
Abstract
Kinemacolor, the first commercially exploited ‘natural colour’ process, has often been considered as a step in the wrong direction for colour cinema. But it was an extraordinarily coherent system, based on a mechanical apparatus and involving a whole conception of what cinema was, what it should be, how it should be done and sold, and what was to be its place within culture. Moreover, the characteristics of the process involved highly original perceptual traits that are of major theoretical interest today. Technically invented by George Albert Smith, it was its promoter Charles Urban that gave it its real coherence. For Urban, Kinemacolor was conceived as a true reinvention of cinema. Cinema thus never ceases to be confronted with reinvention projects.

Keywords: Kinemacolor, Charles Urban, George Albert Smith, technical network, colour cinema, film technology.

In the introduction to his doctoral dissertation on ‘the conquest of the snapshot’, the photography historian André Gunthert writes:

Any photographic image, the product of technique, contains an ensemble of information about the operational modalities which presided over its creation: an iconic document offered up for aesthetic reading, it is also a technological monument capable of becoming the subject of an archaeological interrogation.¹


This ‘also’ is tied up with a shift: the attention to the technological, to its traces in the image, transforms our gaze and has us move to the archaeological level. But this passage involves taking non-verbal elements into account: images, devices, diagrams, graphics, etc. Pierre Francastel, in his article ‘Valeurs sociologiques de l’espace-temps figuratif’, clearly demonstrated the importance of these non-verbal sources, and yet they create methodological problems as part of an archaeology: how (and of what) can they make an archive? It was questions of this sort that led Michel Foucault to pass from an archaeology based on discourses to an epistemology that takes dispositifs into account. I would like to give an example, using a concrete object, to illustrate these questions, one sometimes mentioned by archivists because of the singular problems it poses: the first cinematic natural colour process marketed commercially, Kinemacolor.

This process was invented in 1906 in England by George Albert Smith and was financed and marketed by Charles Urban until 1915. Its first public, commercial presentation was at the Palace Theatre in London on 26 February 1909, and in subsequent years it went on to international success – a success, as Luke McKernan reports, to which the funeral of Edward VII and the crowning of George V, in 1910 and 1912, contributed significantly, as only Kinemacolor was able to render their colourful pomp. In particular, the Delhi Durbar, an Indian ceremony to recognize the new British King as emperor of India, filmed in Kinemacolor in December 1911 and presented for the first time at the Scala Theatre in London on 2 February 1912, was an unprecedented triumph, exported to the United States, France, and elsewhere. It was ‘probably the greatest success that moving pictures have scored at any time or place’, according to the American trade journal Moving Picture World, even though the show lasted two and a half hours and admission was considerably more expensive than usual. This show won fame for Urban, along with the favour of the king.

2. See in particular Nicola Mazzanti, ‘Raising the Colours (Restoring Kinemacolor)’, in Roger Smither and Catherine A. Surowiec, eds., This Film is Dangerous: A Celebration of Nitrate Film (Brussels: FIAF, 2002), 123-125.


George Albert Smith had been one of the most important film directors and producers in the nascent years in England, a ‘pioneer’ in the group Sadoul famously called the ‘Brighton School’. Noël Burch in particular has also pointed out the importance of the film experiments carried out by Smith between 1897 and 1903: The Miller and the Sweep (1897); Grandma’s Reading Glass (1900); As Seen Through A Telescope (1900); Sick Kitten (1903); and Mary Jane’s Mishap (1903)5 were some of the films distributed by the Warwick Trading Company. Smith, a member of the Royal Astronomical Society, was also known previously for his illustrated lectures on scientific topics.

A Technology of Kinemacolor

Around 1903, Smith, financed by Urban, began to devote himself to research into colour cinema. This research led to the filing of a patent application on 24 November 1906 for ‘improvements in and relating to kinematograph apparatus for “the production of coloured pictures”’ consisting of ‘a practical method in which the well-known animated photographs or bioscope moving pictures may be projected in the colours of nature approximately instead of in black & white as usual.’6 In this patent application, Smith described the steps of his procedure as follows:

1. An animated picture of a coloured scene is taken with a bioscope camera in the usual way, except that a revolving shutter [Illus. 45, fig. 1] is used fitted with properly adjusted red and green colour screens [filters] [Illus. 45, figs. 2 and 3]. A negative is thus obtained in which the reds and yellows are recorded in one picture and the greens and yellows (with some blue) in the second, and so alternately throughout the length of the bioscope film [Illus. 45, fig. 5].
2. A positive picture is made from the above negative and projected by the ordinary projecting machine which, however, is fitted with a revolving shutter, furnished with somewhat similar coloured glasses to the above, and so contrived that the red and green pictures are projected alternately through appropriate coloured glasses.

Illustration 45 – George Albert Smith, U.S. patent for Kinemacolor. Fig. 1: Traditional shutter. Figs. 2 and 3: Shutter with red (r) and green (g) filters. Fig. 4: Mechanism showing the two turning discs, single shutter coloured disc. Fig. 5: Principle of alternating the coloured selections on the strip.
3. If the speed of projection is approximately 30 pictures per second, the two colour records blend and present to the eye a satisfactory rendering of the subject in colours which appear to be natural. The novelty of my method lies in the use of two colours only, red and green, combined with the principle of persistence of vision.  

Kinemacolor involved specific equipment for both shooting and projecting film: a rotating shutter with red and green filters and a doubling of the speed of the film. These conditions had consequences: the filters absorbed a great deal of light, the shooting required well-lit conditions, and the projected images suffered from very poor luminosity on screen. The Kinemacolor film stock looked like ordinary black-and-white film, even though it had to be ‘panchromatized’, meaning it had to undergo chemical treatment to make it sensitive to red, something that was not necessarily the case at the time with so-called orthochromatic emulsion. I should emphasize that there is no colour on the Kinemacolor film stock (Illus. 46). This observation led Colin N. Bennett, in 1913, to describe Kinemacolor’s colour as an illusion in a specifically cinematic sense:

Thus, in the case of Kinemacolor, the willing member of the audience is treated to not one, but two separate and complete illusions, for whereas the black and white exhibitor merely makes you believe you see movement which is not there, the Kinemacolor operator does the same for the perception of colour also.  

The Kinemacolor procedure is a fascinating technical object of more than mere historical interest. In this sense, traditional technological film histories have shown little interest in the procedure beyond analysing its ultimate failure and the defects that can account for it, at least in part. Kinemacolor is described, primarily, as a step in the wrong direction, one of the many procedures attempting to create cinema in natural colours through an additive process. From this perspective, the crucial moment was when Herbert T. Kalmus, founder of the Technicolor company, finally understood in 1917 (in his version of events) that the solution could only

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7 George Albert Smith, British patent no. 26,671. See also the United States patent no. 941,960, filed 11 June 1907 and granted 30 November 1909.
be a subtractive procedure, meaning that the colours should be present in the film stock itself, synthesized and visible, so that the film could be projected in a ‘normal’ manner. Kinemacolor simply went a little further than other additive procedures, to the point of commercial use whose


importance has been minimized. The question is not posed, for example, why researchers at the time preferred additive synthesis, a quite interesting epistemological question. One way to think about this point would be to examine the role of James Clerk Maxwell’s founding experiment, described in 1855 and carried out in 1861, which demonstrated that the possibility of three-colour synthesis using an experimental dispositif joining photography and projection\(^{10}\) – thereby playing, once again, on the reversibility of the projection mode of photography. Maxwell’s experiment appeared a suitable application for and easily adaptable to cinema at a time – before the Lumière autochrome, which was introduced to the market in 1907 – when colour photography had not yet taken hold in a concrete industrial manner.

But the historiography barely develops the theoretical implications of the procedure’s specificities either. In George Albert Smith’s patent application, these consisted in the combination of two elements: ‘the use of two colours only, red and green, combined with the principle of persistence of vision.’\(^{11}\) Kinemacolor was thus a two-colour process, which in itself would have major consequences. Authors of the day discussing the validity of this two-colour nature – in light of the images they had seen and by measuring them against other colour procedures, such as stencilling – would employ a discourse in which realism and indexicality were in opposition,\(^{12}\) a rare theoretical event.

The other specificity of the dispositif is also fascinating. Kinemacolor projected in succession, at high speed, a red image and then a green image. George Albert Smith was counting on the same principle of perception, ‘persistence of vision’, to create both and at the same time colour synthesis and the synthesis of movement – an idea, we might recall, already formulated by Charles Cros. Here, the interval between two photograms supported

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\(^{11}\) George Albert Smith, British patent no. 26,671.

\(^{12}\) On this topic I take the liberty of referring the reader to my article ‘Le Naturel et le mécanique: le Kinemacolor à la conquête de Paris, ou Charles Urban vs. Charles Pathé’, *1895 revue d’histoire du cinéma* 71 (Winter 2013). Eirik Frisvold Hanssen has also explored this question somewhat in his Ph.D. dissertation *Early Discourses on Colour and Cinema* (Stockholm: Stockholm University Press, 2006), in which he raises Kinemacolor on several occasions, on the basis in particular of the 1912 film catalogue, but does not explore the technical aspect of the procedure.
simultaneously movement information and colour information. Movement and colour are thus made equivalent, in a sense, by the procedure – an equivalence that Colin N. Bennett had already suggested in his comment quoted above. And both were viewed as possibly being a part of the same fundamental perceptive phenomenon, the ‘persistence of vision’, supposedly capable of carrying out the two synthesis operations in question.

The Kinemacolor principle meant that the colour analysis (in the film shoot) and colour synthesis (in projection) were accomplished through two successive colour selections. For the colours to merge, it was crucial that the two images of ‘colour sensations’, as one expression of the day had it, be superimposed perfectly. This procedure, like other additive synthesis systems at the time, also brought about a disjunction: a photogram was no longer a ‘complete’ image. Two successive photograms had to be synthesized in order to obtain something like an ‘elementary image’. This is why there could be no ‘stop frame’ in Kinemacolor. 13

The first limit to ‘perfecting’ superimposition was that of the mechanical precision of the cameras and projectors: the slightest wobble, meaning the slightest disjunction in the position between one photogram and the next on the film stock, would give rise to a disjunction between the red and green images on screen. As a 1909 review of the inaugural projection at the Palace Theatre in the British trade paper *The Bioscope* remarked, ‘there are blinding flashes of red or green across the entire picture.’ 14 This was due, and this comparison was made systematically in commentary of the day, to the printers being ‘out of register,’ meaning that the coloured layers were not in synch: the colours would spill over. In film equipment, steadiness is directly proportional to the quality of the mechanical workings and thus to the price of the machines. This is one reason why the 1910 catalogue for Kinemacolor materials was resolutely ‘high end.’

In this way, the Kinemacolor procedure – its very viability, but also the frequency with which its ‘defects’ were pointed out by commentators – informs us today on the state of technics around 1910, a moment in the history of cinematic perception that machines determined and of which they are the archive: greater or lesser steadiness; jumping, flicker, complaints of vision fatigue, etc. It also informs us, finally, what film viewers saw in 1910, or the way in which they saw.

13 The case of Gaumont’s Chronochrome (or Gaumontcolor) was different yet again: it was a three-colour additive process, with simultaneous rather than successive coloured sections. There was thus a scission of the ‘elementary image’ into three photograms, but because these three photograms could be projected together it was possible to carry out a stop frame.
The second limitation to the perfection of superimposition was extreme and insurmountable. Because the two coloured selections were successive, they were out of synch with the time of the take. Thus, any moving object would not have the exact same position in the image between the green and red selection; this, in the technical literature on the topic, is called ‘temporal parallax.’ As Jacques Ducom wrote in 1913,

When rapid movements are recorded, the two images of Kinemacolor’s coloured pairs can be sufficiently dissimilar for every element of these images not to be superimposed completely on the screen. A part of the projected image: an arm, a leg or an automobile, for example, can be predominantly red or green.\(^ {15} \)

‘The projection of the moving objects,’ John B. Rathburn wrote in 1914, ‘results in a disagreeable flicker.’\(^ {16} \) According to the ‘opérateur cinégraphiste’ Chevreau, writing in *La Cinématographie française: Technique et matériel* in 1936, ‘the projection was spoiled’;\(^ {17} \) or, as Herbert Kalmus disdainfully summed up in 1938, ‘it was nothing for a horse to have two tails, one red and one green.’\(^ {18} \)

These coloured fringes were Kinemacolor’s major defect, a ‘disconcerting feature’ that, as the British author Frederick A. Talbot wrote in 1912, ‘the most uninitiated observer cannot fail to see’: it ‘has aroused considerable comment’ and, ‘although it is often momentary, it is decidedly distressing.’\(^ {19} \)

For the entrepreneur Charles Urban, these fringes were a major inconvenience. From another perspective, they also made Kinemacolor a truly experimental dispositif in the way it transformed the gaze; each film being read, as André Gunthert has written, as ‘a technological monument capable of being interrogated archaeologically.’ What these fringes fleetingly gave

\(^ {18} \) Herbert T. Kalmus, ‘Technicolor Adventures in Cinemaland’, 52.
\(^ {19} \) Frederick A. Talbot, *Moving Pictures: How They Are Made and Worked* (London: William Heinemann, 1912), 298.
material form was the gap in the position of a moving body between two photograms – or, to borrow Dziga Vertov’s expression, the interval of movement. These fringes show, in colour, the quantity of movement separating two images in the cinema – and they do so at 32 images per second, depicting a shorter interval than the usual speeds of the day or today, from fifteen to 24 images per second. These coloured fringes showed what, in the cinematic mechanism, was constantly threatening to break up the image-movement: the presence, underneath, of a series of fixed flickering images. And the procedure demonstrates that even for ‘the most uninitiated observer,’ the interval of movement is not really an abstraction, it is perceptible.

This is exactly what an artist such as Paul Sharits later sought to bring out, in particular in his 1975 installation Shutter Interface, in which four projectors simultaneously play coloured loops of varying lengths, the images being partially superimposed on screen. For Sharits, the constant coloured flickering and transformations of the hues, through additive synthesis, should make the viewer see the activity of the shutter, should show what happens in the interval between images, and show that we see it. This is something that Kinemacolor had already accomplished.

The Cinema According to Charles Urban

While Smith was the inventor of the Kinemacolor procedure in the technical sense, in fact Charles Urban was its midwife and the person who gave it coherence. The American-born Urban was another central figure in early British cinema. On many points, he was a character of the same stamp as someone such as Charles Pathé in France: a talented and ambitious businessman, who, in just a few years, rose to the top of this nascent industry. But his conception of cinema, its nature and place in society, its function, and the ways one could make one’s fortune in it, were, interestingly, radically different from those of Pathé.

Indeed, Charles Urban had conceived a very precise idea of cinema. I will not explore this figure and his ideas here in all their complexity, even though he certainly merits closer examination. Urban arrived in the United Kingdom in 1897 and, for a time, led the English branch of Maguire

and Baucus, in charge of the distribution of Edison films in Europe. There, he worked with Cecil Hepworth. In 1898, he became director of the Warwick Trading Company, which he left in February 1903 to found the Charles Urban Trading Company in July of that year, along with Alfred Darling and George Albert Smith. During this period, Urban tasked Smith with developing a colour film procedure on the basis of a patent that he had purchased in 1902: the Lee and Turner patent, filed in 1899, for a three-colour process that had not got beyond the experimental stage. The year Smith completed his research, 1906, Urban founded the firm Éclipse in France, from which he resigned in November 1909.

This seemingly eventful if not chaotic professional itinerary (and I have far from outlined every contour, moment of turbulence, and reversal) was curiously compensated for or influenced by a clear guiding principle. Fiction, for Urban, held very little interest. In his memoirs, which McKernan reports were written shortly before his death in 1942, he recounts his initial admiration for the quality of the Lumière machines and productions: ‘The Lumière company of Lyons France could not be induced to sell their cameras, projectors or films. The Lumière product was the best shown […]. Their photographic quality and selection of subjects were superior to any of the others obtainable’.

In a sense, the Lumière model would remain fundamental for Urban. As soon as he began to acquire a little more independence, he focused on the production of ‘non-fiction’ films: travel, education, science, actualities, etc. In 1907, Urban, who had just been nominated to the Zoological Society for his popularizing work, published with his own Charles Urban Trading Company a book entitled The Cinematograph in Science, Education, and Matters of State – here, the adoption of the term ‘Cinematograph’ in English may be indicative of the suggestion of a line of descent beginning with Lumière, although no such connection is discussed in the book. The first section of the book bears this statement as its title: ‘The Cinematograph Demands National Recognition’. Before exploring the possible uses of the cinematograph in the various fields named in the title of his book, Urban sets out his policy:

The entertainer has hitherto monopolized the Cinematograph for exhibition purposes, but movement in more serious directions has become imperative, and the object of this pamphlet is to prove that the

21 Charles Urban, A Yank in Britain, 48.
Cinematograph must be recognized as a National Instrument by the Boards of Agriculture, Education, and Trade, by the War Council, Admiralty, Medical Associations, and every Institution of Training, Teaching, Demonstration and Research.23

From the point of view of dominant contemporary historiography, Urban's position may seem strange to say the least, if not untenable: Urban adopted a position opposed to entertainment and, more broadly, to fiction from within an extremely commercial enterprise. Whereas his commercial energy, entrepreneurial spirit, and flair for promotion made Urban similar to the great entrepreneurs of the nascent industry, his discourse situated him closer to Boleslaw Matuszewski's Animated Photography, What It Is, What It Should Be (1898) and to the later production policy developed and theorized by John Grierson for large state bodies in England and Canada.24 The specificity of Urban's project was to believe in the commercial potential of such a position: from this perspective, his strategy was perfectly consistent with and based on giving legitimacy to cinema in the eyes of his ‘target audience’, the leisure classes then largely absent from cinema halls, whom others at that same time also wanted to win over on the basis of very different principles, those of fiction, through the ‘Film d'Art’. Noël Burch has pointed out that after reviewing the first Lumière projection in England in 1896, the daily newspaper The Times would not mention moving pictures at all in its columns for many years:

In fact The Times did not mention the cinema in its own right until 1906, when the American producer-distributor Charles Urban, a specialist in ‘actualities’ (the only genre to find favour with the middle classes in Britain, too), invited the press to a showing of views – in particular a bull fight filmed in Spain – which he had thought it ill-advised to screen for wider audiences. Whereupon the Times columnist naturally congratulated him for this act of paternalistic self-censorship.25

23 Ibid. Note that the term ‘Cinematograph’ here, even with an initial capital ‘C’ as it appears in the original, is not a reference to the Lumière device alone, as the word ‘Cinématographe’ would suggest in French.
25 Noël Burch, Life to Those Shadows, 97.
The seeming austerity involved in the rejection of fiction was not only the pure virtue of devotion to public causes, to the disinterested discovery of the world and the sciences; it was also a clear and conscious economic strategy. But whatever happened financially to his business dealings, Urban never abandoned these fundamental principles respecting 'animated photography, what it is, what it should be' – principles or fundamental belief in a certain future for kinematography.

This is the context in which the project and realization of what would become ‘Kinemacolor’ must be understood. In 1902, Urban purchased the patent filed in 1899 by the Englishmen F. Marshall Lee and Edward R. Turner26 for a procedure making it possible to ‘produce kinematographic pictures in such manner that they may be exhibited in the colors of the originals’27 – a procedure that, in fact, did not work. But Urban nevertheless believed in the system enough, or had a sufficiently strong wish for a kinematographic system in ‘natural colours,’ to finance four years of research by Turner and later by Smith.

**Technics and the Commercial**

**Compatibility and Specialization**

From a technical and commercial perspective, the Kinemacolor procedure as designed enjoyed a number of interesting advantages. Firstly, it worked with traditional black-and-white film, which needed only an initial pan-chromatizing treatment for it to be made sensitive to red. This treatment was somewhat onerous but not problematic. Next, Kinemacolor could be projected using a traditional projector, as long as it underwent relatively minor modifications: the speed had to be doubled – but when projectors of the day were motorized, the motors always had a rheostat, giving them variable speed, even though that naturally caused greater wear on the machine and the film stock; and the shutter had to be transformed, or a synchronous rotary colour filter added – but projectors of the day always had an immediately accessible external shutter that could be modified very easily.

26 British patent no. 6,202, 22 March 1899; United States patent no. 645,477, filed 14 October 1899.
27 Frederick Marshall Lee and Edward Raymond Turner, United States patent no. 645,477, first page.
This was a crucial argument: exhibitors would not need to change their equipment, they would not need to specialize in the projection of colour films\textsuperscript{28} – they could show both, even as part of the same screening. The programme of the inaugural Kinemacolor screening at London’s Palace Theatre on 26 February 1909 had already demonstrated this possibility. *Sweet Flowers*, the tenth film on the programme, shown immediately after the intermission, was advertised as having to be shown twice:

This picture will first be shown as an ordinary Black and White Bioscope view. After an interval of two seconds for adjusting Colour Filters to the Urban Bioscope Machine, *this same picture* will be shown in its natural hues and tints.\textsuperscript{29}

Two seconds must have been slightly optimistic, and it would be interesting to know what it would look like to present a film recorded in Kinemacolor and projected in black-and-white at 32 frames per second, whose even-numbered photograms had different densities from its odd-numbered ones. In any event, this practice made clear the performative and experimental dimension of a Kinemacolor screening, just as the insistence on the speed with which the transition could be carried out indicated the *dispositif*’s ease of use and its adaptability to existing systems.

This compatibility, Smith remarked in 1908, had been adopted from the outset of his research as a fundamental condition of what would become his *dispositif*. After having set out the technical indications for accomplishing the effect itself, he added the presence of another constraint:

To conform to the condition that any scheme must be easily applicable to the existing cinematograph machinery, and that the standard film with standard perforations must be used, so that any successful results might be readily adopted by every cinematograph user without much trouble or expense.\textsuperscript{30}

\textsuperscript{28} This would be the case, however, for the Gaumont Chronochrome system.
\textsuperscript{29} The *Palace Theatre of Varieties*. Friday, February 26th, 1909, at 3 p.m. Special Invitation Matinée. The *First Presentation of Kinemacolor*. Urban-Smith Natural Colour Kinematography (Animated Scenes and Moving Objects Bioscoped in the Actual Tints of Nature) (programme). Reprinted in D.B. Thomas, *The First Colour Motion Pictures* (London: Her Majesty’s Stationery Office, 1969), 18. Emphasis in the original. The capital letters found in the original have been preserved here, as well as the term ’Bioscope’, still a rival term at the time on England with those terms derived from the term ’cinématographe’ adopted in France.
\textsuperscript{30} George Albert Smith, ’Animated Photographs in Natural Colours’, *Journal of the Royal Society of Arts* 57 (11 December 1908): 73.
These remarks tend to again contradict the idea that technical research took place in two stages, at first ‘pure’ and endeavouring solely to obtain the ‘satisfactory result’, and then adapting this result to practical use. The conditions of possible future use, and thus industrial and commercial policy decisions, came into play in establishing the conceptual framework of the investigations. In the almost contemporaneous research that led to Chronochrome, the Gaumont company would not set this limit on itself.

Whereas Smith held to this line, and Kinemcolor was indeed adaptable to a traditional projector, Urban would nevertheless – by necessity or by choice – produce special, better adapted machinery, and his Natural Colour Kinematograph Company began to sell not only films, but also Kinemacolor equipment: cameras; projectors (Illus. 47); and coloured filters, along with lanterns for projecting still images, motors, rheostats, control panels, etc. Kinemacolor, in the process of being institutionalized, became a complete technical network and, as a result, its users (exhibitors, operators) had to have all the necessary parts. In 1969, D.B. Thomas summed up this evolution to specific equipment designed by Urban’s historical collaborator Henry W. Joy and introduced in March 1910:

During 1909 Kinemacolor projectors were made by fitting the rotating colour disc shutter to an ordinary Urban bioscope projector and running it at double speed. This was an unsatisfactory arrangement and resulted in excessive wear on the film [...]. The Kinemacolor projector was heavier and more substantially built than conventional machines to reduce vibrations which would otherwise occur during the double speed operation.31

The technical need for sturdy projectors was perfectly suited to Urban’s commercial project and enabled him to play resolutely the ‘high-end’ card towards both exhibitors and audiences. Or, as the introduction to the equipment catalogue published in 1910 by the Natural Colour Kinematograph Company described it, the ‘highest plane of bioscopic excellence.’32

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31 D.B. Thomas, *The First Colour Motion Pictures*, 19-20. It is still the wearing out of the celluloid and the perforations which is in question here.

Illustration 47 – Kinemacolor projector. From B.E. Jones, How to Make and Operate Moving Pictures (Funk & Wagnalls, 1917).
Constraints or Coherence

For taking pictures, the Kinemacolor machine was not complicated to use, but it did have its own constraints. Firstly, the faster speed meant that twice as much film was used, and thus higher production costs, more frequent magazine changes for the operator, and an exposure time of half the length for each photogram. In addition, the green and red filters between the camera lens and the film (Illus. 48) absorbed a considerable amount of light. Kinemacolor thus required favourable if not exceptional lighting conditions, meaning a sunny outdoor location.33 In practice, it was virtually impossible to shoot in a studio.34

This constraint may appear quite strong, as it prevented the shooting of scenes with the usual technical materials without coming up with complex and costly adaptations specific to the situation. But here again we see the coherence of Urban’s project: this concrete limitation of the dispositif was not a major problem, his project having always been to make documentary type pictures. As he wrote in 1910,

> With the life and scenery of the world, in every land upon which the sun shines, waiting to be recorded in color, time spent in finding ways and means of photographing artificial comedies or artificial tragedies by artificial light is wasted.35

It was indeed necessary that the sun shine in these countries, but as we all know, the sun never sets on the British Empire.

Although George Albert Smith was certainly the sole inventor of Kinemacolor from a 'strictly technical' point of view, the procedure found its coherence in the overall logic of Charles Urban’s commercial and aesthetic project. For Urban, 'natural colours' were not a supplement to, but rather an achievement; colour was not an advance, a form of ‘progress’, an ‘innovation’, but a return. Commenting in the programme of the inaugural screening on 26 February 1909, Luke McKernan remarks:

> This problem of excessive light absorption is found symmetrically in projection, leading to reduced luminosity of the images or to the need to compensate for this with a strong lamp.
> D.B. Thomas remarks that '[f]ilm studios were increasingly using artificial lighting to replace and supplement natural light, and after 1912 the artificial light was often the Cooper-Hewitt mercury vapour lamp introduced from America. This was particularly strong in blue-violet light and very weak in red and green; quite suitable for black and white filming but useless for Kinemacolor or any other colour process'. (The First Colour Motion Pictures, 31.)
> Quoted by D.B. Thomas, ibid.
With its parades, scenic views, quaint animals and even that oldest of film subjects, waves breaking on the shore, the first Kinemacolor programme reads like a Lumière programme of 1896, certainly a rejection of cinema as diversionary entertainment […]. Urban was reinventing cinema.  

It was thus not a question of giving colour to films as they were being produced by the nascent industry – this, for example, was the goal of

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Technicolor – but to overthrow an industry that had got off on the wrong foot, to return to the sources of kinematography as could be seen in the Lumières’ project, and thus to win over (win back) a finally worthy audience. A similar idea ran through the firm Pathé at the time, as Laurent Le Forestier points out: ‘From 1906 to 1910, shooting outdoors became […] a veritable aesthetic desire, something necessary to win over a broader audience, which appeared to be clamouring for this association of cinema with reality’.37

Pathé’s strategy to win over this ‘broader’ (and ‘improved’) audience had partially similar bases but was diametrically opposed to Urban’s. Naturally, Urban could not reproduce the Lumières’ ‘coup’ exactly: fifteen years later, screen practices had changed too profoundly, the context had been too altered. But this was where the idea lay: to erase this period of history and start over. And Urban’s situation is revelatory of a moment of possible hesitation of the industry and of film as medium and media, between fiction, spectacle, and entertainment on the one hand and science, document, and reality on the other: between applied colours and natural colours.

In her book on the history of American cinema, Eileen Bowser described the position of the Kinemacolor Company of America, the producer and distributor of Kinemacolor films in the United States, as follows:

The special place that American Kinemacolor occupied in the industry is signalled by the fact that the reviews in the trade papers were divided into three groups: the licensed, the independent, and the Kinemacolor productions. The New York Dramatic Mirror sometimes carried news of Kinemacolor in its theatrical section instead of in the moving-pictures section. Kinemacolor was important to the cause of uplifting the industry and attracting a middle-class audience. Operating outside the organized distribution system of the movie theatres, it carried special prestige […] it played in legitimate theatres, auditoriums, opera houses, and similar high-class venues.38

37 Laurent Le Forestier, ‘Une disparition instructive: Quelques hypothèses sur l’évolution des “scènes à trucs” chez Pathé’, 1895 revue d’histoire du cinéma 27 (September 1999), 70. Le Forestier, drawing in particular on a text by Roland Cosandey, shows the existence at the time of a “battle” between the spectacular and the real (p. 71) with respect to trick scenes. We might wonder what role in this opposition was played by colour, whether ‘natural’ or artificial.

Kinemacolor stood quite radically apart from film production as a whole, even though the Kinemacolor Company of America, an independent company founded in April 1910, had its own production policy, which was much less hostile to fiction than was Urban’s Natural Colour Kinematograph Company. Bowser also demonstrates that Kinemacolor’s central contribution to film history may be due at least as much to this ‘prestige’ tied to its production policy, its promotional strategy, and to its modes of distribution as to its technical progress properly speaking with respect to colour. For there was no inherent cultural prestige associated with colour – later, dominant cinema would even appear to reserve its use for spectacular and thus ‘popular’ films – even though the ‘Film d’Art’ also appeared in this era of colour films.

It appears that there was a moment when Kinemacolor represented precisely a kind of ‘apotheosis of the kinematograph’: a luxury version with a somewhat austere sense of good taste miles from the usual film capers, a version of cinema legitimised independently of cinema as a whole by the cultured upper-middle classes, a version capable of pleasing at one and the same time ‘artistic and elegant persons of distinction’, children and royalty, Kinemacolor was both a little outside of cinema and, at the same time, its very essence.

The Kinemacolor procedure appeared at a time of profound upheavals in the field – what some historians have described as the passage from early cinema to a transitional period. Modes of exhibition, the economic structure, the way screenings were organized, film form, and the medium’s role in society were all undergoing great changes. This moment was a historical crux, an intersection from which several paths appeared possible for the medium. Nothing about the time was simple or linear. While Urban may appear to be a ‘pioneer’ or a ‘precursor’ for choosing ‘natural colours’, something history would enshrine many years later, his rejection of fiction and entertainment

39 On the Kinemacolor Company of America, see Luke McKernan, ‘Something More’, 165-170; and Gorham Kindem, ‘The Demise of Kinemacolor: Technological, Legal, Economic, and Aesthetic Problems in Early Color Cinema History’, Cinema Journal 20, no. 2 (Spring 1981): 9-12. Kinemacolor’s distribution policy outside the United Kingdom, developed by Urban, was based on the sale of rights to already existing or specially created local firms, with which Urban may or may not have had financial ties. This model caused him a lot of problems in France and the United States, in particular because of the loss of control it involved. The complex implications of this deserve to be explored separately on the basis of detailed, concrete study of each case, something that remains to be done.

made him out of synch with the dominant current – even though, by virtue of this very fact of being out of synch, he contributed, albeit in a singular fashion, to the task of culturally legitimizing the cinema, one of the great tasks of the day. But ‘progressive’ Kinemacolor ran aground in 1914-1915 even though other colour film procedures – ‘applied’ colours: coloured by hand or stencil, at first manually and then mechanically, tinted, toned, and systems combining these – would continue to be used until the late 1920s.

The reasons for this failure of a procedure that had met with overwhelming success are of keen interest to commentators. Were these reasons mostly technical in nature? Economic? Aesthetic? Legal? Corporate? Did they have to do with the fringes of the two-colour system, with the need to change the projection equipment, with the price of admission, with a production policy founded on the rejection of fiction, or, more broadly, with the rejection of what cinema had become in the first decade of the twentieth century?

What is striking most of all, as I hope to have shown here, is the degree to which the Kinemacolor system was coherent. Taken in isolation, the ‘natural colours’ procedure invented by George Albert Smith had visible limitations and sometimes astonishing qualities, while involving relatively major constraints. But it was never thought of in isolation: from the outset, it was part of an overall project developed by Charles Urban, in which the technical procedure was employed in a certain manner in order to produce certain films, promoted with certain arguments, shown in certain kinds of venues, and made for a certain kind of audience.

Kinemacolor thus formed a specific technical network: cameras; projectors; coloured filters; venues; patents and licences, etc. But its homogeneity came only from its clearly established and equally specific production, promotion and dissemination policies. Its absolute coherence of machines and discourses, its technical, aesthetic, political, and commercial conceptions, made Kinemacolor a true system in the strongest sense of the term. This coherence was the strength of Urban’s project, in which colour, and ‘natural colours’ precisely, played a decisive role. But it may also have been its weakness, or what Gilbert Simondon would have called its ‘residual abstraction’, preventing it from taking concrete form on a large industrial scale. This coherence was contradicted, for example, by Urban’s decision to leave management of the procedure abroad to autonomous firms purchasing a local patent: it would be only a slight exaggeration to say that only Urban

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saw the consistency of the whole in each element of the dispositif, making any loss of control disastrous. While Smith was the inventor of the procedure, it was Urban who can be seen as the inventor of Kinemacolor as a technical and conceptual network.

This cohesion can be seen not only in the procedure itself, as an autonomous entity: it applies to the entire historical context in which it was conceived and in which it was used. Rapid transformations of the context could only interfere with Kinemacolor's internal cohesion, bringing about reconfigurations, dispositions, and evolutions. The solid connections between the dispositif's elements then prevented these modifications to the general architecture. The weakness and, ultimately, the ruin of the Kinemacolor system was its very solidity. But this compactness, the networks of adherences with all of cinema of the day it brought about, and the technical, aesthetic, economic, and perceptual originality of its set-up are also what makes it of special interest today and what gives its archaeology such fertile potential.