

Running heading: DIGITAL PHOTOGRAPHY VERSUS ANALOGUE PHOTOGRAPHY.

Digital versus Analogue Photography: a comparative analysis

(Jim Cummins)

(Waterford Institute of Technology)

Table of Content

|                              |    |
|------------------------------|----|
| Introduction                 | 3  |
| Historical Context           | 18 |
| Methodology                  | 22 |
| Investigation                | 23 |
| Analysis and recommendations | 40 |
| Conclusion                   | 45 |

In this present age we are constantly being bombarded with new representational electronic information and digital tools. These have dramatically altered the way in which we perceive art, photography and society, and call into question the way we acquire knowledge and how we represent it. The development in new technologies in both electronic tools and media have changed our very concept of reality that has existed since the Renaissance. When we look back through history we can see that any major changes in the arts have been brought about cultural changes happening at that period. “The history of every art form shows critical epochs in which certain art forms aspire to effects which could be fully obtained only with a changed technical standards, that is to say, in new art forms.”<sup>1</sup> (Walter Benjamin, 1936) By the mid-nineteenth century, an artist could choose from among charcoal, ink wash, watercolour, oil paint and etching for example, all media available to previous generations, but he or she could also choose to make a daguerreotype or calotype, something that could not have been possible decades earlier.

Resources of art are not simply physical materials and processes. Each process has attached to it beliefs, practices and conventions that affect our understanding and reading of the images produced, and that the artist employs to achieve his or her desired effects. The development of a new medium can change the way we see, and can thus change our readings of works produced in those older media. Once beliefs and practices have altered, artists may find that certain types of effects can no longer be obtained.

To illustrate this point I will look at the most recent developments of photography, production of digital imagery. I will show that while the technologies of digital imagery are expanding certain resources of photography they

---

<sup>1</sup> Margot Lovejoy (2004), *Digital Currents: Art in the electronic age*, Routledge, 13.

are also bringing with them an altered attitude. This change in attitude may ultimately diminish some of the powers to which photography traditionally laid claim.

### The Powers and Limitations of Photography

Before we consider the impact of digital photography, we must understand the ways in which photography functioned before this new technology was introduced. More specifically, we must look at the features that have distinguished photography's use in the production of images. Towards this end, it is helpful to consider the way in which photography has traditionally functioned differently from painting. "There are many things that photography brought to the repertoire of image-making processes: a rapidity and ease of production, a new standard of precision and accuracy, and a more informal and experimental approach to composition and subject matter. But perhaps more distinctive was the perceived status of the photographic image, a status derived from its mechanical nature of its production."<sup>2</sup>

A photograph has a special connection with reality and an independence from the Photographer's intentions. For example, if there is an object or a person in a photograph, we assume that they must have been in front of the camera, since the object or person cannot just be a product of the photographer's imagination. It is for this reason, a photograph is thought to verify the existence of its subject in a way a painting never could. A photograph requires the presence of the subject for its production, while a painting could depend wholly on the artist's imagination. This close connection between what the photograph shows and what exists make a photograph of a subject more pleasing or upsetting than a painting or drawing of the

---

<sup>2</sup> William J. Mitchell (1992), *The Reconstructed Eye*, Cambridge, Mass., MIT Press, 13.

same subject.

Most photography is categorised as documentation or duplication and these can sometimes be at odds with each other. For example a photographer when taking a photograph of a landscape could either expose for the sky or the land but not both. To duplicate the scene requires human intervention as the photograph would require two exposures and this is thought to damage its documentary status. Despite this intervention our faith in the documentary character of the photograph is not lost. Not only do we believe that the photograph of the scene or object is evidence of its existence, but we also believe that is what it looked like. However this intervention could have taken days to produce, and needed great darkroom skill to create a believable image. With the introduction of digital imaging software and digital cameras this process can be achieved effortlessly and seamlessly making it impossible to detect.

In my photograph, St Mary's Ward (Fig1), we see a boy sitting with his back to us in a room across the corridor. We can also see that the image could not be real as the boy is transparent, but because we are so used to accepting photographs as guides to the way things appear it is hard to disbelieve it. The way in which we perceive the distortions of a photograph play's an important role in its aesthetic impact. We can see this by considering some examples of photographic transformations, and comparing them with corresponding examples from painting.

In Imogen Cunningham's *Leaf Pattern* (1929), (Fig 2), the cropping, lighting, two dimensionality of the photograph, and the use of black and white lead to the defamiliarisation of a common object - a houseplant. The Jagged white areas between

the leaves, the stripes of the leaves in the highlights and in the shadows, and the shadows themselves, thrown against the wall, create a confusion of positive and negative space. The close-up nature of the image prevents us from getting our bearings, or obtaining a frame of reference. We are shown a house plant in a way that we would never see it in real life.

Painting has also engaged in the defamiliarisation of common objects. The difference between its use in painting and photography is not just in terms of the materials or processes used, but in the impact itself. If one looks at a Picasso painting, or a nude by Matisse for example, these effects are attributed to artistic licence. An artist can choose to simplify forms, to intensify or mute colours, to highlight certain aspects of a subject or modify others. They can analyse an object into different planes, or show it simultaneously from different perspectives. The strangeness is seen as resulting from the artist's imaginative rendering. The resulting image is seen as diverging from what we would see in the real world. "The defamiliarisation of photography is read otherwise, for despite our knowledge of the ways in which photographs can mislead and distort, we nevertheless irresistibly see the photograph as faithfully recording for us the appearances of the world."<sup>3</sup> A photograph is seen as a means of objective recording, the photographer is not seen as giving his impression of an image, but as showing us the way things really look.

Even staged photographs can partake in the special kind of defamiliarisation characteristic of photographs. Joel-Peter Witkin's artistic approach to photography exemplifies this, as in *Un Santo Oscuro* (1978) (fig3) for example. As with the majority of his work it originated as a sketch based on information he acquired from friends about the subject (fig4). The photograph is of a man, a victim of thalidomide,

---

<sup>3</sup> Giovanni Lista, 2000, *Futurism and Photography*, London, Merrel, Holberton, 36.

he was born armless, legless, without eyelids and living in constant pain. Witkin portrays the man as a martyr based on eighteenth-century Spanish paintings of clerics who had themselves painted as martyrs. His martyr is shown with a cleaver and a chain-mail collar. The defamiliarisation is brought about firstly by placing the subject in an artificial setting, taking him out of context. His skin which resembles papier mache, helps to make one believe it could not be real.

In direct contrast, the Surrealist painter, Rene Magritte is of special interest with respect to this topic, because he often used photographs as studies for his paintings. This allows us to compare closely related images in the two different media. Magritte's painting, *The Therapist* (1937)(fig5) shows a seated man holding a cane, but where the torso and head should be there is only a void, a cage with two birds covered with a cape and hat. The corresponding photograph accomplishes a comparable effect by showing a man with a painting on his lap, hiding his torso and head, the cloak and hat are draped over the edges of the painting (fig6). The photographic study is more shocking in its impact than the painting, because the photograph creates the illusion of a missing torso. It records the image of a real person, while the painting only depicts a fiction, a person whose torso is a void.

In the photographs of *Our Lady's*, the utilisation of defamiliarisation occurs in a number of images. These images, chosen- to be altered, were of significant importance, as they had recurred in dreams during the period in which the research was undertaken. Despite their alteration it was important for me that the content remained unchanged, thus retaining their documentary status. In *Men's Toilet, St Patrick's Ward* (fig7) we see a room with shards of paint strewn across the floor, in the foreground a pair of old shoes. A newspaper is open directly behind them and two toilet cubicles, appear in the background. The fact that the image has been

altered does not harm its documentary status as the content itself has not been altered, only its appearance. If we compare (fig7) and (fig8) the difference in the visual impact is considerable. In (fig8) one can see how low the light and contrast levels were in the room. This lack of contrast lessens the visual impact of the image, but by altering it digitally using Adobe Photoshop it has created a new aura for the image. This increased dynamic of (fig7) would have been impossible to produce in a darkroom, but with the introduction of digital software it has made things that would have previously been impossible, possible, and with relative ease.

### The impact of digital photography

A digital image is an image made up of a grid of discrete units known as pixels, with numbers to specify the colour and shade of each pixel. The image can be stored electronically, copied, displayed, or printed, and can be altered in innumerable ways. The interaction between digital imagery and photography is made possible by the fact that analogue photographs can be scanned and converted to digital format. The smooth curves and tonal graduations of the analogue image are converted into discrete steps of grids. More directly, digital cameras can now be used to capture images electronically on disk, bypassing the photo-chemical process. Once an image is in digital form, its components can be rearranged, extended, deleted, and modified before it is printed. These processes now made easier by software designed for the purpose. When we add to the enhanced ease and the power of alteration of an image, the possibility of simulating photographically realistic components on a computer becomes possible. It appears as though the photographer has gained complete control over the final image, and acquired the freedom of the painter to depict whatever he or she can imagine.



This new creative freedom has opened a window of opportunity for photographic artists, but with every new freedom there is a cost! Like any new medium introduced in art/photography, it opens one field of thought only to close another. These alterations in digital images are seamless and almost impossible to detect. Elements can be reshaped, repositioned, or removed at will. Images from different sources can be freely combined and blended. This relative ease, freedom, and indetectability of digital manipulation make it impossible to resist, and are now commonly employed. For traditional analogue photography alteration is the exception. Alterability and manipulation can be seen as differing characteristics of digital imagery. To the photographic artist today, these programs and cameras could be seen as the brushes and pigments of digital photography. An understanding of these tools is the foundation of the craft of digital imaging.

One can go on to argue that this new technology must ultimately change the way we see and use photographs in the mass media. Now that it has become common to digitise images. It has become easier to alter these digital images through the use of programs such as Adobe Photoshop, to reflect whatever scenarios we might dream up. However the documentary usefulness of news and feature photographs is severely diminished. The fact that there is no negative against which an image can be checked for tampering leave even straight digital photographs open to speculation. There is not necessarily anything about an image if altered digitally that would alert you to the fact it has been manipulated. In a world where manipulation is on the rise, all images encountered in the media, even reproduced photographs, become suspect.

Of course there will always be some images whose altered or tampered status will be obvious, either because of technical glitches or because the scene shown is known to be utterly impossible. But when we look at the reproduction of what seems to be a

straight photograph, it has become more difficult to be confident that no manipulation has taken place. Photojournalism is not the only area open to this growing scepticism. We now find ourselves viewing all photographs in advertising, magazines, textbooks, with increased uncertainty. But more significantly, we find our scepticism extended to our first hand encounters with photographs. We have always had reason to view photographs with some scepticism, for they have always had the potential to mislead us. Not only with such elaborate techniques as retouching and combination printing, but also simple methods as cropping or labelling can radically alter our perception of a photographic event. The expectation formed in these everyday encounters with reproduction may come to condition our less frequent first hand experiences with photographs. We may find ourselves increasingly ready to entertain the possibility that a photograph has been altered.

Our implicit faith in the veracity of the photographic image is deeply ingrained, so it would take much more than a few digital forgeries to reshape our habit of seeing. After all, old-fashioned photographic forgeries have always been plentiful. Examples of hand retouched prints have existed since the 1800's. *Itinerant Priests*, 1880, Kusakabe Kimbei, hand coloured albumen print, (fig9) and more recently the *Cummins Family*, 1974, Ann Brophey, (fig10), hand coloured colour print. Alongside these conventionally altered images, there have always been a much larger mass of photographs that were straight. Some of them by photojournalists and other professionals, but many more taken by ordinary people who sent their exposed film to commercial developing labs. Digital scanners and cameras, however, put manipulation techniques at the fingertips of anyone with the appropriate software and hardware which is now available at very low costs. If we come to the point where photographs are as commonly digitised and altered as not, our faith in the credibility

of photographs will inevitably weaken, and one of the major differences in our conception of painting and photography could all but disappear. This change could not only effect our ability to use photographs as evidence, it could also have far reaching implications for the aesthetics of photography. Most discussions of computer effects on art/photography have emphasised the new opportunities afforded. The freedom of painting is wedded to the realism of photography: The digital artist can modify a photograph to fulfil his or her creative vision. This freedom may be bought at the cost of photography's perceived connection, photography's special surreal fascination may be lost.

The potential threat to photography, does not rest here. If the documentary photograph were a painting, it would only be anecdotal or of historical interest, whether the composition derived from a real event or was invented by the artist. Even when it does happen to correspond to an event or a view of a subject, a painting is seen as a construction and photographs are seen as actual. With the rising prevalence of digital manipulation, photography may also come to be seen as a construction. This changing attitude towards photographs could even affect the way we view photographs taken before the advent of digital photography.. Perhaps those of us who produced photographs before the digital revolution may possibly retain, at least in part, our habitual ways of looking at photographs. The generation that is growing up in an age where the photographic image is seen as fluid and manipulated may have trouble appreciating the aura of authenticity surrounding traditional photography.



Fig 1  
St Mary's ward



Fig2  
Leaf Pattern 1929  
Imogen Cunningham



Fig4 and Fig 5  
Un Santo Oscuro, 1987



Fig 5 and Fig 6  
The Therapist, 1937



Fig 9 and 10  
Men's Ward St Patrick's Ward, 2005





Fig 9  
Itinerant Priests, 1880  
Kusakabe Kimbei



Fig 10  
The Cummins Family 1974  
Ann Brophy

### Historical Context

Digital photography records light impulses as electronic charges stored on a memory disk. The image is a matrix of rows and columns where they intersect are small squares called picture elements, pixels, which carry information about the brightness and colour. A digital image is discontinuous, each pixel is separate from its neighbours. Typically the resolution, or number of pixels per inch, is so large that the human eye synthesises them into an image that appears continuous. When enlarged to a size greater than the file size the pixels become visible. This is not to different to analogue film as the more one enlarges a negative it begins to break up and the grain of the film becomes evident. With computer based images at the most basic level the information in each pixel comprises electronic pulses experienced as a series of 0's and 1's. Digital photography can undergo the same operations as all computer files, including being edited, stored, copied, or transformed into a variety of formats.

### What is the history of digital photography

The development of digital photography occurred in two distinct phases: The digitised analogue image preceded the digital camera. This use of digital imagery originated first in the 1960s, NASA scientists developed a method for the Voyager space probe to scan and send images back to earth from space. The scanned images

were converted into digital information and electronically transmitted back to earth, instead of continuous prints, as would have been the case in previous missions.

For many years, digital photography was limited to the scanning of analogue prints and negatives into pixel files. In 1981 Sony introduced the first digital camera, the Mavica, and this eliminated the scanning step. As with the development of computer technology, its development proceeded rapidly. As the speed and quality of these cameras increased costs began to fall. The first major group of photographers to change to digital cameras extensively in the late 1990's were photojournalists.

### How has digital photography changed photojournalism?

Digital technology has greatly changed the working methods for photojournalists on assignment, and brought operational and economic advantages to the news organisations. In traditional photography, photographers could not be sure of what they had captured until they had processed their film. Digital cameras however have display screens that allow photographers to review what they have captured while covering an assignment. They can decide whether what they have shot is needed or not. So they can continue shooting, or delete inadequate pictures and try them again, to fill in any gaps in the visual narrative.

Photojournalists and news organisations have experienced distinct changes. Eliminating the darkroom phase of traditional photography saving considerable time and money. The time formerly required to process film, make prints and put those prints through the engraving process are now spent covering assignments. It also saves time on the logistics of getting images and film ready for publication. Now photographers can plug the camera into their computer or laptop, select the images and captions and transmit them via the internet to the picture desk in minutes. This logistical advantage means images of a sports or news event even if in a foreign

country can be covered on the day of the event.

The conversion to digital cameras and computers has brought many economic advantages to news organisations. Substantial savings were made, by converting from a wet-chemistry darkrooms to digital media. They include the costs of film, photographic paper and processing chemistry; developers, fixers and bleaches, were no longer needed. Other advantages for example, a film can only be used once, but a digital cameras memory card can be erased and re-used continually. The costs of maintaining the darkroom itself, which typically consumed sizable space and energy are gone. There are also savings from not having to dispose of dangerous chemicals, a plus for the environment. This conversion to digital was expensive to begin with, but over time has proven to be very cost effective. For example in the cost of digital cameras, computers and the retraining of staff in the software used for production. The space for digital photography and the storage space needed was minimised bringing major savings. Perhaps the greatest saving is an operational one. Concurrent with the development of digital photography, newspapers and magazines have transformed their printing processes. The traditional method whereby printers composed pages in a backroom to one where editors and designers produce pages on computers in the news room. This change in technology has brought with it a further significant change, our national newspapers are offered on-line on the internet. The cost of newsprint and the space for photographs is limited to the paper size or format. These limitations of displaying several images from news events have now gone with the advent of on-line versions of the newspapers. They can also remain on-line as long as the publication chooses to archive them.

### Digital photography's effect on education

Education has followed rather than led this transition to digital photography. College departments of photography eventually followed in order to prepare students for jobs in this now changed industry. This was also a two stage process; scanning and computers ( the electronic darkroom ) entered the curriculum in the mid 1990s, but traditional cameras and darkrooms were still retained, and seen as more important. Typically, students would shoot and process film, and then scan the negatives or prints, should they want to alter or correct the image. As the price of digital cameras became cheaper and the image resolution and quality increased to match analogue film many colleges invested in digital cameras and auxiliary equipment. The transition from wet-chemistry to digital did not come into play until the 21<sup>st</sup> century. Most colleges still retained the wet-chemistry labs as some of the older processes cannot be produced by digital printers. This transition it could be said, was forced on the colleges between 2002 to 2003. It was brought about when the three main producers of wet-based chemistry - Ilford, Agfa, and Kodak - closed down production, With supplies of wet-chemistry becoming more difficult to acquire, the transition to digital was imminent.

The skills required for educators to use these new technologies with respect to photojournalism are complex. Not only does one have to learn how to master the programming of the digital cameras, but also learn how to use the software necessary to edit and print digital images. In a great many cases this meant re-learning photography through these new media, in a relative short period of time. While

complex, the workings of most digital cameras can be learned in a few sessions and like all tools mastered with repeated use. However more time and instruction is needed to master the software used to edit the images produced. Adobe Photoshop, Paintshop-pro, and Coral draw, to name just a few these would be the most commonly used tools in the industry, with Adobe Photoshop being the industry standard. These programs are very complex and can take years to master, although this will vary from individual to individual depending on their computer literacy.

### Methodology

My approach to the research will be a practice-based one, as it is the most appropriate for this project - the investigation and cross comparison of analogue film and digital media. Through the production of a large library of images using both media I have analysed the differences between the two media. Charting the differing characteristic aspects they have to offer to both artists and photographers alike. I have particularly emphasised what digital photography has to contribute to both activities. This is a very important issue as we are more and more being forced into this field of digital photography by the camera industry. To this as an educator and artist/photographer it is vital that I have an in-depth knowledge of this new media and the advantages or disadvantages that come with it.

### Investigation

The site chosen to carry out the practical research in, is Our Lady's psychiatric hospital on the Lee road, Cork. The hospital first opened in 1885, and was likened to Westminster in its grandeur. It was also regarded as the most modern psychiatric hospital of its kind in Europe. However in the late 1980s it was finally closed under a cloud of controversy. Both the general public and ministers demanding its closure as it was unfit for human habitation.

It was important not to just make a photographic record of this building, as anyone would be capable of achieving that, but to create a special meaning for those who would view the images produced. What spurred this drive to produce something very special was the fact that no prior record of this historic building had ever been made. To this end it was imperative to attain as much information about this majestic building's history, and the reasons for its closure to achieve this goal. As well as this it was very important to be as close to the subject as possible at all times during the research. This building was under development at the time, and an apartment block was built in the grounds of Our lady's, I rented one in June 2003, 120 River Towers. This apartment had direct views of the building from all the rooms allowing one to gain a greater affinity with the subject. It also afforded one with easy and speedy access to the site, very important with the weather we get in this country. During the early research on the building in the city library, one article in the Irish Times on the hospital had a profound effect on how this photographic project would be approached. The heading "The locked door to another world," changed any perceptions and experiences gained from previous visits to the building. The article was published on the 7<sup>th</sup> of June 1988, p 13, it was an extract from an edition of the

Irish Medical News, by an unnamed doctor, working in the hospital. He describes the appalling conditions there. The following is an edited version of the article and theme behind the photographic study.

“ To visit Our Lady’s hospital you must let yourself in through a large, heavy, locked door. Be prepared, for you will experience something you are unlikely to forget. As the big old door creaks open, the stench assails you, a mixture of ammonia and rising damp from the cracked walls and floors. Peeling paint suggests that it may not always have been like this.

As you climb the stairs you pass locked doors, having no windows or other indications that people reside within. Progressing to the top you hope that the lights will work. They may not and the keyholes can be hard to find in the gloom. Taking a deep breath you enter St Patrick’s 9, a locked security ward for aggressive patients-men incarcerated for so long that they and everyone else have forgotten when and why they were admitted.

Sullen faces greet you, rows along the wall, grey blankets match the floor. The large room is lit by a naked bulb and faint sunlight struggles through the Perspex replacing the windows broken to often. Grey faces, vacant stares, hostile words-you try to ignore them and leave quickly for the next ward. Here most of the men are naked and follow you, shuffling from one end of the long ward to the other. The lino creaks and they stand back, huddled together as you unlock the door, nobody attempts to push through.

Here there are indications of humanity, curtains on the windows, rugs on the floor. pictures on the wall covering the peeling paint or cracks in the plaster. This ward is ok. Its great, but in Our Lady’s, minimum standards have a different meaning.



The population is now under 1000 patients. The aging patients are becoming increasingly psycho geriatric, thus needing increased nursing care and support. Unfortunately this need is not met. Patients are left unsupervised at night, one nurse having to supervise up to three wards, separated by long corridors. Temporary domestic staff have been laid off and the wards are cleaned less and less. Lumps of faeces litter the floors, so you step carefully around them. The female patients have taken to do some of the cleaning chores as there is only so much filth a person can tolerate. Spillages on the floor on a Monday may still be there on Friday.

The two wards have appearances of a place under siege, with staff and patients resigned to the inevitability of their faith. Staff moral is understandably low. Redundancies and layoffs have aggravated an already intolerable situation, worst in the male wards.

Visiting St Johns, if you can stand the smell, it is difficult to distinguish the nurses from the patients, as they both look the same. The place is filthy, a token female nurse makes a resigned attempt at cleaning but its hopeless. All the wards at Our Lady's are segregated male patients with male nurses. All attempts to integrate are strongly resisted by the female staff. It is seen as a disguised attempt to use them to clean the male wards. They would have little alternative if they wanted tolerable working conditions.

Our Lady's is in decay. Its patients are old, the sick and handicapped. For staff and patients the present is grim, the future bleak. It is indictment of our health care policy."

This article emotionally altered the way I had previously perceived the building. It also helped me to resolve my approach to the way I would photograph the hospital and aided in the development of a strong underlying theme for the images. These

images produced will now have a more poignant meaning to the viewer, and not just be a photographic record of this magnificent building.

The equipment and materials chosen for the photographic research, both the cameras and film, would be used by the majority of professional photographers today. The analogue cameras are the Nikon F4 with Nikor 24mm 80mm E type lenses. The digital camera being used is the Canon EOS 20 D with a Canon 17mm to 85mm EFS lens. The digital camera resolution is 8.6 mega pixels and full frame, this camera, due to the resolution, is said to offer a higher quality image than analogue film by the photographic journals. The analogue black and white film chosen for the programme was Agfa APX 100 ISO, and Fujineopan 400 ISO. The colour film is the Fuji Superia 200 ISO. These films are the most widely used professional on the market and have produced good results in a variety of lighting conditions successfully.

Having never used a digital camera before, it was impossible to say how it would react to the low lighting conditions in the building. From working with the cameras internal program it has some features that allow one a high degree of control over the final image. Firstly you can see what you have captured as it is taken and if it is not suitable you can delete the exposure and re-take until you achieve the desired result. Secondly one can change freely between ISO settings with no adverse affects ie: from 100 ISO to 1600 ISO. Another advantage is the fact that as one views the image photographed you can also view the histogram of the image simultaneously, allowing you to see the graph of the exposure, and this lets you see how much the exposure needs to be altered by. The Canon 20 D also boasts a true black and white setting. This was not available in digital SLR cameras until now. They could only offer a monochrome setting. This was only a grey scale setting, offering no true black. This setting was of interest, after having spent nearly twenty five years experimenting with

black and white film, to see if the reviews in the photographic journals are warranted.

As part of the preparation of the photographic project that was to be undertaken, it was important to work out any technical problems that might be encountered while working in the building. In an attempt to avoid any time wasted while working on this project a month was spent taking light readings in different areas of the building at various times of the day. These were then logged, to work out the best time and the best type of daylight to record these images in.

The optimum times to take these photographs worked out to be between 8am and 11am, and to get any reasonable light readings it had to be sunny or at worst broken cloud. In these conditions the exposure times varied. On the south face of the building  $1/30^{\text{th}}$  of a second to  $1/8^{\text{th}}$  of a second at f16 aperture. On the north face of the building the exposure times were varied from 1 second to 30 seconds at the same aperture f16. This choice of aperture was chosen to give the maximum depth of field. These long exposures of the north face of the building have colour cast problems for the colour film, caused by the northern light spectrum. This colour cast tends to produce a pink to purple saturation in all the colours. The amount of colour cast will only be apparent when the images are printed. How it will effect the digital colour setting remained to be seen.

These visits taking the light readings also afforded the opportunity to become more orientated in the building, and work out a plan of approach. There are three floors each almost a quarter of a mile long form the east wing to the west wing. At this stage it was impossible to work out how long it would take to record this gargantuan building. The first photographic shoot should allow for some kind of realistic timescale for the project.

### Photographic Shoot 1

The plan for this shoot is to start in the ballroom at the rear of the building and then progress to St Patrick's ward, on the ground floor. What was not expected was how slow this progress was to be. This was brought about by a combination of things, firstly the weather, broken sunshine which meant long waits between shots for the sun to reappear., and using three cameras and one tripod with long exposure times, only allowed for twelve photographs in each media. The fact that one had only a window of three hours of light suitable to photograph in did not help. However the fact that one could see what was being captured on the digital camera did help speed up the process somewhat. Despite only capturing forty eight images in all they gave a good indication of what to expect in future visits to the building.

The images chosen for analysis from shoot one are, firstly the black and white shots of the Ballroom at the rear of the building. The Ballroom (fig i) taken with Agfa APX 100 ISO film and The Ballroom (fig ii) taken on the black and white setting of the Cannon 20D at 100 ISO. The first of the colour images are of St Patrick's ward (fig iii) using Fuji Sensia 200 ISO film and (fig iv) on the Cannon 20D at 100 ISO. These four images were all on the north face of the building where the light levels were very low. From the south face the images chosen are (fig v) Hallway St Patrick's using Fuji film and (fig vi) on the Cannon 20 D.

Ballroom (fig i) the resulting image shows an extensive loss of detail in the shadow areas of the image. This was not anticipated having used this film in more difficult conditions one would have expected the film to have yielded more information. The loss of detail in the most important features of this room ie: The wall

to ceiling oak girders. They just disappeared into the shadows, even the foreground and middle distance is some what subdued. The atmospheric quality of this image is acceptable as a photograph, but not as documentary record of this room. This was most surprising as the exposure was based on the digital image captured. When we compare the two images one observes a vast difference between them. Although the digital image loses some of the detail in the rafters, the overall majestic atmosphere is visible to see - from the tiles in the foreground to the fireplace in the east wall. One can see the oak beams which arch from limestone plinths inset into the walls upwards to support the roof. This gives us a strong visual impression of the construction of this majestic ballroom. The fact that all this visual detail was lost to the analogue film was surprising. As digital media was created based on how analogue film reacted to light, one would assume that the analogue film ( which preceded this new media) would yield the better results. Both images were exposed for 15 seconds at f16, and in theory the results should have been the same. The colour images of this room were even less successful as the analogue image was unprintable, and so no comparison could be made. The main problem in trying to record this room was caused by the light from the windows in the east wall. If the exposure time had been longer it may have allowed the analogue film to make a more accurate record of the room but the flare from the windows would have burnt out the east wall.

St Patrick's ward "Nurses Station"(fig iii), exposure time 25 seconds at f16. As was expected with the analogue film it experienced a high degree of colour cast due to the length of exposure. While it does not take from the documentary status of the image, the density of colour cast make it unacceptable as a photograph. This long exposure was due to the low light levels in the north face of the building. But

also in an attempt to capture the cold blue hue present in the highlights. But in doing this it has only increased the magenta cast throughout the colours of the image in the analogue media. However the digital media (fig iv) was not affected by this colour cast, and the attempt to capture the blue hue in the highlights was successful without affecting any of the other colours in the corridor. The digital diode used to capture and record the image is unaffected by long exposure time. These photographs, taken on the north face of the building, which is very dark, created major problems for the analogue media. At this early stage of the photographic research, the digital camera was returning the better results despite the lighting conditions in the building.

On the south face of the building - St Patrick's "Hallway1 (fig v) was shot on analogue colour film exposed at 1/15 of a second at f16, and the digital shot at the same time. The resulting images are identical in colour saturation and quality. In fact the colour quality of the analogue film is slightly richer in hue than its digital counterpart.

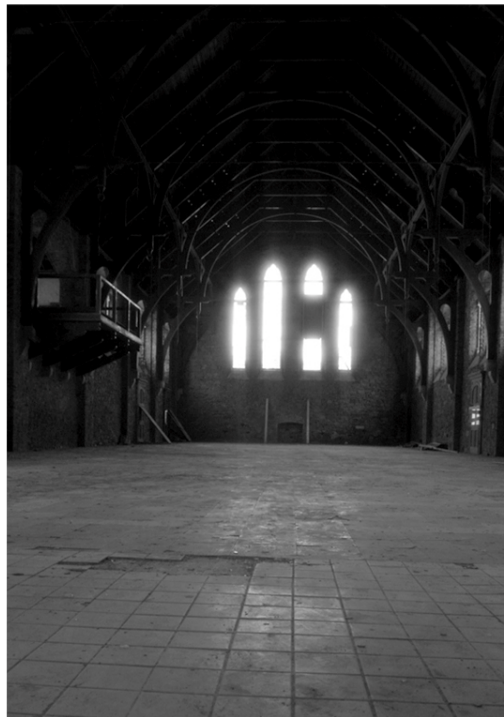
From the results of the first shoot the decision was made to up-rate the film speed to 400 ISO, knowing that the image quality may suffer, but as an attempt to see if the colour cast could be avoided or even better eliminated. However no such change was made in the digital media which remained at 100 ISO and in the raw file format as it proved to be ideal for the various conditions it had to endure. The quality of both the colour and the black and white was far better than expected. When printed first from the inkjet printer the colour quality was exactly what was experienced on the computer monitor. But as this is not a permanent print media, for archival reasons the same images were printed onto photographic paper commercially. The results were very different, and the colours had a completely changed. This after investigation was

found to be due to two different gamma settings being used, and hence the variation in colour.

fig(i)



fig(ii)



fig(iii)



fig(iv)



St Patrick's Ward, Nurses Station



Fig v



Fig vi



St Patrick's ward hallway1

## Photographic Shoot 2

Still on the ground floor but this time at the entrance and in St Mary's Ward in the west wing of the hospital. The images chosen for comparison are Toilet 1 (fig vii) the digital photograph, the (fig viii) the digital black and white image, (fig ix), and the analogue colour film photograph. The second image for analysis is Toilet 2 (fig x) the digital image and (fig xi) the Fuji Sensia film photograph. The final sets of images for comparison are of the children's ward in St Mary's (fig xii) Fuji Sensia film and (fig xiii) the digital photograph. Now as was stated the film was up- rated so the images produced experienced some loss in detail, but in this case it was not the issue. What was being determined was whether the media could cope with the extreme exposures the building was confronting it with. To date the answer was no. Something which was expected, but the extent of the colour cast was far greater than was envisaged. This change in film should have reduced the exposure times and in theory reduced the colour cast experienced in the first shoot, however by how much could not be determined until the images were processed.

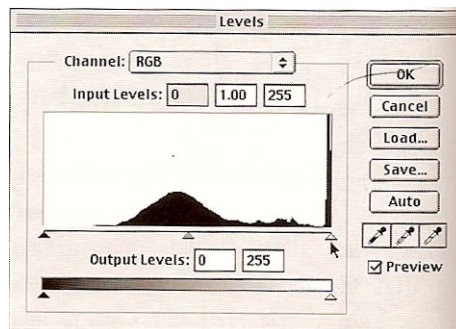
With regard to the printing problem which occurred with the images from the first shoot, it was important to resolve this gamma problem, for archival reasons. The photographic paper used in commercial printing is ultra violet light protected and is for reason vital to the project. By adjusting the contrast levels of the images on the computer by + 6 it was possible to match the gamma settings on the Fuji printing system they were using. In doing this they matched the Adobe settings on the computer. This was a major relief as there is not much point in capturing these large image files with the digital camera if they then cannot be printed to the correct size

and colour one requires to display them at.

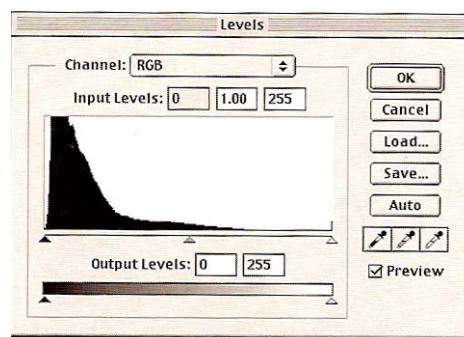
Resulting from the poor results in the first shoot, no black and white film was used on the second. This was also an attempt to speed up the recording process. Black and white digital was used as it had yielded the best results up to this point. Toilet 1 (fig viii) the digital black and white photograph, exposed for 15 seconds at f16. The image captured showed excellent detail and tonal quality throughout, from the foreground to the toilets at the end wall. One other change from the first shoot, involved use of the laptop computer. As the image was taken it was uploaded from the camera to the computer, what seemed to be accurately exposed when viewed on the camera's LCD screen, was not often the case. This meant that as one took the photograph using the image capture program the image was sent directly to the computer by the camera. In doing so, it allowed one to make close comparisons with photographs taken in the first shoot, and more accurate exposure adjustments could be made. This even though the lighting conditions were slightly different. This control over the final image allowed one to almost duplicate the tonal conditions of the first shoot even though they were a month apart. It was impossible for photographers before now to have such control over the series of photographs, and the advent of digital technology opens up vast possibilities for photographers and artists alike.

When one compares Toilet1 (fig vii) the colour digital image, and Toilet 1 (fig ix) the colour analogue film image, there are vast differences between the two images still. Both images were exposed for 20 seconds at f16, but despite the up-rating of the analogue film, the change did not work. The result if anything is worse, as now the image is both experiencing a distinct colour cast and is also over-exposed. When we compare it to the digital image Toilet (fig vii) one can see the obvious lack in both detail and colour saturation in the analogue media. With this loss in saturation the

atmospheric qualities are lost. Then when one views this quality in the digital image colour quality and image detail are vastly better, giving one an accurate record of the decayed state of the room. When one looks at the two histograms of these images one can see how differently both media reacted to the same lighting conditions this space confronted them with. (fig A) the analogue histogram and (fig B) the digital histogram. In (fig A) one can see the main concentration of light is in the mid-tone area of the histogram and the high point of the exposure on the left represents the



(fig A)



(fig B)

highlight area of the image, and has no indications represented in the shadow area of the graph. This shows how over exposed the image is and explains the lack of colour saturation and detail the being experienced in the photograph . However in (fig B) the reaction to the light in the room was not so extreme, and a more accurate image was acquired by the camera. But what must be taken into account is the fact that the IOS speed of the digital media was one stop lower than the analogue media. As the reading in this case was made using a hand light meter for the Fuji colour film, and the two media were exposed at this time, meant the digital media was exposed one f stop less. This would explain why the image produced has a-denser colour saturation, acquired by its underexposure. Never the less the results from the digital photographs to date showed no effects of colour cast in spite of the conditions endured by the media.

In (fig x) the digital colour image and (fig xi) the Fuji film image one sees similar problems arising in the analogue media. That these four images were taken on the north face of the building where the lighting conditions are extreme, would explain the difficulties being experienced by both media. Photographic images are result from a reaction to light. When one views the spaces being recorded one can observe vast variations in the types of light these media are attempting to record. It is these huge variations in light that create the problems for these media. You have the intense northern light through the windows in the background, and the reflections from toilet furniture and gloss paint on the walls, as well as the deep shadows in the room all play an important part in the quality of the final image. This however was not the case on the south face of the building, as the light there was far more evenly balanced, allowing both media to react more accurately to the colour and available light.

In (fig xii) the digital image and (fig xiii) the colour film image, Children's Ward, St Mary's, both images were taken on the south face of the building. Both images were exposed based on a light reading using a Minolta 4 hand meter, time 1/8 of a second at f16, and what we observe are two very different images. They may both contain the same image content but the colour saturation is vastly different. Again in the analogue image one can see a pinkish saturation through all the colours. This was totally unexpected as all the previous photographs taken on film on this side of the building proved to have a better colour saturation than their digital counterpart. For this reason one would have expected a similar result on this shoot even if the light levels were a bit lower than on day one. However, as one can see this was not the case. If however one had not seen the digital photograph of this room then the colour film would seem acceptable, for the image detail is visually accurate.

Having reviewed the results from these two photographic shoots, the only logical progression, with regard to recording this building was to continue only using the digital media. This was because of two factors, firstly the results from the analogue media showed that it couldn't cope with the long exposures it was confronted with, and that coupled with the fact that the demolition work on the interior of the building was progressing rapidly. So if an accurate record was to be made it would have to be completed in the next month or so. To date only the ground floor has been partially recorded, with 150 images to represent it. The first floor and second floor had been visited but no images made.

Over the eight months it took to record the building a total of 750 images were captured and a digital film was also made. From the library of still images, a selection of 250 images was compiled on a DVD for display. The digital video made shows

how much the interior of the building had disintegrated over this time - walls knocked down, doors and all the remaining furniture removed. The images taken are the only existing record of Our Lady's Hospital, and represent a part of Cork's hidden past. A copy of these images has been given to the nurses whom have set up a museum to commemorate the people who both worked and resided there over the years it was open. Now for the first time the general public will be able to view the interior of this major landmark of Cork City.

Fig vii



Fig viii





Fig ix



Fig x



Fig xi



Fig xi



Fig xii



### Analysis of results and recommendations

The results of this particular research are very specific to this project alone, and are not making any profound statements regarding the whole area of photography. The test carried out only deal with interior photography and at that, only with the aspect of working with available light in buildings. They do not relate to other branches of photography in any way.

Over the eight months the images captured on the digital camera show how well this medium dealt with the sometimes extreme exposure times it was confronted with. This was completely unexpected, as the technology was developed according to how colour film reacts to light, and one would have expected the final images to experience similar exposure defects. However this was not the case, as unlike its analogue counterpart, the digital imagery was unaffected by the colour cast created by the long exposure times and the northern light. Instead it produced very accurate colour and black and white images showing great detail, tone and colour saturation. The fact that the diode used to capture these long-exposure digital images, was unaffected by a colour cast is a major advance for photographers and artists alike.

This new technology has boasted that it has surpassed analogue film which many photographers thought to be impossible. But as one can physically see from the photographic evidence of this project, it is true in these particular conditions anyway. One can only assume this would also be the case across the whole area of photography, but this has yet to be shown.

For someone to produce digital images which are seen as equal or in some cases even surpass their analogue counterpart, they will need a digital SLR camera with a minimum specification of 8 mega pixels with full frame capture. A camera of this type is now readily available today and at relatively low cost of around 850 euro. When starting the research project the Cannon 20D an 8 mega pixel camera and high Quality lens cost 4500 euro, and there was a 6 month wait from the time ordered. But with the advances in technology and the increased speed in production, prices have fallen dramatically. The choice of camera available between 8 and 12mega pixel is now the only problem facing the buyer, as the prices range from 700 euro to around 4000 euro. This choice is down to familiarity with certain brand names in most cases, and not more importantly, the internal programming of the camera.

Digital cameras like computers have internal processors and other components, but these can vary in quality affecting the processing power of the camera. The other factor which needs to be looked at is the quality of the lens as most of the cheaper cameras come with lenses of poor optical quality. So one may have a camera capable of capturing high definition images but when printed, the image detail is soft and lacking sharpness. The same results occur when using analogue film and cameras, the optical quality determines the quality and sharpness of the final printed image. This is the most common mistake people are tending to make when buying a camera. If one wants the highest quality images form the camera, then one should be prepared in some cases to spend possibly more than the camera body cost to achieve this. With

these cameras the image capture size is A3 and will range from approximately 50 mega bites over 100 mega bites. So the computer being used to store and edit these digital images has to have a very large hard drive and at least 1000 gigabytes of memory, if one is to work with ease editing these images.

The most common format used to capture these digital images is on the RAW setting of these cameras, and to convert them to TIFF format. TIFF or Tag Image File Format this is the most widely used format in the mass printing and is supported by every important software or system using photographic or digital images. The most important reason is that a TIFF file can be compressed. But unlike other file formats this compression is loss-less, none of the image data being discarded as is the case with filing systems such as JPEG. JPEG or Joint Photographic Expert Group is a lossy file format which means that during the compression process image data is abandoned, and this loss of data is permanent. This loss of data then means accurate adjustments are not possible. Also when printed beyond the capture size of the image the pixel edges become visible, this not the case with TIFF files and prints up to four times the capture size of the camera can be made successfully. All SLR digital cameras allow the user to determine the format they want to use, when taking photographs, as they offer the option of using either RAW format or JPEG format. When shooting in RAW format the image is recorded uncompressed onto the cameras memory card, but because it uncompressed far less images can be captured. By comparison if shooting in large JPEG format with a 1 gigabyte card in the camera we see that the memory card is capable of storing 233 images, but only able to store 108 in the RAW setting. Every digital SLR camera comes with software to allow the user to convert these RAW images to TIFF format, when in this format it is possible to make any corrections to the exposure that may be needed. These changes are not

possible to make when the image is in its raw state of the negative, it could be said. As with a negative, changes to exposure are mostly made at the darkroom printing stage. But even though TIFF formatted files are compressed, the file size is still very large, and because of this can present problems when trying to have them printed commercially. This was one of the most worrying problems encountered during the research. One can produce high-end images, which print out perfectly on the printer calibrated to their computer at home or in the office. But this is not always the case when getting them printed in a photographic lab or printing house.

This problem occurred in many differing forms, the first of these was the fact that all the colours that one observed on the camera or computer were altered dramatically. It was only by searching the inter-net and e-mailing different printer manufacturers for information, that it was possible to determine exactly what was creating this colour shift. The colour shift was caused due to different types of gamma settings being used, as each commercial printer favours a different gamma calibration setting for its inks and paper. These are chosen to give the optimum quality from these materials. But if you are not saving your images with the same colour settings the resulting print is very different to what you had viewed on the computer both at home and in the photographic shop. Once this was discovered it was possible to readjust the contrast of the images to suit the different calibration.

Other problems, which arise, relate to the fact that different print houses will only accept specific file formats apart from TIFF, such as EPS or PDF and the file size is specific. This is because the computers and printers they are using cannot deal with anything larger. This is frustrating as one goes to the trouble and expense of buying a

camera only to find that only very few print houses in the country can produce prints of the quality and size you require, and they are very expensive. To be sure that the quality that one is looking for at the print stage, it is important to either send proofs of the colour quality you require, or physically go to the print house to reset the calibration. This problem is presently being addressed by the industry but it could be 2015 before we will have a printer, that will return a print to match the colours that were captured on the camera. This maybe a major development for printing images in the home, but could mean many of the small photographic labs will have to close through lack of business. This happened to many of the analogue photographic labs when digital technology was introduced.

### Conclusion

If one looks at the speed that digital technology has advanced in a relatively short space of time, it is inevitable that analogue photography could be lost to the majority of photographers in future years. This change of media can already be seen happening in the majority of colleges as wet chemistry darkrooms are becoming smaller to make room for computers. This a development has been brought about by the changes in the photographic industry, and our recent need to have everything instantly. So now techniques that may have taken decades to perfect are being resigned to the past. All the main manufacturers of photographic materials and cameras have either reduced or stopped the production of analogue chemistry and film. For example Kodak Eastman, and both Nikon and Cannon now concentrate on the production of digital cameras. Analogue photography will soon become a specialised area of activity and become very expensive to engage in. Despite any regrets felt at what may be the demise of



traditional photography in favour of its new digital counterpart, the latter brings with it processes and exposure possibilities that before now did not exist. As we know with the process of change, some traditional conventions will inevitably be lost, but as this research has shown, knowledge of an earlier photographic medium, may be used effectively to enhance the development of the new.

#### References

- Ang Tom, 2002, *Digital Photographers Handbook*, London, Ted Smart.
- Ang Tom, 2003, *Photoshop For Photographers*, London, Argentum.
- Darley Andrew, 2002, *Visual Digital Culture*, London, Routledge.
- Koetzle Hans-Michael, 2002, *Photo Icons*, Vol 2, America, Taschen, 174.
- Lista Giovanni, 2000, *Futurism And Photography*, London, Merrel Holberton Publishers, 36-39.
- Lovejoy Margot, 2004, *Digital Currents: art in the electronic age*, New York and London, Routledge, 13.
- Lynch David, 1983, *Indoor Photography*. London, Focal Press.
- Meuris Jacques, 2004, *Magritte*, America, Taschen, 84-85.
- Michael Rush, 1999, *New Media in the Late 20<sup>th</sup>-Century Art*, London, Thames & Hudson.

Mitchell, J, William, 1992, *The Reconstructed Eye*, Cambridge, Mass, Mit Press, 13-16.

Parry Eugenia, 2001, *Joel-Peter Witken 55*, London, Phaidon, 69.

Worswigk Clark, *Japan Photographs 1854-1905*, London, Hamish Hamilton, 1980, 78.