

A context and taxonomy for printing: Intersections of culture and technology, 1850-2000

This project is based upon a research funding application being made to the UK Arts and Humanities Research Council (AHRC), the body responsible in the UK for funding University research in this area. It has been written by myself, Stephen Hoskins and Paul Thirkell in response to a series of discussions at the last AEPM General Meeting in Odense, Denmark and in particular response to Alan Marshall's paper at that meeting. Unfortunately there have been problems in submitting this application, partly because of the pressures of daily life, which fall upon us all, but primarily because of the (AHRC) body closing its application process for 12 months and the ongoing funding crisis in UK universities. However the AHRC is now open to fresh bids, if there are still enough museums interested

Research Context:

As observed by Alan Marshall in 2008,¹ 'in the 1960s, before the extraordinary eruption of digital techniques in the graphic arts, no one, not even the best informed commentator could have imagined the desktop publishing and digital prepress techniques which we take for granted...' Forty years later, we are in a position to put the apparently unique phenomenon of the digital revolution into its broader technological, historical and social perspective. However, there has been little analysis of the technical developments, social impacts, and market shifts that led up to the present domination of digital printing. The printing museum offers an entirely appropriate forum for understanding the core events that have culminated in the digital revolution. However individual museum collections in Europe have not kept up with the many strands of technological development, particularly in the twentieth century, which have contributed to the predominance of digital techniques in graphic communication.

Faced with the apparent complexity of technical changes that accompanied and stimulated the multiplication of forms of printing over the last hundred years, most printing museums have been slow to formulate their own collecting and exhibition policies. These policies must bridge the divide between the traditional processes and contemporary digital print technologies. This institutional reticence is largely due to a lack of consolidated information about existing artefacts, published research in the field, and a detailed historiography of twentieth century developments. Broad historical surveys (M. Twyman, *Printing 1770-1970*), social histories on specific subjects (A. Briggs & P. Burke, *A Social History of the Media*, 2005), and encyclopaedic glossaries of processes (L. Nadeau, *Encyclopedia of Printing, Photographic, and Photomechanical Processes*, 1990) have been published, but to date there has been no effective integration of these

¹ Alan Marshall, 'Learning to live with the 20th century: printing museums in the wake of the digital revolution', paper given at Association of European Printing Museums biannual meeting, Odense, 2008. See AEPM website.

different approaches to print history in a meaningful and accessible way. The underpinning yet divergent histories of graphic communication technology in the 20th century remain at present largely unwritten, something this project hopes to remedy.

Most museums have tended to limit their collecting and exhibiting to the printed matter and associated technologies with the greatest rarity and high art status. These are often related in a linear progression from the beginnings of movable type through to phototypesetting. This study seeks to highlight technology from a wider context, including communication, business, and home-use sectors, which has led to significant shifts in cultural development. Museums are very aware that this linearity in collections policy, has led in recent years to a disconnection between the institutions and their intended audiences. This has perpetuated the popular assumption that digital printing and the dematerialization of print as a technological phenomenon emerged fully formed in the early 1980s. Museums such as the Danish Media Museum and Melbourne Museum (as part of MuseumVictoria) have been reassessing print history in alternative ways. However we feel a published alternative taxonomic scheme of printing history, in relation to the advent of digital printing technologies, should create a forum for debate both academically and within the printing museum sector.

The scope of the subject area will extend from the mid 19th Century, specifically to cover the rapid changes to scientific and chemical knowledge that occurred post 1850. For example, Perkins discovery of aniline dyes and the many changes that led to the rise of photo-mechanical printing. It will encompass the rise of office duplication and copying techniques and the advent of electronic recording leading through to what we in this context refer to as the digital period. (By the digital period we mean those technologies that use stored electronic information) In order to contain the scope of the project it will only deal with the physical printed surface and try to avoid the overlap into film and media technologies. The printed artefact in its broad context is still very much part of everyday life and will be so for the foreseeable future, historically therefore there is a clear academic need to continue to document and collect the changes occurring to the printed artefact and not pander to the common assumption that because new media technologies exist, print will now cease and therefore is no longer a contemporary communication media.

To date, in order to exemplify the scope of the project, we have tried to identify some primary stages of technological development, in this case 6, but we are aware that these are only pointers for debate.

1. The adoption of printing presses compatible with photography (photoengraving, photolithography, photogravure) that progressively reduced the dependence on founder's type and hot metal in printing both type and graphics from the 1880s onwards;

2. The invention of screenprinting from (approximately) 1906, the first extant examples occur in Philadelphia (see Eleanor Noteboom, Richard Field, Dave and Reba Williams.) However the earliest patents date from 1887: Charles Nelson Jones in Michigan, and in Europe a patent from Samuel Simon in Manchester dated 1907. The first photo screen patent was 1901 from Canada and a carbon tissue screenprint patent was issued to S.J.Walters of England in 1920
3. The introduction of pre-WWII text assembly coding techniques, punched tape and networking, and post-war photo and computer typesetting, which began to substitute information for material
4. The development of office duplication technologies, such as the Edison's electric pen, Gestetner's cyclostyle, the Dick-Edison Mimeograph,
5. The development from the 1930's of technologies subsequent to the invention of electrostatic printing by Chester Carlson, facsimile transmitters, electronic engraving machines and scanners, all accelerating the tendency towards the dematerialisation of text and image finally manifested in the digital processes of today.
6. The introduction of alternative electronic imaging technologies, e.g. the first ink jet printer produced by the A.B. Dick Company in 1961. The creators of these early digital technologies are as we speak suffering the same fate as the specialists from industry within the traditional process such as typesetting. They are reaching retirement, to our personal knowledge two of the creators of early ink jet technology have retired in the last twelve months. Taking their notes and lab books with them. This information also needs to be captured alongside retaining the skills of the old processes.

The project proposes, through the formulation of a layered timeline, a multivalent assessment of the historical and social significance of each major technological invention. This unfolding of layers of information about each invention will reveal a confluence of culture and technology, to suggest 'the nucleus of new forms of social and cultural practice' (Mitchell, *The Reconfigured Eye*, 1992).

To put this in context, I want to run through a selection of slides illustrating this set of alternatives. I am concerned that this is a very simplistic overview, but that is the advantage of using visual material- you can state the obvious and present what is needed in an easily comprehensible manner. I particularly want to indicate how traditional technologies are still very much part of the digital revolution and how ubiquitous these processes still are to our every day lives and society in general

I want to show each of the traditional processes as we know them and then develop that into what those processes have become in a contemporary context, -in other words their direct antecedents. This will then be followed by the progression into digital technologies.

(Slide 2) Relief Printing: Traditional hand presses and type as you know them, the majority of these images are of our studios in Bristol.

(Slide 3) Flexographic printing, is the direct descendent of relief printing not only is it from a raised surface but also is still used by letterpress printers. On the other hand it is the process that prints your cereal packet, cheese wrapping, cardboard boxes and wallpaper. Flexo is still an expanding area of print.

(Slide 4) Etching: please note the press in the middle was originally used to print stamps, in fact it is the only surviving press of its type which was originally used for printing the Penny Black, the UK's first postage stamp.

(Slide 5) This led to Photogravure, or dust grain gravure if you prefer.

(Slide 6) Which in turn leads to Roto-Gravure which is still used to print stamps, food wrappings and high volume quality print. Until the recent global financial crisis, gravures share of the print market was not effected by digital technology.

(Slide 7) Stone lithography, leads to plate lithography, which in turn needs a consideration for (Slide 8) lichtdruck, however makes a natural progression to (Slide 9) high speed lithography. The area of the market, which I feel is under threat from digital technologies

Having dealt with the traditional processes let us now move on

(Slide 10) Screen printing, I do not know of any printing museum that actively collects and documents the history of screen printing.

This leads us to the commercial side of screen printing which has moved from a graphic process to an industrial one and is now a growing sector of the print market again

(Slide 11) Screenprinting prints CD's, (Slide 12) Car windscreens, electric kettle elements, printed circuits and bio-medical sensors, to name but a few.

(Slide 13) Office duplicating, the Edison Dick Mimeograph, and Chester Carlson on the right with his 1937 invention of the electrostatic copier. In some ways the real grandfather of the digital revolution.

(Slide 14) Which in turn leads to laser printing and the desktop revolution, but also commercial ink jet printing. In this slide you can see a few of our wide format printers, below is an HP Indigo wet electrostatic which is the industrial equivalent of the desktop laser printer. Without this technology it would not be possible to print online books, those family calendar and photo albums and the print on demand element has revolutionised the short print run capability. (Slide 15) This also leads to Grand format ink jet where whole sides of buildings and very large display graphics can be printed with ease

(Slide 16) Finally, we come to new printing technologies, which are rapidly extending the gamut of digital printing. These are our 3D printers capable of printing an object in three dimensions. In fact we have just filed a patent for printing ceramics in 3 dimensions so I can print you a complete cup and then put it into the kiln and fire it. If you thought there were problems in archiving new technology up until the end of the twentieth century welcome to the problems of the twenty first!
