Fig. 1 - *Lumière Autochrome. The first colour photograph taken in Jersey. 1904. G. Guiton & E. Guiton*.

The Autochromes of Emile Guiton

Introduction

In 1802 Thomas Young theorised that our physiological perception of light was trichromatic, that all perceived colour was produced optically, by the eye's sensitivity to just three wavelengths of light: red, green, and violet.[1] Two centuries on Young's theories are the foundation on which digital colour technology is based. They also provided the theoretical framework for the first commercially viable method of colour photography, the autochrome. On the 10th of June 1907, to an invited audience of 600, the brothers Louis and August Lumière, demonstrated their newest invention, the first combined system additive colour screen process, yet another addition to the long line of revolutionary products produced by the pair (Boulouch 1994: 143).

The photographers Edward Steichen and Marcel Meys were both in attendance, Alfred Stieglitz was in Paris, but unable to attend due to illness, and Charles Zoller is known to have been in the city though his attendance is uncertain (Roberts 2007: 25). The interest around autochromes in 1907 was worldwide, photographically, scientifically and culturally, Fritz Wentzel a chemist later wrote of the 'tremendous enthusiasm' for the first colour plates, "this was an experience of which only someone who was living at the time can have a very clear idea" (Lavédrine & Gandolfo 2013: 71). Accounts such as these only add to the intrigue surrounding the image opposite (Fig. 1), proudly captioned: *Lumière Autochrome. The first colour photograph taken in Jersey. 1904. G. Guiton & E. Guiton*.

This imperfect photograph, of a vase, containing roughly assembled garden flowers, is a likely starting point for a photographer keen to explore the colour possibilities, accessible for the first time, of this new technology. However, the date is somewhat problematic. The Lumière brothers first patented the autochrome in 1903 and presented it to the Académie des Sciences in May the following year. The production process then went through three years of development before plates were commercially available. Whilst experimental plates were produced between 1902-05, the Lumière's were notoriously protective of their technological secrets. Regardless of the accuracy of the date, it is most likely the first colour photograph made in Jersey.

In order to effectively analyse such pieces, it is important to understand both the technology and the contemporary historical context of colour photography, as well as the social circumstances of the photographers. There are twenty-one additive colour screen plates identified in the Société Jersiaise Photographic Collection (the collection), thirteen of which are autochromes attributed to Emile Guiton, with the 'first' being attributed to two Guitons. Emile was born in 1879, into a merchant family, he was educated at Victoria College and continued his studies at a solicitors office in Bordeaux before returning to Jersey to work for Bois & Bois (Corbet 1998: 133). By the early 1900s he was a competent amateur photographer (Syvret 2015: 181) and he went on to become a key figure within the Socété Jersiaise, though there is only a small cross over between his use of autochromes and his association with the Société. It is unclear exactly who the G. Guiton is. One possibility is George, nine years Emile's junior born 1888 in France, grandson of Emile's uncle, James Guiton. George is recorded as living in Jersey in the 1891 census, with his grandmother Mary.

[1] For further reading see LeGrand 1958: 89, Hammond 1991: 96.

Fig. 2 - Children playing in park

Background - The Beginnings of Colour Photography

Proving Young's trichromatic theory of colour vision was the aim of James Clark Maxwell, when in 1861, he asked Thomas Sutton[2] to produce three monochrome positive transparencies from negatives made through coloured filters. These were projected through three corresponding colour filters, once aligned they produced the now famous tartan ribbon image, the first colour photograph. Despite the irregularities of the experiment and the impracticality of the process, the theory, that variations of red, green and blue light could be used to produce any colour had been demonstrated (Pénichon 2013: 10).

Numerous methods were devised between then and 1907 for producing a practical process of colour photography, the most ingenious being the Lippmann plate.[3] The colour photographs were recorded by the physical phenomenon of interference of light waves, where two light waves superpose to form a resultant wave. Invented in 1891 and produced until 1914, Gabriel Lippmann was awarded the Nobel Prize for Physics in 1908 for his invention and what it demonstrated about the nature of light.

Fig. 3 - Rose in vase

Attempts were made between 1891 and 1894 by the Lumières to improve and commercialise the Lippmann Plate, but the market remained small. Instead, they turned to a three colour subtractive method developed by Louis Ducos du Hauron in 1869.[4] A finished three colour Lumière transparency consisted of three superimposed layers of gelatin: yellow, magenta and cyan. In order to produce a finished image, three monochrome photographs needed to be made of the subject through different filters: violet, green and orange. Once these negatives were developed they could be used to produce the three positives required to compose the original subject in full colour. Needless to say the numerous processes involved prevented wide scale takeup (Lavédrine 2013: 68).

John Joly and James McDonough were the first people to find a relatively practical process, by utilising a three colour additive screen. Working independently and separated by the Atlantic ocean their screens came to the market only a year apart 1896 and 1897 respectively. The Joly system consisted of a panchromatic glass plate and two identically patterned screens of parallel bands of died colloid: red, green and blue. One screen was used to expose the plate the other for viewing. A negative would be contact printed to produce a positive transparency that was guaranteed to match up with the viewing screen. The system was far from perfect with around 150/200 bands per inch they were visible to the naked eye, plus getting a good contact and register between the screen and plate was difficult. McDonough's plates were based on exactly the same principles, but his used mechanically ruled lines producing a much finer coloured band, with around 300 per inch. Despite the improvement in image quality production was too expensive for the mass market, by the end of 1900 neither plate was being produced.[5]

---

[2] Thomas Sutton lived and worked in St Brelades Bay, Jersey 1848-54. Sutton, himself invented numerous photographic processes.

[3] For a detailed description of the Lipman plate and process see Lavédrine & Gandolfo 2013: 56.

[4] The Lumières considered the work of Ducos du Hauron so important that he was paid a company pension until his death in 1920 (Hofmann & Schoegl 2001: 74).

[5] For more information on early additive colour screens see Pénichon 2013: 22-24.

Fig. 4 - Marett Road

Background - Autochrome: Production & Technology

“Soon the world will be colour-mad, and the Lumière will be responsible” (Stieglitz 1907: 22).

The Lumières brought the necessary refinements to the theory and experimentation of the previous 40 years. Their process was simple enough for the average photographer of the day to master and accurate enough to be classed as a true colour representation of the world. Importantly an autochrome consists of a single glass plate, by combining the colour screen and photographic emulsion onto one plate they removed the frustrations of poor registration and the restraints of producing multiple exposures.

The choice of potato starch grains for the colour screen was undoubtedly another distinguishing feature of the autochrome. Very fine grains measuring around 12 to 15 microns were dyed blue-violet, green, and orange-red. This gave the plates a more naturalistic look than the geometric screens utilised by other systems, only the Agfacolor plate introduced in 1916 came close to matching the autochromes image quality. The brothers made use of both acidic and alkaline colorants, made available through developments in the chemical processing industries a few decades earlier. [6]

Mixed in roughly equal measures until a neutral tone was reached, a thin coating of the dyed starch granules was then applied to a plate and varnished with the resin portion of dammar, a dusting of lampblack powder was used to fill the interstices between the grains. The coated plate would pass through a high pressure roller, at around 5,000 kg/cm^2 flattening the grains and minimising the light diffusion, a second coat of varnish was applied, made of dammar, castor oil and cellulose nitrate. The final layer being panchromatic silver bromide emulsion (López-Montes, Dupont, Desmazières and Lavédrine 2013: 217).

Fig 5. - Magnified Plate

A correctly exposed plate was achieved by placing the emulsion side into the camera facing away from the lens, to allow light to pass through the colour screen of microscopic dyed grains before activating the emulsion behind. A yellow-orange filter was required to compensate for the emulsions sensitivity to blue and ultraviolet wavelengths. Once exposed the plate could be processed in standard reversal development, to produce a colour positive image when viewed through transmitted light, a coat of varnish and a protective plate of glass would then be applied to the emulsion side.

The image above (Fig. 5) shows an autochrome plate at 40x magnification, the random scattering of coloured potato starch grains is clearly visible. There are between 8,000 and 9,000 grains to square millimeter (Lavédrine & Gandolfo 2009: 156). Whilst the grains tended to form clumps, the Pointillist effect it gave, became one of the autochromes most treasured and recognisable features. The main technical disadvantage for an autochrome photographer was the long exposure time, due to the black pigment used to fill the interstices (Pénichon 2013: 27), even in bright light exposures of one or two seconds were common. But again, the soft, naturalist style that these exposures produced only added to the painterly aesthetic that drove members of the Secession and Pictorialist movements to the process so enthusiastically. (Roberts 2007: 23)

[6] For more information on the dyes used see Hofmann & Schoegl 2001: 76, Pénichon 2013: 24, Lavédrine & Gandolfo 2013: 87/163.

The Autochromes of Emile Guiton

Emile's autochromes form the bulk of the early colour collection, thematically they fall quite neatly into two categories. The first category can be described as still life photographs, images of flowers, a stained glass window, a colour chart, fruit. The second category can be loosely described as domestic photographs, Mrs Guiton, children playing, a garden, local country scenes. Whilst not all the plates are dated, knowing that autochromes were sold in packs of four, and by matching the tapes used to seal the plate and protective glass, allows the suggestion of three/four distinct periods of experimentation with autochromes by Emile: 1904/07, 1909 & 1911.

The 'still lifes' are a clear attempt to study the autochrome process, to improve his technical understanding and the quality of his images. By photographing items within a controlled environment developed plates could be reliably checked against the subject for colour accuracy. Techniques could therefore be adjusted within a measured system of improvement. Going beyond the purely practical explanation of his subjects, Guiton was also making attempts at classical arrangements and compositions, in Fig. 3 and Fig. 7 we see that cleary.

Fig. 7 - Fruit

The second category vaguely defined as 'domestic', shows a man who is very much aware of the everyday beauty of the world we inhabit. Here is a photographer, who, for the first time has colour to work with, but he does not seek out the dramatic and celebrated scenes that Jersey offers. Instead, Guiton's focus is on his immediate surroundings, on personal spaces and relationships. A very different focus to the one he is now so well known for, the recording of our shared visual and cultural heritage.

An image of a Mrs Guiton and another of children playing in a park (Fig. 2), are typical of the pictorialist aesthetic and examples of Guiton's willingness to engage with the artistic styles of the time. Mrs Guiton's gaze is out into the middle distance her detailed blue dress and pink hat are deliberately placed against the green of the bank. Likewise the maroon of the children's clothes being repeated through the flowers only adds to the composed, as opposed to taken, feel of these two images. He also uses the softness of the autochrome to create a gentle and dreamlike world. In Fig. 2 despite the obvious hesertence of the children, the long exposure time of the autochrome has given a soft blur to one child's face as it has to the knee of another. Giving an impressionist touch to an already pointillist scene. The same influence can be found in his choice of subjects, as it was the impressionists thirty years earlier who had used their revolutionary principles to pioneer the recording of everyday scenes.

Fig. 8 - Valley de Vaux

Valley de Vaux (Fig. 8) and Marett Road (Fig. 4), two colour images of Jersey's built environment, offer us a rather interesting juxtaposition. One being a classic country scene, the other an urban setting in St Helier. Despite the decline in the rural way of life, it is the image of Marett Road that is less familiar to us, granite farm houses and fields, no different to those pictured in Fig. 8 are still a common site in Jersey. It is the ceaseless development of St Helier that has lead to the disappearance of the workers cottages and cobbled streets of town, adding to the obviously dated look of Fig. 4.

The glaring omission in the collection of Guiton's autochromes is the lack of any images relating to his most widely photographed subject; the historic heritage of the island, especially as it was

around this time that he was starting to photograph archeological sites and finds for the Société.[7] There are various explanations for not using colour more widely: technical, ideological, financial, to name but three. Sadly with the lack of writings by Guiton on his photography it is unlikely that we will ever know. Whilst it can be argued that the later (1911) autochromes are examples of Emile examining the islands heritage photographically in colour, when viewed in the wider context of his work they hardly scratch the surface of the subject.

Conservation

The condition of the autochromes in the collection as a whole is fair, the plates suffer from a variety of flaws or deterioration, caused by either manufacturing faults, aging, poor processing and handling. However, the content of all the plates is still perfectly accessible. The plates illustrated in this article offer a variety of examples of the issues autochromes face. Fig. 1 demonstrates the damage caused when the dyes bleed. During processing it is possible for the dyed starch granules to come into contact with aqueous solutions through cracks or scratches in the emulsion and varnish layers. The tartrazine and indigo carmine dyes used in producing the green starch are highly water soluble, leading them to bleed onto surrounding granules (Lavédrine & Gandolfo 2013: 217).

When examining the sky area of Fig. 8, bands are clearly visible running parallel to the short edge, these were caused by the rods of the autochrome press. The rods worked the surface of the plate in a sweeping motion, the bands being produced by improper synchronization or wear to the surface of the rod, causing inequalities in colour and density (Lavédrine & Gandolfo 2013: 204). Darker spots can be produced on the image by thicker areas of emulsion, as seen in Fig. 4. These were caused by the unintentional presence of dyes in the emulsion layer or dust particles which the gelatin accumulates around. (Lavédrine & Gandolfo 2013: 202)

Fig. 7 is the only plate in the collection to have suffered a complete break to the glass support, thankfully it is limited to the top left corner, though it has likely led to the deterioration and cracking of the emulsion layer as a whole. Taking this into consideration, along with the known sensitivity of autochromes to light, pollutants, humidity and flooding (Lavédrine 2009: 80) it is necessary that strict preventive measures are in place to limit further damage or deterioration to this collection. A stable environment of 17-18°C and 45%RH are recognised internationally as suitable conditions for their long term conservation. These are obviously an irreplaceable set of images, they connect us with the past on a sensual level, as we are able to accept their visual colour representation of the world, as that of our own contemporary experience. Yet, with a more specific, humanistic reading, they offer us an intriguing insight into the life of Emile Guiton, as a young man, beginning to explore his passions through photography, a task he would continue for the rest of his life.

[7] See the Archaeology Reports of the Société Jersiaise Annual Bulletin 1911-13