible with the computer's working space options. The assigning of a capture profile is specific to the recording conditions for a particular image and therefore the image is dependent on retaining consistent colour information once transferred to the computer's colour space.

The 'image history' section acknowledges the mutability or the many lives of digital images. For example, a digital file may have been previously printed or developed for a different print process or inkjet printer. The continued use of a digital file that has previously been printed will often contain adjustments or additions for a particular workflow method or print process. The assignment of file formats, resolution settings or profiles may hinder the rendering possibilities for a digital image. In terms of externally-generated digital photographic imagery, capture devices such as scanners and digital cameras are predominantly used to generate a digital file. These recording devices are developed by a number of different manufacturing companies that vary in their production methods of digital capture technology. These differences have a direct influence upon the colour and resolution sizes of digitally-recorded information. The documenting of the digital file's construction and parameters provides a context as to how and why the image will be developed in a particular way.

Managing colour outside the technical process

For the purpose of this study, colour management is used as a best practice method for managing the technical transcription and calibration of colour information between the different colour spaces of the digital print process. Whilst the method is designed to control the iteration of colour information, the appearance of colour remains susceptible to the fundamental differences of viewing colour images on a computer monitor – referred to as 'additive colour', or as a printed image on a substrate - referred to as 'subtractive colour'. These perceived differences can be further amplified when considering how different ink sets and substrates change the colour of a single (colour-managed) digital file. We might also consider the effects of different lighting conditions and presentation formats upon the appearance of colour in printed images. Which would lead to the question - what is the correct colour for a particular image? Perhaps 'correct' is the wrong term in this context and instead what is appropriate, better reflects the nature of fine art print production.[lv] The position is further emphasised by the artist David Hockney when referring to colour permanence in an edition of inkjet prints the artist produced with Nash Editions.

> The idea of getting the colour 'right' - comes from the belief that there's a fixed colour out there - Well of course, there isn't. Colour is fugitive in life - like it is in pictures - indeed colour is the most fugitive element in all pictures - a great deal more than line. Dimming down the light immediately alters colour. It does not alter line... Enjoy the moment. The piece of paper is beautiful - it will slowly change like everything else – What's the point of an ugly piece of paper that will last forever? (Hockney, 2009: 194)

Whilst useful, colour management standards within this context provide one part of the colour managing process. In accordance with the premise of colour management software, the Photographer Richard Benson highlights the boundaries of over

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[lv] See Appendix: *Printing a Photographic Portfolio edition by Inkjet,* dialogue between Paul Laidler and Dr Anne Hammond, concerning the goal of appropriate production.

dependence on colour management for fine art digital printing: "technical control with calibration and measurement only have benefits when they connect to established standards, and standards of any sort run counter to the central tenet of art – that its richest ground is the field of the unexpected and unpredictable'' (Benson, 2008: 298).

Processing scale

The wide format inkjet printing process enables an individual to utilise the printer's potential for producing digital prints on a large scale. When digitally printing photographic images, the printable scale - in reference to image clarity- is determined by the amount of pixel information that a digital file contains. The standard print resolution required to create the appearance of a continuous-tone digital photographic print is 300 ppi (pixels per inch). Unlike analogue photography where the scale of the negative is constrained by the size of a photographic enlarger, the print scale for a digital print is determined by the amount of information a specific digital capture device can record at any one time. Therefore the selection of a recording device needs to be considered in advance of producing large-scale prints (when there is a need to retain image clarity for the physically printed scale).

The scaling of a digital image can be performed by the printer's driver software, the computer software, a dedicated software scaling programme such as Photoshop™, or a plug-in that is compatible with a computer software programme such as 'Genuine Fractals'. Each scaling or 'resampling' option uses slightly different interpolation technologies for distributing and adding pixel information to preserve image clarity. These scaling considerations do not apply to vector-based images produced through programmes such as Illustrator™, because these images are made up of many

individual, scalable objects defined by mathematical equations rather than pixels, which always render at the highest quality. It is worth noting that whilst these resampling technologies solve many problems for scaling-up digital images, the physicality of the print often requires further considerations, such as the perceived effects of colour changes (see Susan Collins' case study) and the enhancement of image and surface details (see Neeta Madahar & Jo Lansley Case Study).

Editioning and Storage

> The opportunity to store images and print them whenever required is an opportunity of the medium, and in terms of a limited edition print is not a problem as long as the artist trashes the image at the end of the number required having been printed out. Problems may arise with copyright when using a specialist technician or a computer workshop with regard to the use of an image or storage of data and these problems need to be addressed if the print is to be made into a limited edition and not simply used in a process of transfer into a traditional print medium. (Turner, 1994: 15)

The 1961 publication, *What is an Original Print? Principles Recommended by the Print Council of America,* edited by Joshua Binion Cahn was developed due to the confusion with new photomechanical reproductions and original prints. Later, in 1996 The Fine Art Trade Guild assisted in the development of the British Standards Institute standard *BS7876: Classification of Prints,* which determines original prints according to the level of artistic involvement, with specific reference to the emergence of editioned inkjet prints into the fine art market. The use of digital technology to produce an original, limited edition print, prompted some discussion of originality in digital printmaking. A particular feature of digital that has prompted these concerns is the fact that the matrix does not degrade; it can also be stored indefinitely and is just as easily reproducible as the hardcopy. The versatility and flexibility of the digital matrix is

therefore important in terms of storage considerations relating to access and ownership of image data.

Documented Data storage

This includes the completed digital file, an uncompressed version with its layers and any raw images (none of the manipulated image sources) used in the file. The final addition is the technical information describing how to output the image after the artist's approval of the proof. The documented data storage allows:

- The possibility of revisiting a print (variant edition).

- Reduced hard copy storage by printing when needed (print on demand).

- Replacement of damaged or destroyed prints (museum conservation).

Best Practice

A best practice method is to always duplicate an original image before any adjustments are made for a particular printing process. By always duplicating the original or completed (on screen) image, the printing of the digital file has the best chance to be realised within the specific parameters and qualities of a variety of different print processes. The acknowledgement of the source also provides a history for the work that may not be apparent in the final printed image.

Procedure and Production

The specific procedures and production methods for generating fine art, digital prints within the collaborative print studio are still relatively unknown. Although a large proportion of literature in the field of printmaking is predominantly technically-led there are a number of traditional print studio publications that discuss the nature of

producing prints for artists. One notable publication that elaborates on the 'behind the scenes' experience of working with artists prior to the technical production of a (traditional) print is *Ink, Paper, Metal, Wood: Painters and Sculptors at Crown Point Press* by Kathan Brown (Director of Crown Point Press). Written in a confessional manner, Brown recalls the artist Richard Diebenkorn's continual use of drypoint as a medium, "I couldn't get him to try anything else, as he mistrusted the technical. 'What I want is to be doing something, not making something.' he said. I took that as a maxim." (Brown, 1996: 21). Brown adopted this theory when inviting an artist to work at the press, or hiring a printer, emphasising the uniqueness of each artist and printer combination "that places emphasis on the people involved in making something, on the way they go about, rather than manufacturing." (Brown, 1996: 21) and recognising those subtleties that exist outside of the technical process. "It focuses on the means rather than the end. I think this is a secret of successful art making." (Brown, 1996: 21)

The inner-workings of traditional or digital printmaking studios provide important insights into the collaborative act. With this in mind I have included three areas for further analysis: Participant involvement, Step-by-step production (see Case Studies), and Proofing Strategies (see Case Studies).

Participant involvement

In a similar manner to that of traditional engraving workshop practices concerning the delineation of participant involvement (see 'The team of individuals' diagram on page 59), there are equivalent areas of production within the digital process: capture, rendering, proofing and editioning. Each of these has various levels of input towards the final print and, as such, are important for the comprehension of the print cataloguing process, and for acknowledging participants in the collaborative print

process (see the acknowledgement discussion with Louise Naunton-Morgan for 'The Human Printer' in 8.4.3 A Namesake Production). The specific type of interaction and discussion is also of interest when commenting upon relationship chemistry during collaboration.

Step-by-step production guide

This consists of detailed instructions about how and why the print was created using conversational evidence and references to other artists' works. It also takes into consideration, the use of specific materials, devices and production methods.

Proofing strategies

This refers to the artist's decision-making process, based on the printed artefact, describing their concerns with the printed image, and the adjustment strategy used. These elements will allow this research study to:

- Examine the social aspect of collaborative digital printmaking.
- Highlight artists' concerns with the technology and the process.
- Demonstrate bespoke production methods associated with the traditional print studio.

5.0 Chapter Five: Case Study - Richard Hamilton: *Typo-Topography of Marcel Duchamp's Large Glass*

Computer generated - printer device quality - variant print
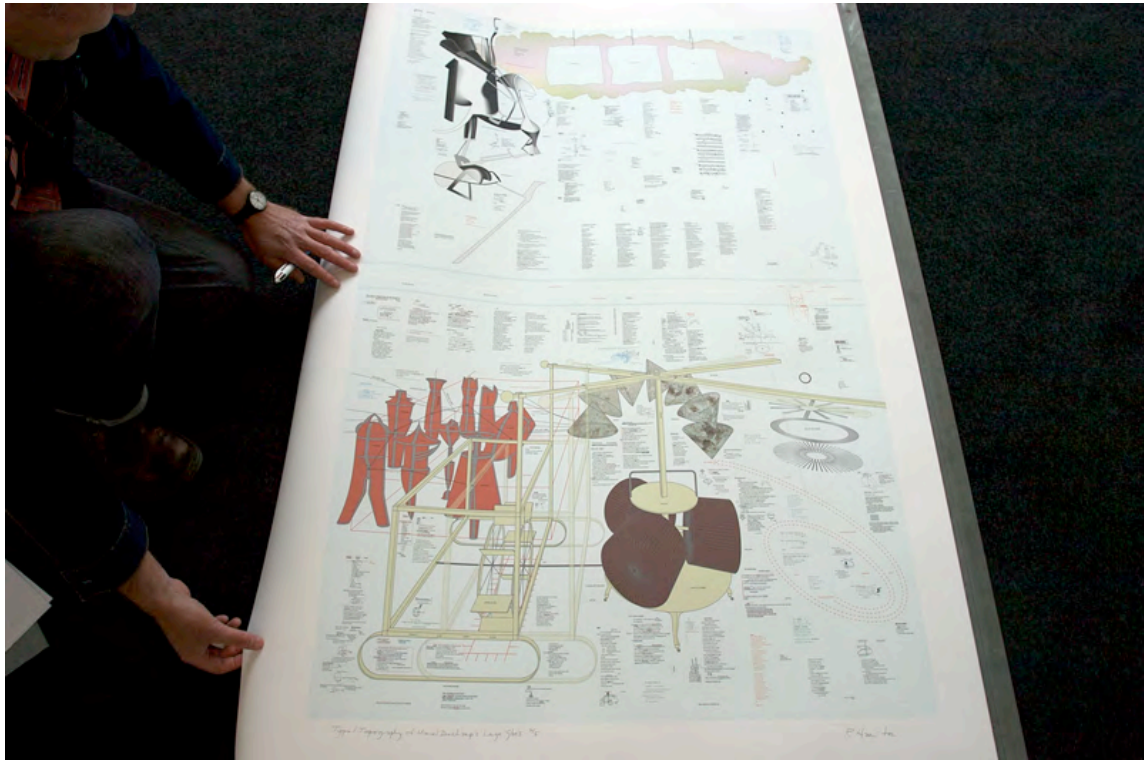
Richard Hamilton, *Typo-Topography of Marcel Duchamp's Large Glass,* 2003

Whilst I was working on the *Perpetual Portfolio* project, the artist Richard Hamilton approached the CFPR concerning the possibility of printing a digital file that he had been working on for a number of years. Hamilton is an artist who has worked extensively in the field of printmaking, producing large bodies of works using both mechanical and digital print processes. The artist is also notorious for working with, and selecting the best Master Printers to realise his ideas across a broad spectrum of print processes. In many respects, the *Perpetual Portfolio* project could be considered as testing the range of possibilities for the collaborative process, but in Hamilton's case the artist was bringing a difficult project that would be a specific test of my abilities, and the proposition of printing for an artist of such calibre added an opportunity for

and extra dimension to the research study. Hamilton agreed that his print project could also be used as a case study for the purposes of my research.

States of Flux: Cubism, Futurism, Vorticism, Marcel Duchamp and Richard Hamilton, Tate Modern, 13/11/2010. Photograph Paul Laidler

5.1 Background to Richard Hamilton and *Typo-Topography of Marcel Duchamp's Large Glass,* 2003

Prior to the generation of the digital file, Richard Hamilton had collaborated with Marcel Duchamp between 1957 and 1965-6 towards the translation and reconstruction of Duchamp's sculptural piece *The Bride Stripped Bare by her Bachelors, Even (The Large Glass),* 1915 -1923. In 1957, together with the art historian George Heard Hamilton, Richard Hamilton began translating Duchamp's notes from *The Green Box* (1934) into English, which were later published by Hamilton as *The Green Book* in 1960. In 1965 Hamilton, aided by Duchamp, began a reconstruction of *The Bride Stripped bare by her Bachelors* for a Duchamp retrospective Hamilton would curate

for the (then) Tate Gallery in 1966. The reconstruction was aided by the fact that Duchamp's sculpture was too fragile to travel from its permanent installation in the Philadelphia Museum of Modern Art, USA.

Hamilton's reconstruction took around a year to complete, prior to being signed by Duchamp at the opening of the exhibition in 1966. Using the previously translated notes as a guide, Hamilton sought "to reconstruct procedures rather than imitate the effects of action."[lvi] From this perspective, Hamilton's reconstruction used the same materials as Duchamp's *Large Glass* to replicate the original work rather than copy the effects of age. The replication of colour in the *Sieves* for instance, was a system- based procedure using "'time' and 'dust' to produce a transparent pastel colour"[lvii].

Sieves, reconstruction by Richard Hamilton 1965
Lead wire, dust and mastic varnish on glass

[lvi] From the display caption June 2010, Tate Modern, Room 1, Level 5. Richard Hamilton in Matthew Gale and Andrew Wilson *States of Flux: Cubism, Futurism, Vorticism, Marcel Duchamp and Richard Hamilton*.
[lvii] ibid.

Hamilton later used these kinds of colour descriptions during the printing of his digital file at CFPR for *Typo-Topography of Marcel Duchamp's Large Glass,* 2003, requesting that colours be formulated as 'chocolate' or 'lead' in reference to Duchamp's text. The print allows two separate works to exist together, the text from *The Green Book* and the image of the sculpture *The Bride Stripped Bare by her Bachelors, Even (The Large Glass)* 1915-23, reconstruction by Richard Hamilton 1965-6.[lviii]

5.2 Initiation of the Large Glass Print Project

Richard Hamilton approached the CFPR in 2003 to print the digital file for *Typo-Topography of Marcel Duchamp's Large Glass,* that he had been working on with his son Rod Hamilton since 2001. Between 2001 and 2003, Hamilton had twice attempted, without success, to print the image at two studios in the UK, the latter of which was The Print Room in London run by Ian Cartwright. Cartwright is considered as one of the leading inkjet Master Printers in the UK, having produced fine art prints for over 25 years before establishing The Print Room in 2000. The studio predominantly produces fine art digital prints for artists such as Richard Hamilton, Langlands & Bell, Julian Opie, John Hilliard, and Wolfgang Tillmans.

Cartwright subsequently recommended the digital studio at CFPR to Hamilton due to the centre's experience with printing for artists, and the range of equipment that could assist Hamilton's printing issues. Hamilton was particularly interested in finding

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[lviii] For a discussion of the historical relationship between Duchamp and Hamilton in print, see Dr Paul Thirkell's *From the Green Box to Typo/Topography: Duchamp and Hamilton's Dialogue in Print,* Tate Papers, Spring 2005. The entire paper can be read online at: http://www.tate.org.uk/research/tateresearch/tatepapers/05spring/thirkell.htm

somewhere that could produce custom profiles for his preferred paper and printer combinations.

The needs of the artist and the project

The initial logistical problem posed in printing Hamilton's file was that the image needed to match the same dimensions as the original two-piece construction of Duchamp's *Large Glass,* which was 60 inches by 90 inches. This required an inkjet printer capable of creating an image of a suitably high resolution that was at least 60 inches across. It also needed to accommodate pigmented inks, and be able to handle the Postscript 2 files necessary to translate the vector imagery into bitmap.

The initial technical challenge in printing this work was to preserve a consistent black gradation (that could only be achieved using a specific output method) without compromising the other correct colour values in each section of the vector file. Prior to working on this particular digital file, the majority of digital prints that I had experience of producing were bitmap images. The bitmap image is predominantly a photographic based file that is resolution dependent. The resolution formula uses a grid-based system of pixels where each pixel holds a specific colour value to map and define various elements of an image. The vector-based image differs from the bitmap in that a vector file is created through a CAD programme such as Adobe Illustrator™. Constructed by a computer, the vector file creates well-defined elements such as lines, shapes and colours that contain only the essential bits of information to generate those specific elements.

Initial proofing stages

In the studio's standard procedures, a paper profile was written for Somerset Enhanced Radiant White Velvet paper, and initial proofs were created whilst Hamilton was present. Hamilton was pleased with the majority of colours in the first printed proof compared to his previous attempts at printing the file. There still remained a few problematic areas of rendered tones in black and grey. Overall Hamilton had seen enough for the Centre to continue proofing whilst investigating how to solve the neutral rendering of the grey tones.

The most difficult part was the particular area of black and grey neutral tones with no other colour. A decision had to be taken to print the entire image as a CMYK file (contrary to current practice of printing most images from an RGB file) making the removal of any other hues in the black far easier. Hamilton responded on receipt of his print:

> I received the prints from Ian a week ago and was very pleased to see them. Ian had spoken to me on the phone so I had his reactions before I opened the package. It's a small step in the Print Industry but a giant step for mankind. You have done well and I congratulate you. When I compared your prints with the technicoloured grey scale of an earlier version I was more than impressed – considering that they were both done on a HP (I assume that you were using the same 60-inch machine you worked with when I was in Bristol) it's a miracle. I waited until my son (who was largely responsible for the Illustrator™ file) visited me at the weekend and he was equally impressed.[lix]

[lix] E-mail from Richard Hamilton to Paul Laidler August 25, 2003 12:52:56pm

Upon Hamilton's return he wished to adjust specific colours that he referred to as 'rust red' and 'milk chocolate'. Up until this point, adjustments had been made to the whole image, and these global alterations to the vector file meant that the alteration of one area of colour created colour shifts in other areas. In particular the very light-toned background colour in large flat areas, and the large areas of bright, solid or strong neutral tone.

The next step was to make local adjustments to separate areas of the file in the Illustrator™ programme. This was done by making alterations iteratively to each of the individual areas in need of colour correction. Once each set of groups and layers had been colour-corrected individually, and proofed as small sections enabling colour comparisons with the larger print, we were able to begin proofing the full-scale image. The full-scale proof required some minor changes once the printed image could be viewed in its entirety, prior to producing the edition of six prints, the final image measuring almost eight by ten feet.

Typo-Topography of Marcel Duchamp's Large Glass, Richard Hamilton, digital print, 2003
Shown on display at Tate Britain where it forms part of the collection.

Revisiting the digital file

One year later Hamilton returned to the CFPR to produce a further edition of the *Typo-topography* print. After producing the first printed edition of the work at the CFPR, Hamilton had decided to add another element to the digital file in the sieves section of the image (see following image).
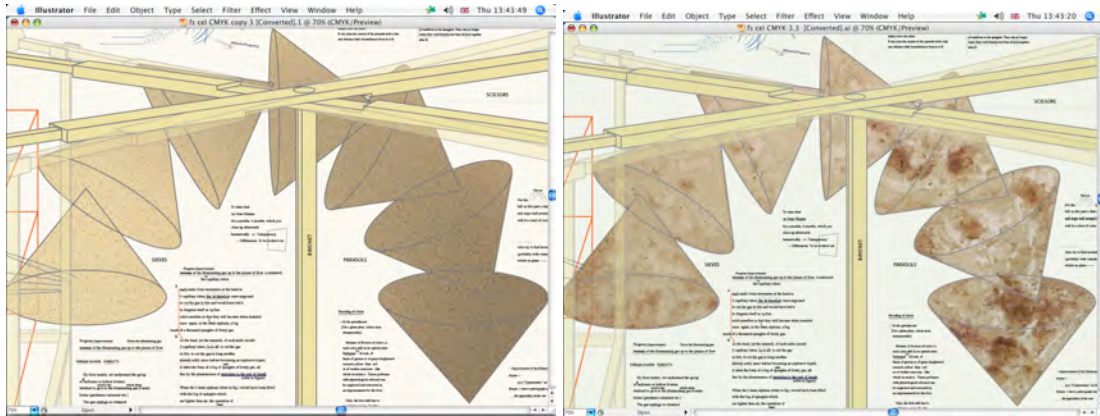
Above left: original file. Above right: new alterations. The discrepancy in colour between the two images comes from different computer monitor's settings that were used to make the screen grabs.

Instead of a computer-generated gradation, Hamilton introduced a photographic rendering of the sieves' glue and dust contents present in Duchamp's *Large Glass* sculpture. Hamilton had added the photographic element to the same digital file that had produced the previous printed edition. With this addition, and a minor adjustment to the background colour, the digital file was prepared for printing a second time. During the first printing of the work, all the adjustments that were made to the file's printing parameters were documented to make sure that the proofing remained consistent. With only two alterations to the initial *Typo-Topography* file, the same output parameters were applied to the second printing, as Hamilton wanted to keep the other areas of the image the same as he had previously approved. Without the documented parameters that were arrived at after months of proofing the whole print proofing procedure for the entire image would effectively have had to start again.

5.3 Summary

The need to document the output parameters became apparent because of the complex adjustment strategy and the intermittent proofing procedure. Hamilton could not be present during every stage of the proofing, so instead a series of proofs had to be sent

to Hamilton for his approval before continuing. Due to the complexity of the printing parameters assigned to each proof, it was imperative to know how they were produced so that the proof selected by Hamilton could be refined based upon Hamilton's instructions.

Although Hamilton had taken both the completed digital file and the editioned hard copy of the previously editioned print, the print data that was used to output the final print remained in the recorded notes held at the CFPR digital print studio. The documented print parameters that were generated through the collaborative proofing stages enabled Hamilton to reproduce the work in a far more efficient manner than it would have if no documentation had been produced. Therefore the data effectively becomes a blueprint with which to reproduce accurately the approved printing of the digital file.

The project highlighted the digital studio's commitment to the production process after completing an edition for an artist. Because of the electronic means with which digital information can be copied and stored, the digital print studio essentially becomes an archive facility for the artist. By archiving both the digital file and the specific print parameters that produce the B.A.T. (g) the potential is created for an artist to accurately revisit a previous work.

The archiving procedure created for this research study has been formulated in consideration of a 'best practice' model, but this procedure can of course be susceptible to the rapid development of digital technology, where software and hardware devices become obsolete after a number of years. The same archiving

procedure should therefore be applied throughout each new development in any technology associated with the production process.

Since 2003, Hamilton has printed three variant editions of *Typo-Topography of Marcel Duchamp's Large Glass* at CFPR; a full size edition of 3 in 2003, produced at the same scale as Duchamp's *Large Glass* (170 x 267.5 cm), another full size edition of 9 with the alteration to the sieves section in 2004, and a smaller-sized edition of 5 (107 x 150 cm) in 2004.

5.4 Further developments

Development of a Linen Coated Canvas

After the successful printing of Richard Hamilton's *Typo-Topgraphy of Marcel Duchamp's Large Glass* the artist returned to the CFPR to produce a number of further inkjet printed works. The most recent of which was an ink-jet on canvas print entitled *Shock and Awe* 2010.

(Left to right) Richard Hamilton and Prof Steve Hoskins, CFPR, UWE, 14/05/2008. Photograph: Paul Laidler.

The project was developed in conjunction with Hewlett Packard and the Getty Institute to create a specially manufactured ink-jet coated linen canvas for the output of Hamilton's digital file. Richard Hamilton's son Rod Hamilton generated the digital image and the print proofing was undertaken at the CFPR. The proofing of the image on canvas was performed over a six-month period allowing for proportional revisions to the figure and colour alterations to the different Photoshop™ layers within the image. To monitor these alterations, the same print documentary procedures created for the case studies were used and archived for each proofing stage, so that Hamilton could compare the different proofing states over the lengthy duration of the project.

Test strip coating samples for *Shock and Awe*, (top to bottom coating solutions: Talens Acrylic Varnish Matt, Lascaux Fixativ and Sikkens Autoclear LV Superior) Photograph: Paul Laidler

The printings of the canvas also brought up further considerations for coating the ink-jet surface, as a means to protect the printed layer from scratches and enhance the colour of the image. The logistics for spray coating such a large surface area lead to further collaboration with the Rijksakademie in Amsterdam and their coatings department (see *Rijksakademie - Skins department* section page 210).

By using the collaborative print studio method as part of a practice lead project, the artist's aspirations for an ink-jet print have instigated the development of a new ink-jet substrate and an alternative to current canvas coating options within the fine art printing market. The project also demonstrated the identification and utilisation of external print production collaborators for the holistic practice of the fine art digital print studio.

6.0 Chapter Six: *Committed to Print*

6.1 *Committed to Print* Case Studies

Using a similar selection premise to the *Perpetual Portfolio* residency project, the second part of the AHRC project, *Committed to Print* invited selected artists to produce a digital print at the CFPR studios. The selection of artists was based again on the concept of covering a broad scope of practice, in order to demonstrate the range of outputs available when using inkjet printing. Invited artists were selected for their use of different digital image generation methods: Neeta Madahar and Jo Lansley used film-based photography to create large-scale digital photographic inkjet prints, Charlotte Hodes combined digitally drawn and scanned images that were printed and laser cut to create collage works, and Susan Collins used digital information recorded by a webcam to create large-scale inkjet prints.

Unlike the *Perpetual Portfolio* residency format where the artists worked at the studio for a continuous two-week period, the time allocation for the artists on the *Committed to Print* residency was considerably shorter. The residency structure meant that the artists would access the studio over a number of separate days equating to five days in total. The shorter period meant that the residency involved more remote forms of communication for proofing rather than actively making the work in the studio as had been the case for the *Perpetual Portfolio* artists.

Because of the intermittent structure of the residency, further additions to the archiving procedure were developed to manage more effectively the stages of each artist's project. This included developing a sticker system to add to each test strip proof which had a breakdown of essential information: date, software, hardware, media, additional

notes. This made the decision process faster and allowed a more efficient management of the proofing system for when artists returned later in the residency.[lx]

A significant addition to the archiving procedure, included the formulation of a digital cataloguing system for each artist (see following diagram). The need for this was more apparent after producing the three variant editions for Richard Hamilton.
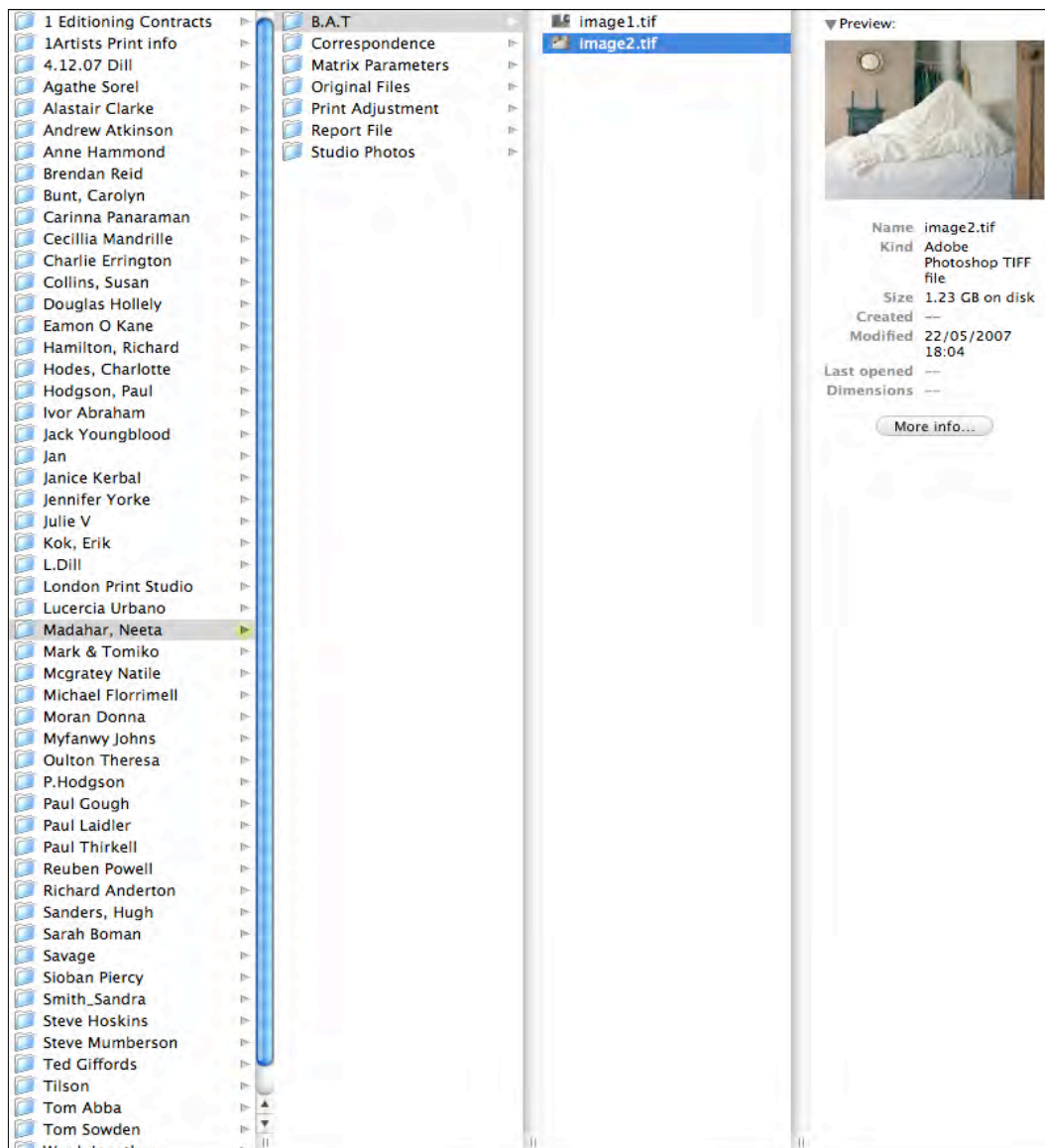
The digital cataloguing system developed for the studio

[lx] This sticker system has also recently been applied in an industrial consultancy for Dycem Ltd to provide them with a best practice model for the organisation and operation of their commercial digital print facility (see *Zen and the art of Print Room Maintenance*, in the Appendices).

The list of documenting categories for each artist includes:

B.A.T.

Once the artist approves the print, the digital files are saved and stored in a folder entitled B.A.T. This keeps the final image file completely separate from any previous states of the image that may exist. The B.A.T. folder contains the digital file(s) used to produce the final printed image, which is paramount for the archival process.

Correspondence

The Correspondence folder contains electronic correspondence – copies of e-mails that have been sent as part of the collaborative process between the artist and printer. The documentation of e-mails describes the continued dialogue that takes place outside of the studio activity as part of the collaborative process.

Matrix Parameters

The Matrix Parameters folder contains electronic documents of the final output parameters as discussed in the *Perpetual Portfolio* case studies. The Matrix Parameters folder also stores an additional document called the *Print document* that collates the edition information for the print. Below is an image of the document followed by a description of its contents.

<table>
<tr><td colspan="5">Print Document   23/05/07   Centre for Fine Print Research, UWE, Bristol, UK.
Last update of Print document: 3/11/08</td></tr>
</table>

Edition		Edition Distinction	Dates of completed states	
Edition Size	5	Limited/ Open/ Variant	Matrix: 11/5/07	
Artist Proof	0	**Limited Edition: (5) Hahnemuhle Photorag (95cm x 120cm)**	Approved proof: 23/5/07	
Printer Proof	0		Digital file completed: 23/5/07	
Studio Proof	1		Edition completed:	

Edition Information:
Work produced for 2008 *Committed to Print* Exhibition.
1. One print of the *Scape* edition was printed on 5/1/08 for the artist Jo Lansley.   The print was posted on the artist's request to an Exhibition in France.
2. Neeta Madahar requested one print of the *Scape* edition on 3/11/08. The print was collected by Madahar on 3/11/08

Artist: Neeta Madahar & Jo Lansley

Title: *Scape*

Paper/ Weight: Hahnemule Photorag 308 gsm

Data Storage	Artist	Atelier	Additional notes
Flat digital file	✓	✓	
Layered states	✓	✓	
Raw / Source files	✓	✓	
Output data		✓	

Paper Dimensions: 95.08 x 120.12 cm (per image)

Image Dimensions: 90 x 114.89 cm (per image)

Print Device: HP Designjet Z3100 Photo
Ink: HP Vivera

Artist Signature   Printer Signature

Medium: Pigmented Inkjet Print

Neeta Madahar and Jo Lansley's *Scape* Print Document information

The Print Document contents:

- The *Edition* category documents the amount of prints produced for a single edition and any prints that are produced outside of that edition number, such as artists' proofs.

- The *Edition Distinction* category lists three types of print edition options:

  - Limited edition: the number of prints in the edition, the paper and image size

  - Open edition: that has no limit - catering for the print-on-demand image

  - Variant edition: when the same digital file or a nominal adjustment of the file is used to print further variations of the work (see Richard Hamilton's *Typo-Topography of Marcel Duchamp's Large Glass*)

- The *Project duration* category documents the three main states of the project. This includes: the start date of the project, the day the artist approves the printed proof for editioning, and the date the whole edition is completed.

- The *Edition notes* category is used to monitor the printing dates of an edition in case an edition is not printed in its entirety after the approval of the proof. For example, for an edition of twenty prints, if the artist wanted the first five prints of their approved print to be produced, they could ask for them to be printed and a note would be made of how many of the total edition had been printed and on which date.

- The *Data Storage* category designates where, and what kind of image information is achieved for the project. The *Data Storage* category includes the *Output data* (as described in the *Perpetual Portfolio* case studies) and three separate saved states of a digital file that exist during the production of a digital print. The three separate states include the *Source file* or the original file that exists before any image adjustments are made to the file information. The *Layered states* refers to the working file(s) generated during the proofing process. These files are often made up of layers of image information that are used to adjust independent components of the image as part of the digital proofing method. The *Flat digital file* refers to the compressing of the working file's layers once the artist approves the rendering of the working file as the print. The flattening of the layers designates that no more image adjustment is required.

Studio Photographs - The *Studio Photographs* folder contains photographic recordings of studio activity such as the artist working in the studio or photographic documentation of printed artefacts in various states of production. These images can be

used for dissemination purposes but primarily aid e-mail correspondence by illustrating qualities that are particular to the printed artefact, such as scale.

Original Files - The *Original Files* folder includes a copy of the artist's digital file prior to any in-house adjustments to the digital image. The copying of the artist's original file provides a back up in case the working file becomes lost or damaged during the studio adjustment procedure. The original file also illustrates the before and after states that demonstrate the effects of print proofing on the digital file.
This is also an important consideration for developing a museum standard archive - where the original file is protected for reference or use by the artist, museum curators and conservators or historians.

Print Adjustments - The *Print Adjustment* folder contains the proofing notes made by the Master Printer that document the image adjustment methods' using the headings of 'situation' and 'solution' to discuss the variables of adjustment methods.

Report file - The *Report file* is used to collate all the above information for disseminatory purposes.

This information is then digitally archived in three places - on the hard drive of the studio computer, and backed up on an external storage device and on a disc.

6.2 Neeta Madahar and Jo Lansley - *Scape*
Film Photography

An unabridged version of this case study can be found in the Appendices.

Neeta Madahar and Jo Lansley, *Scape* 2007

The collaborative project proposed by Neeta Madahar and Jo Lansley brought together their practices in photography and performance. Madahar brought a selection of 5 x 4 colour negatives to the studio that were to be used to begin the digital print project. From the selection, two negatives were chosen to be digitally recorded and enlarged to Madahar's specifications for the final printed image. The project required two main production phases that included joining the separately photographed images and colour retouching the combined image.

Discussions concerning the marriage of the two digital images towards the creation of a single work examined the possibility of digitally merging the photographic images. The desired outcome was to produce a seamless photographic image rather than a print which had the appearance of a collaged photographic space.

Options marked for digital collaging for *Scape*, 2007

A series of digital collage combinations were discussed and tested prior to printing the
file. The initial discussions developed through e-mail correspondence and sketched
instructions from Madahar regarding the methods for combining the digital files for a
seamless photographic appearance. For an example of this discussion and sketch
process see the following image and e-mail copy.

```
-- Original Message ----
From: Paul Laidler <Paul.Laidler@uwe.ac.uk>
To: Neeta Madahar <****************>
Sent: Monday, 14 May, 2007 6:41:30 PM
Subject: Digital File merger
1 attachment
```



```
Hi Neeta
I've left a tiny bit of the windowsill on the left image which can
easily be cloned - but you can get an idea of the maximum length you
can get, based on the dimensions of the right image.  Let me know what
you think.
Regards
Paul
-----------------
Hi Paul

Under the windowsill, there are some cables visible on the floor.  To
make things easy I would just crop out the windowsill and the cables
as well.  Whatever length this then makes the panel, use this to
determine the length for the right panel, i.e. how much of the door
ends up being included. With the door now being visible in the right
panel, can you please straighten it up as much as possible?

If all this sounds straightforward please go ahead with the next
stages.
Regards
Neeta
-----------------
```

The needs of the artist and the project

From the provisional tests, Madahar felt that the space presented in the image appeared

contrived, this was partly due to the fact that the presentation method had not been

considered when taking the photographs. After a number of variations were tested,

Madahar decided that the separate images may be better presented as a diptych.

Madahar referred to the panel works of David Hilliard as an alternative method for combining the separately recorded images.

Observations towards forming the collaborative strategy

The combining strategy meant that the images were printed separately although the adjustment methods for the printed proofs were considered collectively. This meant that the two prints had to look as if they were from the same timeframe, so that the quality of light and tonal information appeared consistent.

To begin matching the tonal information between the two files, a number of colour adjustments were made to large areas of the images before the full-scale proof was produced. The proceeding adjustments made in response to Madahar's assessment of the full-scale proofing gradually became smaller as the process was refined to specific locations of the image. The refinements to the smaller areas were proofed in strip sections to be compared with the previously full-scale printed image.

Madahar was only present in the studio on three occasions throughout the duration of the project, so in order to manage the studio time effectively, the proofed sections were printed ready for Madahar's inspection on each visit. To manage the large number of printed proofs, each printed strip was labelled with information documenting the date, print parameters and Photoshop™ adjustment methods.

Some considerations for artists and printers from this project

Recorded with traditional Photography formats, the digital rendering of *Scape* enables the work to traverse the fields of photography, painting and printmaking. The increase in scale of the 5 x 4 photographic image draws parallels with the scale of paintings, whilst the magnification of the colour negatives' grain adds a painterly appearance to

the surface of the photographic image. Together with the soft, matt-printed surface, the photographic image reflects printmaking's interests in surface quality and the physicality of ink on paper.

The photographic recordings of the tableaux environments together with the image adjustments for the *Scape* image share similarities with digital retouching methods used in the fashion-advertising industry, for example tonal and colour adjustments used to enhance the appearance of an image. The two retouching methods only begin to differ in relation to the production and parameters of the printed artefact. Within a fashion context, retouching is often confined to a screen-based image and determined by the parameters of mass production printing for magazines and advertising displays. Within a fine art print context, the retouching methods are intrinsically linked to the physicality of the image surface and the digital rendering of the image as a limited edition fine art print. The production process is also susceptible to the varying changes that are brought about through the artist's decision making process.

Test strip strategy: The test strip procedure combines the printed image with the written print parameters as a hard copy version (evidence) of the digital documentation procedure. The hardcopy evidence enabled Madahar to make faster, more informed judgments by selecting one of the printed results to be applied to the working file, before reviewing a large-scale proof at the end of each day. The studio method suited the timeframe for the project whilst also saving on consumables such as ink and paper.

6.3 Charlotte Hodes – *Untitled*, 2007
Mixed Digital Processes

Untitled, Charlotte Hodes, 2007, 70 x 122.5 cm

Charlotte Hodes' artworks are arrangements of figurative imagery and floral patterns using both digital and physical collage methods. Hodes' usual working method after making the digital image, involves printing out the digital file using a wide format inkjet printer and then hand cutting small, intricate shapes that create areas of pattern within the image. The cut away sections of the print are then re-used by physically pasting the paper cut-outs on top of the printed surface.[lxi]

[lxi] For an insight into Hodes' complete working method there is a short video: *Drawing Skirts: New Papercuts, University Gallery and Baring Wing, Northumbria University, Newcastle* that can be viewed

The logistics of making works of this complexity means that Hodes spends a substantial amount of time cutting away the individual shapes to reveal the areas of pattern within the printed image. The *Committed to Print* residency at the CFPR offered Hodes the possibility of using laser-cutting technology as an alternative method to the physically cut shape. The practicalities of the laser's cutting speed meant that Hodes could realise a number of works in a significantly shorter time period and consider the qualitative differences in her work between hand and machine cut marks.

Charlotte Hodes brought a series of several, separate digital files that had been constructed in Photoshop™. Each image contained drawn elements that had been scanned and digitally placed into the file, and areas that had been worked on by drawing and adding colour using Photoshop™ tools.

The needs of the artist and the project

The hybrid approach to the project required that Hodes' digital files needed to be separated for the two digital rendering processes that would collectively make the final printed artefact. The printed artefact was to be physically composed of three printed layers of paper, each revealing and concealing printed areas of image once layered on top of one another.

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on the Fine Art Digital Environment (FADE) research website. *The Personalised Surface within Fine Art Digital Printmaking*
 http://www.faderesearch.com/digitalsurface/case-studies/interviews/interview-links/charlotte-hodes/
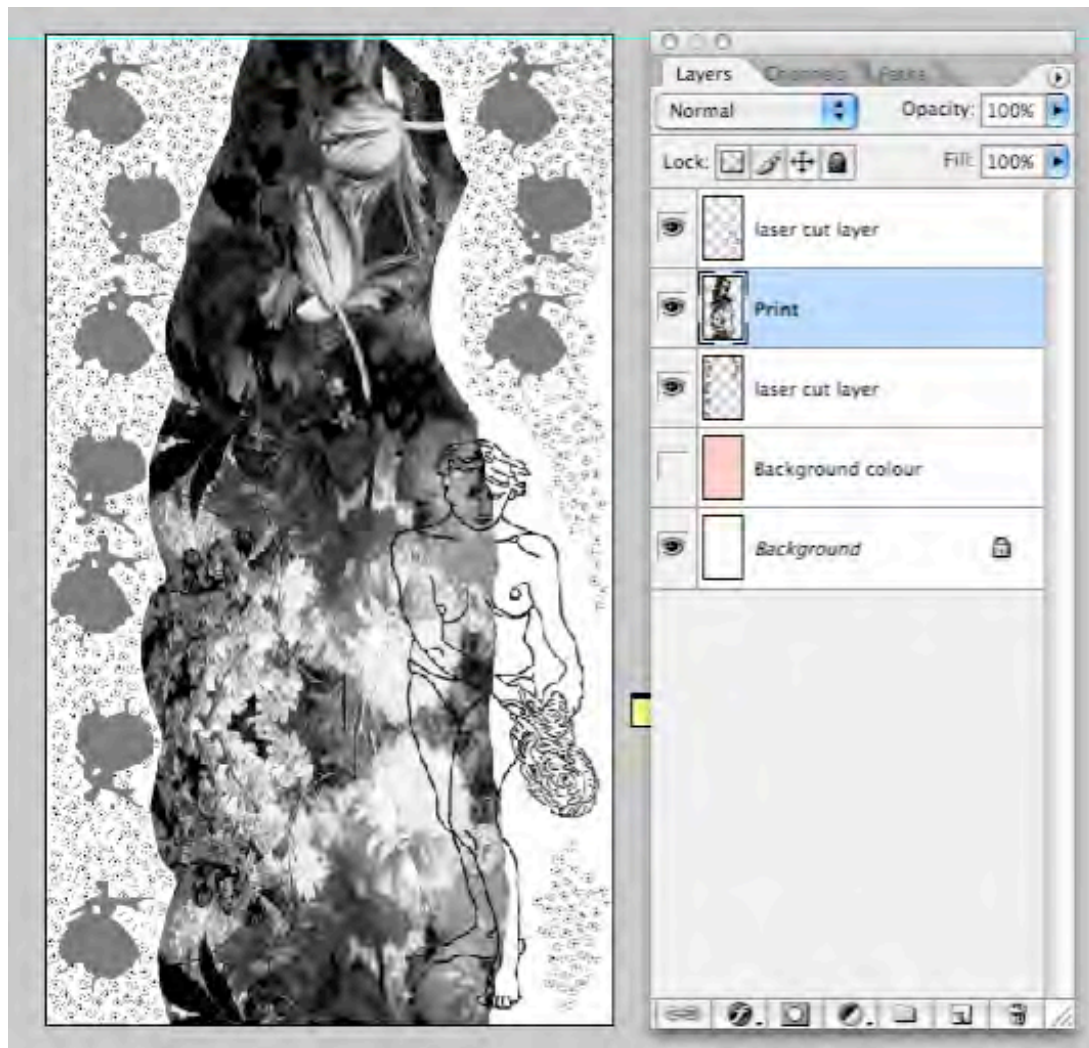
Layer construction for *Untitled*, 2007

Seven prints were produced, each different within the edition. The base inkjet printed layer functioned as a background, and was printed as variable in either a gradient or solid area of colour. The middle layer on each was inkjet printed and laser cut using different sections of Hodes' digital image. The third layer was composed of small printed fragments that had been collected after the laser cutting of the second layer. These off cuts were re-used by gluing a number of them back on top of the second layer making the work three layers in total. For the printing and cutting process, the Photoshop™ image was divided into two sets of image layers, one for inkjet printing and one for laser cutting (see below).
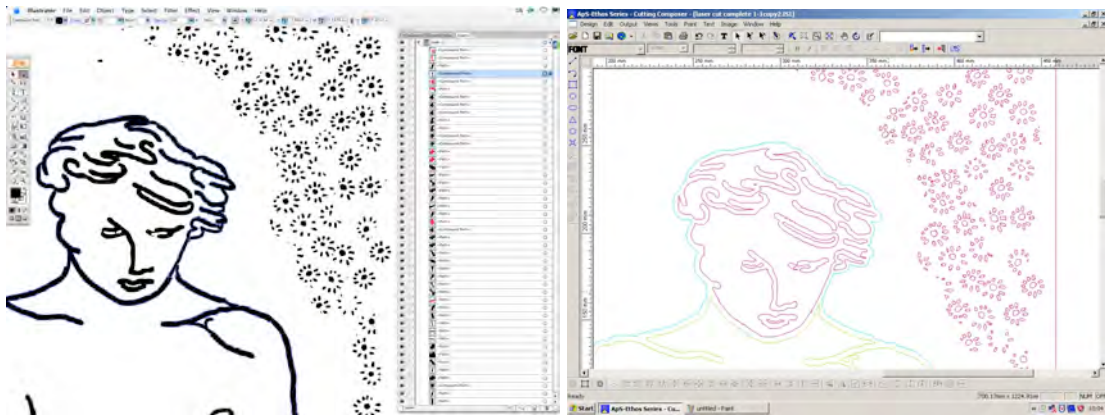
Layers for printing and cutting *Untitled*, 2007

The laser cutting of each designated section of image needed to be exported from the Photoshop™ layer and configured as a vector file in Adobe Illustrator™. The automated configuration of data from a bitmap image into a vector path enables the laser cutting software to read and cut the image sections.

Cut paper layers for *Untitled*, 2007

Proofing

Unlike the majority of artists on the residency, Hodes did not require much inkjet proofing of the digital files. Instead, adjustments for proofing were made to some of the vector paths that had been created by the 'auto trace' function. The auto trace method speeds up the process by selectively creating cutting paths that would ordinarily take a long time to draw in a vector-based program. The function does not take into consideration which part of the image will be cut from the substrate - this is a design element that needs to be addressed by the maker prior to assigning the trace function.

Laser cut proofs of the figure's head for *Untitled*, 2007

The adjustment procedure began after realising that certain key, drawn marks such as facial features began to fall out of the image area. These drawn sections had not been created with the cutting process in mind and therefore the vector paths needed to be manually adjusted after the auto tracing (see example of laser cutting proofs of the figure's head above).

Assembling the layers for *Untitled*, 2007

Some considerations for artists and printers from this project

The working methods for printing and constructing the work were based upon Hodes'
own production methods from her previous inkjet printed works. The most prominent
contribution to the prints produced at the CFPR was through the use of laser cutting as
an alternative to cutting by hand. The process saved on manual labour and enhanced
the artist's potential to realise more ambitious works in a shorter period of time.

The project highlighted the mutability of a single digital file for both inkjet and laser
cutting. In this instance the printer's role broadened from facilitating one digital
process to considering the rendering potential of a digital file for alternative digital
outputs and the creation of digital hybrid productions.

This hybrid approach and multi-faceted facilitator role has previously been employed
in traditional print ateliers, but there is little evidence to suggest that digital print

ateliers are continuing with these production methods. Instead digital ateliers tend to specialise in one digital method or combine it with traditional print processes. Master Printer Ken Tyler is an advocate of both the multi-skilled printer and mixed media approach - as a means of extending the creative potential of the print atelier whilst broadening the field of print through monumental and three-dimensional printed works. This digital hybrid print production for Hodes engages with the current and future potential of digital information as print, and proposes the possibility of reconsidering the role of a Master Printer of inkjet printing, instead as a more mutable role of a Master Printer of rendering digital information as print.

6.4 Susan Collins – *Glastonbury Tor*, 2007
Digital Video Information

Susan Collins, *Glastonbury Tor,* 2007

Collins' practice engages with the transmission of image data through live-streaming such as video installations. The *Glastonbury Tor* imagery that was used for the *Committed to Print* residency came from a series of time lapse pieces that were generated with a web cam over a period of approximately twenty-four hours - where the image is built pixel by pixel from left to right. To create a digital file that could be used to produce a printed image of the data, Collins made a series of screen grabs during the live streaming of the landscape.

This method for creating a static digital file for printing had been developed for a similar body of work entitled *Fenlandia* that was produced in collaboration with Ian Cartwright at The Print Room. The *Fenlandia* large format prints were the first physical renderings of the virtual based works, and provided a rich surface and vibrancy of colour to the imagery that was less prominent in the video-projected pieces. Although the prints had succeeded on one level, the somewhat obligatory

presentation format for prints (framed behind glass) had reduced the initial impact of the printed works. Unlike the video installations, the glass separated the printed image from the viewer's space and partially obscured the printed surface through reflections upon the surface of the glass.

Susan Collins, *Fenlandia,* 2002

The needs of the artist and the project

For the *Glastonbury Tor* piece, Collins was keen to continue with the large-scale format that was used to produce the *Fenlandia* prints. One notable change was made to the rectangular format for the *Glastonbury Tor* prints. By cropping the height of the image, Collins exaggerated the landscape format of the scene as a development from the painterly feel of the *Fenlandia* prints towards a more cinematic format.

The generation of the digital images using the screen grab method produces a digital file that is very small in comparison to the standard file size - of 300 ppi at 100% print scale - that is normally accepted for the wide format printing process. Each screen grab image measured 640 pixels by 336 pixels at 72 ppi, and had to be digitally increased in

scale to the maximum width of the 44-inch printer in order to print at the size and quality needed.

To increase the printable scale, pixel information had to be added to the screen grab files, a digital scaling method known as resampling which is applied using Photoshop's 'image size' dialogue box to change the image's printable width dimension to the desired physical print size. The resample option includes a proportional scaling method so that the image's length was able to be adjusted in proportion to the width whilst increasing the pixel information in the file to a width of 3168 pixels by a length of 6034 pixels.

The increase in scale to the digital file remained arbitrary in the computer, as only small sections of the printable scale could be viewed at any one time on the computer monitor. To view the image in its entirety at the intended print size, the first proof was printed with the sole intention of considering the scaling effects upon the image before discussing any colour adjustments.
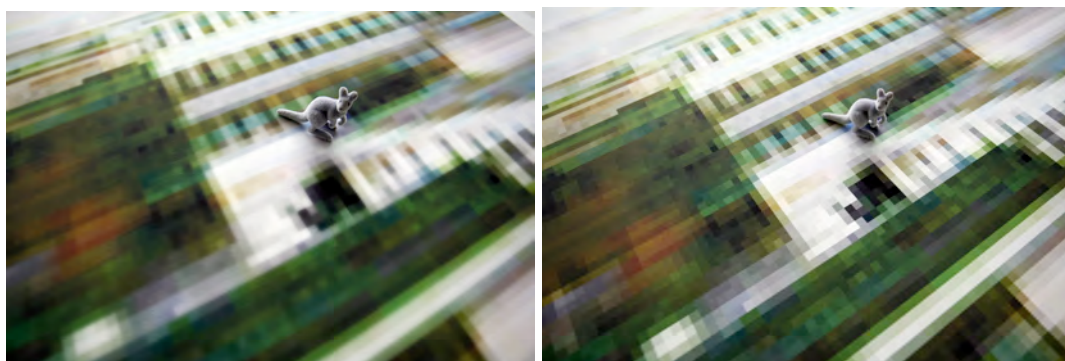
Proofing to show scaling effects upon the printed image

During the printing of the first proof, Collins noted that the image appeared very different to the *Fenlandia* prints that were produced using the same image generation method. The image had no pixel definition, appearing much softer, as if out of focus in comparison to the *Fenlandia* prints produced at The Print Room. As part of a process of elimination to resolve this, each stage of the production process was examined to isolate the cause of the soft rendering of the digital file.

The problem was located within the Photoshop™ scaling method after finding the same soft image appearance in the enlarged digital file that was used to produce the print. The default setting for resampling an image in Photoshop™ assumes that the user wants to conceal the appearance of pixels in an image. This assumption is due to the fact that Photoshop™ has predominantly been developed with the concerns of photography in mind, and therefore retaining image quality is factored into the scaling options. By changing the resampling option in the image size dialogue box from 'Bicubic' (g) to 'Nearest Neighbour' (g), the new interpolation method retained the hard-edged pixel appearance that had been produced in the *Fenlandia* prints.

Above left: Colour proofing size print, and (above right) the full scale sized proof on the studio floor

Colour matching:

From the achieved screen grabs, Collins produced three A4 size prints that were to be used as colour proofs for the *Committed to Print* residency work.

Although these prints had been produced on a different printer, using different ink and paper from the printer and materials being used on the residency, the colour proofing strategy was predominantly informed by the perceptual colour effects of scale and distance.

The perceptual effects of image scaling and viewing distance on the appearance of colour affect the density and amount of viewable colour information that exists within a printed image. When working from a specific size proof, the perceptual effects of increasing the scale of an image make the enlarged printed version become lighter, whilst increasing the viewing distance has the affect of making the image appear darker.

Colour proofing the print

With these perceptual characteristics in mind, and to begin adjusting the colour of the digital file, the A4 printed proof was held in one hand, with the large-scale print proof positioned at a proportionate distance - so that both images appeared to be the same scale. The first set of proofs using this colour-matching strategy adjusted the tonal information throughout each of the files, making the large-scale prints darker. Following the global file adjustments, local adjustments were made to increase the saturation of specific colours in the image using the test strip method previously adopted on the *Scape* project with Neeta Madahar (see following image).

Test strips for colour proofing the print

The tonal alteration method was applied directly to the digital file information rather than assigning the changes in the printer's colour management software. This method of colour adjustment was used as a more direct adjustment of colour, as alterations are previewed in the on-screen image whereas adjustments in the printer's colour management can only be seen once the image is printed.

Collins initially appeared shocked when realising that the digital file was being altered using the proofed printed image as the guide. For her previous works at The Print Room, she had passed over her files for alterations and output to Ian Cartwright. This was the first time that Collins had been in situ, working collaboratively on a print production in a studio, and witnessing the actual process. Collins had assumed that colour adjustments would be made through the printer management system not through the computer on the source file. She was therefore concerned about her original file's altered state which demonstrates that, as stated in the Print Documentation Procedure section, it is essential for a studio to make it a point of practice that a copy of the original file is archived into a print procedure folder before making any alterations to the studio file used.

Presentation Considerations:

As previously discussed, Collins had felt that the presentation of the *Fenlandia* prints behind glass had reduced the impact of the physical surface of the printed images. In response to this observation the possibility of dry mounting the prints onto an aluminium sheet was suggested as an alternative presentation method. The presentation method meant that the prints would occupy the same space as the viewer with no reflective glass obstruction. As part of the dry mounting process, a Mylar coating is used to seal the printed surface of the image, adding a protective layer that also has the affect of fractionally increasing the density of the printed image. Before sending the prints to be mounted by the Darbyshire framing company[lxii] each of the approved images were incrementally lightened to allow for the Mylar coating effect.

[lxii] http://www.darbyshire.uk.com/index.html

Some considerations for artists and printers from this project

The project engaged with the physical and perceptual appearance of large-scale printed works. By factoring in the presentation qualities using an intuitive colour adjustment method, the project broadened the standard colour management considerations from the industrially-defined and automated colour management methods for inkjet printing - asserting David Adamson's intuitive colour adjustment methods that he describes as "where there's still some judgment involved"[lxiii]. By this he refers to a role that is necessary - over and above the inbuilt colour management systems that are in place in any hardware or software device, that measure everything for the user. There are of course the considerations of the various paper or substrate options, and when working collaboratively – discussions with the artist and viewing examples of their work informs the Master Printer of the outcome the artist aspires to achieve – this requires some intuitive value judgements, ones that cannot be made by technology, and which rely upon the insight of, and intervention by, the Master Printer.

Ordinarily the production of a printed artwork within the collaborative print studio practice concludes shortly after the formulation of the B.A.T and the completion of the printed edition. The framing/ presentation considerations for a printed work are normally undertaken by an external facility to that of the print studio. The print amendments made for Collins' mylar coated finish for the work essentially bridged the print and presentation processes by extending the parameters of the B.A.T. This engagement with coatings raised further potential for the production scope of the

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[lxiii] Adamson, David in Offman. Craig. *The New Remasters*, *Artland.com's James Danziger and David Adamson aim to give high-end reprographics mass appeal,* http://www.wired.com/wired/archive/8.11/danziger_pr.html

studio by considering in-house coatings that would benefit both longevity and aesthetic considerations for digitally printed artworks (see Hamilton *Shock and Awe*, page 167).

The project also highlighted the use of unconventional file types for printing large-scale prints and software programmes that predominantly favour the rendering concerns of photography. It also proved the need for the original file to be archived in the folder, not only for future reference but to allay the fears of the artist during production of the printed artefact.

7.0   Chapter Seven: A Digital Atelier Study

The Rijksakademie van Beeldende Kunsten, Amsterdam, The Netherlands

The formulation of this research enquiry has been to develop and define facilitation techniques for producing digital prints for artists. The previous chapters have discussed some historical precedents for collaborative printmaking (Chapter 2), explored the emergence of digital technology within collaborative printmaking practice (Chapter 3) and tested the notion of the digital Master Printer through a series of practice-led case studies (Chapters 4, 5 and 6).

This chapter provides a comparative assessment of a digital print studio in order to evaluate the facilitation techniques and practices that have been developed during this research. The assessment for the research includes primary source material of a renowned *Contract Workshop* studio that has the closest relationship to the functioning of the CFPR's studio model and the production of inkjet prints for artists.

The study also includes the production of artworks through the workshop collaboration model that is specific to the Rijksakademie, from the perspective of my role as the artist rather than in my research role as the printer. This allowed me to experience and reflect upon the collaborative creative process from both perspectives. The report on the production of the artworks can be found in the Appendices: *Testing the notion of the Contract Workshop model through a collaborative print production at the Rijksakademie's digital print facility: 'Vanitas'*

7.1 Background to Rijksakademie Study

On 22 September 2008 Roy Taylor (Senior Coordinator for all Media Departments and digital print) and Willem Moeselaar (supervisor of the traditional print studio), both fine art print specialists from the Rijksakademie (The Royal Academy), Amsterdam visited the CFPR to continue previous discussions concerning the production of digitally-printed artefacts. The previous meeting had taken place in Enschede, The Netherlands (21 May 2008) during an International Erasmus Intensive Programme: *Borders of Perception* (19-30 May 2008). During the first discussion, a number of issues concerning facilitation methods, archival standards and technical possibilities concerning fine art digital print production were highlighted.

During the visit to the CFPR by Rijksakademie staff (22/09/08-25/09/08), I explained and demonstrated CFPR methods and our studio's *Contract Workshop* philosophy for printing with artists using examples such as Richard Hamilton, Joe Tilson and Neeta Madahar. This also included hybrid productions that the CFPR has been investigating using high-end digital capture devices, laser cutters and 3D printing technologies. After viewing the work and discussing aspects of my own PhD research in the field of fine art print, Roy Taylor invited me to visit their institute in January 2009, to explore their working practice - providing primary source material towards my research[lxiv].

7.2 The Rijksakademie

The Rijksakademie offers artists the opportunity to produce work over a two-year period using an artist-in-residence format. Approximately1300 artists apply for a place

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[lxiv] Please also see: *Testing the notion of the Contract Workshop model through a collaborative print production at the Rijksakademie's Digital Print facility: 'Vanitas'* in the Appendices.

at the Academy that has an intake of 25 artists per year. A lengthy selection procedure is undertaken where applications are assessed upon artistic quality and development potential. This potential is often considered to be within the 3-5 year period after an artist has completed any educational study, so a large portion of successful applicants tend to be in their early-late twenties and early thirties. Other criteria of the selection procedure can be seen through the diverse nationalities of participants attending the Rijksakademie each year - reflected in the breadth of submissions that arrive from artists in c.80 countries.

Each resident artist attending the Rijksakademie obtains a Fellowship fund of EUR 1500 per year. The fund is sponsored by a mix of government bodies, foundations, companies or private donations, and enables the Rijksakademie to provide facilities and support for each resident. A portion of the support funding is prescribed to a facilitator who assists with anything relating to the artists' working process, such as helping to organise events or advising on issues concerning the daily running of the Rijksakademie etc. The funding towards the facilities provides workshop and technical support in: ceramics, metal, wood, plastics, painting, printmaking and media. A further annual budget of EUR 1950 is provided to each resident as a 'work budget' that pays for materials used in each of the workshops.

In the early stages of the residency all of the artists are given introductions to each of the Rijksakademie's workshop facilities. These general introductions provide information about the facility, the equipment available, technical possibilities and the option to learn the technical process alongside one of the technical support members.

The Rijksakademie began to use digital technology in relation to photographic printing in 1994, during the period when the technology began to make inroads to address some of the concerns associated with the photographic and fine art print markets. At this point, Photoshop™ had upgraded to version three, which featured an option for layering images (multiple exposures) and the first high photo-quality ink jet printer was released - the Epson Stylus Color. Although there were initial issues over longevity with Epson's dye-based inks, the possibility for high-quality digital print production at an affordable price had reached a stage where the Rijksakademie felt it was worthy of investment. Four years later (in 1998), the Rijksakademie also purchased Hewlett Packard's first wide format pigment-based printer the Photosmart DesignJet. The DesignJet matched the previous photographic print quality of the Epson, and addressed Epson's print permanence issues. It also opened up further artistic interest with printable scale and the potential to use a range of substrates. Taylor initially attended some short Photoshop™ training courses (starting with Photoshop 3™) but is primarily self-taught in digital software.

7.2.1 Special Skill

Taylor has helped produce digital prints for a large number of artists over the last fifteen years and continues to be used by previous academy residents who trust his judgment when producing their inkjet prints. With no specific fine art digital print training available during that period, Taylor believes this successful practice may be attributed to his previous photographic work at the Rijksmuseum where technical precision was paramount in reproducing works of art in print. Taylor's background in reproduction and the transfer of information from one medium to another resonates

with Richard Hamilton's assertion that the best printer craftsmen were those who had been involved in some form of reproductive endeavour (see page 65).

During our conversation, Taylor described this period at the Rijksmuseum as "grounding his photographic eye", enabling him to later advise artists about the subtleties and nuances achievable through photographic capture and its relationship to the printed image. Taylor explains that these subtleties can often get overlooked in digital prints, although the artist generally knows when it is wrong but is unable to articulate why, and how to make it right.

As digital photography has essentially mimicked analogue technology, Taylor has been able to simply transfer the fundamentals of his analogue practice of darkroom knowledge through the software and materials specific to digital printmaking. Taylor's photographic affiliation with inkjet technology shares similarities with the development of Nash Editions and their pursuit of high quality digital photographic prints for the fine art market (see page 94). Taylor asserts that he has no allegiance to analogue or digital photographic processes. Their use he feels should be determined by the artist's idea.

7.2.2 Collaborative Strategies

The development of the print projects in the Rijksakademie's digital studio function in the same manner as the CFPR's digital studio. Taylor describes these as falling into one of two categories: completed digital images ready for print proofing (for CFPR example see Susan Collins – *Glastonbury Tor)*, and unrealised projects that require some form of photographic recording to bring them into the digital domain (for CFPR

example see Hugh Sanders – *Delivery Entrance)*, which is done under Taylor's

guidance. Although 'technical know-how' is encouraged when using the workshops, it

is not a prerequisite, as projects often require specialist knowledge that can only be

gained through long-term of experience of working with a material or process. When

asked about his motivations in the role of Master Printer, Taylor explained that the

position allows him to work with a variety of artists, each with a range of different

problems to solve.

7.2 *Rijksakademie Digital Department*

Rijksakademie's *Digital Media* area

As previously stated, the most comparable digital print facility to the CFPR's digital studio is the Rijksakademie's *Digital Media* area. The area is divided into four departments, each of which is overseen by a specialist advisor for that specific field. Further specialisms within the departments include: programming and electronics, video, 3D software, photography, printing and equipment loans.

Photography & Inkjet Printing Facilities

The photographic and print section of the Digital Media facility has an extensive range of production possibilities. The area can cater for the complete workflow, from initial capture and image adjustment, to printing with mounting and presentation considerations. Although the majority of the department is digitally orchestrated, there are still analogue devices and mechanical processes in use, such as a dedicated darkroom for wet photographic print processing.

Capture facility

The photographic capture facilities include two large studios catering for artificial and natural light environments. Both studios are equipped to record two and three-dimensional works with a large selection of photographic studio apparatus, and the latest blue screen environments. For works that may require a significant amount of studio preparation, the artificial light studio has a dedicated space that can be transformed for the duration of specific projects.

Capture Equipment list

Digital - Mamiya ZD 22 MB - Casio Exilim EX-F1 plus a range of Canon compact

and SLR cameras. *Analogue* - Mamiya RB67 & 645 - Nikon F3 and a Cambo technical

camera. An extensive range of lenses. *Scanner devices:* Imacon – Intelli Scan 1600

Quato Technology A3 flatbed Epson Perfection 2480 Photo A4 flatbed scanner.

Image Adjustment and Workstations

Workstations area

The workstation areas affiliated to the digital print department are located in a separate

room away from the main printing studio, creating a quiet space for the artists to work.

The area is reminiscent of Tatyana Grosman's philosophy at ULAE, and her empathy

with artists, in particular Barnet Newman, where she made sure that the studio felt

completely his own when he worked there, reflected in Newman's proposition that

"Studio is Sanctuary".

Workstation Equipment list

Apple Mac G5. Processor: Dual 2.3 GHz Power PC G5. Memory: 2.5 GB DDR

SDRAM. OSX 10.4.11. Adobe CS4. Lacie 324 LCD with hood. A5 Wacom tablet.

Printing

The digital print area

In similar practice to my own at the digital print studio at CFPR, Taylor has assessed the characteristics of different printers for particular projects. The digital print area has a series of desktop inkjet printers and three wide-format inkjet devices ranging from 44-60 inches in printable width. The wide format printers are produced by Canon, Epson and Hewlett Packard, with each printer using archival ink-sets produced by the printer's manufacturer.

The wide format machine where a 'printer selection system' has emerged, assigned by Taylor - that dictates which printer will be used for a specific job - performs the bulk of the studio work. Apart from some logistical reasons (scale, speed), the two principal decisions for selecting a printer are image quality and choice of substrate. In this instance ''image quality' refers to the photographic rendering of the detail, colour and tonal information that can be displayed in a print.

An example of the 'printer selection' where a high-quality photographic paper is required before any considerations of image size or speed then the Canon IPF 9000 printer is often selected by Taylor. The IPF 9000 is also a 12-colour cartridge printer unlike the Epson and Hewlett Packard 8-colour ink set. The larger ink-set in the IPF 9000 produces a wider range of colours with smoother gradations in the printed image. For this reason the IPF 9000 is predominantly used for the majority of artists that use some form of photographic imagery in their work.

The other two wide format printers are the 42 inch HP Designjet z6100 and the 44 inch Epson Stylus PRO 9450. The Epson is the most recent addition to the studio and is currently in use as an output device for printing onto clear films, creating positives for various photomechanical printmaking processes. The Hewlett Packard printer has a unique function in that the printer produces far better image results on backlit film despite the higher spec technical parameters of the two devices. (For more specific results of the substrate and printer combination see *Crewde attempt* on backlit film page 248).

Equipment list

Printers:

HP Designjet z6100 42 inch.

Epson Stylus PRO 9450 44 inch.

Canon IPF 9000 60 inch - Canon IPF 5100 A3 & a selection of Epson desktop printers.

Sample prints in the digital print area

Paper

Taylor stocks a range of inkjet coated rolls of paper, although around three quarters of the paper stock is smooth heavyweight cotton-based paper (see Paper stock list below). Other inkjet substrates include a variety of transparent films and polyethylene papers with both matt and gloss receiver layers. The most popular paper range in supply is Hahnemühle, which also includes a fine art canvas and a protective spray (see inkjet spray section). Taylor's preference for the smoother papers is due to the majority of artists who use the facilities to produce photographically generated images. Taylor has found that these artists are more concerned with clarity of image, and tend to see textured or off-white papers as distractions to the image.

Paper stock in studio

Kodak Wide-Format Inkjet Media, Premium Photographic Satin Paper / 180g / 36in

Hahnemühle Fine art, Fine Art Pearl / 285g / 44in

Hahnemühle Fine art, Photo Rag / 188g / 36in

Hahnemühle Fine art, Photo Rag / 308g / 36in

Hahnemühle Fine art, PhotoLine – smooth, Photo Rag / 308g / 44in

Hahnemühle Fine art, Matt FineArt – smooth, Photo Rag / 308g / 36in

Hahnemühle Fine art, Photo Rag Bright white MAT / 308g / 44in

Innova, FibaPrint White Matte / 280g / 44in

Magic, Universal Backlit / 24in

HP Premium Instant Dry Gloss Photo Paper / 60in

Colour management

As with the CFPR digital facility, all monitors are colour-calibrated for print on paper, although (and unlike practices at the CFPR) no paper profiles for specific paper and printer combinations are made internally. Instead, generic paper profiles that come with the printer are used. Taylor uses papers that are common to each of the printer manufacturers so there is little need to create 'in house profiles' as the generic paper profiles are considered to be well within acceptable standards. Taylor's position on colour management also concurs with Master Printer Ian Cartwright who I asked the same the same question of when I met with him to discuss the initial proofing of Richard Hamilton's *Typo-Topography of Marcel Duchamp's Large Glass*. Cartwright also does not generate his own profiles because he does not think that it makes a discernable difference. At CFPR, as paper-profiling technology has improved I feel there is, in general no need to generate individual profiles for the more commonly used substrates. However, less common substrates such as canvas or lightweight Japanese papers do require this, as the printers do not have a specific profile for achieving the best results on these substrates.

When questioned about the possibility of purchasing paper profiles for a specific paper and printer combination, Taylor felt that if a profile was to be made then it should be created on the specific printer device that would use the profile. Taylor makes the point that each printer has its own idiosyncrasies and therefore a profile should reflect these rather than the idiosyncrasies of another printer.

Taylor's assessment of print software options is similar to mine at the CFPR, in that the output of each image is processed directly from the supporting software programme (generally Photoshop™) with no external RIP device used for printing. Previous research by Taylor, into the possible use of a RIP has been deemed unnecessary when comparing workflow results against expense.

All images are printed by one individual from one computer that is managed by a specific print technical advisor, with a view to ensuring that no tampering with settings will go unnoticed in a 'closed loop' system (the in-house processing and transfer of digital information). With this in mind, the proofing practice that leads up to the B.A.T print are only known to the Master Printer and for the period in which the image is being printed. When asked about previous print productions and the use of an archiving system for the studio's workflow (in relation to my own CFPR archiving method discussed in Chapter 6) Taylor replied that the functioning of the studio had not yet required such a procedure. In further discussions concerning how applying archiving methods could assist with alleviating the studio's dependence on an individual Master Printer and provide rich dissemination material for the Rijksakademie print facility, Taylor was interested in the potential for this.

Print Coatings

For the majority of digital print studios, including the CFPR, the B.A.T. (g) proof, followed by the completion of the printed edition, signals the end of the printer's role with the artist and the work. The following stage often includes framing and presentation considerations for example coatings or further development of the printed works with other mediums. The Rijksakademie facility provides artists with various possibilities for coating and enhancing the printed image using sprays and lamination methods. The three coating procedures below describe some of the Rijksakademie's finishing systems for inkjet prints as an extension to the digital atelier practice.

Inkjet spray

Hahnemühle Image Shield (see following image) – The spray is designed to protect the surface of the print with no trace of its application within or upon the image.

Coating *Vanitas* in the spray area

The application of the spray is performed shortly after printing in a separate room to the main studio then brought back into the studio to await collection. Taylor explained that within the print studio environment, two of the most common marks found on prints (laid flat) are fingerprints and scuff marks (caused by paper corners catching on printed surfaces, especially black areas). The spray helps protect from these potential marks, and for this purpose the spray is used on top of all inkjet prints produced in the studio irrespective of whether or not the substrate is Hahnemühle.

Lamination

The majority of gluing, laminating and coating inkjet prints normally takes place outside of the digital print department. Gluing and lamination is handled by the Graphics department (Printmaking) and coatings by the Painting department.

Lamination area in the Graphics department
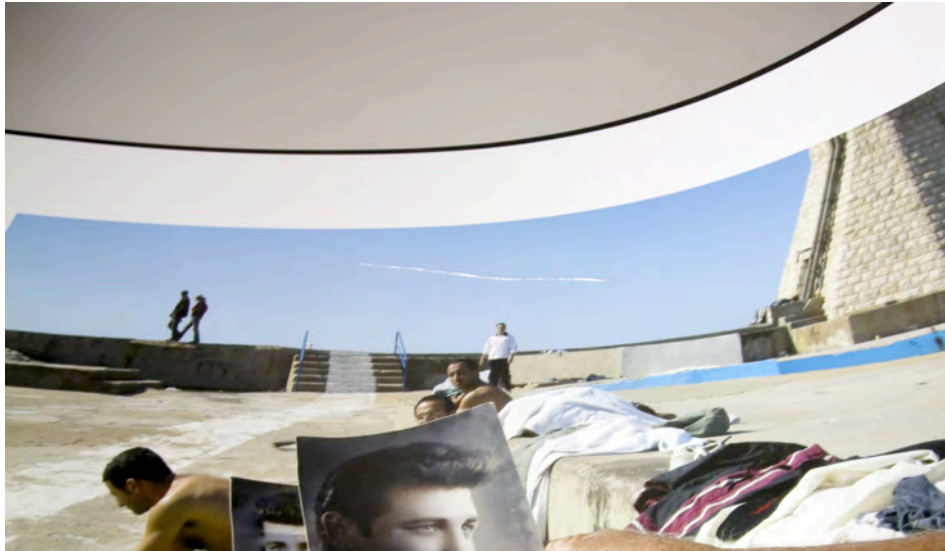
Lamination samples in the Graphics department

The system is mostly used for printed works on polythene papers as opposed to cotton-based papers or single works. This practice of laminating particular substrates of printed artworks is a precautionary measure due to a certain amount of risk involved with the lamination process. The risk mostly occurs during the sealing of the plastic layer to the top of the printed surface, it is at this point that the plastic can easily crease if not guided by either operator through the laminating device.

Skins department

Skins department

Artists can often require the use of multiple processes in a single work, and for this separate departments will work together to realise the artist's aspirations for a specific project. This often includes technical collaboration between facilities in order to adapt processes enabling the transcription to run more smoothly.

The digital print facility, for example, continues to collaborate with the ceramics, graphics (printmaking) and painting departments on a variety of artists' projects. The painting department, also known as the 'skins' department, is the most flexible and sophisticated facility when considering coatings and finishes to inkjet prints. The skins department has a dedicated, large spray room that is used for coating inkjet prints on canvas. This was utilised in a collaboration with CFPR in 2010, when I contacted Taylor to request the use of this expertise to complete the *Shock and Awe* edition for Richard Hamilton, who wanted an archival coating that would protect the surface of his large-scale work.

7.3 Summary

All the technical facilitators at the Rijksakademie specialise in more than one area and Taylor has extensive experience of traditional and digital photography and digital print. A well-planned, inspirational layout of interlinked studios means that production can move smoothly across any area from photography to inkjet print, coating or new media in the electronic department, to combine processes for hybrid print artefacts. Any facilitators involved in production will meet together with the artist to plan the transition from concept to final piece across all areas involved. Taylor and his team are aware that there are many ways to use a single digital file to create a range of final

artefacts although the facility does not yet include rapid prototyping or laser cutting in its repertoire.

The comparative assessment of the Rijksakademie studio's procedures and practices presented many parallels with the development and running of the CFPR digital print studio. The one notable difference was the lack of an archiving procedure that when discussed offered the potential of a significant addition to the studio's production procedures. On reflection, the comparative assessment of the Rijksakademie's *Contract Workshop* model, proved inspirational as an example of best practice for the potential of creating hybrid, digitally generated and printed artefacts, through the way in which the interlinking of processes, the opportunity for artists to experiment across these areas, and the way in which they are utilised to produce the best possible result for the artist.

The Rijksakademie facilities presented a number of production possibilities that normally exist outside of an individual digital print studio, with particular emphasis on surface enhancement and coatings. The Rijksakademie's coating considerations for the digital surface provided an interesting addition to the scope of the digital print studio possibilities. These reflections began to formulate a classification system for the varying levels of digital print facilities that have evolved. The following three examples cannot be definitive as there are many crossovers, but they do indicate what an artist might be accessing when selecting a print studio or Master Printer to work with in the digital age.

Bureau

The most common digital print facility tends to operate in a bureau fashion. In this context there is less emphasis on experimentation and extensive proofing. Instead standard colour management procedures become the primary image adjustment method. The facility predominantly caters for the digital photographic market that is reflected in the work produced by the facility and knowledge an expertise of the facility.

Atelier

This digital facility is more representative of the traditional printmaking studio. The focus of production extends from concerns with surface and materials and will often combine traditional and digital processes. By adopting traditional collaborative practices, the facilities will cater for the complete digital workflow from image capture to the final printed output. With a wider range of resources than the bureau, the atelier facility is likely to take on more adventurous print productions and therefore the expertise of the studio will encompass a broad field of applied practices.

The Digital Print Fabrication Facility - The future

This digital facility approaches print in its broadest sense and subsequently the production possibilities with the latest technologies and expertise will be equally as expansive. From this perspective production expertise may incorporate engineers, colour scientists and computer programmers. Perhaps the term 'digital fabrication facility' may be a more suitable description as the production process is more akin to digitally mediated artefacts that contribute to the discussion and definition of what constitutes a digital 'print' today.

The digital fabrication facility will have all of the attributes from the atelier facility plus:

- Facilities will be expansive; high-end technology for digital capture and rendering (including 3D technologies) with bespoke devices.

- Will reconstruct and refine technology to realise adventurous projects

- May have a background specific to particular digital technologies such as programming, colour science, engineering etc.

The potential capacity to manufacture new materials, software and devices related to the production of printed artworks.

Whilst each of the studios continue the traditional print studio's associations with facilitation tactics and collaborative endeavour, the rapidly evolving nature of digital print technology has had a significant influence upon the above digital print studio definitions, that predominantly vary in terms of technological production possibilities. As previously stated, these technological advances have begun to broaden the possibilities of what a digital print actually is. These developments bring us back to how the new modes of production of inkjet were first used and considered within the context of printmaking, and more importantly how these new developments will be driven and shaped through the concerns of the artists using them.

8.0 Chapter Eight: Process in Practice (The Human Printer featuring The *Print is Dead* series)

Chapter Eight is a response to the advancement of digital print technology that has developed during the writing of this research study. This section will elaborate on the broadening of the term digital print (beyond inkjet) and thereafter describe further production possibilities for the digital print studio and the scope of a 'digital Master Printer'.

This chapter uses my own artwork as a practitioner contributing to the field of printmaking, with a view to reflecting upon the collaborative and technological themes of the PhD study. Within this context, the reflective position is addressed by exchanging printer and artist roles and perspectives as a means to continue the dialogue of print production concerns. It also posits how technological influences may begin to challenge and expand definitions of print, opening possible further areas of research for others.

Having witnessed the collaborative model first hand at the Rijksakademie, from the point of view of the artist[lxv], I was inspired to explore other models of collaborative practice to produce my own artwork. I did this over a series of three artworks to continue my investigation of the notion of the printed artefact in the digital era - as a broader field which encompasses production methods such as laser cutting, print on demand and three dimensional print. The artefacts produced were: *Stretch out with*

[lxv] Please refer to the Appendices: *Rijksakademie Report - Testing the notion of the Contract Workshop model through a collaborative print production at the Rijksakademie's Digital Print facility: 'Vanitas'*

your feelings (2009), *Build it and they will come* series (2010) and *Print is Dead* series (2010).

8.1 Unique Reproductions and Inherent Qualities (Historical Baseline)

Historically within the fine arts print was used as a means to reproduce other works of art such as paintings - a medium with higher status. Although the premise of the reproduction was often for disseminatory and financial reasons, the quality of execution was still important. The reproduction was dependent upon the original source material, the skill of the engraver and techniques developed over the years to transcribe and replicate accurately.

The transcription processes used to produce the *Print is Dead* series differ from the historical rationale for replication in art. Instead the work can be seen as an examination of a process rather than the reproduction of an existing work; elevating the 'reproduction' to the status of an 'original'. For instance, the dependence upon an original source for accurate replication becomes impractical in this context - instead the source image exists as only an infinitely reproducible digital file that is susceptible to a number of transformations in appearance, both on screen and as a printed image. The resulting series of individual artworks can only ever be copies of the original digital file, yet remain unique in their systematic production.

8.2 Print Modellers and Print Fabricators (Practice in Process)
Michael Craig-Martin in conversation with Professor Paul Coldwell in 2009, stated: "I think there are two kinds of artist - modellers and fabricators, and I'm definitely in the fabricator group" (Coldwell & Rauch, 2009: 184).

Michael Craig-Martin's division of artists as either modellers or fabricators positions artists' relationships with making and practice. These relationships are hinted at through the associative meanings of the two descriptions. When thinking about the fabrication of artefacts, there are associations with industrial manufacturing and systematic methods that construct a somewhat detached approach to preconceived notions of originality in the making of art. 'Modelling' assumes a direct interaction with materials and tools that often reveals associations with craft skills, intuition, personal expression and individuality.

The modeller's relationship is often identifiable by a preference for, or affinity with, a particular medium or process in the realisation of an idea. The fabricator's practice tends to be the reverse of this approach - where it is the adoption of a medium or process that is deemed to be most appropriate for a particular idea. These two approaches are not always separate and can be interchangeable as an artist may oscillate between the two methods within a single work.

8.2.1 Craft and Crafted (Realisation)

The engagement with process and making share equal importance within modeller's and fabricator's practice, although there is often an emphasis on the distinction between the crafting of an artefact and the crafting of an idea. With this emphasis in mind, fabricators are more likely to traverse many mediums and processes as part of their idea crafting. This affinity for creating artwork lies in the selection of a material or production method as a means to end. Similarly, this emphasis on the distinction between craft and crafted can be understood in the adoption of a process as a medium or a tool. The 'medium versus tool' position is discussed in Tom Moody's 'Digital Media Tree' blog under the posting *Artist vs Programmer: How Low Can You Go?*

As the title suggests, the discussion develops from whether or not an artist needs to have a technical understanding of a specific medium to realise fully the potential of an artwork in that medium. One comment in response to Moody's post is as follows:

> Perhaps people are confusing these two things: are you using the computer as a tool or as the medium?
>
> When your friend states: "the resulting visual product is what matters." This means he's using the computer as a tool to a visual end. In this sense it doesn't matter, he could be using a pencil or camera or computer or eggplants to get whatever sort of visual "product" he's after.
>
> But if one is using a computer as the MEDIUM (not simply a means to a visual end) then it seems one should have an understanding of that medium. And it's arguable that to understand a computer as a medium you really need to be able to program it.
>
> Then of course we can start talking about using computer networks as a medium...[lxvi]

Moody continues this train of thought by discussing computer-based artworks where the ideas engage with the medium, tool and content within a single work.

This eventually leads Moody to ask whether or not a work can be equally engaged with a medium and its processes without literally being conceived in the medium that the ideas refer to.

8.2.2 Intuitive Systems: The Modeller and Fabricator Continued

The order of the realisation processes - where the idea and its design are conceived first, or through the experiential process of making, an idea is realised - often highlights the associations with intuition. Here the distinction of intuition differs between the modeller and fabricator positions. The affinity with, or expressionistic use of a medium is given value through the modeller's intuitive craft skills, whereas the

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[lxvi] *Artist vs Programmer: How Low Can You Go?* Discussion 10-15-2004 6:28 pm. http://www.digitalmediatree.com/tommoody/comment/29472/Accessed 11/01/2005

fabricator's premeditated production of an artwork uses intuition in the specific design

of a system that allows the work to be realised.

An exhibition curated by Jasia Reichardt at the ICA, London in 1968, *Cybernetic*

Serendipity, introduced the system art of John Cage, Nam June Paik, Brian Eno, Peter

Schmidt and many others to a public audience, with artworks created by artists,

engineers, musicians, poets and architects, using the computer as a means of systematic

production. Writing for the New Museum of Contemporary Art, New York's online

platform Rhizome, the music critic Geeta Dayal's article *Brian Eno, Peter Schmidt,*

and Cybernetics, describes the cybernetic/systems art process as:

> "The discipline of whole systems thinking... a whole system is a living
> system is a learning system" as Stewart Brand put it in 1980. Cybernetic
> systems have been used to model all kinds of phenomena, with varying
> degrees of success – … and many noted artists and musicians have
> derived inspiration from this powerful conceptual toolkit.[lxvii]

The fabricator's system-based method for making resonates with computer-based

operating systems through the adoption of a programming procedure for realising

artworks. Both Tim Head's *Slow Life* 2002 and Tom Friedman's *Untitled* 1999 employ

similar system-based procedures for their work although the resulting artworks are

rendered by hand.

Tim Head's *Slow Life* (2002) is an ink drawing that was created by using a system-

based method to produce the image. The drawing is created according to the results of

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[lxvii] *Brian Eno, Peter Schmidt, and Cybernetics*, Geeta Dayal. *Rhizome*, New Museum of
Contemporary Art, USA. Wednesday, October 21st, 2009 at 1:00 pm.
http://rhizome.org/editorial/3015 [Accessed 15/05/2010]

flipping a coin, if the coin lands on heads, a horizontal line is drawn and if the coin lands on tails, a vertical line is applied. The resulting image bears little relationship to the linear, regimented patterns associated with the binary functions employed in the work. Tim Head describes the work as "unlike the remote precision of digital programmes, the drawings carry the nervous rhythms and seismic waverings of the hand made."[lxviii]

Tom Friedman's *Untitled* (1999) is constructed out of thirty-six dollar bills that were systematically cut into repeat grid patterns prior to being recombined to make one large dollar bill. Each of the squares in the reconfiguration is slightly offset from the other, in an analogue design that evokes the appearance of a pixellated image.

The integration of the hand made and systematic method in these works draws upon our association with appearance, and assumptions about media, tools, modellers and fabricators that have much in common with the *Print is Dead* series.

8.2.3 Summary

The consideration for medium, tool and content are addressed within the *Print is Dead* series although in this instance the work is conceived by thinking about the print medium in terms of a process rather than producing printed artworks; the medium is addressed in relation to print's inherent quality of reproduction, where the POD facility becomes the appropriated tool. The content arises from the seamless integration of digital technology within pre-digital processes, practice and media.

[lxviii] Guide to exhibition *Tim Head: Raw Material*, 2010, curated by Sotoris Kyriacou. Published by Kettle's Yard Gallery, 2010, p.7

The resulting (non-digital) artworks can be seen as a response to Marshall McLuhan's "rearview-mirror view of the world"[lxix] observation, that we are initially numbed by new technology until it has been completely superseded its predecessor. McLuhan states that in this transition period of 'the present', our senses become overwhelmed so much so that we go from the unfamiliar back to the familiar. We attach ourselves to the objects and atmospheres that characterise the past where we feel a compulsion to make the old environment more visible. McLuhan describes this predicament as a reoccurring trait of societies when one considers that:

> At the height of the mechanical age, man turned back to earlier centuries in search of "pastoral" values. The Renaissance and the Middle Ages were completely oriented toward Rome; Rome was oriented toward Greece, and the Greeks were oriented toward the pre-Homeric primitives.[lxx]

8.3 Fab POD (Tool)

The POD (Print on demand) facility is a relatively new addition to the artist's possibilities for producing printed artworks via digital means. The development of the technology is a product of the digital revolution that has democratised the opportunity to self-publish. The democratisation has been possible because of the technology's economic potential to reduce the costs previously incurred through mechanical printing processes such as offset printing. A large percentage of the POD industry caters for book publishing, although there are a growing number of POD facilities that specialise in fine art, digital prints for both artists and publishers.

[lxix] *The Playboy Interview: Marshall McLuhan*, Playboy Magazine, March 1969. The Marshall McLuhan Center on Global Communications: http://www.mcluhanmedia.com/m_mcl_inter_pb_02.html [Accessed 18/10/10]

[lxx] Ibid

From the self-publishing artist's perspective, the process follows a system-based procedure through a set number of options for printing a digital image. These options often include a choice in scale and substrate before remotely uploading the digital image (via the Internet) to a POD facility server. Once stored on the server, the digital image is then downloaded and printed to the previously established print options. Because the digital file can be reproduced and stored indefinitely, the edition size may be left open allowing for further renderings of the digital file at the client's request – hence print on demand.

Is it a game, or is it real? Paul Laidler, 2009. Print Edition: unlimited (hardback and soft cover versions). Process: produced through www.blurb.com

8.3.1 Print On Demand: *Is it a game or is it real?*

As previously stated a large percentage of POD facilities use the book format in conjunction with digital printing. The book work above, produced via the POD facility

Blurb in 2009, is a reinterpretation of David Bischoff's book *War Games* (Penguin, 1983). In this instance the book work is developed from a later edition of the novel that uses the 1983 film adaptation of Bischoff's novel as the cover image. The visual reference of the film as a printed cover image is employed by publishers as marketing tool to sell more copies of adapted novels. Marcella Edwards, senior commissioning editor at Penguin Classics sees the film's influence as a way to tap into new markets. The film image appears to make some classic texts more approachable for these new audiences. Edwards describes this phenomena where the text "becomes less classic, less difficult. You don't need a PhD to read this stuff - it's readable".[lxxi]

The book work is a digitally recorded version of the Penguin publication although the transition from physical to digital becomes pronounced through the flatbed scanning of the books three dimensional form and the pixellated appearance of both text and image. The book has been recorded using the different resolution sizes of 12, 32, 42 and 52ppi (pixels per inch). These resolution settings assigned to the recording of the book are purposely set below the standard amount of pixel information required for reading digital images on screen (72ppi) and in print (300ppi). Here the 'readability' of a text and an image become integrated within the designing and rendering of the book as a visual metaphor for the novel's dystopian undercurrents concerning digital technology and our trust in its utopian design.

[lxxi] *Designs for dollars*, Susie Steiner, the *Guardian*, 5 May 2006, *The Guardian special5*, p 4.
http://www.guardian.co.uk/books/2006/may/05/filmadaptations4
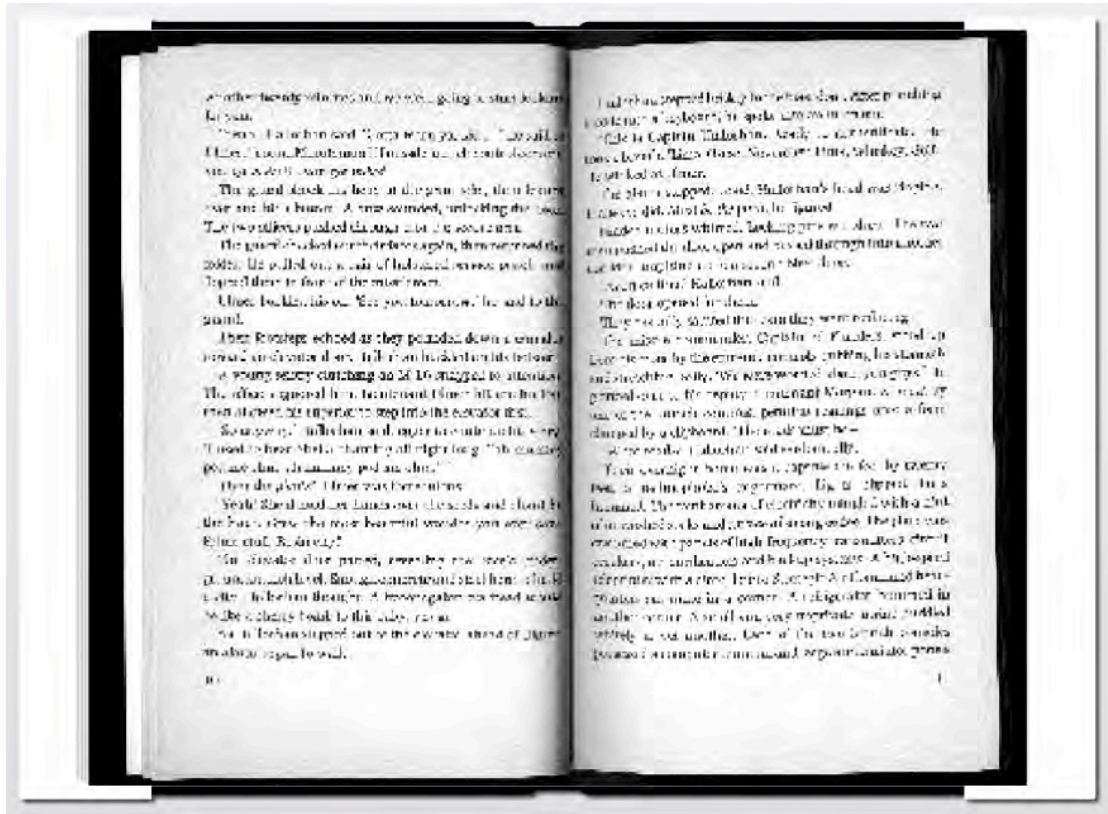
Screen grab from Blurb's animated page reader http://www.blurb.com/books/810224

8.3.2 Digital Facsimile

As well as the physical, printed edition of the book, the Blurb facility also offers a virtual rendering of the book format that can be considered as a digital edition in the truest sense. The electronic format otherwise known as an e-book, allows the user to view the on screen flipping of pages as animated actions that refer to the experience of its physical counterpart. Although the e-book phenomenon engages with the dynamic potential of the Internet and allows publishers to reduce publishing costs, it does not currently provide the best reading experience to the customer.[lxxii]

[lxxii] *Presenting content online: where digital editions fail*, Andrew Davies, February 22nd, 2009. http://idioplatform.com/2009/02/presenting-content-online-where-digital-editions-fail/ [Accessed 03/11/10]

The pixellated appearance of *Is it a game or is it real?* as an e-book initially makes the viewer question the technology as a reliable tool for reading digitised information. Viewed on screen the image appears to have become corrupted, or the correct resolution setting has not been assigned to the digital file. The assumption that the e-book is not a true representation of the printed version is re-addressed once seen in conjunction with the printed, signed edition. As an artist's book, the signature confirms the intentions for the final printed results and the subsequent reading of the physical work as an e-book facsimile. In one sense, the book fails to function before the concept reveals the object's primary function as an artwork that appropriates the formal designs of the book format.

The appropriation and function distinctions resonate with Michael Craig-Martin's thinking of real objects as if they were art. Here Craig-Martin considers utilising the characteristics of objects rather than the Duchampian idea of art by nomination, "The defining aspect of an object is what it is used for e.g. scale, material, look – using their functionality as a device to make art from." (Cork, 2006: 43) However, the resulting book as an art object is not in the strictest sense a direct appropriation of a previously existing object. The work is an appropriation of an object's function that is conceived and realised in conjunction with the object's associated on screen presence.

Collectively, the physical and virtual formats for the work raise issues of 'future proofing'. If unchecked, the digital archiving of paper-based texts can be susceptible to software developments and the migration of digitised information from one platform to another. The compatibility of digital information between old and new recording and display software questions whether we are preserving the past or distorting it.

8.3.3 Getting Physical With The Digital

The design for the book *Is it a game or is it real?* was developed from the film's association with digital technology, but more specifically the technology's pixellated appearance in the 1980s. Some thirty years later, the visual association with the pixel has become a retro-aesthetic, as the rendering potential of digital information has essentially concealed its computational source. The production of the book is therefore a seamlessly digitised rendering of the technology's pixellated past. Here the collaging of pixel resolutions within a ppi (pixels per inch) determined virtual image space, forces us to get physical with the virtual, in so much as a digital image only displays a single resolution setting at a one time.

The scans of *Is it real, or is it a game?* were printed and rescanned physically create the digital image prior to realising the work as print on demand. The book's physical creases and folds also became digitised, layered within the surface of the book's cover. Producing *Is it real, or is it a game*? through the POD facility Blurb, highlights the relative ease with which one can copy, reproduce, store and send digitised imagery without any concern for origins or authenticity.

8.4 Fabbing (Method)

As previously stated, digital technology has extended the possibilities to self publish through the POD facility. During the POD facility's short existence, the rendering potential of digital information has developed from 2D to 3D print. Manufacturers creating models or prototypes have predominantly used this resource for industrial purposes, although facilities such as Shapeways (www.shapeways.com) have adopted the mass customisation approach to enter consumer markets, producing 3D objects

such as sculpture and jewellery to order. Digital fabrication is now often referred to by creators as 'fabbing'.[lxxiii]

The democratisation of digital technology and the marketing potential of the POD facility developed the idea of the 'personal factory, where you can make almost anything – including electronics, homeware, fashion and furniture'.[lxxiv] Consumers in search of bespoke designs can now access digital fabrication technologies through companies such as Anyline, A.R.T, imaterialise, Ponoko and 3DDC using a range of Laser cutting, rapid prototyping, 3D rapid printing and surface coating options.

Although the *Print is Dead* series does not directly use digital fabrication technology, the artwork *(order272)completed.jpg* shares similarities with the fabrication process as part of the artist-fabricator approach to making. These associations consider manufacturing as part of a systematic method to making, by employing the technical skills of others to help realise the work and the use of the prototype as an 'in between state' that informs an idea.

Unlike most POD facilities that produce printed images for clients, the two facilities selected for *The Print is Dead series* use the hand-rendered methods of painting and drawing as processes to reproduce a digital image. Both The Human Printer and Odsan function in the same manner as a POD Company.

[lxxiii] See: *Means of Production: Fabbing and Digital Art*, by Greg J. Smith on Rhizome for discussion of the term http://rhizome.org/editorial/2400 and The Fab Lab programme - part of MIT's Center for Bits and Atoms (CBA) for research in digital fabrication http://fab.cba.mit.edu
[lxxiv] http://www.ponoko.com/make-and-sell/how-it-works

Paul Laidler, *Print is Dead Series*, Image of digital (source) file, 2010

8.4.1 Replica Factory (Inherent Production Quality)

(order272)completed.jpg is an oil painting on canvas produced through Odsan Oil

Painting Gallery in Dafen, China. The company is one of many in the region that

employ academy trained artists within a factory-line approach to reproduce vast

numbers of old master oil paintings. The act of copying great masters' works by artists

has been a continued practice throughout the ages. Conventional practices have often

required that artists access the original painting to capture the intricacy, scale and

presence of the work. Although I do not profess to being a master artist, the idea of

having a work reproduced in paint that follows none of the traditional means of

reproduction was what interested me for the purposes of this research study.

8.4.2 Printed Paintings (Artist as Director)

Paul Laidler, *(order272)completed.jpg,* 2010

The Odsan Gallery's reproduction process functions in the same manner as the POD facility when offering a client the possibility of 'self-publishing'. This involves the transfer of a digital image that is rendered to the specifications of the client. *(order272)completed.jpg* was created from a digital print made from the low resolution digital file that was requested by the Odsan Gallery to create the artwork. In this situation, the rendering is by hand, not restricted to the scale of a print device and can be reproduced in a range of different painting styles. The resulting painting for the *Print is Dead* series, is a photo-realistic style reproduction of the digital print that was used as the source image for the work.

Although the process generates a painting I consider the paintings as prints. In this sense the work aligns itself with the curatorial premise behind the Philagrafika Print Exhibition *The Graphic Unconscious*, with works by 35 artists from 18 countries, held at five consecutive venues in Philadelphia, 2010. The Artistic Director of Philagrafika, José Roca described the curatorial team's[lxxv] assessment of print within in a broad context: "we consider a print anything that had three components: a matrix, a transfer medium, and a receiving surface [...] The matrix stores the necessary information to reproduce; the medium transfers the information, and the support receives it. All kinds of contingencies can alter the outcome of the process and often enrich the results." [lxxvi]

For *(order272)completed.jpg* the matrix that stores the necessary information is a digital file; the medium that transfers the information is oil paint, and the support that receives it is the canvas. The contingency emanates from the printed reproduction of the source image - that contains a magenta hue produced by the printing of the digital file.

[lxxv] Curated by José Roca, Artistic Director of Philagrafika 2010; John Caperton, Curator of Prints and Photographs at the Print Center; Sheryl Conkelton, for Temple Gallery, Temple University; Shelley Langdale, Associate Curator of Prints and Drawings at the Philadelphia Museum of Art; Lorie Mertes, Director/Chief Curator of The Galleries at Moore College of Art & Design; and Julien Robson, Curator of Contemporary Art at Pennsylvania Academy of the Fine Arts.
[lxxvi] José Roca, *Prints, or Contemporary Art?* Philagrafika 2010, Concurrent with Southern Graphics Council Conference 2010, Philadelphia, USA. http://www.philagrafika2010.org

Scan of the Odsan Gallery's print proof (21 x 28 cm) for the *(order272)completed.jpg* painting, 2010

The inclusion of the colour cast in the painting should not be seen as a fault with the reproductive artwork but as a reminder of the parameters of the tools and processes we use. In his article *The Aesthetics of Failure*, the American composer Kim Cascone discusses the positive outcome of imperfection:

> Indeed failure has become a prominent aesthetic in many of the arts in the late 20th century, reminding us that our control of technology is an illusion, and revealing digital tools to be only as perfect, precise, and efficient as the humans who build them. (Cascone, 2000: 13)

Despite the absence of technological production in the appearance of the *(order272)completed.jpg* painting, the association with the reproductive process aligns itself to the content of the work. The possibility of an indefinite number of copies remains, although the reproductive endeavour is one of human automation or human printers.

8.4.3 A Namesake Production

 "We shape our tools and thereafter our tools shape us." (McLuhan, 1964: 130)

The Human Printer.tiff version for the *Print is Dead* series was produced by a group called The Human Printer. The group consists of eleven individuals who specialise in reproducing by hand, the digitised rendering of a half-tone image that is normally associated with mechanical print processes. The Human Printer group has adopted the remote Print-on-demand facility for transferring digital files, although the potential to rapidly produce large editions is somewhat limited due to the extensive labour involved and the small-scale production of the studio. *The Human Printer.tiff* took just over two weeks from order to receipt.

In keeping with the mechanised half-tone print process, the digital image is printed as colour separations using the four printing channels of CMYK. To produce the final drawn image, each colour separation is traced individually on to a single sheet of semi-transparent paper so that collectively the channels register with one another. The layering order of each colour follows the half-tone print procedure using four different coloured pens that correspond to each of the separate colour channels.

Paul Laidler, *The Human Printer.tiff,* 2010

Unlike *(order272)completed.jpg* which is, and has the appearance of, a painting, the

Human Printer.tiff looks mechanical/digital but is not, it is hand rendered in pencil.

I noticed on receipt of the *Human Printer.tiff* that it had been signed by Louise

Naunton-Morgan. I emailed my order to The Human Printer's generic email address on

the website (http://www.thehumanprinter.org) with my request. The response to my

order was from Louise Naunton-Morgan, so I was aware that she would be drawing the

image for me, but thought it would just be returned either with The Human Printer's

chop mark, or unsigned. As the initiator of the concept, and my perception of

Naunhton-Morgan as the print device, did her signature now mean that she was the

creator of the artwork? I decided to email her and ask:

On 28 Sep 2010, at 10:34, Paul Laidler wrote:
Hi Louise,
Received the drawing this morning and it looks great. Have just put the cheque in
the post so it should be with you soon. I noticed that you have signed the image
which got me thinking... is The Human Printer a service (like a print bureau) or
is it more along the lines of an individual (me) commissioning a particular artist
(you)?
Many thanks
Paul

28 September 2010, at 10:41, Louise Naunton-Morgan wrote:
It is set up as a service - though I have recently started to sign the prints
especially for prints that are completed just by me alone. I guess it would make
more sense to sign them the human printer. I am glad that you like it.
Thanks
Louise

26 October 2010, at 21:53, Louise Naunton-Morgan wrote:
Hi there Paul
Hope all is well. I completely forgot to take a photograph of the print I did for
you - would there be any chance you could so that I can put in on the website?
Many Thanks
Louise

On 27 Oct 2010, at 10:53, Paul Laidler wrote:
Hi Louise
I was about to contact you actually so this is a pleasant reminder.
I am currently writing up my research and have included the drawing you
produced for me as part of my practice-led work (including a bit about The
Human Printer as a resource for producing artworks). Prior to handing in, I was
thinking of posting an edited version of this text on my blog and was wondering
if it was possible for you to put a link from the Human Printer site page (that
contains my skull image). After our previous conversation about the signing of
the artwork I was wondering if you wouldn't mind if I signed the drawing as
well? I have scanned the drawing rather than photographing and have attached
the image to this e-mail. Let me know what you think about the above.
Kind regards
Paul

27 October 2010, at 16:10, Louise Naunton-Morgan wrote:
Hi Paul
Yes I think you signing it makes a lot of sense. I am going to suggest this from
now on! Putting a link to your blog would be fine. I am happy and flattered to be
included in your research. Thanks for the picture.
Louise

In the spirit of collaborative artwork, the 'machine' with which the artwork was

created has been acknowledged in the case of The Human Printer. From my initial

visual survey for this thesis I often found that accreditation had not been given to

printers at all. I have found hardly any evidence of which print studio, or printer

actually produced the artwork, especially for digital prints, which made my search

quite frustrating. Most listings for digital prints credit only the artist, or the artist and

the publisher. This difficulty in ascertaining where prints were produced and by whom raises issues not so much of acknowledgment, but for documentation of authenticity. If each part of the production process is properly documented and the information is archived, the means of establishing authenticity is readily available for museums, collectors and researchers.

8.4.4 The Need for Speed (Processing Content)

Associations with process and processing are a core component within the *Print is Dead* series. The Human Printer facility approached the print process through the appearance of mass-produced imagery whilst the actual processing/labour of the image subverts any association with rapid production. The preconceived associations of speed through image and process in the work, share similarities with Christiane Baumgartner's large-scale woodcuts.

Baumgartner records photographically news footage from television screens, which is then transferred onto the surface of a wood block before being cut over a number of months. Like The Human Printer facility's production method, Baumgartner's production process is labour-intensive and time-consuming which provides the contrast between the TV aesthetic - and our viewing association with the medium's speed - and the actual hand rendered artefact.

Unlike the Odsan Gallery reproduction of the *Print is Dead* digital image, The Human Printer's transcription process includes the visual descriptions associated with reproduction through the mechanised image. The Human Printer's rendering of a coarse photographic half-tone and its associations with automation are reminiscent of

Andy Warhol's 1963 comment "I want to be a machine" (Wilson 1968: 13). Further overtones of convergence between humans and technology reference a (hypothetical) post-human future where a biological generation of humanity ends and technological one begins. The influence of science and technology upon the human condition has been a constant source of inspiration for the field of science fiction. In more recent times, the fictional associations with phenomena such as implants, smart materials and cloning have accelerated the science fiction world towards our own.

The idea that a fiction can become functional through an associated process has been incorporated in to the selection of a specific technology for the work entitled *Stretch out with your feelings*.

8.5 An Art of the Surface (Form Follows Fiction)

Stretch out with your feelings was created as part of a continuing fascination with the oscillations between image and object - fact and fiction. I have an interest in the role of film props and replicas; where our associations with these objects are generally through their 'on screen' image presence. From this position the film prop becomes an object that is preceded by its image, and as such the object is able to traverse fiction and reality when we consider the fact that a prop can be described as 'real fictional' object.

The oxymoron association with the object is transcribed into the making of the work by using the opposites of surface and depth to visually describe the interplay between

object and image, reality and artifice. The relevance of print as a medium for the work resonates with Dr Ruth Pelzer-Montada's description of printmaking as an art of the surface that has cultural connotations of surface and depth within western thinking. In an essay *The Attraction of Print - Notes on the Surface of the (Art) Print* published in the Art Journal, she writes: "Put simply 'surface' tends to be conflated with the superficial and the artificial, 'depth' with their counterparts, 'deep' meaning and 'the real.'" (Pelzer-Montada, 2008: 74)

In this instance the surface relates to the fictional component of the work (the object as an image) whilst the physical depth of the image alludes to the real. Here the contradictory source for the work reveals the image simultaneously upon, and within the surface of the substrate.

The orb image depicted in the photo (see following image) was cut with a laser into a black heavy weight cotton based paper by Paul Sandameer at UWE Bristol. The image is of a 'Jedi training remote' from the film *Star Wars* (1977, George Lucas). Here the training remote image is only visible because of the different surface depths that are burnt by the laser into the depth of the paper. This means that the orb image is described only by the darker fibres that sit beneath the (slightly lighter black) surface of the paper.
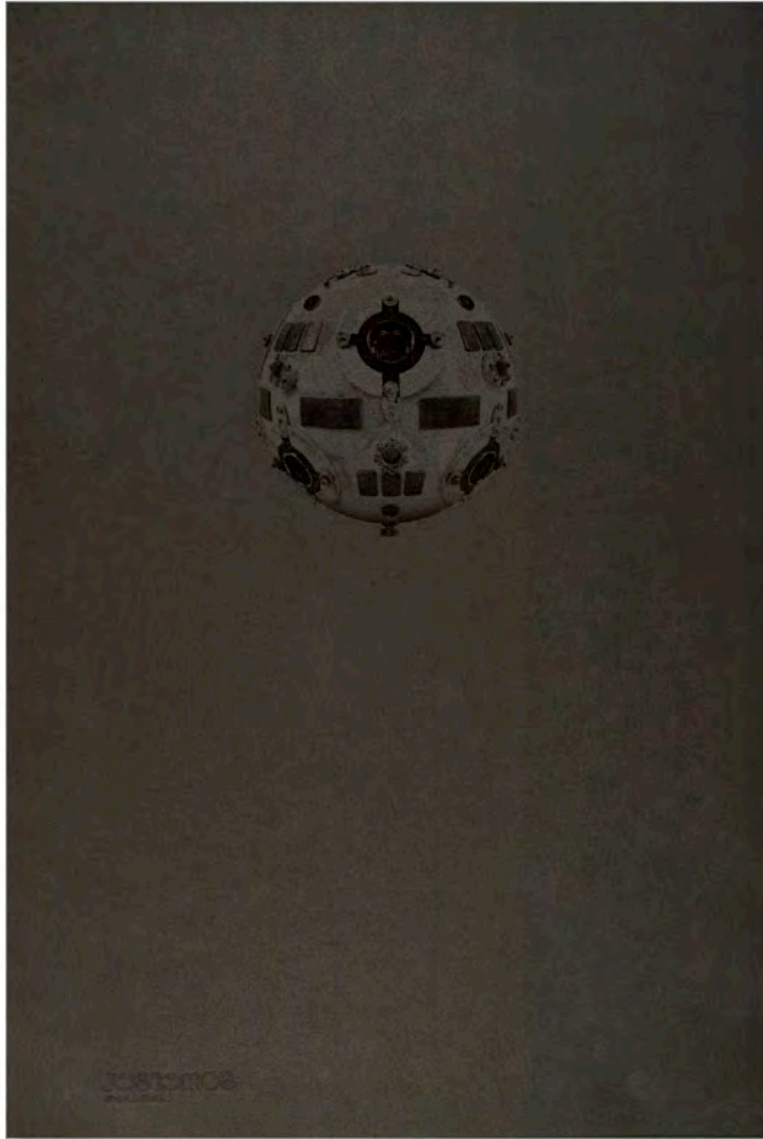
Paul Laidler, *Stretch out with your feelings,* 2010. Laser etching on Somerset Black paper.

Stretch out with your feelings was exhibited in *Drawing with Fire: An exhibition of laser cutting by book and paper artists*, as part of a CFPR, AHRC supported project exhibition at UWE, Bristol (14 - 23 September 2010, and touring). I was also invited by the curators Eva Moseneder and Marta Raczek to exhibit the work at the *International Experimental Engraving Biennale* (IEEB) in Timisoara, Romania (20/11/2010 – 30/01/2011), after they noticed the artefact on my online notebook at:

http://justpressprint.blogspot.com[lxxvii]. I created this site in 2008 as a virtual notebook to publish some observations and examples of digitally-conceived artefacts as a means of engaging with the 'art' in digital practice. IEEB presented twenty-eight artists' works of serial art made by mechanical, digital reproduction, classic but re-contextualised printing techniques, computer based technologies, video interventions linked to the printing process, printed objects, book objects, installations or video actions/performances of new ways of printing, multiplying, deteriorating or modifying images" (www.experimentalproject.ro).

The concept of *Stretch out with your feelings* was that of fiction informing reality. Upon our first encounter with the 'Jedi training remote' in the film *Star Wars* (1977) we find Luke Skywalker struggling to focus his Jedi abilities during the laser training exercise. It is decided that Skywalker should be blinded - allowing the force to guide his actions instead of his eyesight - or should 'let go of his conscious self'. Now blinded by 'the blast shield' Luke sees nothing except darkness (black paper) and by using the force Luke is able to render the object's image in his mind (the image on the black paper). Although in his mind's eye the object is devoid of physicality, Skywalker has the ability to sense the training remote's presence in a space (the laser cut depth within the flat space of the paper). The realisation that *Stretch out with your feelings* is essentially both image and object creates a sense of mystery around the work's visual presence, perhaps drawing further parallels with the order of the Jedi Knight.

[lxxvii] http://justpressprint.blogspot.com/2010/03/stretch-out-with-your-feelings.html

In this instance, laser cutting technology was used to initiate the traversing between fiction and reality, creating a 'real fiction' where the artwork is literally formed by an aspect of its fictional reference; the laser cutting technology refers to both the Jedi remote's fictional function (shooting lasers at Skywalker) and the technological process that renders the Jedi training remote visible. *Stretch out with your feelings* is a self-referential play with new technology - printing with a laser cutter, and the subject matter of a fictional world draws art's attention to the rapid advancement in science and new technologies. What was once thought to be only possible in science fiction is now becoming 'science faction'.

8.6 Series Versus Edition (Image and Object Collaboration)

A continuation of the influence of film and new technologies in the production of printed artworks was developed further in *Ray Kinsella*. This piece was produced as part of the series of artworks *Build it and they will come;* a collaboration between myself and the artist Brendan Reid that refers to architectural practice within a fine art context. The work contains a series of four quotes that have architectural connotations and are printed using rapid prototyping technology to create three dimensional, text-based objects. The three dimensional printing process is used as device to create a series of self-referential dialogues within the work.

For example the three-dimensional printed text of Sol LeWitt's statement "The idea becomes a machine that makes the art" (Sol LeWitt (1928-2007), in "Paragraphs on Conceptual Art", *Artforum*, Summer issue, 1967) refers to both idea and process. Here the rapid prototyping process is used for its industrial function - as a machine that produces prototypes rather than creating final artworks. The technology is commonly

used in architectural practices to produce concept models/ ideas, which makes the

three-dimensional printing device essentially an 'ideas machine'. In this instance the

machine becomes an idea that makes the art. Reid and I share a mutual interest in the

oscillation of two-dimensional and three-dimensional graphic forms, and we approach

this from both perspectives. The fine art context emanates from collaborative practice

in art and the ensuing self-referential play between image and object, process and idea.

Paul Laidler & Brendan Reid, *Ray Kinsella,* Pigmented Inkjet Print of 3D print, 2010

From these dual perspectives, *Ray Kinsella* exists as a series of artworks that include

3D and 2D printing methods. The marriage of these two spatial and graphic concerns is

alluded to through the photographic recording of the 3D print, both upon and within a

2D printed surface (see illustration). With this in mind photography is not used as a

means to document objectively the physical work, in the same way for example as

Hugh Sanders (see 4.5 case study: Hugh Sanders – *Delivery Entrance*). Instead the photographic recording is indicative of a 'photosculpture' that utilises the inherent qualities of photography to recreate the sculptural form anew.

Ray Kinsella (played by Kevin Costner in the 1989 film *Field of Dreams*), a crop farmer, is walking through his field one evening where he hears a voice uttering the words 'If you build it, he will come'. After pondering the meaning of the words, Kinsella decides to construct a baseball pitch in his cornfield despite the financial risks to his farm and family. Not completely sure why he is making the pitch, the compulsion to do so outweighs any thoughts of purpose for, or economic return from the pitch. The compulsion to make has many parallels with art and its intended function (to be received by an audience). Towards the end of the film the baseball pitch becomes an attraction as it is deemed that 'people will come'. *Ray Kinsella* was the first text piece that initiated the *Build it and they will come* project, and as with the film character Ray Kinsella, the work had no intended audience, it was just a feeling that something had to be realised. The realisation was due to the fact that for the idea to function as an artwork, it had to be more than an idea. As an idea the words 'build it and they will come' remained a solitary and silent voice. For the idea to be 'heard' the text requires audience participation, therefore the work refers to itself as an object for exhibition - to physically exist in a space where 'people will come'.

Paul Laidler & Brendan Reid, *Ray Kinsella s*creen grab image, 2010

The design and photographic recording for the 5cm^2 text block was developed using an open source software programme called SWTSG 1.2.1. This specific software allows users to modify and generate the complete animated title sequence for 20th Century Fox credits. The image above was captured as a screen grab before being printed framed and presented in the style of an LCD screen. Both the 3D printed text piece and the wall mounted printed were exhibited at the *3D2D3D: Object and Illusion in Print*, at the Edinburgh Printmakers Gallery, 18th Sep - 30th Oct 2010.

Paul Laidler & Brendan Reid, *Ray Kinsella,* Laser Jet print dry mounted between black
Perspex backing and clear acrylic, 2010

Another three-dimensional printed artefact in the series, references more specifically the notion of art collaboration, and is a printed quote "This town ain't big enough for the both of us" produced as an artwork titled *The Western Code* (in homage to the first time this phrase was used, spoken by the character Nick Grindell, in the film *The Western Code*, 1932). The work itself poses a question - can artists really collaborate given the individual status assigned to the discipline? Art's association with individual expression as the highest form of originality has devalued the collaborative venture in art. Art as a discipline is predominantly taught from an 'individual' perspective and historically the making of art is steeped in self-indulgence and vanity. Unlike art, the acceptance of collaboration as a means of making is a common practice within architecture. 'This town ain't big enough for the both of us' intends to bring to the foreground art's collaborative dilemma as a means to 'build' a successful collaborative work.

8.7 The Printed Reality

As an extension of my exploration of collaborative print at the Rijksakademie and the subsequent further development of my own practice, and interest in, the recorded image using two and three-dimensional depictions of reality, I curated an exhibition in September 2009, which was presented as part of *Impact International Multi-disciplinary Printmaking Conference,* UWE, Bristol UK, 16/09/09 - 21/09/09.[lxxviii]
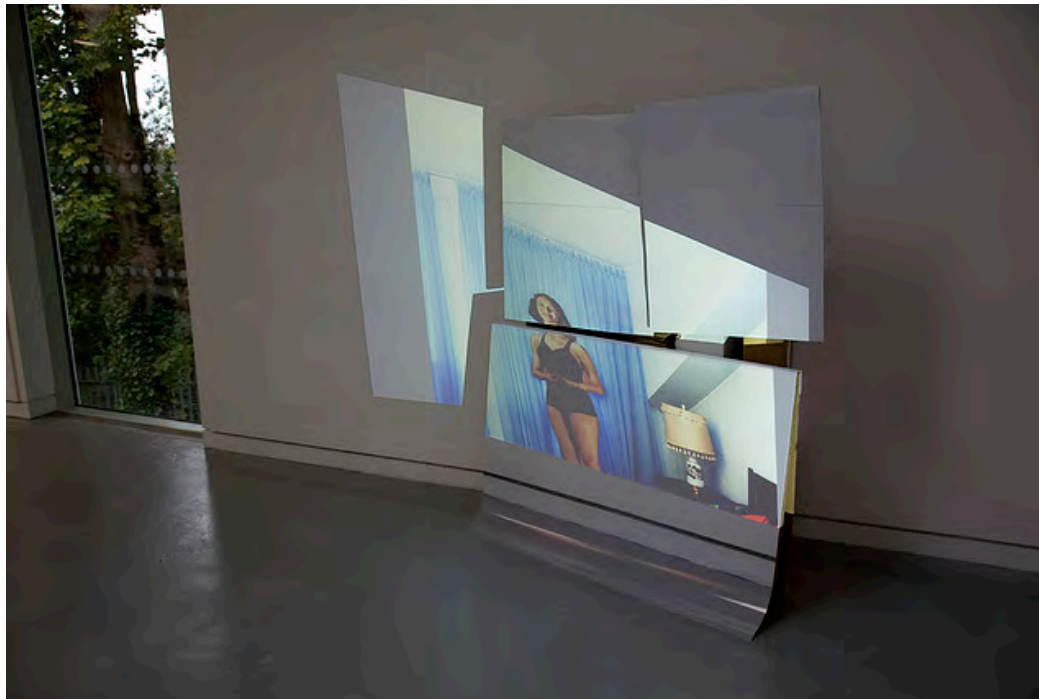
The Printed Reality exhibition installed at Impact Multi-disciplinary Printmaking Conference, September 2009

The Printed Reality exhibition presented photographic works within a gallery installation setting, by seven artists selected from the group I created in June 2007, on the flickr Internet photography platform.[lxxix] I founded the group as a means of extending contributions from and to my research into print, and the notion of creating an environment of two-dimensional projections unfolding from three-dimensional

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[lxxviii] http://www.uwe.ac.uk/sca/research/cfpr/staff/paul_laidler/profpractice/exhibprintreality.html
[lxxix] The *Printed Reality* group's 397 photographic recordings containing print and 'reality' can be viewed at: http://www.flickr.com/groups/644896@N24/

beginnings. The flickr group currently has 85 members, and postings to the group can be made under the broader art themes of portrait, landscape and still life. For the purposes of the group it should be clear which of the photographic capture is the printed artefact and which bit is the recorded 'reality'. The invention and subsequent development of the printed image has changed the way in which we learn, see and describe the world around us. Within the *Printed Reality* group, the interplay between image and object is not a seamless transition but one of artifice, theatre. Here the recorded image functions as a backdrop, a stage prop positioned and presented in such a manner that we are readily accepting of its fictional role. The performance emanates through the recording of edges and folds, casting both shadows and omitting reflections from an external world, a reality not of our own but somewhat more representative of our own.

8.7.1 Photography 2.0

The Printed Reality exhibition was conceived as a way to bring together the physical and virtual gallery space, presenting imagery that documented the recording of photographic and physical space. As part of the physical-virtual gallery merger, *The Printed Reality* exhibition dispensed with conventional and established printmaking exhibition formats. There were no artists' prints, or any traditional hanging and framing methods in the show; all images were digitally projected across a 'site' specific structure situated at an angle to the gallery wall.

The artists were invited through the group created at flickr, where the participant's work commented upon print but had little or no concern for surface tactility, process or materiality. The overlapping of image and presentation in *The Printed Reality* show

was conceived as a way to create further merges between collaboration, curation and artwork. The exhibition was later featured on the *Printeresting* website.[lxxx]

To utilise the Internet as a platform for the viewing of and dissemination of my own practice and that of others artists exploring these themes, I created a series of four groups on flickr from 2006. The first group I created was *Verisimilitude* in October 2006, which currently has 44 members[lxxxi] The focus for this initial group was that of the appearance of reality, and is centred round the premise of how we have learned to see and understand the world through a variety of different media. I have always been intrigued by the effects of image mediation upon our perception of 'reality' and the subsequent blurring between reality and fiction. The classic examples within flickr are often cited as a photographic recording that has the appearance of a painting, film or a 3D rendering programme. However there are many other possibilities with which this hyper-real phenomenon can be presented. It was from this group that I extended the focus through the other three specific groups to engage with other artists interested in the same subjects and concepts. In July 2008, I created the group, *SUBLIME STRUCTURE featuring Romantic Deadpan*, which currently has 160 members[lxxxii]. The idea for the group developed from Sol LeWitt's statement "Photographs make the grand trivial and the trivial grand" (Marcoci & Batchen, 2010: 31), and showcases artists' images relating to themes I explore through my own prints such as *Crewde Attempt,* produced as a test piece at the Rijksakademie in January 2009, (see following image).

[lxxx] http://www.printeresting.org/2010/03/06/the-printed-reality/
Posted by RL Tillman on March 6th, 2010.

[lxxxi] 95 images from the *Verisimilitude* group can be viewed at:
http://www.flickr.com/groups/54366210@N00/

[lxxxii] The *SUBLIME STRUCTURE featuring Romantic Deadpan* group's 1,197 images can be viewed at:
http://www.flickr.com/groups/970916@N24/

The original image was created at the AKI/ArtEz Academy of Arts in Enschede, The Netherlands, during an Erasmus intensive programme called *Borders of Perception* (19th - 30th May 2008). The portable toilet trailer in the foreground of the image was provided to cater for the 80+ participants in the event, who camped on site over a two-week period.

Paul Laidler, *Crewde Attempt,* Pigmented inkjet on backlit film, 2009

The work questions visual and contextual 'perceptions' of beauty using romantic and picturesque devices to conceal the actuality of a situation. The *Crewde attempt* image also references the work of the American photographer Gregory Crewdson, after seeing his exhibition *Twilight: Photography in the Magic Hour* at the V&A Museum in December 2006. Crewdson often uses elaborate cinematic production methods (stages, lighting, actors, crew) to create what he calls 'frozen moments' that lure the viewer's gaze. The *Crewde attempt* title is therefore used as an abbreviation to refer to the low-

budget production, pastiche association and comment upon the facilities offered to the participants in the Erasmus programme.

Lastly, I created the *Textimage* photography group on flickr in October 2008[lxxxiii], inspired by John Baldessari's 1966 text-art statement painting: *A word can't substitute for an image but is equal to it.* The group has 86 members who post images where text has become image, and was created to explore these themes in the same way that I used to produce the collaborative piece *Ray Kinsella* (2010) with Brendan Reid. With this concept of text as image in mind, images posted are looking to copy a few things from 'image's language'. Although we realise that as soon as text is transferred into image's domain (e.g. via a recording device) it does essentially becomes an image. These have been useful platforms for presenting some of my explorations around the concept of print that relates to my own practice and the printed reality, and to elements of creative collaborative practice in this PhD study. They allow me to present examples to a wide audience, and also to view works by others in related areas, through sharing artworks and ideas via an online community.

8.8 Summary

As previously stated, the art works in this section were discussed in relation to the printmaking themes that this study encounters. Here the discussion emphasises the 'making of art' before the 'art of making', the latter being the focus for the artists' case studies chapters. At the same time, the artwork also reflects upon the context of its production through associations with time, environment and collaboration.

As a full time researcher in the field of fine art print there is often little time to develop

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[lxxxiii] The *Textimage* group's 547 images can be viewed at: http://www.flickr.com/groups/933195@N21/

or labour over the making my own artwork. By reflecting upon this situation, both the conception and production of the artwork incorporated the use of external and collaborative production methods as a time saving device. Similarly, the digital print environment at the CFPR has had an influence upon the content and aesthetics of the work.

The introduction of digital technology at the CFPR has had a direct result upon the designing of the environment in which the hardware and software is situated. The digital print room is a clinical space, housing uniform structures that are essentially constructed from plastic and aluminium surfaces. Beneath the surface each device conceals its function through an interconnected network of electric circuitry that is accessed through the pushing of buttons and reading of surface displays. The influence of this environment upon my work did not occur to me until the artist Neeta Madahar asked if I had always been interested in technological aesthetics and fiction based themes. Without really thinking about it - and whilst looking around the room,
I replied that it seemed inevitable given that I would make the kind of work I do as
I practically work on the bridge of the Starship Enterprise.

The interaction with artists on the residencies, and colleagues at the CFPR has had a direct result upon the artwork I have produced over the last few years. In this sense the work resonates with Joann Moser's pluralist theory (page 54) of collaboration, where without this period I may never have made certain conceptual leaps in the work produced. David Shapiro and Joann Moser's previously stated views that art is collaborative in nature, disagreed with the Romantic notion of the individual 'genius'. Moser highlighted the particular collaborative exchange where an artist relies on the

hands of another to execute the work, which was most prominent within the traditional printmaking studio. This continues to be relevant in the contemporary digital print atelier, where the skill is of the Master Printer remains in his or her ability to negotiate successfully, the transfer of an image from one space to another.

During the production of the art works in this chapter, I was able to reflect upon the role of the Master Printer in the digital age. Whilst looking at the production possibilities of new, non-inkjet technologies in this sphere and reflecting back upon the core of this study, I asked some of the people I consider as pioneers of the digital atelier about their views on the future. I asked each of them, bearing in mind the rapid expansion of technology; for their projections of what the digital print studio might evolve into over the next twenty or thirty years, and what could it be producing for artists. I also asked what they would imagine to be the key skills for the digital Master Printer of the future. Here are some of the edited responses.

From David Adamson of Adamson Editions, USA:

> Given the exponential expansion of print technology it is almost impossible to forecast 20-30 years ahead. If you realise that we went from crude single bit monochromatic displays to full color HDR images viewed in 16-bit colour in a matter of 5 years (1985 - 1990)… who knows?

> Let me guess 20 -30 years from know, will we need images on physical substrates such as paper? Let's say yes, given this I would see machines of similar format but capable of delivering slightly higher resolution and colour gamut and the ability to print on any substrate not just specifically coated papers. We already have machines that can print white ink and metallics but at a relatively low resolution, I think we can see these entering the market at much higher resolutions.

> Of course the rise in other types of digital printing devices will be mature in 20 years so we will see studios adopting the use of laser and three dimensional printing devices to service the needs of artists in making multiples and all of these will migrate down to the desktop level at consumer pricing.

In terms of skills for the Master Printer of the future I do not think that will change, obviously it is a much faster changing field, I studied as a master lithographer - a print technology that did not substantially change in 200 years so one learned the craft and that was that. Today one has to completely immerse oneself in all emerging technologies. … Given that one can do this then the skill that is and always will be paramount, is the ability to collaborate and discreetly manage the artist's wishes in the translation of the idea into a concrete form.

From Dr Brian Gilkes of Pharos Editions, Australia:

Software will continue to evolve, which will further opportunities for collaborative printers to utilise their skills to assist artists. I would expect more dedicated and targeted applications by small companies such as we have seen with the Serendipity Mega-RIP, Astra Image deconvolution, Joseph Holmes colour spaces, OnOne's Genuine Fractals. There are, and will be, a lot more.

Perhaps more important for printmakers and artists is the way the new technologies are used to facilitate and further the artist's intent, and realise possibilities that the artist may not have envisaged. Convergence and extension will continue. Initially with the advent of digital controls, printmakers from intaglio and painting backgrounds started to incorporate photography. Then around 5 years ago I started to work with sculptors and performance artists who were recording their works photographically, often with added elements… Sound and light are also now being integrated. Increasingly the Master Printer is being required to assist and often produce these events for the artist-director. Thus contribution is added to facilitation, which brings me to the answer your next question.

The key skills will be the ability to develop intelligent strategies to use media, hardware and software to further and manifest art directions and outcomes.

As in many cases in traditional printmaking, for example intaglio and silver halide, an accepted base of common skills (ability to see tones, colours, use equipment etc.) enables operation at a basic level, but that's colour lab stuff, not fine printmaking. I think Master Printers will have, and be known for, personal individual skills - like film directors. To develop these skills will (and does) require a lot of time dedicated to research. That research needs to be practical and theoretical. The practice needs experimentation in software application and pathways. It also require constant appraisal of new equipment and media. Theory, like practice needs to diffuse interdisciplinary boundaries. Art theory now incorporates psychology, anthropology, history, literary criticism and more. This implies opportunities for universities such as your own. I must say that to date this type of education is thin on the ground in Australia.

From Roy Taylor, Rijksakademie, The Netherlands:

> Your first question about the future is a difficult one. In 1989 I was the recipient and user of the first computer in the Rijksakademie; a Commodore Amiga, with no hard disk and 265k memory, and no printer to go with it yet. That however was only 21 years ago, so you can imagine that in another 30 years time, there will be a revolution in the digital print studio. Perhaps we will be producing three-dimensional prints in all kinds of materials and sizes, including electronics, so perhaps you could print your own telephone yourself to talk through.

> The second question about skills: When artists come to me with their images, they often don't know what to do, with colours or contrast corrections because these can be too difficult for them. Perhaps because I am a photographer, who was trained in a manual darkroom, I can see how to solve these problems more clearly. I still think that the most important thing that the digital Master Printer must have is a trained eye.

I asked Richard Hamilton in November 2010, for his views on digital technology and

the role of the Master Printer:

> PL: *As an artist who has explored new technologies in print and worked collaboratively with a number of Master Printers, may I ask you for your thoughts on the possible future of the collaborative print studio in relation to the rapid growth of digital technology and how you think digital has expanded the potential of print?*

> RH: In my experience any printing 'collaboration' requires a relationship in which the printer serves the artist: if the printer does not respect the artist's technical competence, or the artist does not have sufficient knowledge of the medium to participate in the work, or understand the way his mental image might be transferred to paper, then the result will be unworthy of either printer or artist.

> When working with a craftsman possessing the incredible skills and aesthetic sensibility of Aldo Crommelynck I never doubted that the prints that resulted were my work. I do not believe that digital printing has expanded the potential of print yet and we may have to wait a long time to discover whether artists are up to the task of gaining the technical skills to exploit that potential. It seems to me more difficult than, for example, making a drypoint.

> PL: *You have stated that the Five Tyres project was finally realised because of the computational possibilities of the computer. Can I ask you – with hindsight, if you have been hindered by current technology in the realisation of a work or if you could access a new (yet to be developed) piece of technology towards the production of an artwork what would it be?*

RH: There is no doubt that working with computers is completely unlike working with the classical methods of print. My contribution to 'Five tyres remoulded' was to provide the information that could be put into a perspective programme to draw some difficult vectors. Digital image making has moved a long way since 1971 and digital printing will only produce great art when artists master the software tools as advances in printing machinery continue.

9.0 Chapter Nine: Conclusion

My purpose in this thesis has been to provide some methods and considerations on collaborative digital wide format printing for the artist and Master Printer. The research was primarily initiated as a response to the introduction of digital print technology within fine art practice, and my role in the development of a digital print studio.

The specific need for the enquiry became evident whilst working collaboratively with artists who had begun to use the technology in the production of fine art digital prints. Here the specific concerns of the artist in relation to the technology and the printed artefact highlighted a number of issues regarding the collaborative undertaking, including expectations of the technology and the technicalities of the production process. These issues became more pronounced after discovering that there was very little evidence, literature or resources available discussing the collaborative production of digital prints within a fine art context.

With these concerns in mind, the three key areas of fine art printmaking, collaboration in art, and digital technology provided the framework and context for this research around the role of the Master Printer. The research aims and objectives were formed as a response to these circumstances in order to develop best practice methods towards the function of a collaborative digital print studio. The following outcomes of this research study overlap and interlink through these three concerns, as outlined in the diagram reproduced overleaf, from Chapter Two.

Digital Technology

Inkjet Printing   Facilitation

The Digital Atelier &
The Role of the Master Printer
in the digital age

Fine Art Printmaking   Art Collaboration

The Traditional
Collaborative Print Workshop
& The Master Printer
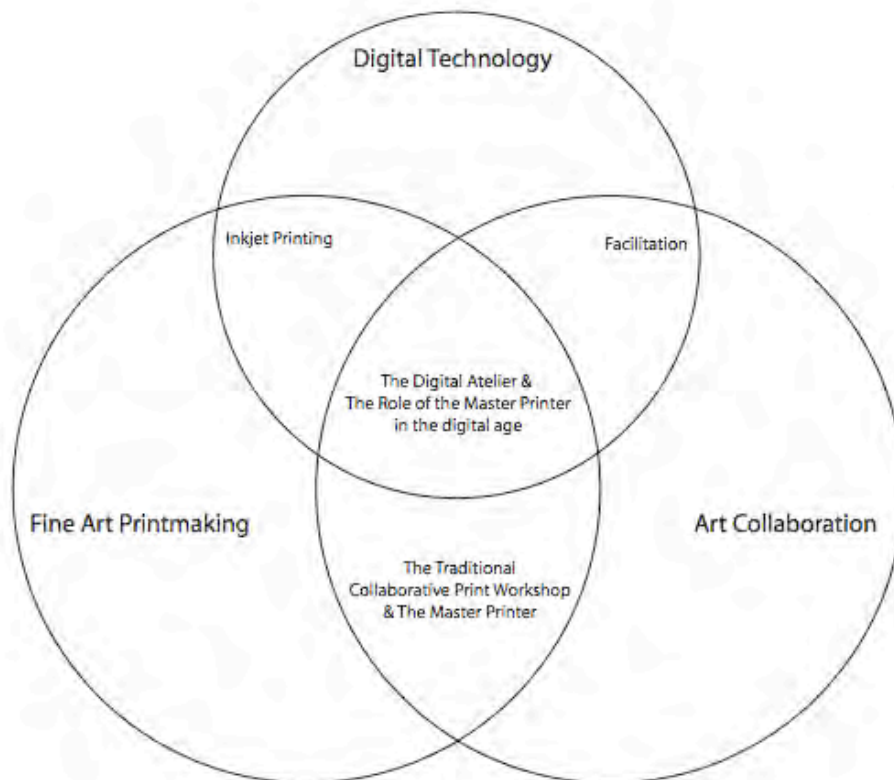
9.1 Revealing the Collaborative Digital Printmaking Process through the Case Studies

The case studies were undertaken to discover how the process of collaborative digital print works. The development of facilitation strategies from the case studies, highlighted a number of recurring production considerations. These formed the basis of the best practice methods for facilitating the collaborative digital print process. The resulting methods included the formulation of a documentation procedure (see 4.6 the Print Parameter Document) with which to record the essential print parameters for any individual print production.

The case studies contained in Chapters Four, Five and Six, provide a brief synopsis of each artist's background in relation to the project, a step-by-step production guide, and reflections upon the decision-making process that informed the collaborative

undertaking. The unabridged case study of Neeta Madahar's *Scape* in the Appendices is included to show the breadth of information generated during a single print production.

These case studies offer insights into the collaborative process from a variety of artists' approaches, with all facilitation specific to the inkjet process. Chapter Four reveals the working facilitation process for: combining traditional and digital printmaking (Siobán Piercy) experimental digital process (Jack Youngblood) and the complete workflow from image capture to output (Hugh Sanders). The analysis of those case studies formed the blueprint for the Print Parameter Document contained in section 4.6.

The case studies from the *Perpetual Portfolio* project could be considered as testing the range of possibilities for the collaborative process. Chapter Five followed on from these tests, with a case study of the artist Richard Hamilton. Hamilton has worked extensively in the field of printmaking, producing large bodies of works using both mechanical and digital print processes. He is also notorious for working with, and selecting the best Master Printers to realise his ideas across a broad spectrum of print processes. This case study of a demanding print production offers a practical insight for the documentary production process developed in Chapter Four. In this instance the archiving of the print production parameters (4.6) allowed Hamilton to revisit the printed edition at a later date, thus creating a variant edition. Hamilton's revisiting of the work included a minor addition to the digital file that was then printed using the documented Print Parameters to reproduce, accurately the previously approved colours attained during the initial collaboration. Without this best practice documentation, the printing of the new digital file would have been a lengthy process if even possible, as

the specific digital colour adjustments would have had to be established again. The archiving of the work acknowledges that the work is a variant edition, which is of potential interest to collectors, curators and historians for the purposes of authentication and for revealing the history of the artist's work on a particular project.

The final set of artists' case studies in Chapter Six, expand upon digital print production considerations for the Master Printer and provide additional evidence for the archiving procedure and the development of a print document that authenticates the studio's digital editioning activity for any individual project.

The expanded digital production considerations are encountered first in the combination of inkjet and laser cutting in Charlotte Hodes' case study. Here the digital print studio's association with inkjet is broadened by considering the rendering potential of a single digital image. Subsequently the role of a digital Master Printer needs to be more inclusive of other potential production possibilities. Susan Collins' case study addresses the visual effects of presentation considerations upon the production of an inkjet print. In most cases the completing of a print edition and the presentation of the work are considered as separate fields, and therefore responsibilities. The case studies addresses how the Master Printer be mindful of the relationship between these production stages through pre-impact image adjustment considerations of coatings on printed colours.

The inclusion in the Appendices of the collaborative print project *Vanitas* at the Rijksakademie between myself and Roy Taylor, offers a case study from the perspective of the artist. Here I adopted the role to experience and reflect upon a

Master Printer's facilitation methods, special skills, and advice during the production

of an artwork from an alternative perspective within the collaborative print process.

9.2 The Print Parameter Document

The Print Parameter Document (demonstrated in section 4.6) is a practical application

for aspiring digital Master Printers to enable the best practice production of printing

and managing a digital file for artists. The document was generated through the case

studies, and breaks down the specific stages of the printing process into; image source

and image generation, image file parameters, printer driver information, substrate, data

storage and participants in production. These categories identify the usually unseen

parameters that manage and contribute to the digital production of the final printed

artwork.

The Print Parameter Document was derived from identifying the key production

considerations for each artist's case study, recording how a digital image is generated,

adjusted and printed. The documenting of data is an absolute necessity in order to

record the huge array of variables that go into producing a digital print. An image can

be modified at many stages of the generation process, and recording each variable

allows the Master Printer to isolate anomalies in the output of the print, to reproduce

accurately previous prints and print states, and to produce the final edition after the

B.A.T.

The use of digital technology to produce an original, limited edition print has, as

discussed in section 1.8, prompted some discussion of originality in digital

printmaking. A particular feature of digital that has prompted these concerns is the fact

that the matrix does not degrade; it can also be stored indefinitely and is just as easily reproducible as the hardcopy. The versatility and flexibility of the digital matrix is therefore important in terms of archiving its various states and acknowledging storage considerations relating to access and ownership of image data.

The Documented Data storage (Chapter Six) includes the completed digital file, an uncompressed version with its layers and any raw images (none of the manipulated image sources) used in the file. The final addition is the Print Parameter information describing how to output the digital image after the artist's approval of the printed proof. As a best practice method the Print Parameter information was fundamental to Richard Hamilton's case study when revisiting the print for the variant edition.

The archiving practice presents another function of a digital print studio as a digital storage facility. For artists who may not have space to store large digital print editions, the potential to produce digital prints on demand (POD) becomes an option. Similarly the storage potential also realises the possibility of replacing damaged or destroyed prints for publishers and museum conservation purposes.

The purpose of the documentation procedures that result in the generation of the 'blueprint' was developed as a pragmatic method that would allow the editioning of digital prints to be accurately printed by a studio. The documentation procedure also provides a best practice method for artists wishing to produce their edition/s in stages by having an option of print on demand. The resulting document is specific to a given project, and collaboratively generated between the artist and master printer during the studio collaboration. Interestingly, this pragmatic pursuit raises potential issues around ownership and usage of the documentation between artist and studio.

The publishing of fine art print editions has an established an often pre-defined set of procedures that define the author(s), publisher and the ownership of a printed edition. These publishing procedures would also dictate that the matrix (that stores the information from which the print is made) would be destroyed so that the edition would remain limited.

Ownership, or perhaps possession of the digital file (the matrix) is somewhat less defined within these precedents given the ease of duplicating a digital file (the matrix). Whilst some print studios still insist on making it known that the digital file is destroyed after editioning, I would be hesitant in assuming that there is no longer a copy or version of the digital image in existence. Through my own experience I have yet to witness an artist insisting that the digital file be destroyed after editioning; instead the file tends to exist in duplication – safeguarding the possibility of file corruption or loss of the storage device that contains the digital image.

The addition of the blueprint (documentation procedure) alongside the digital file would essentially enable the owner to continue producing prints outside of the set edition number, accurately. Printmaking as a reproductive medium has always had an unstable relationship with such unauthorised potential and therefore its association with originality. Ultimately the presence of trust and integrity on behalf of the artist or studio will and does play a major part in ensuring authenticity.

These editioning concerns, and ownership of information are addressed through the spirit of collaboration, where the information remains accessible to both parties. To

inform an artist that they must never consider using the collaboratively generated information again restricts the possibility for development. The studio should encourage artistic exploration rather than assume that information is purely for unauthorised production and financial gain. With the consent of the artist, the studio archives the information as a record of its publishing activity whilst offering the artist the potential to print on demand or (as in the case of Richard Hamilton's variant edition), to revisit the previous work anew. Despite the potential for unauthorised prints I have yet to experience an artist who distrusted the studio and wanted this information for themselves alone. More importantly, the documentation supports and authenticates the collaborative undertaking, providing evidence and records that are of interest to museums, historians, academics and dealers for example. These procedures also address Marjorie Devon's call for evidence resulting from the studio's activity and designation of a collaborative print production (Chapter 1.8).

9.3 Appraising the Role of the Digital Master Printer

The role of the digital Master Printer has been discussed in this thesis by reviewing the historical precedents of traditional print collaboration in Chapter Two, and the development of the collaborative digital print studio and digital print pioneers in Chapter Three. This has been carried out as a means to examine the evolving field of digital printmaking as a practical contribution to the production of fine art digital prints for artists. As stated in Chapter One, wide format inkjet printing within a fine art context has been in existence for a relatively short period of around twenty-two years. Over these last two decades, inkjet print technology has responded to the concerns of the fine art printmaking field through image permanence, increased colour gamut, high-resolution output and an array of substrate selections for the process. Although

this is a relatively short period of time in which to appraise an emerging fine art print process when compared with traditional print processes, the research offers a timely appraisal of digital inkjet printing when a shift of interest in digital print technologies has to some degree created a plateau effect upon inkjet printing developments. This has enabled a reflective study to take place.

Many established artists are using digital technologies to produce high quality fine art prints in collaboration with Master Printers - such as Richard Hamilton and Damien Hirst - that are purchased for museum collections. As the medium is now appreciated as means of producing high quality prints, aspiring digital Master Printers need to be able to know how to produce works that that are responsive and representative of these demanding standards.

Practical Methods for Aspiring Digital Master Printers

The available evidence of the inner-workings of traditional printmaking studios including the notable *Ink, Paper, Metal, Wood: Painters and Sculptors at Crown Point Press* by Kathan Brown, has provided important insights into the collaborative act. This study has aimed to do the same with the digital process as an exploration of how the act is undertaken in the digital age. The analysis of the roles of artist and Master Printer in a similar manner to that of traditional engraving workshop practices acknowledges the team of individuals through the equivalent areas of production within the digital process: capture, rendering, proofing and editioning.

Because the technology and process is relatively young, it has not yet allowed digital Master Printers to learn their craft in the manner that Crommelynck or Hayter for

example, would have trained traditional Master Printers in etching or lithography. The training process for digital Master Printers has been predominantly experiential, with manuals available for the technology but no literature or guidance on the logistics of the actual collaborative process to consider. In looking at the current context and importance of the collaborative act in digital printmaking, and establishing an understanding and appreciation of the role of the Master Printer in the digital era, a practical means is put in place to assist upcoming digital Master Printers.

Managing the Project

The focus of this research has been to discover digital print facilitation methods specific to the collaborative production of digital fine art prints for artists. As a collaborative process, the Master Printer's management of any given project is just as essential as their technical know how. From the research study and working collaboratively with artists, there emerged three core 'understandings' that must be considered when working with artists: the initial project plan: reaching the stage where the word 'acceptable' can be coaxed out of the artist through determining their needs, and: the point of the artist's designation of the B.A.T. when they are ready to produce the proof. These are crucial in order to manage successfully, the physical production, budget and time allocation for any given project. In *Printing a Photographic Portfolio Edition by Inkjet,* a dialogue between myself and the photographic historian and photographer Dr Anne Hammond in the Appendices, we also discussed the necessity of achieving a level of 'acceptability' at the proofing stage.

Similarly the management of the CFPR digital print studio developed from this study has aided the functioning of a digital print studio space and workflow methods.

The *Dycem Ltd* document in the Appendices, provides consultation evidence for the application of print studio management methods that have been generated from the research for this doctorate.

Printmaking with Digital Technology

The sensibilities for transferring information from one space to another are prevalent across all traditional printmaking processes. It has been my experience that the tacit knowledge of the digital Master Printer is in an understanding of the relationship between the digital image and its printed physicality. Just as Joann Moser highlighted the particular collaborative exchange where an artist relies on the *hands* of another to execute the work, for example Ken Tyler's collaborations with Robert Rauschenberg for *Booster* in 1967, the artist in the digital age relies on the *skills* of another to produce the fine art digital print. An example of this, and of using digital technology in a traditional printmaking manner is shown in the case study of Jack Youngblood. Youngblood had an exceptional knowledge of digital imaging software but what he lacked was the specific knowledge to achieve the physical result. Here, even though inkjet is considered as a single pass printing process, we were using digital technology but thinking in traditional printmaking layering processes. Using the double pass printing method allowed the artist to achieve both a denser black, and colours that cannot be created in a single pass.

A Responsibility Beyond Technical Consultancy

The digital Master Printer's role as described through the case studies naturally lends itself to the role of consultant. This role is fundamental to the collaborative endeavour that takes place between the artist and the Master Printer, but it also extends beyond

the technical production process to include the concerns of conservators, academics, curators and historians, all of whom invest in the appreciation and value of the printed artefact. The best practice methods for the digital Master Printer, of documenting and archiving studio activity can provide a rich vein of information for these interested parties to use for further dissemination to the field of printmaking.

To some degree print has grown beyond the confines of its traditional frame, and contemporary modes of presentation inform, and need to be considered during production. There are also the concerns of exhibiting the works in galleries and capabilities of transportation that contribute to the dissemination of the printed artwork. This extension beyond the printed image has seen digital Master Printers become more involved in the final presentation of the printed artwork, as discussed in Chapter Seven. This is especially true in the production of wide format inkjet prints and artefacts that have more in common with the scale of paintings and the potential of installations.

Evolving Technology and Skills

As with traditional print devices, a substantial amount of digital technology is industrially-designed, with purposes and functions often outside the concerns of the fine art printmaking field. Therefore the Master Printer's investment and concerns within such an arena are those of estimating potential and evaluating the appropriate selection and refinement of these tools within a fine art printmaking context. As also discussed in the feedback from digital Master Printers in Chapter Eight, technology is constantly evolving, and the digital Master Printer's knowledge also requires constant renewal. Digital Master Printers need to be able to embrace change, and keep up with

advances in digital technology and contemporary art practice, which necessitates a constant revision of skills and knowledge.

Rapport

As previously stated, the ability to translate image information from one space to another accurately, remains a fundamental quality of both the traditional and digital master printer. The affinity with the inter-relationship between materials and process is predominantly associated with a printer's technical comprehension, although the translation process and ultimately the assertion of a 'master' printer is not complete without the sensibilities that are acquired through the inter-relationships between individuals. In this, instance the translation process encompasses the qualitative attributes associated with the print studio collaboration, in so much as the process evolves from one that is technically-orientated towards a facilitation role that is more indicative of an interpreter.

Here the position of interpreter is open to the transcription of ideas through the print process, rather than imposing process and pre-configured methods upon ideas. In this sense there is no single formula that would meet all artists' needs. The approach is often subtle, intuitive, even unspoken between the artist and master printer, and subsequently the mode of facilitation is one attuned to developing inter-personal rapport and trust.

During the development of this research and facilitation roles at the Centre for Fine Print Research I have helped to produce digital prints for around fifty artists. As previously discussed, a Master Printer has a tendency to have either (or somewhere in

between) an altruistic or catalytic disposition. I have found that I naturally lean towards the altruistic end of the spectrum, where the empathetic role develops an acute ability to listen to what is discussed - although what is not said can be just as beneficial to facilitating the production process. Similarly it is often through peripheral conversations and activities that an inter-personal rapport can evolve.

For example, in the case of the artist Michael Florrimell; early discussions about the work were not forthcoming in the studio. What did emerge was that we had a common interest in cycling that resulted in a foray of bicycle journeys. Outside of the studio the artist discussed his interest in fly-posters and graffiti in the area that subsequently helped to inform the studio activity. Here the relationship is not built on an exact science but an art that requires subtle, soft, even alchemical skills, as personal relationships cannot be reduced to formulae.

This thesis has predominantly dealt with process-led considerations and methods for the artist and master printer whilst acknowledging the collaborative context in which the research is based. Therefore it should also be noted that the research is not a comprehensive guide for aspiring master printers but rather a portion of the multifaceted role. Having researched and experienced the master printer role, I believe that a definitive text in the format of PhD may be difficult to achieve. Perhaps an appraisal of the role would benefit from or even require a number of PhDs to better articulate such a multi-faceted role.

9.4 Further Developments of the Digital Print Studio and What Constitutes a Digital Print

Digital Print technology has advanced very rapidly from the dawn of the digital era in 1984, and it does not appear to be slowing down. The summary in Chapter Seven discusses the emergence of three different types of digital print facilities that describe varying print production possibilities. The studios also present the evolving nature of the digital print studio towards the definition of a digital fabrication facility that extends beyond the inkjet process such as Factum Arte (see 3.7.1). This digital facility is unique at the moment but provides a glimpse of how the other types of digital studio may develop as digital technology broadens the production possibilities and definition of constitutes a digital print.

In response to these technological developments and production possibilities, Chapter Eight presented a series of artworks that embrace the evolving nature of digital technology, its relationship to the concerns of the artist and the field of fine art digital printmaking. With this in mind the Chapter functions as reflective summary of key themes from the thesis (Digital technology, Collaboration and Printmaking) using my own practice as a means to present the dual perspectives of artist and printer. Therefore the artefacts' descriptions concerning intention and production are one and the same, as opposed to the predominantly production-orientated perspectives used in the artists' case studies of Chapters Four, Five and Six. The Chapter broadens the possibilities of the digital print studio's predominant association with inkjet through the use of 3D printing (see 8.6) and laser cutting (see 8.5) technologies. This provides insights on how a digital studio may consider developing production possibilities that may also attribute to a Master Printer's use of a technical lure.

The development of the publish-on-demand (POD) facility that has been a direct result of the digital age initially questions whether or not there is need to access a specialist digital Master Printer. The resulting themes of automation (in 8.3 and 8.4) remind us that the removal of human interaction reduces the number of possible outcomes that are a core component of the collaborative digital printmaking process. The inclusion of painting (8.4.2) and drawing (8.4.3) within a thesis that is concerned with digital technology and printmaking expands upon the possibility of what constitutes a print in, line with the premise of the *Graphic Unconscious* exhibition (page 230), but more specifically the digitally mediated artefact. With this in mind the digital Master Printer's engagement with activity in their field can be considered as both the art of production and the production of art.

These expanding concepts of the printed artefact and digital production possibilities present printmaking as a field in flux. I therefore believe the role of a digital Master Printer can also be that of a consultant for production possibilities for artists, as no one studio would encompass all solutions in house.

9.5 Areas for Further Research

The research presented here contributes to new knowledge not only through the empirical material from the case studies, but in the formulation of the Print Parameter Document as a means of best practice for the aspiring Master Printer to produce high quality digital, inkjet fine art prints for artists.

As previously stated, digital technology is providing continual developments for the possibilities of rendering digital images as printed artefacts. So much so, that we are beginning to need to address what constitutes a 'print 'today. This is largely due to the mutable nature of the digital file that is able to traverse a range of different media, whilst combining old and new processes of image production. The convergence and flexibility of the digital file has had an impact upon more familiar modes of image production. We are now beginning to discern the next incarnation of the printed artefact through rapid prototyping and laser cutting technologies. The advancement of rendering devices can also be supplemented with evolving smart material technology for the development of hybrid substrates, such as thermo-colour materials, which can change colour in response to temperature, and the inclusion of macro electronics such as audio files within materials.

A small fraction of these new technological developments has been discussed in Chapter Eight whereas the main focus of the study has been concerned with digital technology in relation to inkjet printing. As with inkjet printing, the ubiquitous nature of digital technology will eventually see these developments become more accessible, opening up further areas of research for others to investigate their impact upon the field of fine art printmaking.

Glossary of Terms

Adobe RGB. The most commonly used colour space within inkjet printing. Designed by Adobe Systems Inc. as a compatible colour space for digital cameras and computer display monitors. *Adobe RGB* has a larger colour space than CMYK.

B.A.T. From the French *bon à tirer* - good to pull. The designation given when an image is ready to produce the first proof.

Beta test site. The sponsorship of a print facility by a printer manufacturer, usually through equipment, in return for testing and feedback on the equipment supplied. This can include trialling equipment before it is released to the public, which is referred to as pre-beta testing.

Bicubic. A digital image resampling method that is used to distribute pixel information for the scaling of Photographic (bitmap) images. The resampling method is one of four offered in Photoshop's 'Image Scaling' options. The Bicubic option generates smooth pixel transitions when increasing the scale of a digital image that has the effect of concealing individual pixels.

Bronzing. Refers to a visual defect found in some inkjet prints due to compatibility issues between early ink-sets and paper coatings. The visual appearance of bronzing results in sections of the printed image seeming to disappear or taking on a uniform tone in appearance.

CAD. Computer-aided design software has replaced much of the need for hand drawing plans with pencils and traditional measuring instruments. CAD software is used for 2D vector-based imaging and also for rendering 3D objects. It provides geometry and visual output that is dimensionally accurate.

Chop mark. A signature of an editioning studio or in some instances, a printer, usually a small stamp or emboss that denotes where the print was produced.

Colour gamut. A subset or range of colours which can be represented accurately in a particular space, or by a particular output device.

Cross-platform. Software applications which run on more than one platform, for example PC and Macintosh are referred to as Cross-platform.

CRT display. Cathode Ray Tube. Used previously for television screen and computer monitor displays, CRT which uses glass screens has been superseded by LCD flat panel displays which are now common for television screens and computer monitors. *Digital matrix.* A digital file that exists on the computer and is used to generate the printed image.

Dye-based. An organic chemical compound, an ink-set used for non-archival printing, to produce more vibrant colours. Used predominantly in mass-reproduction, for example posters, where longevity is not an issue.

In-house production. A term used to denote that a single digital print studio has performed all stages of image production from initial capture or image generation to the final printed output.

Lambda printing (also referred to as LightJet printing). A digital print process, used for photographic printing due to its large format capacity for display graphics. Used by artists and photographers to produce photographic editions on gloss substrates that most closely resemble the results of the traditional wet photography process.

Nearest Neighbour. A digital image resampling method used to distribute pixel information for the scaling of Photographic (bitmap) images. The resampling method is one of four offered in Photoshop's 'Image Scaling' options. The Nearest Neighbour option preserves the appearance of pixel information when increasing the scale of a digital image.

Pigment-based. A liquid containing some colour particles that are often mineral compounds, used to create stable colours for archival inks and paints.

sRGB is a standard RGB colour space proposed by HP and Microsoft to approximate the colour gamut of the most common computer display devices. It serves as a "best guess" for how any monitor produces colour, and has become the standard colour space for displaying images on the Internet.

Technical Lure. A ploy used by studios, describing the attributes and possibilities of production that a studio offers above and beyond the normal expectations, to entice an artist to work with them. For example Ken Tyler's investment in new and unorthodox printing machinery such as vacuum forming machines and hydraulic presses for the artist Frank Stella.

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Exhibition curated as part of PhD study:

The Printed Reality, at Impact International Multi-disciplinary Printmaking Conference, UWE, Bristol UK, 16.09.09-21.09.09 www.uwe.ac.uk/sca/research/cfpr/staff/paul_laidler/profpractice/exhibprintreality.html

Flickr groups established/curated as part of PhD study:

Printed Reality, group, established June 2007.
http://www.flickr.com/groups/644896@N24/

SUBLIME STRUCTURE featuring Romantic Deadpan, group established July 2008.
http://www.flickr.com/groups/970916@N24/

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Lectures, Demonstrations and Talks presented in relation to PhD study:

Recording Landscape: The Photographic Panoramic, Public Workshop, Doverodde Book Arts Festival, Doverodde Book Arts Center, Fjordstræde 1, Doverodde, Denmark, 13-16 May 2010

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Reproduction & Facsimile using Digital Print. Best Practice talk/ demonstration. Consultation visit for Bristol Museum Conservation Team, University of the West of England, Bristol, 30th Aug 2008

Creating Inkjet Editions. Best Practice talk/ demo on creating inkjet editions, Planet Earth Series, for BBC Photographer, Ted Giffords, University of the West of England, Bristol, 9th April 2008

Just Press Print, (MA) Experimental Practice Lecture, Graham Sutherland Building, Coventry University, UK, 13th March 2008

Coating canvases. Best Practice talk/ demo for artist Therese Oulton, University of the West of England, Bristol, 6th – 7th Feb 2008

Studio Practice with Canon Printers. Best Practice talk/ demo, Canon Wide format Research Project, Anne Sharp, Canon Europe, University of the West of England, Bristol, 18th Jan 2008

Committed to Print, Curatorial talk (Art and Power Group), Royal West of England Academy, Bristol, 18th June 2007

Wideformat Print Masterclass. Committed to Print Royal West of England Academy, Bristol, Tuesday 12th June 2007

Digital print production for artists. Best Practice talk/ demo, for Tate Britain, Archive & Restoration Department, University of the West of England, Bristol, 20th July 2006

HP Wideformat Workshop, Museo Nacional Del Grabado, Buenos Aires, Argentina, 2nd - 26th June 2005

Collaborative Print Projects and Artists' Residencies managed, which have informed this PhD study:

Collaborative Workshop, Artist in Residence, **Carolyn Bunt** (Prints for solo exhibition at ROOM Gallery, London), CFPR, UWE Bristol, 25th -26th Jan 2010

Collaborative Workshop, Artist in Residence, **Donna Moran** (Pratt Institute, NY USA), CFPR, UWE Bristol, 4th – 25th June 2009

Collaborative Workshop, *Shock and Awe* Project Printing with **Richard Hamilton**, CFPR, UWE Bristol, 8th May 2009

Collaborative Workshop, Artist Residency, **Carolyn Bunt**, (Prints for Z00 Art Fair) CFPR, UWE Bristol, 23rd – 24th Feb 2009

Collaborative Workshop, with artist **Erik Kok** (for exhibition and installation at The Bergkerk, Deventer, The Netherlands), CFPR, UWE Bristol, 10th – 14th Aug 2008

Collaborative Workshop, with artist **J. P. Willis** (Australia), CFPR, UWE Bristol, 4th −8th Aug 2008

Collaborative Workshop, Proofing with **Richard Hamilton**, CFPR, UWE Bristol, 13th May 2008

Collaborative Workshop, Proofing with **Richard Hamilton**, *Passage of the angel to the virgin & A D Nuttall* Project, CFPR, UWE Bristol, 21st April 2008

Collaborative Workshop, *The CRUCIBLE* - digital photographic print portfolio, **Dr Anne Hammond**, CFPR, UWE Bristol, 30th Jan 2008 – Nov 2009

Collaborative Workshop, **Paul Hodgson** (Marlborough Gallery Artist) & **Frankie Rossi** (Marlborough Gallery Publisher), Cranick Portrait work, CFPR, UWE Bristol, 16th – 17th Jan 2008

Collaborative Workshop, Artist Residency, **Jan Davis** (Head of Visual Arts, Southern Cross University, Australia), CFPR, UWE Bristol, 22nd – 26th Oct 2007

Collaborative Workshop, Artist Residency **Paul Hodgson** (Marlborough Gallery Artist), *Late Berlin interior*, CFPR, UWE Bristol, 15th – 16th Oct 2007

Collaborative Workshop, Artist Residency (AHRC Wide Format Project) **Neeta Madahar** Purdy Hicks Gallery Artist), CFPR, UWE Bristol, 2006 11th-23rd May 2007

Collaborative Workshop, Artist Residency (AHRC Wide Format Project) **Charlotte Hodes** (Marlborough Gallery Artist), CFPR, UWE Bristol, 16th- 17th April 2007

Collaborative Workshop, Artist Residency (AHRC Wide Format Project) **Paul Hodgson**, CFPR, UWE Bristol, 12th- 13th April 2007

Collaborative Workshop, Artist Residency (AHRC Wide Format Project) **Susan Collins**, CFPR, UWE Bristol, 9th March & 26th April 2007

Artist Residency, *Dead Star* Project, **Janice Kerbal**, CFPR, UWE Bristol, 21st & 26th June - 7th & 16th Aug 2006

Collaborative Workshop, Artists Residency in Association with Brodsky Center, Rutgers University, USA, **Lesley Dill**, CFPR, UWE Bristol, 1st – 5th May 2006

Collaborative Workshop, Reproductive work with **Leo Baxondale**, CFPR, UWE Bristol, 16th Feb 2006

Collaborative Workshop, CFPR Artist Residency Prize, **Agathe Sorel**, CFPR, UWE Bristol, 8th & 15th Nov 2005

Collaborative Workshop, Perpetual Portfolio Artist Residency, **Michael Florrimell**, Australia, CFPR, UWE Bristol, 4th - 15th Oct 2005

Collaborative Workshop, Islington Library Print project, Artist **Charlie Errington**, CFPR, UWE Bristol, 22nd Nov 2004

Collaborative Workshop, Artist Residency Camera Work with **Hugh Sanders**, CFPR, UWE Bristol, 8th – 9th Nov 2004

Collaborative Workshop, CFPR Artist Residency Prize RWA, **Jessica Ward**, CFPR, UWE Bristol, 14th – 21st Oct 2004

Collaborative Workshop, Perpetual Portfolio Artist Residency, **Hugh Sanders**, CFPR, UWE Bristol, 20th - 21st & 29th – 30th Sep 2004

Collaborative Workshop, Perpetual Portfolio Artist Residency, **Alastair Clarke**, CFPR, UWE Bristol, 13th - 15th Sep 2004

Collaborative Workshop, Perpetual Portfolio Artist Residency, **Myfanwy Johns** CFPR, UWE Bristol, 16th – 20th Aug 2004

Collaborative Workshop, Perpetual Portfolio Artist Residency, **Jack Youngblood**, CFPR, UWE Bristol, 12th – 16th July 2004

Collaborative Workshop, Perpetual Portfolio Artist Residency, **Jennifer Yorke** (USA) CFPR, UWE Bristol, 21st – 25th June 2004

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Collaborative Workshop, Perpetual Portfolio Artist Residency, **Lucrecia Urbano** (Argentina), CFPR, UWE Bristol, 10th – 21st May 2004

Collaborative Workshop, Perpetual Portfolio Artist Residency, **Douglas Holleley** (USA), CFPR, UWE Bristol, 16th - 20th Feb 2004

APPENDICES

1. Rijksakademie Report - Testing the notion of the *Contract Workshop* model through a collaborative print production at the Rijksakademie's Digital Print facility: *Vanitas.* January 2009

A collaborative, practice-based print project was initiated at the Rijksakademie, Amsterdam, The Netherlands, between myself and the Rijksakademie's Senior Coordinator for all Media Departments and digital print - Roy Taylor, with Taylor facilitating the production of an artefact that I had envisaged prior to my arrival. The practice-based exploration with myself as the artist, and Taylor as the Master Printer, presented the opportunity to experience Taylor's working methods, special skills, and advice during the production of an artwork from an alternative perspective. By assuming the role of the artist for the production process, I was able to reverse my previous facilitator role and reflect upon the position of the artist within the collaborative print process.

The project was conceived in relation to one of the two most prominent facilitation strategies of the CFPR and Rijksakademie's collaborative practices; the *Contract Workshop,* where an artist will work 'in house' during the entire process of creating a print, from initial concept to final output, rather than the less exploratory *Editioning House* system, where the artist brings a completed digital file for proofing toward the B.A.T. (g) print.

Aims

- To observe Taylor's facilitation methods for the proofing of the completed digital image file, and the unrealised project requiring capture and rendering.

- To utilise Taylor's 'special skill' through photographic printing.

The idea presented for the *Contract Workshop* took into consideration Taylor's background in Museum photography and my interest in self-referential work and fiction and reality crossovers.

Vanitas Still Life, Pieter Claesz (Dutch, C.1597-1660), 1630.
Oil on canvas, 39.5 x 56 cm. Mauritshuis, The Hague

The work I aimed to create at the Rijksakademie was to be produced in the context of photography's impression of painting. Key references that I envisaged for the work, in my role as the artist at the Rijksakademie, and that I wanted to bring out in the final piece were: *the optical base line, sight size, the prolonged gaze, seeming without being, the mediated real, verisimilitude, the familiar.*

David Hockney's *Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters* (2001), describes the influence/use of photography and optical aids from the early 15th C, upon the depiction of reality within the still life painting traditions of Van Eyck, Holbein and Vermeer, which were also used by artists such as Caravaggio. By comparing the rendering of reality through human and optical vision Hockney identifies a range of photographic codes within the paintings (the optical base line). By drawing attention to these codes, the contrast between the camera lens and the human eye becomes more prominent revealing the subtle mediation of reality through a camera lens.

It is this 'mediatory real' where the image has replaced the object that we might look for in a contemporary pursuit of the 'real' in art (layered real) - bestowing three dimensional representation in to two dimensions and vice versa. Here, the method begins with the presentation and works backwards, considering 'how' something is presented rather than what is actually represented.

In traditional Dutch still life painting, real objects assumed many fictional values, operating as signifiers for the passing of time / mortality, religion, political or social references of that time, etc. Those objects project their associated meanings to the gaze of the viewer. In my contemporary rendition of the *Vanitas*, the intention was to make a version contrary to the Dutch tradition by inserting some physical objects that were not 'real', alongside the traditional objects in the composition. These 'unreal' objects are imbued with a physical presence, which projects fiction into reality as real fiction.

The objects selected fell into three categories: replicas of 'real' objects - for example the plastic skull, purchased from a medical training suppliers; as objects that we recognise not from their physical value but their appearance as 'props' in films - for example, the golden key in the middle of the arrangement is a 'prop' replica of the golden key that unlocks the door to the tunnel in the film *The Fifth Element* (1997, Luc Besson) purchased from The Propstore in London; real objects included in homage to the traditional still life paintings that provided the inspiration for the *Vanitas* - a hand blown Dutch glass from a 15th C. design purchased from the Rijksmuseum, and antique books from the library collection at the Rijksakademie.

Image production considerations:

Through photography I aim to create an image as if conceived by 'eye' considering the abnormalities, localised construction methods and multiple viewpoints incorporated within the human rendering of reality.

Scale

The actual scale of the objects described in the work will determine the size of the print (using a 1:1 scale), although in some instances abnormalities such as 'sight size' will be used refer to the codes associated with human vision.

Surface

Any physical surface such as paint will be recorded within the digital file, as it is the appearance/simulation of surface quality that is of most importance within the work.

Colour

Colour is predominantly considered in terms of the objects' appearance under artificial lighting, reminiscent of the controlled lighting conditions in traditional Dutch still life painting.

Presentation and reception as a light box, to reference the use of light in traditional Dutch still life painting.

The above considerations will hopefully provide similar responses to realist painting such as 'seeming without being' and the 'prolonged gaze'. The specific description of the image creation will be shown over eight production stages, with each stage describing the considerations and methods used to create the work.

Capture Settings: lighting

Considerations: using Dutch still life painting imagery, and replicate the lighting positions and conditions (see following images).

Method

Two different directional light sources were used to illuminate both the foreground and

background spaces of the scene (reminiscent of the Dutch still-life paintings).

The main light source for the foreground projected light diagonally across the left

of the scene, falling upon a 'golden reflector' situated to the right of the objects.

The second light source was directed onto the background from a steeper, more

elevated position than the foreground lighting.

Capture Settings: Positioning

Considerations: the camera position for the photographic capture was informed by the viewing angle and composition of the still life painting i.e. the lower table edge, main central body of objects and a generous upper portion of background.

The objects are situated upon a light-absorbent, non-reflective material where the positioning of objects appears similar to many of the still life painting arrangements.

Method

A few variations of arrangements of the selected objects were tried after considering; the possible obscuring of objects within groupings and positions that better accentuated the three-dimensional form of any particular object.

Equipment and settings used: Mamiya ZD, 22 Mega Pixel Back Mamiya Sekor C 1:2.8 80mm. Settings – ISO 50, 1/50's, f16-18-22

Capture settings: Depth of field

Considerations: The clarity of the rendering of physical objects in Dutch still life painting is a prominent feature of the genre, so a small aperture setting was used to utilise the camera's narrow depth of field. After previewing some initial aperture settings it was decided that three f-stops would be used, so that the different tonal and focal information achievable through the three aperture settings could be combined within the final image.

Above: examples of the variations in the amount of light used in the *Vanitas* arrangement in the
Rijksakademie studio.

Perspective arrangement

Traditional still life paintings are created through a linear perspective, where the artist builds the image in focused sections rather than creating the image in its entirety as a photographic exposure would. Here the painter's specific method for visualising and rendering reality becomes evident when the viewer is confronted with what is believed to be the same scene through the viewfinder of the camera.

The physically constructed space of the *Vanitas*, offers a binocular perspective through a monocular process, which shows an impossible perspective from the camera's viewpoint. What the camera reveals is one example of the traditional still life painter's perspective distortions, for example, the painter may move around within the composition of the painting, but the viewpoint of the camera remains fixed.

The intention here was for the camera to become the painter, describing the scene using painterly codes, as shown in the images below. The first image on the left shows the entire scene, the middle image reveals the side view of the table as the camera has moved sideways – parallel to the front of the table; the third image (right) shows the two previous images, combined into a single file to achieve an impossible monocular perspective - of the receding diagonal of the table when compared to the foreground angle of the table's edge – revealing two binocular perspectives within one scene.
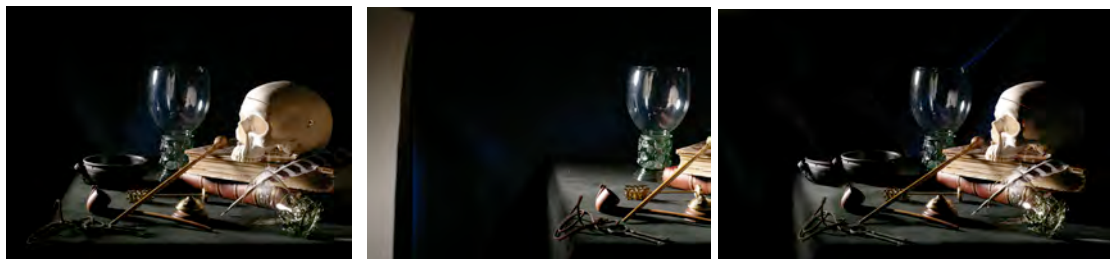
Method

For this image it was important to incorporate the visual codes used in still life painting, through photography, so a second capture position was recorded (see middle image above). By moving the camera along an axis parallel to the front of the table a second recording was made to capture the depth of the table (similar to that in the painting).

The two separate recordings were then opened in Photoshop™ using a layering system so that the receding table edge layer sat on top of the other. The duplicate objects were then removed from the top layer with the rubber tool.

Hardware: Computer: Apple Mac Dual 2.3 GHZ Power PC G5. Monitor: Lacie 324 LCDA5. Wacom Tablet

Software: Operating System: OSX 10.5.6. Raw Processing: Camera Raw 4.6 – White Balance setting Shady. Programme: Adobe Photoshop CS4.

Two *Vanitas* Still Life paintings by Pieter Claesz left: c. 1634; right: c. 1590-1661, showing variations of reflection and light.

The light quality recorded during the previous capture stages was set to a temperature of 5500k. This light temperature is reminiscent of daylight, a quality and source of light often referenced by Dutch painters through various reflective surfaces within their assortment of objects. Seen in the images above (left) in reflective metal describing the room's interior, and (right) glass reflecting the windows. Both describe the source of lighting falling upon the still life. Together with the ageing process of paintings and various qualities often assigned to the reproduction of artworks through the printing process, we largely encounter these works with a slightly yellow tinge, which spreads a glow over the whole.

Method

To reproduce the warmer tones indicative of the mediated *Vanitas*, the file is adjusted in the Raw processing software. Here any previous white balance setting assigned to the creation of the digital file during capture can be adjusted. The eight white balance

settings available in the software cater for most eventualities of light source and allow further refinement of the Raw file data if necessary. In this instance the white balance setting was changed from 'as shot' to the 'shade' option.

Integrating varying light qualities

For the majority of this image the f16 aperture setting was used to retain the clarity of mid tone information within the scene, although, both shadow and highlight information needed to be retrieved from the parameters of the f16 setting.

For example, in the following images, detail is lost in the skull's facial highlights, and the surface pattern detail in the pot.

The retrieval of highlight and shadow information (shown in the images on the right above) was achieved by selecting areas from earlier recordings where different lighting and camera settings had been used. First the particular highlight information would be selectively retrieved from the f18 and f22 capture settings, then the shadow information would similarly be transferred from previous captures where the golden reflector was more prominent in the scene.

In some instances, the initial exposure defined in the camera was digitally altered in the Raw processing software to the equivalent of a couple of f stops, using Exposure and Fill light options; see following diagrams.
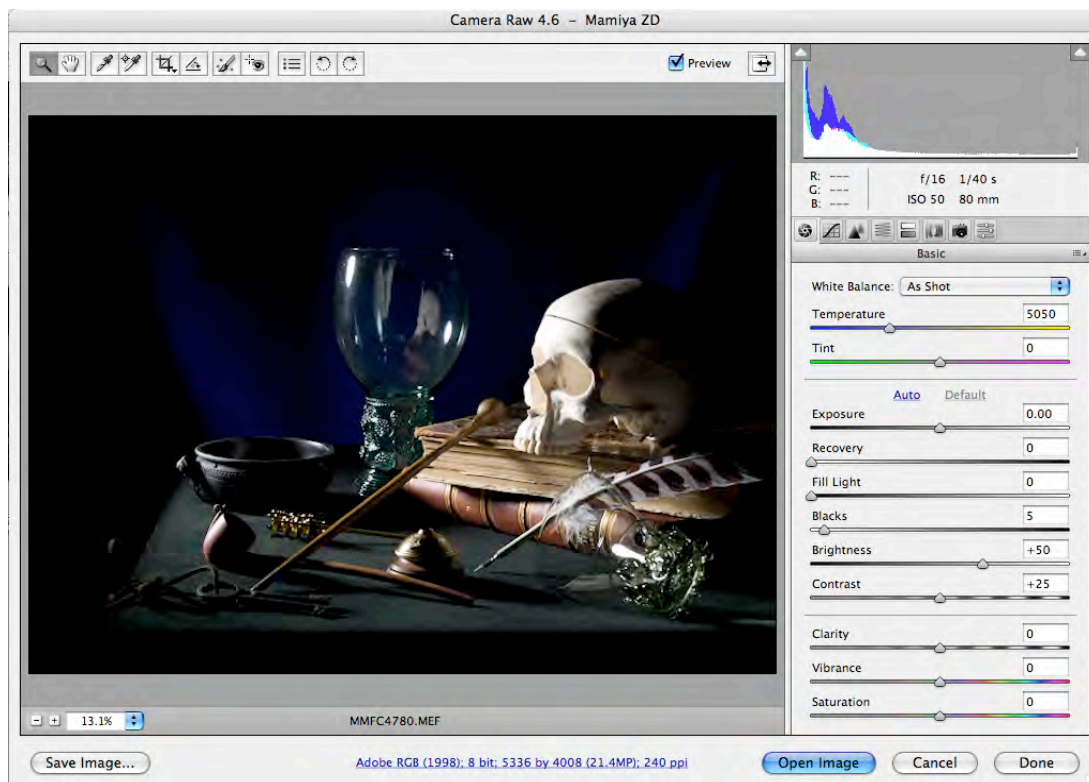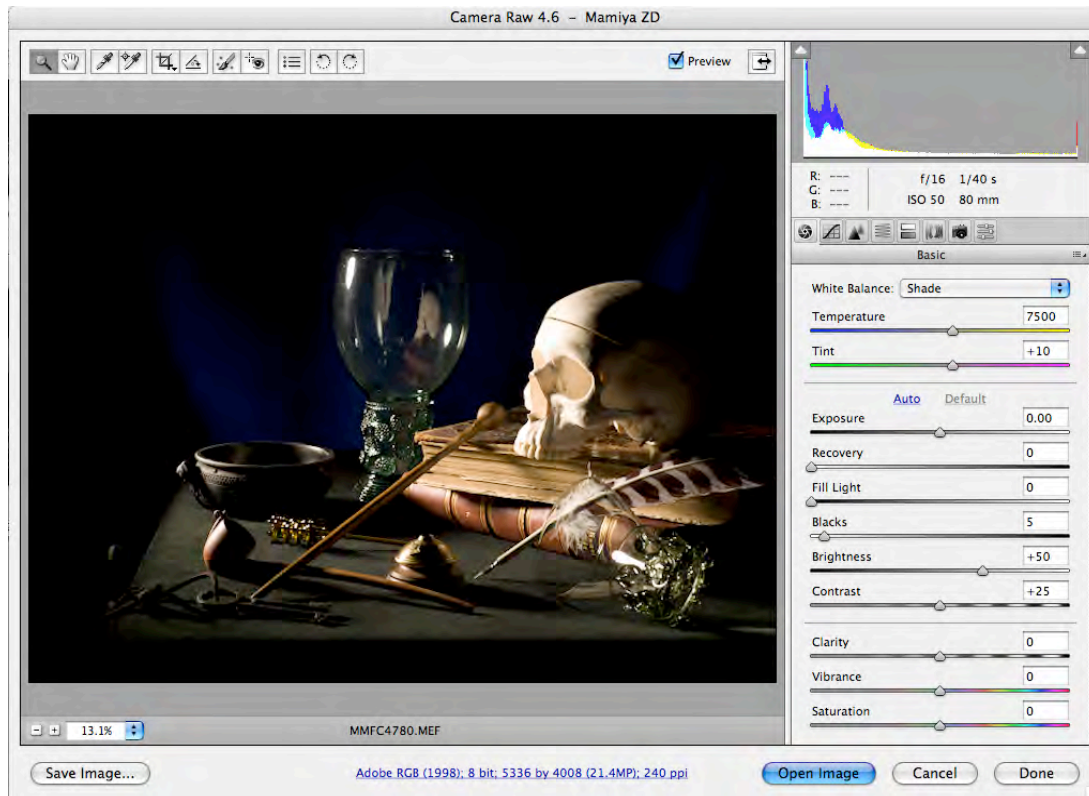
Substrate choice for rendering of light

Although the images are photographic recordings rendered as inkjet prints, the creation of the work is dictated by the appearance and construction - the painterly codes - that are indicative of many still life paintings. The choice of substrates was narrowed down to three different substrates, selected firstly with the intent to refer to the painting genre rather than the printed qualities of the photographic recording.

The first substrate – for rendering light: *Magic Universal Backlit Film*

Backlit film is a semi translucent substrate that allows light to pass through both the material and the printed surface. However, an image may have varying degrees of translucency depending upon ink coverage levels, the density of different colours and the digital rendering of light to dark in dots of ink using gradations.

Human vision is only possible because of the presence of reflecting light that describes the appearance of depth and surfaces in our surroundings. The portrayal of light and dark is a prominent feature within the still life painting genre, where the rendering of light (in paint) is observed by eye and subsequently encased within the painted image.

A digital photographic recording of a surface produces an image in a different way to the eye of a painter, but the similarity in the appearance of light is that it is fused within the image. The interesting relationship with light when using backlit film is that light is both recorded and present simultaneously within the image. For the production of *Vanitas* there are also obvious connections with 'cinematic' presentation which reference the origins of some of the source material in the work.

Second substrate – for historic materials: *Hahnemühle Fine Art Inkjet canvas*
Paintings are traditionally as intrinsically linked to canvas as prints are to paper; the digital print on canvas in this instance was produced so that an interweaving of these historical assumptions could begin. In this instance, the printed artefact (inkjet print on canvas) is used as a surface to be re-recorded and applied within the final image (alluding to the physicality of paint). Here the appearance of impasto together with the flat seamless surface of a photograph moves closer to the most common original experience of art - the mediated reproduction of the painting's image in print.

Technical Consideration
Paint would be applied on top of the printed area so that the surface quality could be recorded (optimised with specific lighting). The surface of the canvas was firstly

coated with *Hahnemühle Protective Spray* to stabilise the inkjet layer before the application of paint.

Third substrate – for the mediated image: *Hahnemühle Photorag 308gsm*

This smooth photorag paper is a popular choice for the majority of photographic output that uses inkjet technology. This may be attributed to the high photographic image quality attainable on this surface and also a relatively unique matt graphic finish that the inkjet print produces.

The cotton-based paper also has a historical relationship with printmaking and the physical manipulation of surface as opposed to the gloss finished papers associated with the flat seamless image of photography. In this instance the printing of a photograph onto a particular substrate can begin to enhance or allude to qualities within an image by the historical associations assigned to the substrate.

By taking a photograph that is about painting, and printing it on a surface associated with touch - whilst describing physical objects that are intentionally conceived for an image world - I hope to retain the prolonged looking experience associated with painting.

Printer: Canon IPF 5000 & HP Z6100

The two printers that were used to print onto the three different substrates were the Canon IPF 5000 and the Hewlett Packard Z6100. The HP Z6100 was used for the Backlit output, as the printer produces the best print results in that studio. The Z6100 comes with a media profile for the Backlit film but *Vanitas* was output as a printer managed file. The other two substrates were printed on the twelve colour Canon IPF

5000 using the 'application managed' option with the standard ICC profile supplied by Canon - for the relevant paper printer combination.

Summary

Production issues

The lighting conditions have essentially been resolved and the initial considerations that will be needed to produce a multi-perspective representation. By describing objects in isolation the image is literally created in sections, assuming the still life painter's ability to move around the image, and unlike the usual global (monocular) creation of a camera exposure. The separately conceived objects, through photography and collage, will create a visual conundrum of space reminiscent of the hyper-real.

Technical considerations of the multiple viewpoints describing one object or a space – would involve the use of a rig to move the camera with precision each time. The Cambo camera body on the parallax stand which adjusts where the lens sits in relation to the sensor with a Leaf digital back attached could be a useful option to exaggerate the 'sight size' phenomenon in future projects. Sight size is discussed by David Hockney in the previously mentioned book *Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters* where when the scale one normally draws objects/people from reality, anything smaller hints towards an optical device, for example in his investigation of van Eyck's jumps in size when rendering scale from a smaller drawing for his painting *Portrait of Cardinal Albergati* c. 1435 (Hockney 2001: 276).

By assuming the role of the artist, I was able to observe how an artefact is realised through a collaborative effort at the Rijksakademie – accessing Taylor's specialist photography skills and tacit knowledge of the subject, for example his ability to spot certain colour shifts and tint corrections in an image onscreen or in the output print that artists would not necessarily notice without that extensive experience, they might notice that something is wrong, but not how to make it right.

In my assumed role of the artist, I was freed from having to consider how the processes of actually producing the work would operate. Unburdened from having to consider what might go wrong with a process, I was able to concentrate on the idealisation of the final arefact and consider experimenting without having to think of how something might go wrong or not be achievable.

Having knowledge of the process as an artist participant was beneficial. In much the same way that Richard Hamilton - who was brought up through the process of print, and who has mastered digital print technology though a background of teaching printmaking and his previous employment as a draughtsman, will use specific studios for what they are best at - I was able to work collaboratively with Taylor having planned a project that would allow a joint intellectual effort which would utilise his specialist photography skills alongside our comparable experience of digital print.

2. *Printing a Photographic Portfolio edition by Inkjet*

A Dialogue between Paul Laidler and Dr Anne Hammond - Photographic Historian

and Photographer, Visiting Fellow at the Centre for Fine Print Research.

23rd November 2009, in consideration of producing Hammond's *The Crucible*, and

working with artists.

Anne Hammond, *The Crucible* (detail). Pigmented Inkjet Print on Hahnemuhle
Photo Rag, 31 x 31cm, edition of 9

AH: You're accustomed to working with major artists and professionals with years of

experience with Photoshop™ – it must have been quite different working with a

photographer who is completely new to digital colour-management techniques?

What do you find are the primary differences between painters or printmakers, and photographers, in the solutions they will accept to the different kinds of problems in the image?

PL: It is always different, but I would say "good different'. The collaborative print studio process forces a constant revision of approaches (generally by the printer) given the varying degrees of 'technical know-how' that the artists may have. In some cases the different backgrounds and sensibilities between artists means I am often trying to find analogies (both visual and language based) that may describe a digital procedure without using too many 'digital descriptions'. This type of transcription becomes tailored to an individual's thinking and image-generation methods. Although I don't profess to be an expert in the process of painting or photography; having an arts background and experience with these mediums does prove to be very useful.

If artists introduce or define themselves as a painter, photographer etc., then it is often an early clue for me, to the position that they wish to approach the technology from. However, I don't think there is a formula for working with artists who may have specific skills in other disciplines. If you were to push me, though, I could think of some obvious stereotypes from those disciplines!

I do think the word 'acceptable' is an important description for the printer to extract from an artist during the production process. The term often proves to be a fundamental stage of the proofing process, as in most cases, the identification of an 'acceptable' proofed print provides the first indication that the artist is able to consider all components of the image (colour, surface, scale etc) in their entirety. Prior to this

point the artist has to be mindful of how isolated image adjustments may affect other aspects of the whole image.

This then creates a base line, an agreement of sorts that the printer can visually measure other proofs against. Now the artist's and printer's conversations become less susceptible to the misinterpretation of visual ideas through words. Now the conversation moves away from 'do you know what I mean' towards 'do you see what I'm saying'. Another plus is it keeps the printer sane.

AH: When you use the word 'acceptable', you're really acknowledging that there may or may not have been a solution which might have approached even more closely the 'ideal' envisioned by the artist, but that this particular degree of correction, or choice of solution, would definitely fall within the required range of 'rightness'. The fine-tuning in the expressive printing of an image is a very subjective thing. There is no quantifiable degree of perfection, only a judgment on the part of the artist that this particular version expresses what they meant – or even offers something slightly more than they suspected was possible! But of course this is true in any medium.

You could you say that the most important quality in a Master Printer is the ability to assess the kinds of colour-management tools appropriate to the project at hand, and to quietly encourage the artist without imposing his or her own aesthetic preferences. Letting the artist's own questions lead the printer to the best possible outcome…
It seems to me this requires an extraordinary quality of intuition, patience (in addition to a mastery of the technology), and calm guidance through sometimes unfamiliar (to the artist) technical territory. This is something that can't really be taught, but must be

built-in, a part of one's personality. It is a bit like being an interactive but non-interventionist counsellor.

PL: I would say that the assessment of tools in relation to a specific task is a quality that stands any printer in good stead. However it is important to remember that there are many different ways to address a single task and I'm not sure I know every permutation. Luckily, in the studio where I work there are a number of other individuals with experience in related areas of the digital print field and can therefore offer other methods of production to an artist. So whenever the situation arises I don't hesitate in seeking advice from another colleague.

Subsequently I think it is debatable whether or not a printer can completely detach what maybe considered as an aesthetic preference. After all, we are limited to what we know at a given moment and the printer cannot escape the particular way in which they have learned and understood a process. So when an artist works with a printer they are entering into a set of parameters that reflect some characteristics of the printer no matter how subtle those parameters may maybe.

AH: Do you find the requirements of the photographer a great deal different from the painter/printmaker in terms of their uses of Photoshop™ tools for adjustments to the image?

PL: Those stereotypes pop up in my mind again. The whole 'requirement' thing for me is interchangeable, based upon the artist's goal, the holistic nature of facilitating,

and the simple fact that some tools (in certain situations) are much more appropriate than others.

If an artist describes their thinking through a specific process then I will begin by identifying similar digital tools and methods that relate to their specific making practice. After all, the print software programmes simulate processes and tools that refer to previous creative practices. Ultimately I try and think as pragmatically as I can about potential problems that may be incurred by working with digital technology, and thinking in a non-digital way. I do this by making sure the artist is aware of how the digital print process works; and how certain decisions (that may differ within another medium) may impact upon the work in an unexpected way or create difficulties at a later stage.

AH: In keeping with the traditional portfolio format, we also needed to print a title page, which revealed the shortcomings of Photoshop™ for typography – do you think it would have been better to have done it in InDesign™ or some other design software, and import it, or even produce it separately?

PL: On reflection it would have been better to use InDesign™. My initial thinking was that there was not much text on the title page and the layout appeared relatively straightforward. So I didn't feel that there was a need to introduce a new programme into the mix on top of getting to grips with Photoshop™.

PL: Prior to the printing of *The Crucible*, how much exposure had you had to digital printing?

AH: This was an entirely new departure for me, from the process of printing in photochemistry, which (while approaching some of the accustomed printing controls of conventional photography) demanded a new vocabulary and a conscious awareness of the potential instability of pictorial elements.

PL: How do you think of inkjet compares to traditional photochemical printing?

AH: In 2004, I took a photochemical print (out of a previous portfolio of silver gelatine colour coupler prints, *The Stone*) to a professional digital printer in London and asked him to scan the negative, and see if he could duplicate the exact aesthetic qualities of that particular photochemical print. Although his best efforts came close to the subtleties of colour in the Fuji Crystal Light print I had given him, he was of course unable to exactly match in the soft neutral tones of the rock surfaces in the original. I realise now, however, that it was like comparing apples and oranges – the different gamut of digital inkjet pigments and the different weight and surface of the paper give inkjet quite a unique identity. Four years later, the process of proofing the images for *The Crucible* on the Epson 9880 has taught me a great deal about the differences in the way photochemical prints and inkjet prints convey contrast, tonality, and colour transitions, and that they are, finally, as much separate forms of expression as a drypoint and a lithograph.

PL: Do you think the degree of realism that we take as characteristic of the traditionally printed photographic image is reduced in any way through the process of digital printing?

AH: This project made me realise that, although one might value the silver gelatine photograph for its apparent indexical relationship with the real object – the effect of transparency in which the image in the photograph seems to carry an imprint of reality - that relationship is probably framed in the individual and collective psyche. We recognise and identify with photographs based on a profound desire to connect at some level with the real object or event, and while subtle differences of contrast, colour range and surface texture may inflect or enhance that experience, they do not negate it.

PL: After this initial experience, do you think you will continue to work with inkjet?

AH: Absolutely. There are qualities of colour and surface in inkjet that simply can't be obtained in traditional colour coupler printing. In my academic life, I've worked a great deal with books, and I've always wanted to create an artist's book myself – so perhaps that will be the next step. Thanks for setting me on the road!

3. *Dycem Ltd* – consultancy visit to offer a best practice model for the organisation and operation of their commercial digital print facility, February 2011

Dycem Ltd Digital Print Room. Photograph: Paul Laidler

The document 'Zen and the art of Print Room Maintenance' is the course of action put into place during a consultancy visit to the Bristol factory of Dycem Ltd, a privately owned British manufacturing company, with offices in Europe and the USA. Dycem Ltd specialises in printed substrates for industrial use: contamination control, forensics, and safety (www.dycem.com). Dycem are collaborating with CFPR under the Knowledge Transfer Partnerships scheme through which Lee Hamilton is undertaking at CFPR 2010-2012. The Knowledge Transfer Partnerships (KTP) scheme helps businesses to improve their competitiveness and productivity through the better use of knowledge, technology and skills that reside within the UK knowledge base.

Dycem Ltd invited me to visit as a consultant to provide them with a best practice model for the organisation and operation of their digital print facility at the Bristol base. This will hopefully show that the strategies I put in place for operating the CFPR digital studio are transferable to an industrial print facility.

The print document labelling systems, image parameters list, paper inventory, and peripherals labelling systems were provided with the main document as a best practice model for Dycem to use as a template with a view to modifying them for the specific Dycem workflow.

Zen and the art of Print Room Maintenance

By Adam Samuel, Lee Hamilton and Paul Laidler. Consultation document created by Paul Laidler for a Digital Print Studio Management and Audit, Dycem Ltd, KTP Knowledge Transfer Partnership, 3rd Feb - 3rd March 2011

Chapter 1: Provisional documentation for Print Room

'There are two rules about Print Club, the first rule is everything must be labelled. The second rule is EVERYTHING MUST BE LABELLED'.
Note: Consult documentation examples left by P. Laidler

- Shelf space needs to be labelled so that any documents and products are easy to locate (no handwritten text - print out labelling and keep the same font)

- All inner core rolls and media boxes need to be labelled (Key details to be decided by Adam) Note: Consult documentation examples left by P. Laidler

- A media inventory needs to be established detailing stock list, quantities and amount of media left on opened roll etc. Note: Consult documentation examples left by P. Laidler

- All documentation labels need to be readily accessible as hard copies and shelved somewhere.

- Whiteboard to be installed onto wall as a weekly planner for Adam

- Adam will 'ideally' have a virtual version of his activity on the shared Google

Calendar

- Adam needs a filing system for his desk and ideally this should be replicated in folders on his computer.

Chapter 2: Organisation of Print Room space

'There needs to be a designated space for everything'.

- All equipment for printer (inks, device documentation, driver discs, maintenance kit etc. needs to have a dedicated space/ shelf.

- All unused products and un-sensitive media to be stored (tidily) on the balcony outside the print room.

- Store media under cutting bench

- Designate an area for all items that do not appear to have a home 'at the moment'.

Chapter 3: Desirables/ Showroom notion

'Look smart, think smart'.

- Create a wall display for Dycem products and manufacturing process. This may incorporate graphic illustrations, insallation photographs, small printed samples and articles or reviews of Dycem. Possibly collaborate with marketing on this and make sure the wall presentation looks professional.

- The 'installation replica samples' could be utilised as a means to demonstrate the resulting physical product. Documentation of the process and materials should be attached on the reverse.

- The central hub of the print room will be the database. A hard copy of the

(developing) database should exist in the room and be allocated a shelf space. For example (and in no particular order): test information sheets, customer and material supplier contact details, product information, installation guides, customer feedback, etc

Note: Lee and I will begin to implement this as the database is still under construction and there needs to be a serial number system that refers to and between the physical and virtual information.

-Take photos of trials, keep samples of all work produced with paperwork for further re-prints

Chapter 4: Acquirements/ Purchases

- Ample size rubbish bins (preferably paper recycle and general waste)

- A table for samples (preferably on wheels and collapsible if possible)

- Shelving unit for under the table (vinyl boxes etc)

- Filing draws/ shelving for intended paper work

- Filing trays for Adam and Lee's desk

- Digital camera and desktop printer for print room

- Adobe Suite for print room computer

- A wireless network in print room

Date:

Order number:

Order raised by:

Purpose / Usage:

Substrate description:

Further information:

Date:

Order number:

Order raised by:

Purpose / Usage:

Substrate description:

Further information:

Date:

Order number:

Order raised by:

Purpose / Usage:

Substrate description:

Further information:

Date:

Order number:

Order raised by:

Purpose / Usage:

Substrate description:

Further information:

Boxed Paper data sheet labels

Date:

Printer Model:

Substrate:

Software & Operating System:

Working Space:

Colour Management Method:

ICC Profile: /

Media Profile:

Further Info

Date:

Printer Model:

Substrate:

Software & Operating System:

Working Space:

Colour Management Method:

ICC Profile: /

Media Profile:

Further Info

Date:

Printer Model:

Substrate:

Software & Operating System:

Working Space:

Colour Management Method:

ICC Profile: /

Media Profile:

Further Info

Date:

Printer Model:

Substrate:

Software & Operating System:

Working Space:

Colour Management Method:

ICC Profile: /

Media Profile:

Further Info

Image Parameters data sheet

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Inkjet Paper Inventory in Supply Room					
	1/4/09				
Canon Art Paper / Smooth					
17"	1				
36"	1				
Canon Matte Coated Paper					
17"	1				
42"	1				
Canon Pearl Photo Paper 260gsm					
42"	1				
Canon Economy Gloss Photo Paper 200gsm					
17"	1				
42"	1				
HP Paper Backed Fabric Silk Satin					
54"	2 (1 open)				
HP Linen Canvas (special run)					
44"	2				
60"	5 (1 open)				
HP Durable Flag Canvas					
36"	1 open				
HP Studio Canvas					
54"	2 (1 open)				
HP Productivity Photo Gloss					
60"	3				
HP Vinyl					
60"	1 open				
HP Fine Art Paper Vanilla					
36"	1				
HP Fine Art Paper Aquarelle					
36"	2				
HP Premium Plus Photo Satin					
24"	1				
HP Professional Matte Canvas					
42"	3 (1 open)				
HP Premium Canvas					
42"	1				
Somerset Photo Satin					
44"	4 (1 open)				
60"	1				
Somerset Satin Enhanced					
52"	1 open				
Somerset Velvet Enhanced					
36"	1 open				
52"	1 open				
Hahnemuhle William Turner					
44"	1 open				
Woodstock Superfine					
52"	1				
Bockingford Inkjet					
24"	1 open				
Roland Peel Away Backing Paper					
48" (approximate)	1 open				
Pro-jet Artist Grade Matte Canvas 400gsm					
36" sample roll	1				
Pro-jet High Quality Matte Canvas 290gsm					
36" sample roll	1				
Agfa Select Jet Screen Film					
36"	1				

Paper Inventory

Substrate/ Paper: Somerset Photo Satin Manufacturer: Somerset Coated/ Uncoated: Coated Substrate Weight: 300gsm Date:	Substrate/ Paper: Premium Vivid Colour Backlit Film Manufacturer: HP Coated/ Uncoated: Coated Substrate Weight: 285gsm Date:
Substrate/ Paper: Premium Professional Matte Canvas Manufacturer: HP Coated/ Uncoated: Coated Substrate Weight: 430gsm Date:	Substrate/ Paper: Productivity Photo Gloss Manufacturer: HP Coated/ Uncoated: Coated Substrate Weight: 260gsm Date:
Substrate/ Paper: Sekishu Shi Manufacturer: Coated/ Uncoated: Uncoated Substrate Weight: 31gsm Date:	Substrate/ Paper: Premium Vivid Colour Backlit Film Manufacturer: HP Coated/ Uncoated: Coated Substrate Weight: 285gsm Date:
Substrate/ Paper: Somerset Photo Satin Manufacturer: Somerset Coated/ Uncoated: Coated Substrate Weight: 300gsm Date:	Substrate/ Paper: Productivity Photo Gloss Manufacturer: HP Coated/ Uncoated: Coated Substrate Weight: 260gsm Date:

Substrate/ Paper: Premium Professional Matte Canvas Manufacturer: HP Coated/ Uncoated: Coated Substrate Weight: 430gsm Date:	
Substrate/ Paper: Sekishu Shi Manufacturer: Coated/ Uncoated: Uncoated Substrate Weight: 31gsm Date:	

Samples of Paper labels

4. Unabridged Case Study

Artists: Neeta Madahar & Jo Lansley

Documenter: Paul Laidler

Case Study structure

This case study is written in a sequential format so that the image generation and decision making process can be understood within the context of this particular project and its timeframe 11th May 2007 to 23rd May 2007. The case study is structured into production sections that present the action research method of: Planning, Acting Observing, Reflecting and Revising.

The studio activity forms a large portion of the content for the case study, however external dialogue such as e-mail is included to present actual conversations and the specific language used for the digital production process.

The written case study includes a series of recorded images using scanned prints, digital photographs and computer screen grabs that illustrate the production process and acknowledge the difference between the digital and physical image that is a fundamental component of the digital printmaking field.

Rationale:

The artists Neeta Madahar and Jo Lansley were invited to the CFPR to produce an inkjet printed artwork as part of the *Committed to Print* project (See Chapter Six 6.2, Neeta Madahar and Jo Lansley, *Scape*). Prior to the project commencing the CFPR had consulted Master Printer Ian Cartwright of The Print Room, London and asked him to recommended artists that would suit the *Committed to Print* project. From Cartwright's recommendations four artists were contacted, of which Neeta Madahar was one. The inclusion of Jo Lansley on the project developed as part of a collaborative proposal that Madahar was interested in pursuing at the time of the invitation.

Plan

Two weeks prior to the start of the residency, a meeting between the artists and affiliated CFPR staff took place in order to assess the artists' proposal in relation to the duration, production and management of the project. The intended production of the work was to be developed form a series of photographic colour transparencies that would utilise the potential of inkjet's large printable scale and matt surface paper options.

Project Duration: 11th May - 23rd May 2007

Neeta Madahar in studio: 18th, 22nd & 23rd May 2007

Act

From the provisional meeting, the artists discussed a photographic based project that they had already begun working on. Whilst the images for the collaborative work had been recorded photographically they had not yet been realised as a final artworks. The photographic images that had been produced using a medium-format analogue camera were discussed in relation to the digitisation of the analogue images and the rendering possibilities of the printed artefact through scale, image format and surface quality. These discussions provided an early indication of the technologies and materials that would be used for the printed production of the work.

Equipment and Materials to be used (Hardware, Software, Materials)

Expression 10000XL flatbed scanner or a drum scanner

G5 Apple Mac Power PC (dual 2 GHz)

Adobe Photoshop CS2

HP Designjet z3100 photo

HP Vivera Pigment Inks

Hahnemuhle Photorag 310gsm

Friday 11th May 2007

Plan

A series of medium-format photographs were taken by Madahar and Lansley , from which two images were selected and combined to make one work for the exhibition. Early discussions concerning the particular strategy of uniting the two separately captured images examined the possibility of creating either a panoramic or a diptych image (see fig. 1).

Act

Madahar and Lansley had produced some preliminary sketches to indicate how the panoramic option may work with the two images. Using photocopies of the transparencies at 5 x 4 scale, Madahar and Lansley composed the panorama over two stages. To help create a successful marriage between the images the two stages centred on aligning the two camera positions used to capture the space, and the removal of any repeat forms.

Firstly by cropping the end of the bed (one of the repeat forms) currently inhabiting both spaces, the perception of two separate photographs begins to narrow to a single photographic space. The subsequent alignment of the picture plain along the cropped edges informs the cropping of top and bottom so that a rectangular format is maintained. Madahar's illustration (seen in fig. 2) shows some of the cropping ideas worked out on photocopies of the film, prior to any high-resolution scanning or digital file adjustment.
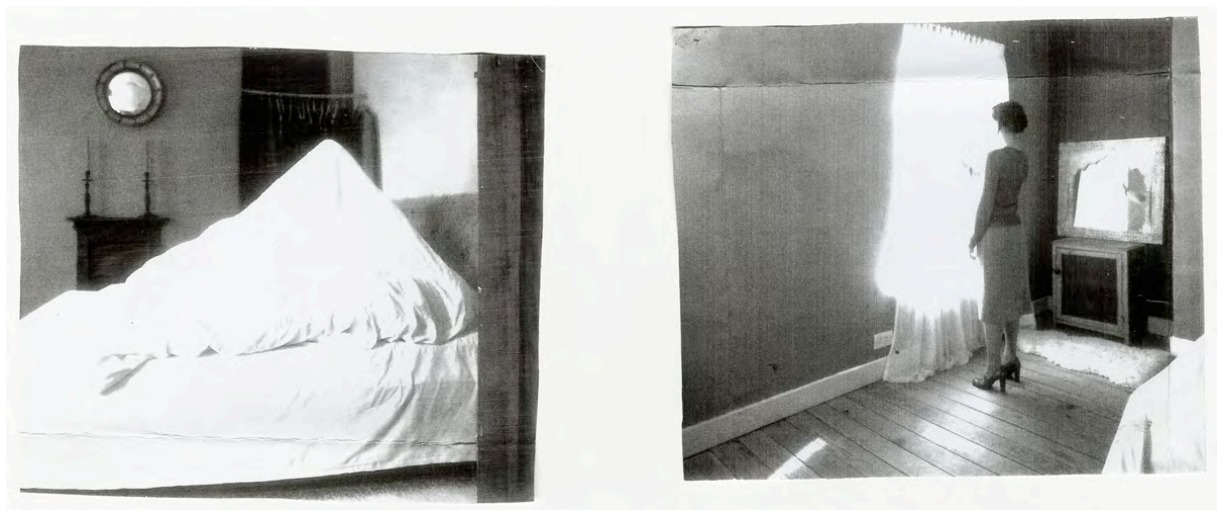
Figure 1: Two scanned black and white photocopies of the colour negatives at 5 x 4 scale
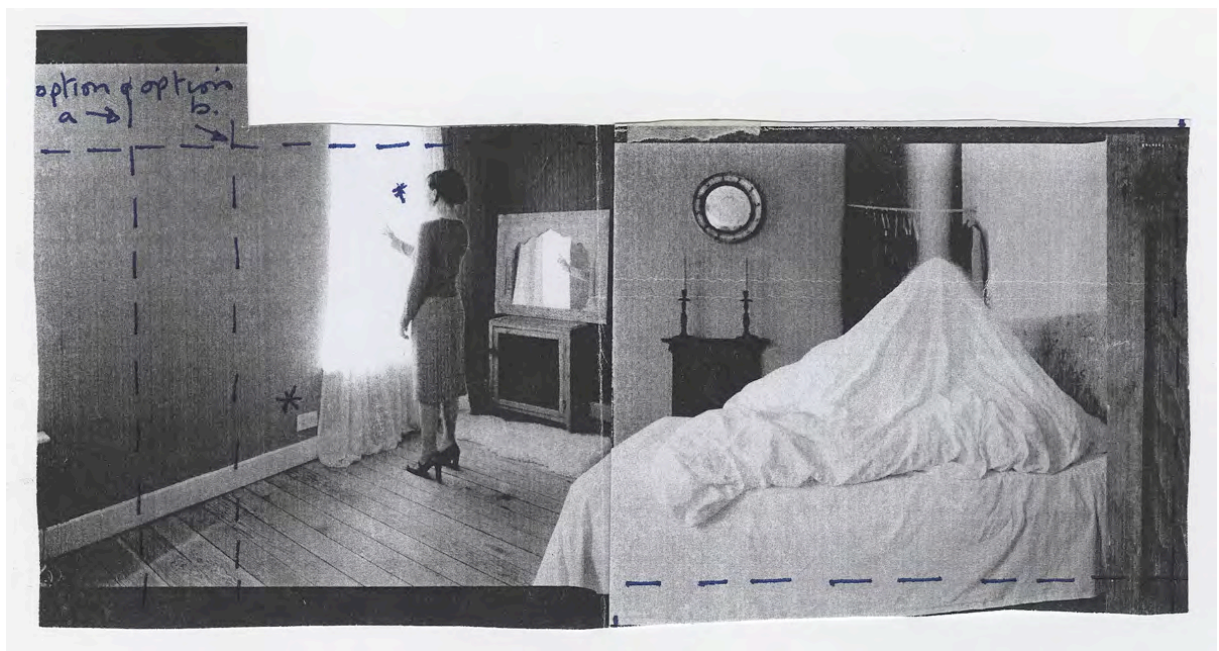

Figure 2: A collaged scan with notes for cropping possibilities of two black and white photocopies of the colour negatives at 5 x 4 scale

Observe

During the studio discussions, two scans were produced from the original negatives using an Epson Expression 10000XL flatbed scanner. In this instance there was no access to a specific capture profile for the Kodak Colour Negative film that Madahar

had used for the photographic recordings, as this was not included in the scanner's software. The lack of a specific capture profile resulted in a green colour cast being recorded from the generic colour transparency capture settings assigned to the scan (see below).

The flatbed recording process was also prone to attracting large amounts of dust on the negatives that would require a substantial period of time to clean.

Figure 3: Digital files of colour negatives captured by the Epson Expression 10000XL flatbed scanner

Reflecting

Although the scanned files could be colour corrected and cleaned, it was decided that this might restrict the time allowance for the project.

Revising

Based upon these possible time restrictions, it was decided that the colour negatives would be scanned externally using a dedicated film recording process known as a drum scanner.

Figure 4: Digital files of colour negatives captured by drum scanning process

Interestingly the drum scanned digital files had no dedicated attached capture profile and had been recorded using the smaller CMYK colour space as opposed to the larger RGB colour space conventionally used for fine art inkjet printing. Despite this, the drum scanned images were more consistent with the colours present in the original colour negatives and had less traces of dust in the recording.

14th May 2007

Plan

After the medium format film had been digitised using a drum scanner a series of cropping systems were to be applied to the digital images. These cropping systems were to follow the previous cropping strategies formulated on the photocopies.

Figure 5: Digitally joined images of the scanned colour negatives

Act

The cropping of the digital files was performed in Photoshop™ using the crop tool function. The two separately cropped images were then joined together in Photoshop™ to form a single digital image file.

Observe

The digital representation of the panoramic image on the computer monitor instantly highlighted some visual differences between the two panoramic constructions. Despite the introduction of colour to the image seen on the computer monitor, the discrepancies referred to a less convincing panorama through the digitally-composed view. Although there were a number of transcription influences between the two panoramic images (changes in scale, material, medium etc.) the two most influential components noted for this work were the tonal and 'join' qualities between the two panoramas.

Reflect

During the image joining process Madahar explained that the photographic recording had not been initially conceived as a panoramic image and therefore certain allowances for this photographic format were not employed during the capture. The success of (fig. 2) as a panorama is partly due to the amount of tonal information that the photocopy contains, and the material qualities of folding and joining compared with the Photoshop™ construction (fig. 5). A comparison of these tonal and joining observations for the two panoramic constructions is described below.

Revise / Join area

By considering the location and precision of the central cropping line in the digital file we can begin to identify how the rendering of the panorama differs between the two formats. The vertical left edge of the chimneybreast was chosen as pragmatic crop line for the image. The physically folded edge of this line in the photocopy retains similar soft qualities akin to the appearance of its printed reality. In contrast, the precise cropped line in the digital file bears no relationship to the chimneybreast's photographic reality when comparing it to the right hand side.

Revise / Tonal Shift

The particular tonal shift in this instance refers to the joining of the bed end. The exposure settings for the two photographic captures were considered separately, based upon the area of importance within the particular scene. This produced two different qualities of light when composed as a panoramic image and resulted in the tonal variations of the white bed sheets. Furthermore, a high ISO film was used for the scenes producing a noticeable grain in the enlarged digital recordings.

Plan

Following the completion of my alterations to the drum scanned image, the digital file was e-mailed to Madahar for comments and suggestions to act upon:

-- Original Message ----
From: Paul Laidler <Paul.Laidler@uwe.ac.uk>
To: Neeta Madahar <***************>
Sent: Monday, 14 May, 2007 6:41:30 PM
Subject: Digital File merger
1 attachment

Hi Neeta
I've left a tiny bit of the windowsill on the left image which can
easily be cloned - but you can get an idea of the maximum length you
can get, based on the dimensions of the right image. Let me know what
you think.

Regards
Paul

Hi Paul
Under the windowsill, there are some cables visible on the floor. To
make things easy I would just crop out the windowsill and the cables
as well. Whatever length this then makes the panel, use this to
determine the length for the right panel, i.e. how much of the door
ends up being included. With the door now being visible in the right
panel, can you please straighten it up as much as possible?

If all this sounds straightforward please go ahead with the next
stages.

Regards
Neeta

Act

From the provisional tests, Madahar felt that the space presented in the image appeared

contrived, this was partly due to the fact that the presentation method had not been

considered when taking the photographs. After a number of variations were tested,

Madahar decided that the separate images might be better presented as a diptych.

Observe

Later in the conversation, Madahar referred to the panel works of artist David Hilliard as an alternative method for combining the separately recorded images.

Reflect

Taking into consideration the alternative format and the logistical operations regarding the amount of digital file adjustment, proofing, deadline circumstances and the artist's studio time it was decided that the diptych option was best suited to the circumstances.

Revise

Thereafter the image was divided in to two separate image files with a view to matching the tonal and colour information between the separately captured images.

Figure 6: Digital images of the cropped scanned colour negatives with provisional colour correction

17th May 2007

Plan

To begin preparing for the next stage, a series of test strips were printed prior to the artist arriving. Using the previously established workflow parameters, the test strips would present the artist with a series of printed options of how the digital printing of

the image may progress (see fig.7).

Act

Before progressing with any extensive adjustment to the digital images, some minor colour corrections were applied to the scanned colour negatives. Each print was printed using the previously established print parameters (HP Designjet z3100, Hahnemühle Photorag, using the printers inbuilt colour management procedures).

Three examples were to be produced to show the artist the difference between the drum scanning and flat bed scanning recording processes. As previously, stated the drum scanned digital file was considered to be the most appropriate source image for this production. The third printed example used a duplicate version of the drum scanned source file that was adjusted for the intended print workflow by converting CMYK to RGB. Each test strip was documented with the specific source information and the print parameters assigned to the file. This allowed the artist to follow the procedures that were being performed between each production stage.

Observe

Although the test strips would not allow the artist to see the variations of printed information across the entirety of the printed photographic images, they presented a number of imaging considerations towards the development of the proofing process.

Figure 7: Scanned test strips printed on Hahnemühle Photorag (from right hand image in the diptych). From left to right: Example 1, 2 and 3.

Reflect – see Figure 7

Example 1, (Serial number NM3A) Epson Expression 10000XL flatbed scanner -

The overall image quality recorded by the flatbed scanner (using a generic input profile) achieved an acceptable level of colour and tonal information for this particular image. However, the increased scale of the printed image emphasised earlier concerns regarding the amount of dust attracted to the film during the flatbed scan. As previously anticipated, the cleaning of the dust was considered to be too time consuming at this particular stage of the project.

Example 2, (Serial number NM3A) Drum Scan CMYK

An ideal situation for a digital print studio is to try and keep the majority of the production process in house. The in house production allows for an optimised workflow to be assigned to a digital image for the generation of a digital print within a specific studio. From this perspective, the CMYK digital file that was printed on an RGB printer presented a colour space conflict resulting in some loss of colour information.

Example 3, (Serial number NM2A) Drum Scan CMYK converted to RGB

The conversion process used in example 3 to match the image colour space with the printer colour space provided the most acceptable rendering of the digital image. From previous experience, the matching of recording, viewing and outputting colour spaces eliminates inconsistencies in the workflow. Figure 7 shows the printed result of converting the digital file's colour space (CMYK) to the printers' configuration (RGB).

The printed test strip examples highlighted some characteristics of recording devices and workflow compatibility, whilst establishing the collaborative relationship with the artist.

18th May 2007

Revise

Upon the artist's arrival in the studio, the test prints were displayed. After a relatively quick assessment, Madahar decided that example 3 was the most pleasing test. In this instance it was decided that no revision of the test strip would be necessary.

Plan

Following Madahar's assessment of the test strips, a full scale version of each image would be printed to begin considering the relationships between the printed images and the digital files on the computer monitor - with a view to formulating specific image adjustment methods.

Act

With the full scale printed images completed, Madahar felt that the light recorded in the two photos would need to be more harmonious, so that the separate images could be more easily viewed as a single work. Madahar referred to the warmer tones in the right image against the darker left side, and the relationship between the white of the bed that traverses the two spaces.

To begin matching the recorded light in the photographic images, the tonal information would need to be adjusted. The digital alteration method was to be divided into two separately adjusted stages, first a global adjustment (an alteration applied to the entire digital image file) followed by a local adjustment (an alteration applied to a selection of the digital image file).

Observe

After assessing the tonal information in both photographs it was decided that the right hand photograph should be darkened towards the quality of light present in the left hand photograph. Madahar's specific description of 'towards' as opposed to 'matching' took into consideration the qualities achieved from the initial capture of the image. The amount of global adjustment to the file was very subtle in order to retain most of the highlight and shadow detail from the initial capture.

Reflect

The alternative global adjustment (lightening the left towards matching the right) would have meant blowing out the subtle highlight information in the window area and exposing further grain in the larger midtone to shadow areas.
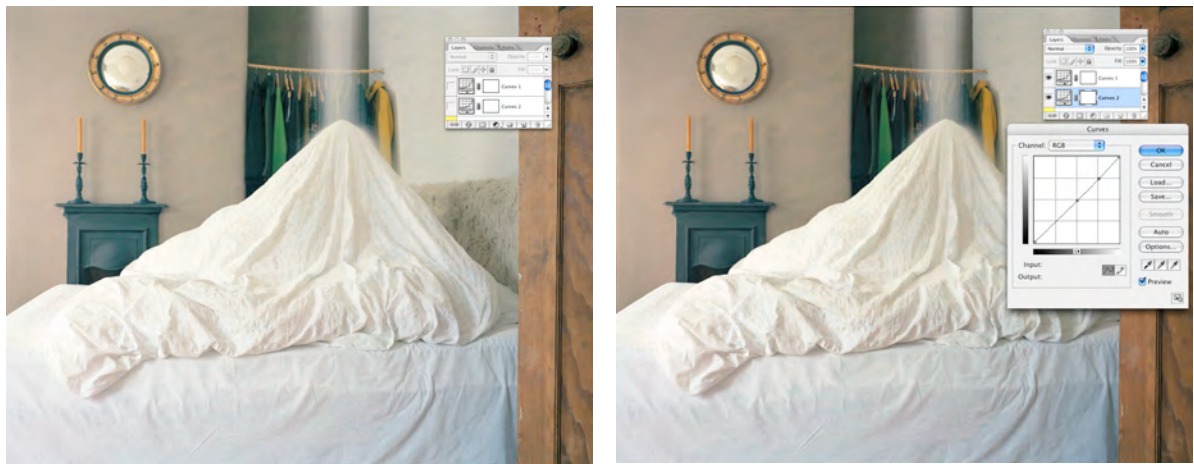
Computer screen grabs in Photoshop™
Global image adjustments to the right hand image in the diptych
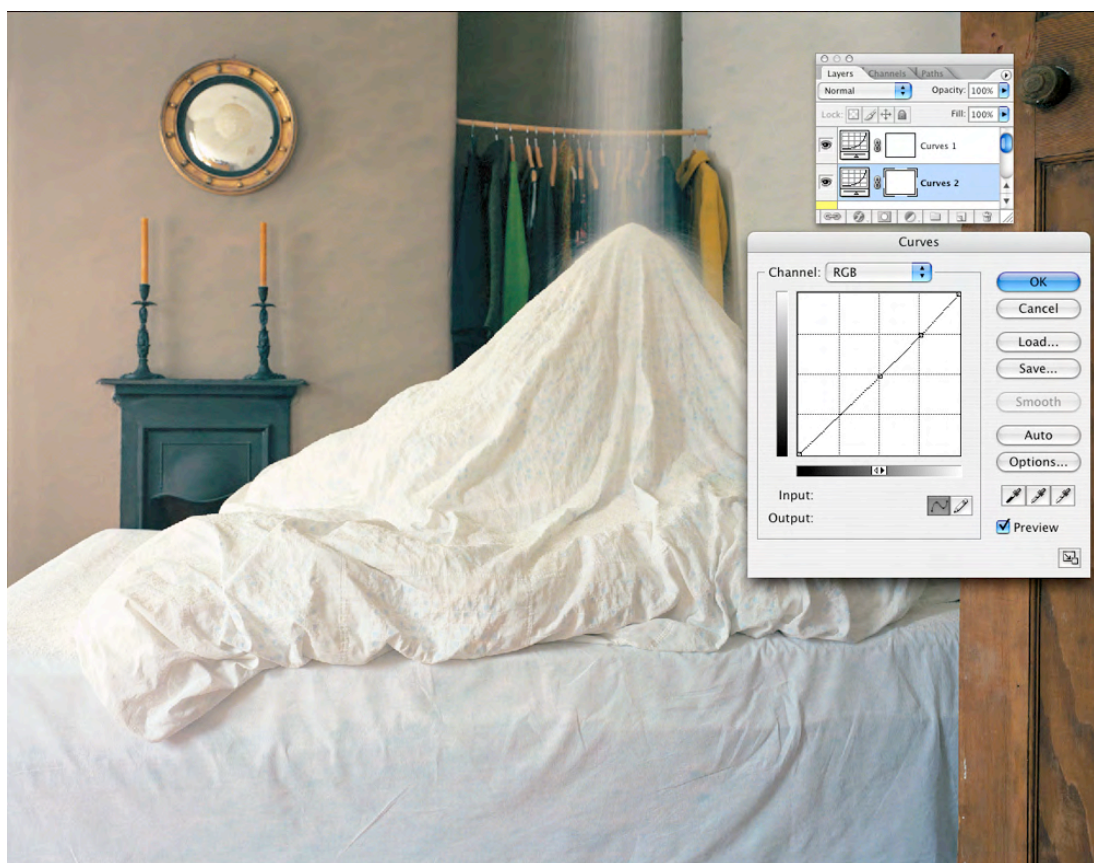
Revise

During the global adjustment Madahar noted that the yellow coat in the background appeared slightly too distracting within the whole image.

Plan

To reduce the yellow coat's vibrancy and prominence in the background a localised adjustment would need to be applied to that section of the image.
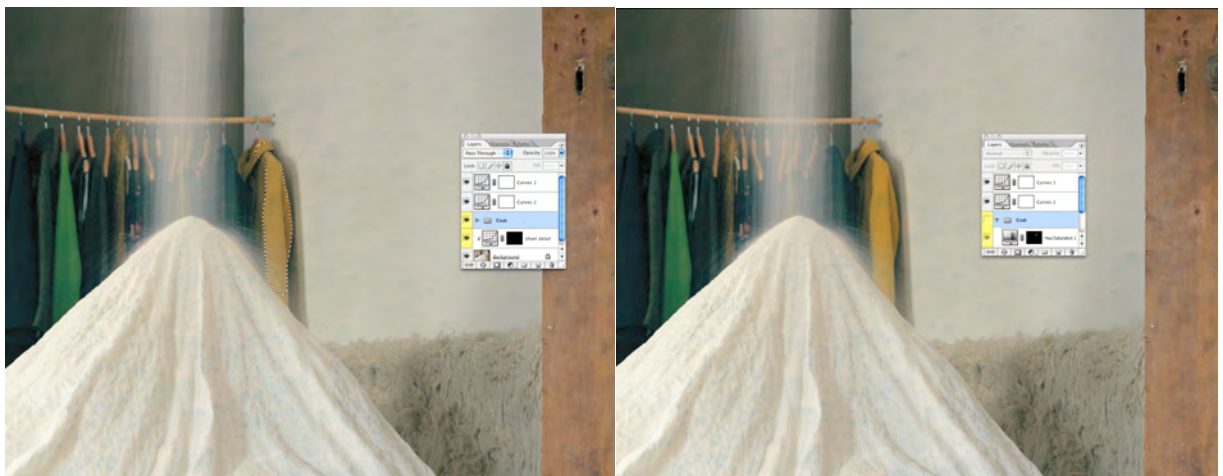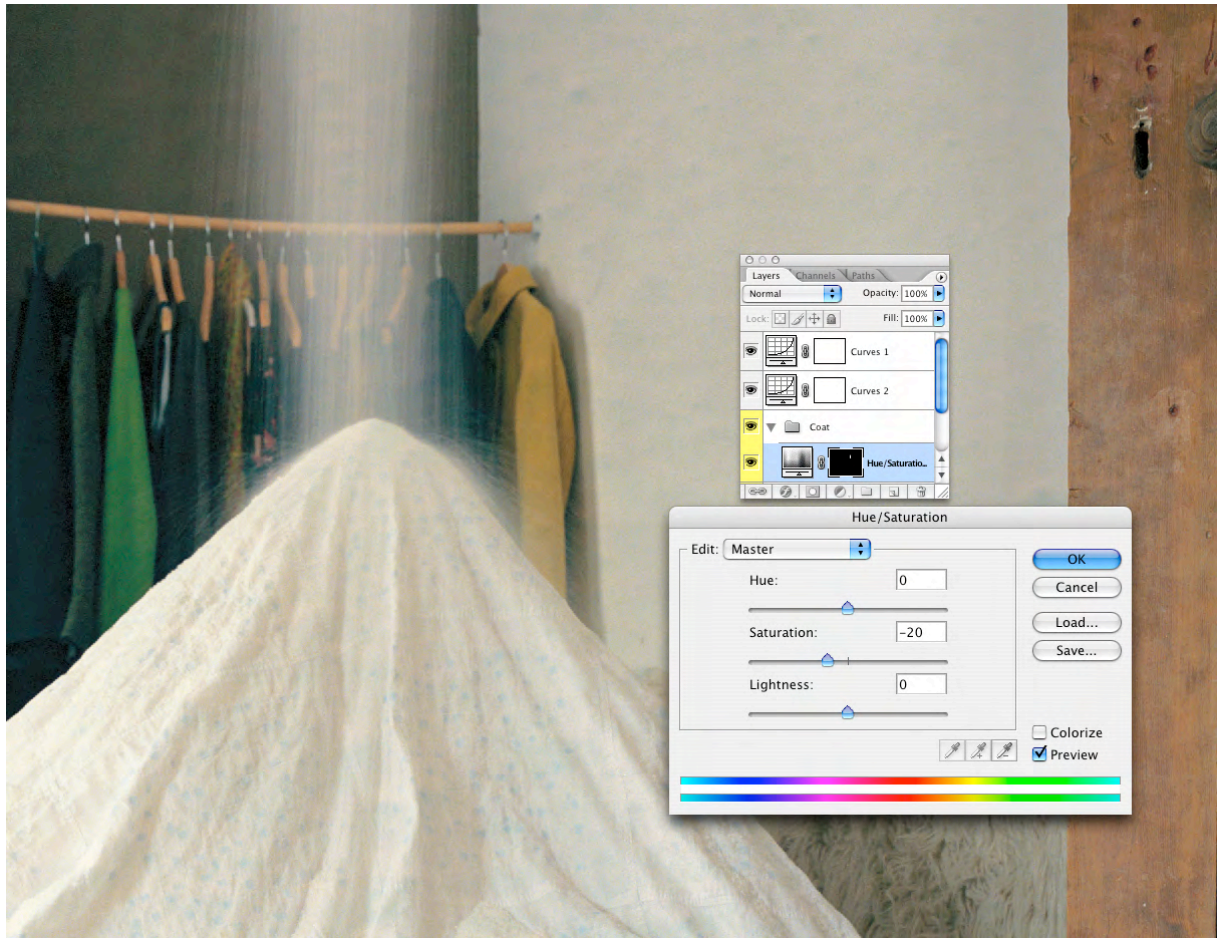
Computer screen grabs in Photoshop™, showing localised image adjustment to the yellow coat
Photoshop CS2 Procedure: Layer > New Layer Adjustment > Hue Saturation > Saturation -20

Act

A local selection was made using a 'soft brush' tool within the 'quick mask' facility.
Through this method the selection could be made relatively quickly (by brushing the
area) while utilising a tool that produces a gradiated selection. The gradiated selection
enables the manipulated area to merge seamlessly with the unmanipulated
surroundings. Once the selection was made, the yellow coat was desaturated
accordingly so that it resembled the other more muted tone garments.

Observe

A test strip section was then printed to view the results of the digital adjustments.
The adjustments had increased the appearance of the colour negatives' film grain that

resembled the appearance of digital noise.

Reflect

The film grain had not previously gone unnoticed after initially enlarging the digitised film. Madahar had felt that the film grain added a painterly appearance to the photographic image that was relevant to the themes and references within the work.

Revise

After comparing the recently printed test strip with previous unadjusted prints, Madahar decided that a small amount of global adjustment was needed to soften the grain that would help balance the distinction between digital noise and the utilisation of film grain.

Plan

An influential component towards reading the work as a single image can be seen through the one object that traverses the two photographs -the bed. Although this foreground element had received adjustment from the previous alteration, it still lacked parity with the unaltered section in the left hand photograph. The previous global adjustments were predominantly derived to match the recorded lighting within the two separately captured spaces. However, due to the parameters with which the file could be adjusted (image threshold) prior to any noticeable loss in image quality, the localised area of the bed's corner would require a smaller, more subtle change to make the transition complete.
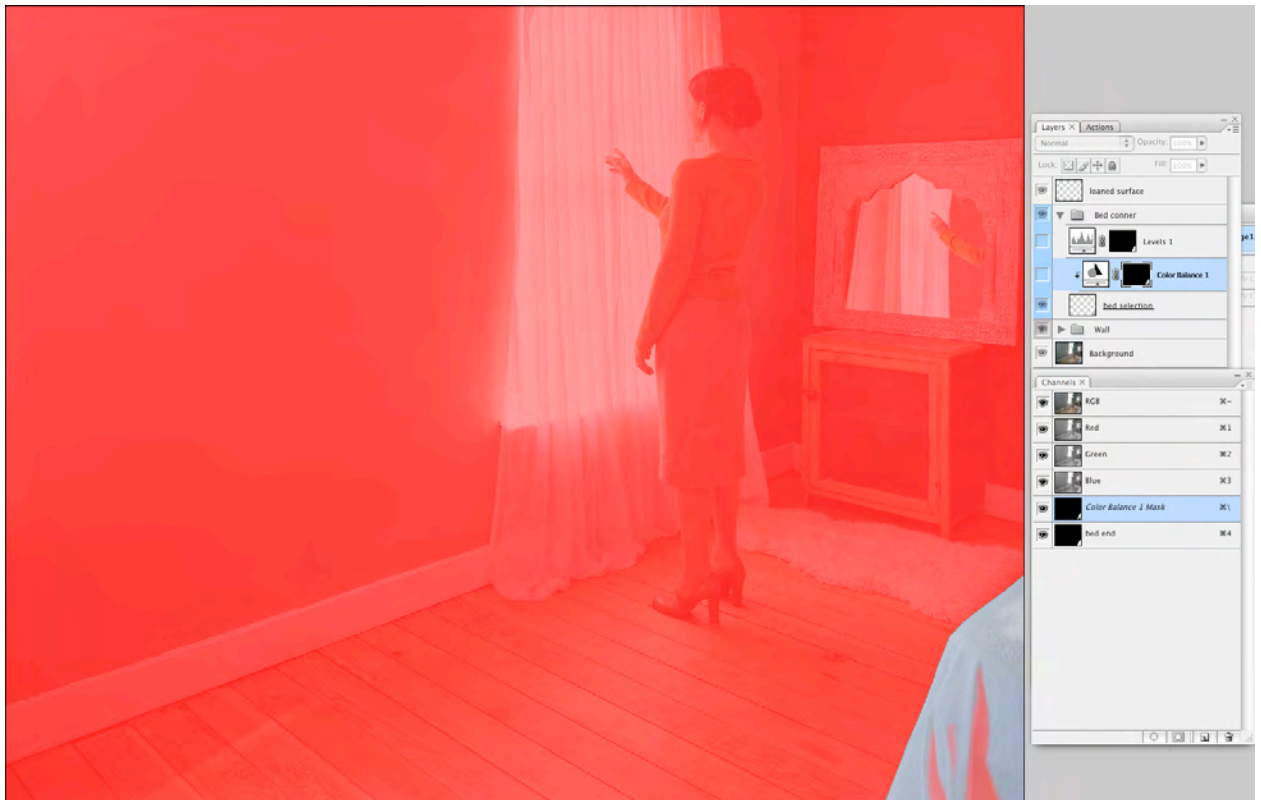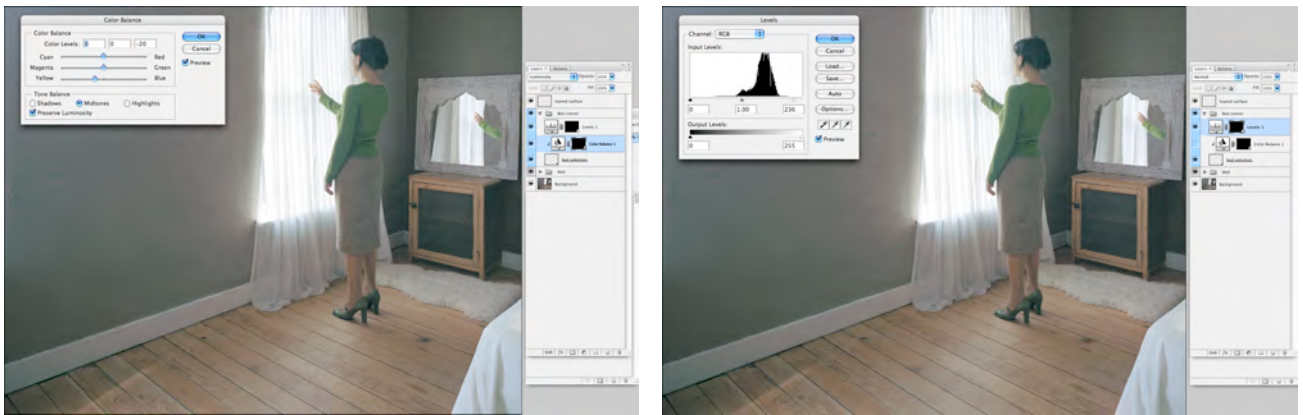
Computer screen grabs in Photoshop™ of quick mask selection

Act

The second stage adjustment was to be applied to the bed area in the lower right corner of the scanned image. Using the 'quick mask' tool a local selection was applied to the bed corner. The selection incorporated a feathered setting, which softens the selection edge with a uniform blur, avoiding any unseemly hard contrast between the outer bed edges and the background.

Once the quick selection mask had been saved, the bed corner could now be adjusted independently to the rest of the image. As previously stated, the tolerance for adjustment would be fairly low due to the film's grain structure and the lack of colour information with which to conceal any substantial adjustment of the area in question.

Computer screen grabs in Photoshop™ of the Image Adjustment Layers

Observe

After a range of Photoshop™ image adjustment tests were performed and proofed on the selected bed corner, it was decided between Madahar and myself that a combination of colour balance and image levels provided the best solution for managing the sensitivity of tonal and colour information in the masked area. Prior to completing the bed end adjustments Madahar noticed that the green wall looked different from how she remembered it when recording the scene. There appeared to be (an unwanted) slight magenta cast that faded from left to right across the wall's surface. Madahar asked if an adjustment layer could be generated that would remove the subtle discoloration.

Reflect

Over the course of the studio activity, the majority of adjustment strategies had been developed through an exchange of imaging methods between Madahar and myself. During these discussions, Madahar remarked that whilst studying in the USA she had learned digital imaging techniques from artist/educator Youngsuk Suh, and digital print considerations from having editions produced at the USA-based digital print studio Singer Editions (http://www.singereditions.com/singer.html).

The exchange of digital print production methods and shared interest in a number of artists working with digital imaging, broadened the context for the production process and the range of dialogue between the artist and Master Printer. References concerning the production process and image aesthetics within the *Scape* image were discussed in relation to artists Florian Maier-Aichen and Gregory Crewdson's photographic works. Both artists use analogue and digital imaging methods to invoke painterly and cinematic images respectively that can be found in the concerns of the *Scape* image.

21st May 2007

The development of the adjustment was tested without Madahar in the studio.

Plan

Without the artist present in the studio, the previous observations concerning the subtle discoloration in the left wall were addressed. The focus of the adjustment strategy needed to be responsive to the tonal fade in the wall so that the removal of the colour cast adhered to the gradation of magenta.
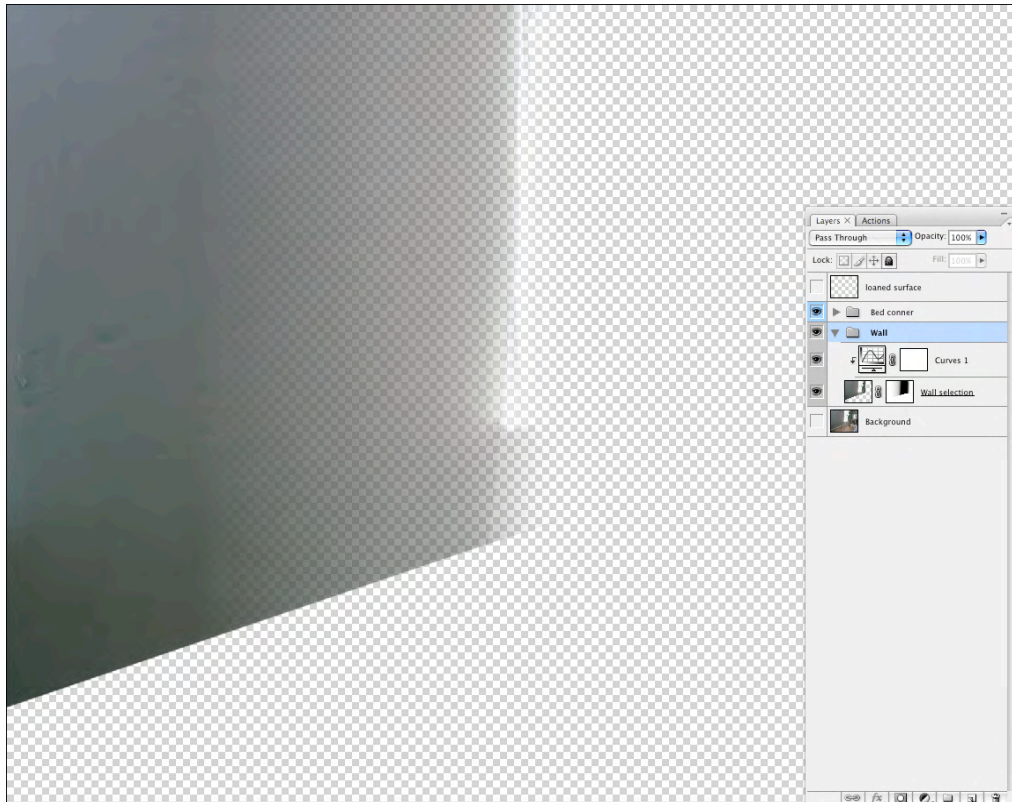
Computer screen grab in Photoshop™ - Layer of wall image section

Act

Using a similar localised masking technique to previous alterations of sections of the file, a mask with a transparent gradation setting was generated. This allowed for the subtle shifts of tonal information across the light and dark areas of the wall and the extraction of the magenta cast. A series of test strips were printed to review the digital adjustments.

Observe > Reflect

After reviewing the printed test strips, the cast had been removed, although the removal of the magenta colour became problematic in that the artist had referred to a memory of the colour green rather than a specific colour match. When correcting the colour shift using incremental adjustment methods there are a variety of resulting greens possible. Achieving the particular green for the wall required that the artist be present before continuing.

22nd May 2007

Neeta Madahar in the studio looking at the wall and marking areas for further cleaning on the prints, and colour and tonal adjustments to the wall.

Studio photograph viewing full-scale proofs, (Left to right) Paul Laidler and Neeta Madahar, 2007

Plan

Up until this point, the image adjustments had predominantly been proofed in test strip sections for the artist to assess at the beginning of each visit to the studio. The test strip

method helped to focus the production stages of the work before considering the adjustments upon the whole image. To give the artist the best chance of assessing the recently added wall adjustments, and the multiple alterations made to the two images, the reviewing procedure was altered as the work was reaching the end.

Act

Prior to the artist arriving, all test strips were placed into categories of production and presented alongside a full-scale printed proof of the diptych work.

Observe

When viewing the printed work in its entirety, Madahar instantly felt the work was almost complete. Madahar assessed the wall colour adjustment by registering the different test strips over the full-scale printed image, so that the different adjustments to the test strips could be considered in the context of the whole image. Madahar commented that the location and subtlety of the gradation mask had worked well although the amount of colour adjustment in the test strips and the full-scale work resulted in the wall containing too much green.

Reflect

The presentation of the proofs allowed the artist to review the development of the project as the work neared the end. Having spent the time generating the specific adjustment layer (that was assigned to the mask for the wall) Madahar would be able to quickly alter the localised area, matching the artist's memory of the green wall colour.

Revise

Madahar decided to fractionally adjust the red channel in the assigned adjustment curves layer.

Plan

A test strip was proofed to begin the reviewing process of the digital adjustment.

Act

The new test strip was placed over the large proof, in registration and compared alongside the previous test strips to ascertain whether the level of adjustment was correct.

Studio Photo, Neeta Madahar locating recorded areas of dust and scratches in the digital file, 2007

Observe

After reviewing each of the previous test strips, Madahar decided that the new proof was successful. Madahar also noted that there were a number of scratches and bits of

dust that had been recorded during the scanning process, each was circled with a pen on the large-scale proofs, to be removed before any final proofing.

Reflect

Before leaving Madahar approved the large-scale proofs for printing the edition prior to the remaining amendments being undertaken.

23rd May 2007

Plan > Act

Each scratch and area of dust was located by following Madahar's directions on the large-scale proofs. The digital files were cleaned using the Photoshop™ cloning tool and then saved on to disc and an external hard drive. The print output parameters for the work were also stored with the files as a guide for printing the work prior to the *Committed to Print* exhibition.

Source		Additional information
Source of image	5x4 Colour Kodak colour neg. 400 ISO	
If digital print (what was it printed with)?		

Recording Device & Image generation		Additional information
Type of image capture device & model	Drum Scanner	From Esprit Imaging Bristol
Generated with which programme	Photoshop	

Image File Parameters (Studio Computer system)		Additional information
Operating system	10.4.9 OSX	
Computer hardware	Apple Mac PowerPC G5 (dual 2 Ghz)	
Software	Photoshop CS2	

Working Space	Adobe RGB (1998)	

Assigned Image File Information		Additional information
Colour mode	RGB	Converted from CMYK scan
File type	TIFF	
File size / megabytes, physical scale	90 x 114.89 cm 10800 x 13787 pixels Resolution 120	Both images
Attached Profiles	None	The Scanned file did not come with an attached CMYK profile

Assigned Print Information (Computer software print driver)		Additional information
Method of scaling	Photoshop CS2	
Colour Handling	Let Photoshop determine Colours	
Print Document	Profile: Untagged RGB	
Print Profile	Photorag (271106) Paul	Made by P. Laidler on HPZ3100
Rendering Intent	Perceptual	No Black point compensation
Assigned Printer Driver Information (specific to Printer hardware)		
Printer device	Design jet hp z3100	44 inch printer
Printer firmware	TR12-RO_4.0.0.6	
Paper type	Fine Art Material – Thick Fine Art Paper (>250g/m2)	
Quality Option	Custom – Best – Max detail – More Passes	

Colour	No change	
Lightness and Hue	No change	
Lightness	0%	
Cyan - Red	0%	
Magenta - Green	0%	
Yellow - Blue	0%	
Grey Balance	No change	
Layout	No change	
Software (RIP)	None	

Substrate	Technical information	Additional information
Substrate	Hahnemühle Photorag	
Weight	310gsm	
Format	Roll	
Selected Media type in printer	Fine Art Material – Thick Fine Art Paper (>250g/m2)	

Data Storage	Technical information	Additional information
Device	DVD – R (Verbatim) & Studio G5 Hard drive	
Software	Roxi Toast 6 Titanium	

Participants & Production	Capture	Matrix (delineavit)	Proofing	Editioning
P. Thirkell P. Laidler N. Madahar	N. Madahar	P. Laidler N. Madahar	P. Laidler N. Madahar	P. Laidler

Print Parameters Documentation process

29th May 2007

Plan

As part of an AHRC-funded research project, the work produced through the residency

programme was to be exhibited at the Royal West of England Academy, Bristol (from

3rd June to 22nd July 2007). Because of this, the presentation of the work was included

as part of the residency programme. Each of the artist's prints had been conceived

through individual concerns with scale, format, surface and colour and therefore

similar sensibilities were addressed when presenting the work for exhibition purposes.

Prior to Madahar approving the prints, a few suggestions about options for framing the

work were discussed. Although undecided at the time, Madahar suggested the

possibility of a subtle presentation format that would not distract too much from the

work, and asked for possibilities to be e-mailed before any final decision was made.
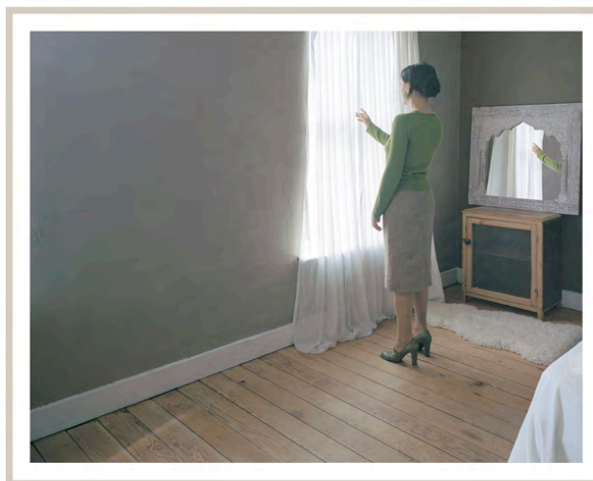
Act > Observe

Two subtle contemporary photographic framing formats were sourced and simulated in

Photoshop™. The framed digital files were e-mailed to the artist for comments.

----- Original Message ----
From: Paul Laidler <Paul.Laidler@uwe.ac.uk>
To: Neeta Madahar <neeta@***********>
Sent: Tuesday, 29 May, 2007 11:52:58 AM
Subject: Framed Jpegs

Frame 1, digital frame example

Frame 2, digital frame example

Hi Neeta
I've sent you two different 'virtually' framed versions of the files:
Frame 1 - is the 'cropped to edge' black frame
Frame 2 - is the white border with the 'wood colour' frame
I can send you the files just floating in a white space if you prefer
but didn't want to clog your e-mail with too many versions. Let me
know either way.
Cheers
Paul

From: neeta@***********
Subject: Re: Framed Jpegs
Date: 29 May 2007 15:24:43 BDT
To: Paul.Laidler@uwe.ac.uk
Thanks Paul
Both are great!
Neeta

Reflect > Revise

With both framing possibilities approved by the artist the final decision was discussed with Mark Darbyshire owner of the framing company Darbyshire (www.darbyshire.uk.com/index.html). Since 1992, the company has been providing consultation and bespoke framing fabrications for a range of high-profile clients such as Tracey Emin, Douglas Gordon and the Gagosian Gallery. The resulting framing method for Neeta Madahar and Jo Lansley's work was developed through discussions that considered the prominent area in the photograph and the physicality of the printed image. With this in mind the off-white colour of the frame was selected to mimic the bed linen whist both the depth of the frame and the inclusion of an image border (within the frame) accentuated the presence of print on paper.

Committed to Print Exhibition, Royal West of England Academy, Bristol, 2007

My role as researcher, documenter and archivist

The documentation of the print parameters provided the means with which to
reproduce the work accurately (see print parameter documentation) at a later date.
This blueprint information was then archived alongside the digital files ready for
completing the edition. As part of the archiving procedures a number of details
concerning the printed edition still remained outside of the documentation methods.

Print Document   23/05/07   Centre for Fine Print Research, UWE, Bristol, UK.
Last update of Print document: 3/11/08

Edition		Edition Distinction	Dates of completed states	
Edition Size	5	Limited/ Open/ Variant	Matrix: 11/5/07	
Artist Proof	0	**Limited Edition: (5) Hahnemuhle Photorag (95cm x 120cm)**	Approved proof: 23/5/07	
Printer Proof	0		Digital file completed: 23/5/07	
Studio Proof	1		Edition completed:	

Edition Information:
Work produced for 2008 *Committed to Print* Exhibition.
1. One print of the *Scape* edition was printed on 5/1/08 for the artist Jo Lansley.   The print was posted on the artist's request to an Exhibition in France.
2. Neeta Madahar requested one print of the *Scape* edition on 3/11/08. The print was collected by Madahar on 3/11/08

Data Storage	Artist	Atelier	Additional notes
Flat digital file	✓	✓	
Layered states	✓	✓	
Raw / Source files	✓	✓	
Output data		✓	

Artist Signature   Printer Signature

Artist: Neeta Madahar & Jo Lansley

Title: *Scape*

Paper/ Weight: Hahnemule Photorag 308 gsm

Paper Dimensions: 95.08 x 120.12 cm (per image)

Image Dimensions: 90 x 114.89 cm (per image)

Print Device: HP Designjet Z3100 Photo
Ink: HP Vivera

Medium: Pigmented Inkjet Print

The studio print document for *Scape*.

To monitor the later editioning activity, and catalogue key details concerning the work's archived digital image states, a 'studio print document' was generated to complete the digital print archiving procedure.

Summary and thoughts

The residency was initiated as part of the *Committed to Print* project that had an influence upon the parameters of the collaborative undertaking. For instance, the project was developed in conjunction with Hewlett Packard and largely determined the use of HP printing devices rather than those of other printer manufacturers. The duration of the residency was relatively short and therefore the production stages focused on print proofing as opposed to generating a new image.

The short period of time allocated for the residency meant that the production parameters were introduced fairly early in the project. As previously discussed, these parameters were developed to coincide with the *Committed to Print* project, but also as a response to considering the artist's aspirations for the work. This meant performing background research on the artist's work for potential production indications, and where possible, providing physical examples of similar printing methods undertaken by the studio. These provisional strategies helped assure the artist that their specific concerns could be catered for by providing physical examples that permitted the artist to see the potential of the intended work.

The production of the *Scape* print predominantly involved digital retouching methods, using tonal adjustments to both global and localised areas of the photographic image.

A large portion of the Photoshop™ retouching techniques had been developed through my own practice with digital imaging. The insight for realising the *Scape* image lay in understanding how digital adjustments would render when using specific materials and hardware devices. The empirical and experiential development within this particular facet of the digital print field goes some way towards the assertion of a traditional printer's special skill, although that is somewhat less defined within a digital print context.

The considerations during the studio production of *Scape* focused on the artist's concerns for adjusting the digital image. The varying methods were also discussed in conjunction with other artists' work in the field of digital photographic practices. The engagement with other digitally-mediated artworks meant that the resulting conversations and considerations broadened the context for a specific use of digital enhancement methods and how similar ideas functioned within the *Scape* work. In this case study, having a practice-based interest myself proved to be advantageous when understanding the artist's aspirations for the work and enriching the collaborative undertaking. From experience, this form of dialogue is very much dependent upon individual artists approaches and should be developed slowly or not at all.