The 'look' and how to keep it: cinematography, post-production, and digital colour.

Jacques Aumont has noted that, throughout screen history, film-makers have tended to regard colour as something to be controlled.[i] Between the rise of Technicolor in the mid-1930s and the emergence of digital cinema in the late 1990s, controlling colour typically involved controlling the colours that appeared in front of a film camera through techniques including production design, costume design, lens filtration, and coloured lighting. Since the spread of 'Digital Intermediate' (DI) in the early to mid-2000s, screen colour has owed at least as much to computer-based post-production processes as to camera-based production processes.[ii] In this article, I explore colour as the focal point of a renegotiation of the historical roles of what are anachronistically still called the 'production' and 'post-production' sectors of the film industry. I do so by means of a case study: the recent activities of the American Society of Cinematographers (ASC). Though the society's membership numbers barely three hundred, it has for many decades been a prominent advocate of the 'art of cinematography' and of the interests of the cinematography profession as a whole.[iii] Using articles from its widely read trade journal, *American Cinematographer*, I explore some of the strategies used by the ASC over the last decade to preserve the privileged creative status of the Director of Photography (DoP) in the context of rapid technological and industrial changes.[iv] These strategies have typically focused on colour. By exploring the various interactions between the ASC and the post-production sector reported in *American Cinematographer*, as well as the rhetoric used to report them, I address the question: if colour is something to be controlled, who controls it?

The ASC's view of film production can be summarised as follows. A film's director has a mental image (a 'vision') of how the script will appear on screen. The Director of Photography realises this 'vision' by registering moving images with a 'look' that corresponds to, or improves on, what the director imagined. By setting the 'look' of images registered by the camera, the cinematographer is thus by implication responsible for the overall 'look' of a film. Colour constitutes a key aspect of a film's 'look', and so falls within the cinematographer's creative territory. This view of film production, and so also the cinematographer's status as a key creative, has historically owed much to the limitations of photochemical post-production technology. Not much can be done to alter the appearance of a film print in a laboratory; the limited options available centre on 'colour timing', otherwise known as 'primary colour grading'. Colour timing involves adjusting the relative amount of each primary colour that an interpositive is exposed to, thereby altering the relative amount of red, green, and blue in a film's internegative and exhibition prints. Too much primary colour, however, cannot be removed, because reducing the amount of red, green, or blue light passing through a print also results in a darker image. Thus the 'look' of a photochemical film is indeed primarily dependent on choices made when filming.

A film's 'look' is now typically no longer set during production. Primary colour grading is now carried out digitally; as a result, it can be used to adjust colour balance without the restrictions inherent in photochemical colour timing. Red, green, and blue can be adjusted in any combination, without causing reduced exposure. Conversely, exposure can be changed without affecting colour balance. And this is just the beginning of what can now be done with colour. Writing in the early 1990s, William Mitchell noted that the essential characteristic of digital information is the fact that it 'can be manipulated easily' because it is simply 'a matter of substituting new digits for old.'[v] 'Secondary colour grading', first used in television commercials in the mid-1990s, has translated the promise of 'easy manipulation' into practice. Primary grading alters the colour balance of an entire shot; secondary grading allows specific colour values and areas of the frame to be altered in isolation. A blue sky, for example, can be made pink, without changing the hue of the sea.[vi] Any range of colour values in any area of the screen can be transformed into any other range of colour values, without having an effect on the rest of the image. Digital colour grading makes possible such extreme chromatic alterations that it is not enough to say that a film's colour can now be *adjusted* in post-production; rather, a film's colour can now be *created* in post-production. For example, the colours of Zack Snyder's *300* (2006) bear virtually no resemblance to those registered on set. Snyder gave the film its comic book aesthetic of clipped highlights, crushed shadows, and desaturated colour through primary grading, and settled on yellow as the film's chromatic major through secondary grading (see fig.).[vii]

Accompanying the shift in chromatic decision-making towards post-production has been the emergence of a new creative role: the 'colourist'. As the degree to which colour could be adjusted in post-production increased during the 1990s, many colour timers, film scanners, and telecine operators upgraded their skills and moved into colour grading suites to become colourists.[viii] Colourists now have a significant effect on the final 'look' of almost all film and television production, and have accordingly become highly valued. They are among the highest-paid workers in the post-productions sector. They are even, as the news pages of industry journals including *Broadcast* regularly demonstrate, routinely headhunted by post houses seeking to attract high budget projects.

Unsurprisingly, the changes signalled by the rise of the colourist have excited anxiety among cinematographers, albeit sometimes mixed with technophilic excitement.[ix] Accordingly, since the spread of digital colour grading to cinema in the early 2000s, the ASC has attempted several distinct strategies to keep control of colour. Its initial strategy involved campaigning for cinematographers to become involved in post-production. Articles in *American Cinematographer* drew attention to, and furthered, this agenda. For example, a 2002 article entitled 'A legacy of invention: cinematographers exploring the growing possibilities of postproduction are continuing in a time-honored tradition' emphasises the historical connections between cinematography and post-production.[x] The article

comprises examples of cinematographers' involvement in post-production, and of the perceived creative triumphs that resulted. It presents these examples chronologically, from Billy Blitzer's background as a projectionist to Andrew Lesnie's involvement in the digital 'look development' of Peter Jackson's *Lord of the Rings* trilogy (2001-2003). The article thus provides cinematographers with a ready-made argument for persuading producers of the value of paying them to spend time working on a film after principal photography finishes. From the evidence of this and similar articles dating from the early 2000s, it appears that the ASC felt that getting cinematographers into colour grading suites would be a hard sell.[xi] However, given the expertise of a typical feature film's DoP, and the fact that most colourists were recently promoted technicians, the ASC was in fact pushing at an open door. By the mid-2000s, cinematographers were routinely carrying out much of their work at post houses. Zack Snyder's DoP on *300*, Larry Fong, continued to work on the film throughout post-production.[xii]

Although the cinematography profession's anxiety about being excluded from post-production proved unfounded, its anxiety about losing control of screen colour did not. Securing access to grading suites did not ensure control of colour. Regardless of what happens during grading, the colour values of pixels change of their own accord at each stage in the post-production process, as digital video files are copied, transcoded, and compressed. m For the last decade and a half, the cinematography profession has been struggling to retain a relation between the two. Between the mid-1990s and the mid-2000s, as well as campaigning for ASC members' access to post-production, *American Cinematographer* routinely reported on cinematographers' ideas about how the 'problem' of colour management could be solved by technological means.[xiii] In 2002, the ASC went a step further. It set up a 'Technology Committee', and began to engage directly with colour management technology. *American Cinematographer* announced the committee's establishment as follows:

> Look-Up Tables, cameras, algorithms for color sampling, compression and conversion, etc. – are being developed at a breakneck pace. With manufacturers pursuing their own directions and goals, this has led to a digital realm without order, beyond the controlled borders of a select group of post facilities who have been engineering their own proprietary workflow solutions. Taking on the difficult role of sheriff in this lawless land is the ASC Technology Committee …[xiv]

As in many Westerns, the sheriff was a self-appointed one. Within two years, the Technology Committee had developed plans for a multi-million dollar research centre next to its clubhouse, devoted to refining post-production workflows.[xv] Companies involved in post-production research and development would be invited to use the ASC's state-of-the-art facilities to test their workflows. Curtis Clark, chairman of the Technology Committee, summarised the purpose of the prospective research centre as follows:

> Our work will reinforce the value proposition for the cinematographer's role in managing the look within the new hybrid imaging workflow. As a consequence, we will generate greater awareness and respect for what cinematographers do and cement the importance of the ASC's leadership role.[xvi]

The sheriff may have overestimated his ability to lay down the law. Progress reports continued to appear in *American Cinematographer* for just over a year, and then stopped. Perhaps the ASC realised that by building a research centre it risked overextending its territorial reach, and that the various parties involved in developing post-production technology would be unlikely to accept a cinematography union's leadership. Whatever the reasons for the project's demise, the ASC instead spent its spare millions on refurbishing its clubhouse.

The society has nonetheless continued to develop plans to keep control of colour throughout post-production. In 2007, the Technology Committee announced that it was developing a 'colour decision list' (CDL).[xvii] The colour decision list takes the form of metadata attached to video files, detailing the original colour and exposure properties of each shot.[xviii] In principle, the metadata allows operators using any post-production platform to adjust the colour values of video files so that they will look exactly the same as they looked on the cinematographer's monitor.[xix] In contrast to its plans for a research centre, the Technology Committee's less overtly territorial plan to establish an industry-wide CDL has met with some success. For example, apparently in response to an article in *American Cinematographer*, Technicolor (which now operates as a post-production company) has begun to trial the colour decision list, and is exploring ways of integrating it into post-production workflows.[xx]

The involvement of Technicolor in research and development of the colour decision list demonstrates that, despite the cinematography profession's on-going anxiety about 'the look' and how to keep it, its relationship with the post-production sector is symbiotic. Cinematographers and post-production professionals collaborate on a daily basis; to keep any degree of control over a film's 'look', a cinematographer needs to cultivate close working relationships with colourists and post-production supervisors.[xxi] Post-production houses, in turn, depend on close relationships with cinematographers, not least because DoPs can often have a major influence on producers' choices about which post-production companies they use. Perhaps this is why Joshua Pines, Vice-President of Imaging Research at Technicolor Digital Intermediates, praises the CDL as 'a way of giving creative control back to the cinematographer.'[xxii] Pines even reiterates the ASC's mantra: 'Just like the director has first cut, the cinematographer should have first look.'[xxiii] Indeed, rather than interpreting the colour decision list as another attempt by the ASC to sheriff post-production, perhaps one might interpret it instead as evidence of how far understanding between the two industry sectors has developed. The most telling feature of the colour decision list is what it does not include. The CDL's metadata only provides

information usable for primary colour correction – notably RGB values, saturation, contrast, and brightness. It provides no instructions for secondary colour correction.[xxiv] The colour decision list cannot, for example, tell a colourist how to apply chromatic changes to individual areas of the screen or to isolated colours.

The CDL's focus on primary colour grading is quite understandable. Cinematographers have historically always involved themselves in colour timing, and the ASC's goal of keeping control of a film's overall 'look' necessitates its members' continued control of primary colour grading. However, it is telling that the Technology Committee is not even bothering to assert control over secondary colour grading. Perhaps it accepts that, as secondary grading has no photochemical precursor, the ASC cannot really make a persuasive historical argument for why a DoP should have creative control over it. If this is the case, then perhaps an implicit agreement about how cinematographers and colourists divide responsibility for realising a director's 'vision' has at last been achieved. Cinematographers control the overall colour scheme of a film; colourists have control over more precise shot-by-shot colour effects.

The above equilibrium suggests that, in a sense, the ASC has won its recent battle. DoPs' influence over the 'look' of feature films has survived the rise of the colourist. However, the ASC's choice to restrict its territorial claim to primary colour grading hints that the cinematographer's status as a key creative may now be restricted to forms of screen media in which 'filming' is still a major element. Prominent among these is narrative cinema, which still typically involves physical locations, actors performing in front of a camera, and so on. In feature film production, as *American Cinematographer*'s continued focus on high budget studio films demonstrates, the Director of Photography's role as a key creative remains intact. The ASC's membership can breathe a collective sigh of relief – their jobs are safe. Beyond feature films, however, the outlook for cinematographers is quite different. Contemporary screen media are now typically the result of numerous processes, only one of which involves actual filming. In television commercials, pop promos, web advertising and many other forms of moving image, motion graphics typically play at least as important a role as cinematography. Stephen Prince goes so far as to suggest that, in the context of contemporary media hybridity, cinematography is simply an 'image capture' process – like scanning a photo.[xxv] Indeed, in many examples of contemporary moving image (notably web video), cinematography often plays *no role whatsoever*. Inasmuch as the ASC has succeeded in reasserting its members' creative influence over feature films, it has won its territorial conflict with the post-production sector. By restricting its fight to feature films, however, it may have lost the subsequent peace.

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[i] Jacques Aumont, 'La trace et sa couleur', *Cinémathéque*, no. 2 (1992), pp. 6-24.

[ii] The first feature film to go entirely through a digital post-production workflow was the Coen Brothers' *O Brother Where Art Thou* (2001). Over subsequent years, DI became an increasingly popular post-production route. By April 2003, almost 30 films had gone entirely through DI (see Debra Kaufman, 'A flexible finish', *American Cinematographer*, vol. 84, no. 4 [2003], pp. 80-89). DI is now the industry norm.
[iii] 'The legacy lives on', http://www.theasc.com/society/index.php?pagename=About_the_ASC. Accessed 15th February, 2010.
[iv] In Britain and most other Anglophone countries, the acronym for Director of Photography is 'DoP'. In the United States, it is 'DP'.
[v] William J. Mitchell, *The Reconfigured Eye. Visual Truth in the Post-Photographic Era* (Cambridge, MA: M.I.T. Press, 1992)
[vi] For a more detailed history of digital colour, see Richard Misek, *Chromatic Cinema: A History of Screen Colour* (Malvern, MA: Wiley-Blackwell, 2010)
[vii] David E. Williams, 'Few against many', *American Cinematographer*, vol. 88, no. 4 (2007), pp. 52-65.
[viii] Stephanie Argy, 'Post focus: the colorist's perspective', *American Cinematographer*, vol. 86, no. 7 (2005), pp. 82-88. Film scanning involves encoding sections of a film as high-resolution files for visual effects work. Telecine involves transferring film negatives or prints to video for television broadcast.
[ix] Ironically, cinematographers have more recently also become anxious about technological developments in pre-production – notably the spread of digital 'pre-visualisation'. The anxiety is that, in the words of DoP Roberto Schaefer, 'people tend to see [previsualisation] as the written word, the Bible,' and that the creative status of the cinematographer will suffer further as a result. Stephanie Argy and Richard Edlund, 'Assessing previz', *American Cinematographer*, vol. 90, no. 6 (2009), pp. 70-77.
[x] Debra Kaufman and Ray Zone, 'A legacy of invention', *American Cinematographer*, vol. 83, no. 5 (2002), pp. 64-77.
[xi] Christopher Probst, 'Picture perfect', *American Cinematographer*, vol. 79, no. 4 (1997), pp. 30-34.
[xii] Ibid.
[xiii] Suggested solutions most often took the form of software-based 'Look-Up Tables' (LUTs). See Elina Shatkin, 'Post focus: creative bridge puts digital lab in motion', *American Cinematographer*, vol. 87, no. 6 (2006), pp. 100-104.
[xiv] Douglas Bankston, 'The color-space conundrum, part 1', *American Cinematographer*, vol. 86, no. 1 (2005), pp. 88-110.
[xv] Douglas Bankston, 'The color-space conundrum, part 2', *American Cinematographer*, vol. 86, no. 4 (2005), pp. 76-107.
[xvi] Ibid.
[xvii] Douglas Bankston, 'Tomorrow's technology', *American Cinematographer*, vol. 88, no.12 (2007), pp. 110-112.

[xviii] Iain Stasukevich, 'Post focus: achieving color symmetry', *American Cinematographer*, vol. 89, no. 1 (2008), pp. 100-104.
[xix] Ibid.
[xx] The article is Richard P. Crudo, 'A call for digital printer lights', *American Cinematographer* vol. 87, no. 9 (2006), pp. 70-77; Technicolor's response is detailed in Iain Stasukevich, 'Post focus: DP dailies system targets image control', *American Cinematographer*, vol. 90, no. 7 (2009), pp. 60-62.
[xxi] See, for example, DoP Oliver Wood's discussion of how he attempted to 'build a look' for Paul Greengrass's *The Bourne Ultimatum* (2007). Jon Silberg, 'Bourne again', *American Cinematographer*, vol. 88, no. 9 (2007), pp. 32-43.
[xxii] Pines also sits on the ASC's Technology Committee. Benjamin B, 'An overview of the ASC CDL', *American Cinematographer*, vol. 89, no. 10 (2008), pp. 74-76.
[xxiii] Ibid.
[xxiv] Ibid.
[xxv] Stephen Prince, 'The emergence of filmic artifacts: cinema and cinematography in the digital era', *Film Quarterly*, vol. 57, no. 3 (2004), pp. 24-33.