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Film Color

> *"Last night I was in the kingdom of shadows. If you only knew how strange it is to be there.… Everything there – the earth, the trees, the people, the water and the air – is dipped in monotonous grey. Grey rays of the sun across the grey sky, grey eyes in grey faces, and the leaves of the trees are ashen grey. It is not life, but its shadow…."*
>
> Maxim Gorky (Leyda 1960: 407)

Coloration in Early Cinema, 1895–1927

It was the sheer *grayness* of the first films by the Lumière brothers that most startled Maxim Gorky. Black-and-white photography had been an element of everyday life for over a generation, but as soon as monochrome images began to move, they became ashen. Movement brought still images to life, but it was a deathly life without its essential color. In his famous review of an 1896 screening of the Lumières' early films in St Petersburg, Gorky expressed the awareness widespread among early cinemagoers that behind each black-and-white image there existed a color reality that had not survived the transition to film. In an article entitled "A Montreal, des sujets hauts en couleur, dès 1897 …," a reviewer for Montreal newspaper *La Presse* (June 29, 1896) noted cinema's audio-visual lack equally emphatically: "On peut dire que le résolution obtenu est vraiment étonnant. Pour rendre l'illusion complète, il ne manquait que les couleurs et le phonographe reproduisant les sons." Like sound, color was an absence immediately felt and a need immediately addressed. Even before these reviews, early film practitioners were already adding color to black-and-white prints. In this chapter, I explore color as an addition in early cinema and classical Hollywood. Between the 1890s and 1920s, this

addition took place through techniques including hand painting, spray painting through stencils, and the immersion of film prints in baths of colored dye. With the rise of Technicolor in the 1930s, screen color became the result of a process that reproduced the color frequencies of light cinematographically onto a film print.[1] Nonetheless, as I discuss later, even the "natural" color of Technicolor films involved the application of colored pigments to black-and-white film prints. Throughout this chapter, I refer to the color achieved by applying pigments directly to black-and-white film prints as "film color."[2] My use of the term is inspired by, but distinct from, psychologist David Katz's use of the term to describe color that one is able to look through, as distinct from color that exists on a surface and forms a barrier to vision (1935: 8). Between the 1890s and 1940s, almost all screen color was film color.

The earliest film color involved hand painting. A startling example of hand painting can be seen in a print of a "serpentine dance" film by the Edison Manufacturing Company held at the British Film Institute (BFI), probably dating from 1895 (Yumibe 2005). Made fashionable by Loïe Fuller in the early 1890s, serpentine dances involved a female performer dancing in a flowing white dress under varyingly colored stage lighting. In the BFI's copy of *Annabelle Serpentine Dance*, hypnotic swirls of hand-painted color move through different hues and saturations, mimicking the changing colors of stage light reflected by the dress (Plate 1.1). Despite its artistic potential, hand-painted film died in its infancy. By the mid-1900s, the average length of films had increased and the number of exhibition venues demanding prints had multiplied, so coloring entire films frame by frame with a paintbrush became economically unfeasible (Neale 1985: 115).[3] In order to reconcile film color with cinema's rapid industrialization, French production giant Pathé pioneered a partially mechanized stenciling process in 1905/6 and began to use it commercially in 1908 (Musser 2002). Stencils for Pathécolor prints were created by using a pantograph connected to a needle, which cut out pieces of each frame of a film print. Like needlework, the process was considered (by men) to be too delicate for men, and so was carried out by an exclusively female workforce – a rare example of patriarchal stereotypes benefitting women in the workplace.[4] The resulting stencil was placed in front of a second print of the film and the two prints were run together under a roller saturated with colored ink or put in front of an airbrush.[5] Each extra color required a different stencil, but stencils could be re-used many times, so the process was far more efficient than hand painting.

Early films were alive with color, but color fades. Over the last century, most of early cinema's colors have melted away to the point where – to appropriate Gorky's metaphor – they too have become shadows. The instability of film color compounds the already considerable difficulty of writing about an era of cinema over half of whose products are lost to us.[6] Nonetheless, even from the imperfect evidence available, some visual characteristics typical of early color processes are immediately apparent. Hand painting resulted in amorphous, oscillating colors that varied from moment to moment, according to the amount of pigment applied on the brush strokes, as seen in *Annabelle Serpentine Dance*. Stenciling resulted in blocks of color whose outlines were more clearly defined and whose density was more consistent, but which often did not quite register with the cinematographic image they overlaid, creating a slight visual mismatch between the outlines of objects and their colors. In addition, both hand-painted and stenciled colors were translucent. The combined result of these visual properties is that early film color appeared clearly separate both from the objects filmed and from the monochrome film itself. The fact that it resulted from the addition of dyes to black-and-white film was so obvious that newspapers routinely referred to color films as *colored* films.[7]

Color and black-and-white coexisted not only materially, one applied onto the other, but also visibly next to each other within the frame. Economic constraints frequently prevented entire frames from being hand-painted or stenciled, as each added color was also an added expense. The Pathé workshop had the capability to stencil up to six separate colors onto a black-and-white negative but typically added only one or two (Nowotny 1983: 12). As a result, much of the frame often remained black-and-white, with color restricted to specific details. The features most consistently colorized were items of clothing, though colorists often also painted prominent props and elements of the production design. Naturally colored phenomena – trees, rivers, rocks, sky, etc. – typically remained uncolored. As Philippe Dubois notes, the tendency for color to be added to costumes and sets was commensurate with the general perception of the period that cinematic color was a surface characteristic (1995: 77). The addition of pigments to the surface of the film mimicked the addition of pigments to objects within the film: what was painted in front of the camera was painted onto the print. For example, in the cave scenes of a hand-painted 1905 re-release of *Ali Baba et les quarante voleurs* (Segundo de Chomón, 1902), the thieves' costumes appear in assorted colors but the natural rock walls of the cave remain gray (Plate 1.2). The amount of film color varies from shot to shot according to the amount of surface color

present in front of the camera. As a result, black-and-white and color exist in a dynamic visual relationship: color variously surges into and drains out of the image. For example, when the 40 thieves evacuate the cave, leaving Ali Baba alone with their riches, chromatic chaos gives way to monochrome calm. In later scenes set in opulent domestic interiors, the presence of gray is largely restricted to people's skin, a surface whose essential color not even the most enthusiastic colorist dared mimic.

The most meticulously colored films of the 1900s came from the Pathé workshop: for example, in *Le Scarabée d'or* (Segundo de Chomón, 1907) multiple layers of stenciled color mimic the chromatic cacophony of a fire-work display (Plate 1.3).[8] Similar, if less spectacular, uses of color also occurred in early American films. For example, a print of Edwin Porter's *The Great Train Robbery* (1903) held at the BFI features selective hand coloring. Explosions and gunshots are painted red, and a few clothes are painted purple and yellow. In the film's famous gunshot-to-camera shot, which exhibitors were able to splice in at the start or end of the film according to their preference, the shootist is adorned with green and purple (Plate 1.4). As in *Ali Baba,* the colors do not perform any obvious narrative or thematic function: they do not help establish continuity, draw attention to significant narrative details, or emphasize visual leitmotifs. Indeed, as Tom Gunning has persuasively argued in a seminal article on early film color, "meaning" is not a concept that we can usefully apply to early cinematic color (1995). For example, though the colors in *Ali Baba* are primarily those of surfaces, in one shot set in a loggia looking out over a cityscape, the sky is painted blue. Why is the optical blue of the sky, a result of white sunlight refracted through atmospheric gases, represented with pigmentary color? It is probably because the even expanse of gray sky in the film print was amenable to rapid coloring. Unconcerned with the nuances of atmospheric optics, the film's colorists painted the sky blue because it allowed them to achieve maximal color with minimal effort.

Gunning observes that in early cinema color appeared far more often in films that sold themselves as spectacles than in documentaries. Many prints of early fantasies by George Méliès, for example, were hand-painted; Méliès's later films, including *Le Voyage à travers l'impossible* (1904), were typically stenciled. Color here again fulfils no clear narrative or thematic function – what matters most is simply its presence. If one accepts Gunning's description of early color as "more or less arbitrarily applied," rather than something to which meaning can be affixed, then one must also accept that this arbitrariness precluded color and black-and-white from signifying opposition.

The fact that color was a material addition to black-and-white further militated against opposition. Opposition requires mutual exclusivity. It is difficult to imagine how black-and-white and color could be perceived as mutually exclusive in the above examples, in which black-and-white underlies the added color and variously surrounds and is surrounded by it. In early cinema, color was not a negation of black-and-white but something "superadded" to the film print, providing audiences with what Gunning refers to in his article as "an extra sensual intensity which draws its significance at least in part from its difference from black and white."

It is therefore surprising that Gunning follows the above sentence with a *non sequitur*: "We do not need a historian or critic to point out the significance of this paradigmatic opposition between color and black and white images." He refers to "this" paradigmatic opposition as though he has just demonstrated it, when in my view he has demonstrated the contrary. In fact, Gunning's assertion that there existed an opposition between black-and-white and color is dependent not on his exploration of the material nature of early cinematic color but on his observation of the existence in the late nineteenth century of a culturally constructed opposition between black-and-white and color print media. "Quality" newspapers were black-and-white, while penny novels had color covers. It is far from clear, however, how – if at all – the chromatic oppositions evident in print media migrated to cinema. It is telling that to demonstrate black-and-white and color's cinematic opposition Gunning cites *The Wizard of Oz*, a film made long after the era of early cinema.

Underpinning the contradictions in Gunning's article is his use of the word "paradigmatic." When used of a set of linguistic terms, it describes grammatical choices that are mutually exclusive. To refer to black-and-white and color as paradigmatic in this sense is to suggest that each is what the other is not; when one changes, the other changes inversely. The word can also be used to identify the various manifestations of a hegemonic worldview – the belief that the Sun revolved around the Earth was once a paradigm, as is now the belief that the Earth revolves around the Sun. These two uses of the word are themselves mutually exclusive. It is my view, and I suspect Gunning's too, that black-and-white and color are not paradigmatic opposites in the sense that they are intrinsically opposed. They have, however, often been *perceived* as opposites. In other words, there has at various points in history developed a culturally constructed paradigm of opposition between black-and-white and color. In early cinema, there was no such cultural construct.

The boundaries between black-and-white and color were already unclear in hand-painted and stenciled films, but they became even less clear following the invention of color tinting. Producer Sigmund Lubin first offered "mono-tinted" films in 1904, and by the following year tinting was already widespread (Musser 1990: 398). Stenciling and tinting coexisted until the late 1910s, at which point the final stage of the film industry's move from artisanal to industrial production caused producers to regard the labor-intensive process of stenciling – like hand painting before it – as unacceptably expensive (Neale 1985: 117). The ease with which tinting, and the less popular alternative of toning, could be carried out resulted in color permeating cinema more widely in the 1910s. By the early 1920s, between 80 percent and 90 percent of films were colored.[9] In comparison to the attention given to the troubled progress of early cinematographic color processes of the 1900s and 1910s (for example, Kinemacolor and the earliest Technicolor), journalism of the period rarely referred to tinting. Color monochromes were not the next big thing: they were already an aesthetic norm, and accepted as a given. Joshua Yumibe observes that tinting was so common by the late 1910s that the Biograph Company's tendency *not* to tint their films was often singled out for mention (2005).

In tinting, a film print is immersed in a colored dye. The dye is absorbed by the film's emulsion, resulting in an evenly – and often intensely – colored image in which the white highlights are replaced by color (Plate 1.5). In toning, only the opaque areas of the film positive absorb color; the clear portions remain unaltered, resulting in an image in which the highlights are colorless while the midtones and shadows adopt the color of the dye. Philippe Dubois succinctly summarizes the difference between the two when he refers to tinting as "black-and-color" and toning as "color-and-white" (1995: 75). Through tinting and toning, early cinema reached a new level of chromatic mixture. Black-and-white and color chemically combined to create images in which the hue was the product of a colored dye but the tone was that of a monochrome photographic image. As Dubois's transchromatic labels imply, tinting and toning often led to an aesthetic cleavage of black-and-white into black and white. Black, white, and color were able, through tinting and toning, to interact in any combination.

An example of black and color can be seen in Lotte Reiniger's *Die Abenteuer des Prinzen Achmed* (1926). A mythical fantasy based on *The Arabian Nights*, Reiniger's tinted animation was achieved through the manipulation of hand-cut silhouettes, and takes the form of filmed shadow theater. Pure black figures move across evenly colored backgrounds (Plate 1.6). From scene

to scene, the film moves between black and blue, black and yellow, black and green, black and orange, and black and red. When all is reduced to solid blocks of black and color, the result is a visual binary. But this binary is not between black-and-white and color; rather, it is between black and color. Each appears as an absence of the other: the outlines of the black shapes visually define and are defined by the outlines of the colored shapes.

Reiniger's shadow puppetry is an extreme example of black and color, but equally extreme examples occurred in live-action cinema. Early black-and-white film stocks were not panchromatic – they were not sensitive to the full spectrum of color frequencies. Insensitive to red frequencies, they registered them not as shades of gray but as black. In addition, film prints due to be tinted were routinely processed at higher than normal contrast to ensure firm blacks (Usai 1996: 25). So all tinting tended toward black and color, because the stock that was to be tinted tended toward black and white. The appearance of "low-key" lighting in the mid-1910s exacerbated this tendency. As Janet Staiger notes, the introduction of directional arc lamps in the mid-1910s led to a decrease in the use of diffused lighting in favor of spotlighting, resulting in shots with selective areas of brightness surrounded by pools of shadow and relatively little by way of midtones (Bordwell et al. 1985: 223). The opportunities provided by arc lamps to use light creatively were quickly exploited throughout the film industry. In the United States, low-key lighting became closely associated with the work of Cecil B. DeMille. In Germany, it became the visual mainstay of Expressionist cinema. When low-key lighting combined with tinting, as in Paul Wegener's *Der Golem* (1920), the result was startlingly similar to Reiniger's animation (see Plates 1.5 and 1.6). The influence of German Expressionism on international cinema, and on Hollywood in particular, contributed to the continued prominence of black and color throughout the 1920s, even though the black-and-white film stocks of the period were becoming progressively more responsive to the full spectrum of colors.

Philippe Dubois further distinguishes between two forms of chromatic interpenetration (1995: 74). He refers to the co-presence of monochrome and color within shots as "métissage" (mixture), and refers the coexistence within a film of monochrome shots and color shots as "hybridation" (hybridity). Throughout this book, I return to the distinction between chromatic mixture *within* shots and chromatic hybridity *between* shots. However, when discussing the first three decades of cinema, this distinction is of limited use. The concurrent availability of hand painting,

stenciling, tinting, and toning made possible a diversity of chromatic combinations that defy Dubois's categories. For example, early films often included tinted and untinted sequences. In these films, black is a constant, but white is an intermittent presence; white is only one of a range of colors used as a visual counterpoint to black. In addition, many early films are the product of more than one color process. Paolo Cherchi Usai has uncovered footage from as early as 1908 that combines tinted and stenciled scenes (1996: 25). Films could also be tinted *and* toned, resulting in color duochromes. For example, prints of Frank Lloyd's *A Tale of Two Worlds* (1922) were tinted in amber and toned in green (Parker 1972: 21). The result was not "black-and-white," not even "black-and-color," but "color-and-color." Prints of D. W. Griffith's *Way Down East* (1920) were tinted and toned and may also have included some hand painting (Limbacher 1969: 3). Augusto Genina's *Cyrano de Bergerac* (1922) was toned and then stenciled with up to four colors (Gili 1992: 125). The rise of Technicolor allowed for further chromatic variety in the tentative form of brief cinematographic color sequences. For example, Cecil B. DeMille's *The Ten Commandments* (1922) and *King of Kings* (1927) combined tinted footage and material shot in Technicolor. King Vidor's *The Big Parade* (1925) and Rupert Julian's *The Phantom of the Opera* (1925) included black-and-white footage, a Technicolor sequence, and a more sophisticated version of stenciling known as Handschiegl coloring (Nowotny 1983: 297).[10] Erich von Stroheim's *The Merry Widow* (1925) combined black-and-white sequences, tinted sequences, a Handschiegl insert, and a Technicolor sequence (Koszarski 2000: 341).

Chromatic variations also occurred from print to print of the *same* film. Tom Gunning draws attention to the fact that in the first decade of cinema a film could often be bought in black-and-white or color versions (1995). For a higher price, an exhibitor could buy a color print and charge higher ticket prices. At the same time, Usai suggests that hand-painted color was so expensive that "the cost of producing colored prints was only partially justified by the demands of the exhibition market" (1996: 23). This may be true for hand painting, but with the development of stenciling and tinting, the economics of coloration became more persuasive. For Pathé, color itself, regardless of the film, could generate profit. After 1908, the company began to re-release films from its back catalogue in the form of new stenciled prints, the addition of color to these prints giving them new economic life (Musser 2002). Richard Abel further suggests that distributors unwilling to pay Pathé's premium for

color may have added their own colors (1994: 95). If this did indeed happen, then there could have existed at any point in time countless different color versions of the same film.

Little is known about the economic factors that decided why color was added in some cases and not others. Little is also known about why some prints have more color than others. And why, as Nicola Mazzanti notes, different colors were typically added to film prints depending on which countries they were being exported to (2009: 70). Yet though the details of the decision-making behind early film color remain elusive to contemporary researchers, this much is clear – economically, as well as materially and aesthetically, color was an addition to black-and-white. For distributors and exhibitors, coloration was a means of increasing marginal revenue; like special edition DVDs, it redirected products toward consumers with surplus disposable income. For consumers, it was a means of gaining more pleasure for more money.

Over the course of the 1910s and 1920s, directors found various ways for color to play a less arbitrary role within their films' structures of meaning. Tinted color could provide rudimentary narrative information, in particular indicating if a scene was set in moonlight (blue) or artificial light (yellow). It could also provide rudimentary thematic information: red, for example, might signify a character's anger. At the same time, then – as now – no definitive meaning could be attributed to a color. In a different context, red could just as easily suggest heat.

In a minority of films, color fulfils more subtle functions. Though rare and not necessarily influential, such films constituted a form of "best practice," and so it is worth looking at a few examples. For example, D. W. Griffith's *The White Rose* (1923) features a brief red blush. To achieve this effect, Griffith used Handschiegl printing; by doing so, he cleverly subverted the cliché that applied color was for surfaces only. Though printed onto the skin of the film, the red appears to emanate from underneath it. The same trick is used by the aging nymph Celia in Jonathan Swift's poem *The Progress of Beauty*, but with less success; every morning Celia tries to "teach her cheeks again to blush," but colored pigments cannot bring back the essential reds of a youthful face (Swift 1983: 193). In certain prints of *Greed* (1924), Eric von Stroheim also used Handschiegl color, integrating it into the film's narrative. According to Jay Leyda, not only was the protagonist's fateful stash of gold yellow, so too were "gold teeth, brass beds, gilt frames and canary" (Koszarski 1999: 14). The yellow in *Greed* marked a further development in color's ability to signify. Von Stroheim imbued the color

with thematic meaning, turning it into a leitmotif, a recurrent chromatic expression of the insatiable avarice of *nouveau riche* dentist McTeague and his mercenary wife Trina. Leyda's comment also suggests that chromatic variations continued from print to print into the 1920s. This fact is confirmed by Richard Koszarski, who observes that though hand coloring became less common in the 1920s, it still existed in certain prints of certain films shown in certain theaters (2000: 341).[11] However, in contrast to the chromatic vagaries of the films cited above, the absence of yellow in certain prints of *Greed* is not an example of arbitrary coloring. It is instead an example of economic limitations preventing a director's specific chromatic intentions from being implemented on all prints of his film.

A more complex use of color occurs in Sergei Eisenstein's *The Battleship Potemkin* (1925). Following a successful mutiny aboard the Potemkin, we see a hand-painted shot of a Soviet flag hoisted up the ship's mast (Plate 1.7). It is difficult to imagine a more symbolically direct use of color: the flag is both red and Red. Eisenstein harnesses the sensual power of the flag's redness to glorify and elicit a sense of pleasure in the rise of Communism. Yet even in this inspired example of symbolic color, the sensual immediacy of the red overwhelms its intended meaning. We feel the flag's redness more intensely than its Redness. The intensity with which red asserts its redness was famously summarized by Jean-Luc Godard, in his response to an interviewer's comment on the profusion of blood in *Pierrot le fou* (1965): "Not blood, red" (Godard 1972: 217). It is no coincidence that Gilles Deleuze picked out this line as evidence that color tends to absorb the referential into the affective, overwhelming meaning through its sensual directness (1986: 118). Nor is it a coincidence that C. S. Peirce, who had such an immense influence on Deleuze, used red as an example of his category of "firstness" (Hanssen 2006: 104). Red's singularity was even intuited by the colorists at the Pathé studios, who never allowed it to mix with other colors in their stenciled prints: "Le rouge n'était que du rouge" (Dana 1992: 127). In *Potemkin*, red is not quite "only red," but it is primarily red.

It was left to Abel Gance, in a startling *coup de cinéma* at the end of *Napoléon* (1927), to tap the affective power of primary color and simultaneously give it meaning. Gance shot the film's climactic battle sequence with three synchronized cameras, so that it could be projected in cinemas on three screens. The multi-screen climax begins with the three shots combining to create ultra wide screen panoramas of epic battle scenes. Gance's use of three screens soon becomes even more experimental. His experiment culminates in a moment of overwhelming chromatic nationalism: the left-hand

image is tinted blue, the right-hand image is tinted red, while the central image is left untinted so that its highlights remain white. The result is a giant widescreen *tricolore*, which integrates Napoleon's pallid face into France's national colors. In this way, black-and-white becomes color, joining black-and-red and black-and-blue. For the French nationalist, white – not green – is the third primary color. Six-and-a-half decades later, Krzysztof Kieslowski again chose white as the central color of his post-Communist *Three Colours* trilogy (1993–4), emphasizing that blue, white, and red carry potent political meanings.

The cooperative interaction between black-and-white and color, which had been developing since the beginning of cinema, reached its apex in *Napoléon*. Subsequently, black-and-white and color progressively disengaged: first they separated, and then they became opposites. Separation occurred in the late 1920s in tandem with two parallel developments: the end of tinting and toning and the rise of "natural" color. Widespread tinting and toning began to die out after (or possibly even slightly before) the rise of sound in the late 1920s. The first sound films remained untinted because the addition of color dyes interfered with their optical soundtracks.[12] A solution to this obstacle soon appeared: in 1929, Eastman Kodak announced "Sonochrome," a range of pre-tinted print stocks available in 17 colors (Jones 1929: 221). However, these stocks were not commonly adopted within the industry, and most sound films remained uncolored. Steve Neale hypothesizes that tinting was abandoned because the rise of sound led to a new aesthetic orientation favoring verisimilitude over rhetoric, resulting in a perception that the most appropriate color technology to accompany sound was photographic color (1985: 119). Tom Gunning offers two alternate explanations, both rooted in the rise of sound in the late 1920s. His first explanation is that "maybe there's a rather similar sense of making sure people are listening, rather than distracting them with colour … of concentrating on one dominant channel of meaning or sensation at a time" (Hertogs & de Klerk 1995: 47). His second explanation is that "the primary thing in the classical era becomes the story with dialogue – maybe this becomes so dominant that colour becomes marginalized and associated with the spectacular" (Hertogs & de Klerk 1995: 47). These three (not necessarily contradictory) explanations together problematize the still too common assumption that there is a simple causal connection between changing technology and changing artistic practices. In the following section, I discuss not only the technological but also the economic and ideological context within which black-and-white and color progressively disengaged.

The Rise of Technicolor, 1915–35

In the mid- to late 1920s, as tinted color disappeared, cinema – contrary to all models of historical evolution that one might apply to it – became black-and-white. Of course, the film industry's attraction to color did not end there. Rather, it entered a new phase. The late 1920s also saw the first widespread use of Technicolor, an early "natural" cinematographic color process. Technicolor Inc. was established in 1915 by three M.I.T. graduates: Herbert Kalmus, Daniel Comstock, and W. Burton Wescott, though by the late 1920s only Kalmus remained (Basten 1980: 32). Technicolor was both the name of the company and the name of the color film process that the company repeatedly refined and re-released between the late 1910s and early 1950s. Like many other start-ups of the period, Technicolor aimed to create the best and most successful color film process in the world.[13] Unlike most of its prospective competitors, who typically went bankrupt within a few years or less, Technicolor benefited not only from strong research personnel but also from the exceptional resilience and economic inventiveness of Herbert Kalmus, its CEO.[14] Nonetheless, despite Kalmus's business acumen, Technicolor struggled to stay solvent in the late 1910s and throughout the 1920s.[15] By 1928, it had already adopted and abandoned two different technologies for recording and reproducing the various color frequencies of light. The most recent, Technicolor Number II, had been made commercially available in 1922, even though it was still experimental. Its use in several major productions, notably the Douglas Fairbanks star vehicle *The Black Pirate* (Albert Parker, 1926), had resulted in technical problems and additional costs that left producers wary of Technicolor's new technology. This wariness subsided following the introduction to the market in 1928 of Technicolor Number III, a far more reliable process. In the opinion of Kalmus, the release of Technicolor Number III was timely: the radical changes being undertaken by studios during the move to sound resulted in their openness to the somewhat less radical changes involved in adopting color.

All of the various Technicolor processes involved using a specially constructed "beam-splitter" camera, which divided light passing through the lens into two or three separate beams, each of which passed through a different color filter and exposed a separate black-and-white negative.[16] Technicolor Numbers I to III were two-color processes: two negatives were exposed through two filters (red-orange and blue-green), resulting in the reproduction of slightly over two-thirds of the full spectrum of color frequencies.

Technicolor Number IV (1932) was a three-color process, in which three negatives were exposed through three color filters (red, green, blue), allowing the full spectrum of color frequencies to be reproduced. In terms of inscribing color onto a negative, Technicolor was thus an additive process. In terms of projecting color onto a screen, only Technicolor Number I (1915) was additive. In Technicolor Number I, color was added to black-and-white prints in cinemas, by means of special projectors that included red-orange and blue-green filters. The complexity of the projectors required an operator who, in the oft-repeated words of Herbert Kalmus, "was a cross between a college professor and an acrobat" (1967: 52). So Kalmus's researchers subsequently developed processes in which films' colors existed on the print itself, allowing Technicolor films to be screened using conventional white light projectors. Technicolor Number III and Number IV, for example, utilized a subtractive dye-transfer process: prints of each of the two or three negatives of an image had color dyes applied to them and became printing plates. The dye on each of these plates was then transferred onto a final print, which ended up with two or three layers of color dye added to it.

Technicolor was thus – like hand painting and stenciling – technologically still a form of film color, a refinement of the various processes used in early cinema to add color dyes to black-and-white prints. The Handschiegl process, for example, had already been using dye-transfer printing since 1916 as an alternative to stenciling. What made Technicolor's dye-transfer process different was the fact that it added dyes in variable and precise combinations, reflecting the color frequencies captured by the Technicolor camera, rather than adding dyes evenly across the gelatine. Color thus became incorporated into the cinematographic process and "naturalized." Of course, the intense colors of early Technicolor did not even come close to anything one might ordinarily regard as natural; however, they were still far more "natural" than previous dye-transfer processes, inasmuch as they were no longer perceptibly "superadded" to a black-and-white print. In this way, Technicolor bridged cinema's historical transition between film color and surface color. Though still technologically an example of film color, Technicolor made possible films whose colors derived from the colors of surfaces in front of the lens. As I discuss further in Chapter 4, throughout classical Hollywood and beyond, surface color was cinema's dominant color mode.

The establishment in the 1930s of black-and-white as a chromatic default, together with the rise of cinematographic color, resulted in a visual

segregation between color and black-and-white. No longer did they visibly coexist in the same frame. A shot appeared *either* as black-and-white *or* as color. For the time being, there appeared between them an iron curtain. Segregation in turn carried within it the beginnings of opposition, though this opposition developed gradually. For a codified opposition between black-and-white and color to develop, chromatic decisions needed to be taken during pre-production. Until the decision to add color was brought forward in the production process and placed within the director's sphere of responsibility, there was little room for color to carry meaning. And unless the presence of color signified something, the presence of black-and-white could not signify the opposite.

Few details are known about how decisions regarding color fitted into the production process in early cinema, but what evidence there is points to the fact that color did *not* play a major role in directors' thoughts. The knowledge that blue tinting could be used to make a scene shot during the day appear to take place at night may have encouraged directors to film day-for-night, but there is little evidence that any more sophisticated color decisions were taking place during pre-production. Nico de Klerk suggests that throughout early cinema "colour wasn't considered when the film was being made, but was simply added in the production companies' buildings … a bit like gift-wrapping in fact, just an extra" (Hertogs & de Klerk 1995: 22). Ennos Patalas adds a crucial piece of evidence reinforcing this claim:

> I've been through Murnau's own annotated copies of his scenarios, hoping to find something on colour. All I could find was a point in the scenario for *Vogelöd Castle* [1921] where he notes: "dream sequences – leave them black-and-white." (Hertogs & de Klerk 1995: 46)

If F. W. Murnau, one of the great stylistic innovators of 1920s cinema, did not pay much attention to color, it is unlikely many other directors did either. Despite isolated uses of individual colors for thematic reasons, in most films of the 1920s color seems to have remained largely an afterthought.

Color's place in the production process changed in the 1930s. With the end of tinting and toning, and the rise of Technicolor, color could no longer be added to a film as an afterthought; color films had to be shot in color. To shoot in color, a studio needed to draw up an agreement with Technicolor well in advance of production. The film's producers needed to reserve special Technicolor cameras, rent extra lights, budget for dye-transfer printing,

and so on. The movement of color from something that only needed to be considered in post-production to something that needed to be considered during pre-production favored its integration into films' aesthetic, narrative, and thematic schemata. The first stage in this integration occurred soon after the release of Technicolor Number III. 1929 and 1930 were boom years for Technicolor. However, the limited capacity of the company's factories soon resulted in supply lagging behind demand (Kalmus 1967: 55). As a result, most of the initial burst of Technicolor production in 1929 and 1930 took the form of color sequences inserted into films that were primarily black-and-white. Though clearly a stop-gap, this rationing brought immediate benefits for both client and supplier: it gave producers a chance to use Technicolor without feeling they were taking a major risk, and allowed Technicolor to gain its first significant foothold in Hollywood (Gomery 1992: 234). Ironically, it also encouraged the studios to take their first steps in a codification of color that, as I discuss later in this chapter, would cause Technicolor corporate neurosis for many years.

Before 1929, Technicolor was such a rare presence that there was little opportunity for the development of any industry norms for how color should be used. The circumstances surrounding the inclusion of color in *The Ten Commandments* and *The Black Pirate* were unique to those films – their use of color did not follow an established pattern because none had yet been established. The mismatch between supply and demand that occurred in 1929 changed this. The limited availability and high cost of Technicolor meant that it could not be used for sensual effect in films throughout the industry, as had tinting and toning. Producers needed to choose which films would benefit most from color. Their initial choice was to use color primarily for musicals. Of the 18 films to include Technicolor in 1929, 14 were musicals; of the 29 films to include it in 1930, 25 were musicals (Limbacher 1969: 269).

Color and music have historically been regarded as having a natural affinity, and the word "chromatic" is used with reference to both. When Aristotle asserted the presence of seven primary colors, it was so that they might correspond to the seven notes of the diatonic scale. His classification was a means of suggesting that harmony existed in color as well as music (Kemp 1990: 286).[17] Similarly, when Newton divided the infinite colors of the spectrum into seven "simple" colors in his 1671–2 revision of the "Optical Lectures," he tentatively explained this arbitrary division by suggesting that color harmonies were "perhaps analogous to the concordance of sounds" (Shapiro 1994: 619). Later, more confidently, Newton likened

the eight boundaries of the seven colors to "the eight lengths of a Chord" (1721: 186). Color cinema provided a new means by which the affinity between color and music could be expressed. Sergei Eisenstein went so far as to regard film as the fulfilment of their shared destiny:

> The higher forms of organic affinity of the melodic pattern of music and of tonal construction of the system of succeeding color shots are possible only with the coming of color to cinema. (1983: 257)

According to Eisenstein, film-makers needed to transform their work into "a symphony of colour" (1977: 181). One might speculate that were it not for early Technicolor musicals and animations (in particular, Disney's color *Silly Symphonies* of the 1930s, which Eisenstein greatly admired), Eisenstein and many subsequent artists might not have surrendered themselves so willingly to the chromatic song of the siren.

Given the synaesthetic link between color and music, it is fitting that cinematographic color sounded its feature film debut in the form of the musical.[18] At the same time, there was a much more banal reason for producers' choice to use musicals as the vehicle for their first engagement with color: the presence of musical numbers. The division of musicals into discrete dialogue sequences and musical sequences provided an obvious solution to the dilemma of how to ration their limited supply of color. The presence of color did not at this stage function to communicate narrative information. The chromatic hybrid movies of 1929 and 1930 did not, for example, use the appearance of color to signify shifts from reality to fantasy: such chromatic motivation was still a decade away. For now, the presence of color within a musical was simply dependent on the presence of singing in it, and its absence in other parts of the film was explainable by economic factors unrelated to the film's narrative.

Chromatic Cold War: Black-and-White and Color in Opposition

David Bordwell has observed that one of the key features of classical Hollywood films is motivation. Motivation is the explanation offered by a film for why its formal elements take the form that they do. Bordwell highlights three key forms of motivation in classical Hollywood: compositional, realistic, and intertextual.[19] Compositional (narrative) motivation refers to

the elements that allow a story to proceed. The most obvious narrative motivation is psychological causality. A character has a goal and acts to achieve it. The character's actions form causal story elements that are psychologically motivated. In classical Hollywood, the vast majority of a film's narrative, visual, and aural devices are explainable in terms of psychological causality. For example, classical Hollywood films motivate flashbacks by turning them into an act of remembering: through the flashback, a formal element of the film (narrative retardation) became motivated by a character-driven action within the story (a character thinking back to the past). Realistic motivation refers to the mobilization of elements in a film in order to increase its plausibility: "In a film set in nineteenth-century London, the sets, props, costumes, etc. will typically be motivated realistically" (Bordwell et al. 1985: 19). Intertextual motivation occurs when an element of a film is used in a particular way because it has been used the same way in similar films. The most common intertextual motivation is generic: when characters in a film repeatedly burst into song, they probably do so because they are in a musical. All three forms of motivation played a part in how the uses of color developed in classical Hollywood. Black-and-white was cinema's technological and aesthetic default, and so exempt from the need to be motivated. Color, less common and so more noticeable, was not.

Color evaded motivation for longer than most aspects of film form. As seen during the 1910s and 1920s, color remained an afterthought for most film-makers. This precluded it from being consistently motivated within a film. So, as films' other formal aspects (including camera movement, lighting, and editing) became incorporated into the Hollywood paradigm of character-driven motivation, color remained largely unmotivated. It was only when film-makers began to think about color earlier in the production process that narrative motivation began to take hold. The chromatic separation of early Technicolor musicals including John Murray Anderson's *The King of Jazz* (1930) and Cecil B. DeMille's *Madam Satan* (1930) was the first stage of this process.

Color still evaded motivation into the 1930s. In trying to satisfy the sudden surge in demand for color in 1929 and 1930, Technicolor over-extended itself. The resulting decrease in print quality combined with the onset of the Great Depression to cause an equally sudden collapse in demand (Kalmus 1967: 56). Within the period of a few months in 1931, Technicolor's workforce shrank from 1,200 to 230, and color's incorporation into the classical Hollywood paradigm stalled (Greene 1947: 410). As an alternative to increasing its live-action output, in 1932 Technicolor suggested a joint venture with

Disney. Following some hard negotiations, Disney agreed, on condition that it have exclusive access to Technicolor's technology for two years. Starting with *Flowers and Trees* (1932), the presence of color in Disney's *Silly Symphonies* proved highly popular, amply rewarding Walt and Roy Disney's decision to risk using color. The exclusive-use contract also worked for Technicolor. As J. P. Telotte notes, the company's detour into cartoons provided it with an opportunity to showcase its technology without compromising its claims to provide "natural color" in live-action film (2008: 47).

By the time demand for live-action color picked up again in the middle of the decade, Technicolor had released its first three-color process, completed its exclusive deal with Disney, and expanded its facilities. The first full-color feature film, Rouben Mamoulian's *Becky Sharp*, was released in 1935. Following its box-office success, further color features appeared rapidly. Despite this development, color sequences were still occasionally used for sensual or spectacular effect in films whose budgets precluded 90 minutes or more of Technicolor. Late 1930s films with color sequences include Herbert Wilcox's *Victoria the Great* (1937), in which color is reserved for a pageant, and George Cukor's *The Women* (1939), in which it is reserved for a fashion show.

Such uses of color soon became outmoded. In *The Wizard of Oz* (1939), in contrast to almost all previous hybrid black-and-white/color films, the presence of color is narratively motivated. Of course, the film still fits firmly into cinema's lineage of sensual and spectacularly colored surfaces. Oz is not a symphony but a cacophony of color. Vivid colors jostle for attention, boldly declaring their presence textually as well as visually: the yellow brick road, the ruby slippers, the Emerald City. A horse changes color from shot to shot, a visual *ne plus ultra* of silent cinema's non-referential use of additive color (Plate 1.8). As Edward Buscombe points out, color functions self-reflexively in *The Wizard of Oz* (1985: 91). By drawing attention to itself, the film's color manifests a technological fetishization typical of early Technicolor films. At the same time, black-and-white and color also function thematically, emphasizing the opposition between Dorothy's dull gray life in Kansas and the colorful fantasy life of Oz. Significantly, they are also psychologically motivated. In Baum's story, Dorothy is transported to Oz by a tornado that uproots her house; at the end of her adventure, she flies back to Kansas with the aid of a pair of magic "silver slippers." As Salman Rushdie observes, "in the book *there is no question that Oz is real*" (1992: 30). By contrast, in the film, Dorothy falls asleep at the climax of the tornado, *before* the fantastical uprooting of the house takes place; to get home, she is

told to repeat over and over again "There's no place like home," which she continues to do until a fade up reveals her asleep in bed. In this way, the film declares that we have just been watching a color dream sequence. In a quintessentially classical Hollywood turn, the film's use of color is made to signify the protagonist's mental state.[20]

The Wizard of Oz marked a key development in the evolving opposition between black-and-white and color. It was not the first film in classical Hollywood to make black-and-white and color signify opposition, but it was the most prominent.[21] By the late 1920s, chromatic mixture had given way to separation; by the late 1930s, separation had become opposition. Virtually all hybrid films made between the late 1930s and the late 1950s – within Hollywood and beyond – used transitions between black-and-white and color in order to signal moves between opposed physical spaces or perceptual states. Though the opposition itself was codified, the lines along which it was drawn were not, so the juxtaposition of black-and-white and color could signify a variety of oppositions. The most common of these were as follows:

Waking/dreaming. Surprisingly, *The Wizard of Oz* did not set off a trend in the use of black-and-white to signify waking and the use of color to signify dreaming. Nonetheless, the film's popularity inspired a few chromatic imitations, including Herbert Wilcox's *Irene* (1940) and Walter Lang's *The Blue Bird* (1940), and continued to be replicated as late as Jerome Hill's *The Sand Castle* (1961).

Sanity/insanity. A move to color could also signal the distorted perceptions of a mentally unstable character. For example, in Sam Fuller's *Shock Corridor* (1963), the memories, dreams, and delusions of patients in a mental asylum are somewhat bizarrely illustrated by color ethnographic footage of exotic locations that Fuller shot while working on previous projects. One patient remembers a Buddha he once saw in Japan. Another imagines he is a boy in an Amazonian tribe. In a climactic sequence, the film's protagonist (an investigative reporter who poses as an inmate to uncover a murder, and then gradually loses his sanity) hallucinates a rainstorm in the corridor of his ward. His hallucination is punctuated by color footage of waterfalls. The spectral colors refracted by the falling water are almost psychedelic: the chromatic chaos of these shots can be seen both as an evocation of the character's distorted vision and as a metaphor of what is happening inside his head.

Life/art. The codification of black-and-white and color also brought with it films that made explicit the historical connection between color and painting. In Albert Lewin's *The Picture of Dorian Gray* (1945), a melodramatization

of Oscar Wilde's aesthetic parable, the use of color is reserved for two inserts of Dorian's unnaturally aged portrait.[22] A more interesting, though no less literal, variation on the life/art dichotomy can be seen in Henri-Georges Clouzot's *Le Mystère Picasso* (1956). The film intersperses black-and-white documentary footage of Picasso at work with color stop-motion footage of brush strokes appearing on a canvas, as if Picasso's paintings were painting themselves. The first painting is black on white. The second begins with black strokes, but then color strokes also appear. Clouzot, often touted as France's answer to Hitchcock, turns the appearance of color into a source of surprise, adding it to a film that we have been deceived into assuming would be black-and-white. Though Clouzot shot the paintings on subtractive Eastman Kodak stock (whose color dyes already existed within the film negative rather than being added later), the film plays on the tradition of color as an addition: it seems as if Picasso is hand painting the film print itself.

Heaven/Earth. In Michael Powell's *A Matter of Life and Death* (1946), a wartime pilot finds himself miraculously surviving a plane crash, and unexpectedly caught between Heaven and Earth. Accordingly, *AMOLAD* is set both on Earth and in Heaven, but in an inversion of the model established by *The Wizard of Oz*, the scenes set on Earth are color and those set in Heaven are black-and-white. Color is reality not fantasy, essence not addition. In the film's most famous transition, a monochrome close up of a rose dissolves into color. Like the blush in *The White Rose,* color is intrinsic to living objects. It is also exclusive to living objects: it is not just that we *see* Heaven in black-and-white, Heaven *is* black-and-white: "One is starved for Technicolor up there!" an angel declares. Color is not an addition – black-and-white is an absence.[23]

Past/present. To regard the past and the present as opposites, it is necessary to disregard the future. In terms of cinematic tense, most films do just that: the future is frequently anticipated but rarely represented. Flashforwards are rare, leaving the past and the present as de facto opposites. In Otto Preminger's *Bonjour Tristesse* (1958), a man and a woman meet by chance in a jazz bar and reminisce about an idyllic summer they spent on the Côte d'Azur the previous year, prior to the suicide of a mutual friend. The scenes in the bar are in black-and-white while the flashbacks are color, evoking the sensual intensity of their holiday. Once again, black-and-white is color drained of its essential life. *Bonjour Tristesse* also reflects a twentieth-century preference for representing the urban spaces of modernity in the concrete grays of black-and-white, and pre-modern pastoral spaces in

"natural" color. For example, American crime melodramas rarely ventured out of the city or into color. By contrast, post-war German *Heimatfilme* sought a lost national innocence by withdrawing to an idealized countryside filmed in color (Kaes 1989: 14).

Underlying the apparent variety of these uses of black-and-white and color was a guiding principle. The various oppositions listed above can be regarded as the manifestations of a single binary, summarized by Philippe Dubois as the movement between reality and the imaginary (1995: 85). All of the above examples use black-and-white to signify temporal and spatial proximity, the "here and now" perceived by the films' characters. In all of the above examples except *AMOLAD*, black-and-white is objectivity not delusion, the clarity of consciousness not the mental fog of somnolence, the moment currently being experienced not the memory of a prior experience. So too, just as these films demonstrate a codification of color, through opposition they demonstrate a codification of black-and-white. Commensurate with the fact that black-and-white was cinema's aesthetic norm, black-and-white forms these films' default state and color their altered state. André Bazin observed in an article on *Le Mystère Picasso* that by filming only Picasso's paintings in color, Clouzot "makes us thus accept (so implicitly that only some serious reflection reveals it to us) as a natural reality that the real world is in black and white, 'except for the paintings'" (1997: 216). In each of the above examples, again except for *AMOLAD*, the film begins in the black-and-white "real world."

Even *AMOLAD*, though an apparent inversion of classical Hollywood's chromatic norm, can be regarded as an example of what Bordwell calls "non-disruptive differentiation" – an allowed divergence from the classical Hollywood paradigm that provides the pleasure of novelty without causing undue confusion, thereby reinforcing the paradigm (1985: 71). Michael Powell's view of cinematic color was a conventional one: "that an ordinary street scene on the screen looks less real when coloured" (Powell & Heckroth 1950: 5). His reaction to Emeric Pressburger's idea of making the film a chromatic hybrid was to assume that Heaven would be "all colour and gold and that sort of thing" (Macdonald 1994: 251). Pressburger's perverse chromatic choice was a model of allowed divergence: identify the dominant paradigm (in this case, the belief that color signifies fantasy), find a way to subvert it (make the fantasy black-and-white), but be sure not to question the basic assumptions of the paradigm (that black-and-white and color are opposed).

For all these intriguing temporal and spatial oppositions, narrative motivation did not become a common means of explaining the presence of

color in a film. Despite exceptional growth in color output in the post-war years, chromatic hybrids remained rare throughout the 1940s and 1950s. To a degree, this is not surprising; relatively few films are structured around narrative movements between opposed states. By demanding that transitions between black-and-white and color explicitly signify narrative transitions, the paradigm of opposition made chromatic hybridity less likely. But if narrative motivation was not enough to provide color with a raison d'être, what were the alternatives? Following Bordwell's tripartite division, the two remaining alternatives were realistic motivation and generic motivation. In the mid- to late 1930s and throughout the 1940s a covert conflict took place over which motivation would dominate. On one side was Technicolor and on the other side were the Hollywood studios. It was a conflict that shaped classical Hollywood's color aesthetics for almost 20 years.

"Technicolor *Is* Natural Color": Color and Realism, 1935–58

By late 1935, Technicolor had a collaboration with Walt Disney behind it and a busy production schedule ahead. Having spent almost 20 years refining its color process, the company was at last establishing itself within Hollywood as a reliable supplier. What the company most wanted now was for color to become an industry norm. In order for this to happen, color needed to dislodge black-and-white as the perceived index of reality, so that instead of requiring a reason to film in color, producers would require a reason *not* to film in color. Unfortunately for Technicolor, Hollywood producers and directors did not always share its aspirations that film color should be used "realistically." Vorticist painter Paul Nash aptly summarized the approach of many first-time color directors as follows: "They are like the children in the nursery again. They have been given a box of paints and they are having a fine time laying it on thick anywhere they can" (1937: 121). Nowhere was this childish excitement more apparent than in *Becky Sharp*, the first full-color Technicolor feature, which culminates in a ball scene whose swirling colors recall the serpentine dance films of the 1890s. Unsurprisingly, the film set alarm bells ringing at Technicolor's headquarters (Basten 1980: 66). Even more unfortunately for Technicolor, early "natural" color had an innate tendency toward excessive saturation. The company was struggling not only against Hollywood practitioners but also against the technological limitations of its own product. Steve Neale regards a Technicolor advertisement declaring that "Technicolor

is Natural Color" as symptomatic of the conventional Hollywood wisdom of the 1940s that color should be used in a restrained manner (1985: 147). To me, the advertisement suggests not an aesthetic consensus but a supplier desperately trying to elbow its product into the market. If the Technicolor process had indeed provided natural colors, then Technicolor would not have needed to emphasize the fact.

The alternative to realistic motivation was generic motivation. This was precisely what Technicolor did not want. If color became coded generically, then it would only be seen as an appropriate format for some films rather than all films. By the early 1930s, color was already being used for certain types of films over others: mainly musicals, but also some histories, fantasies, westerns, and films which variously included or combined these generic elements.[24] Given its expense, producers were understandably selective about which films they made in Technicolor. To pre-empt generic codification, Technicolor began to assert control over how its clients used color. Because its process was technologically far in advance of the competition, Technicolor was effectively a monopoly supplier to the "A-movie" market. Its only competition in the 1930s and 1940s came from Cinecolor and Magnacolor, both inferior two-color processes whose core market comprised "B-films" that could not afford three-color Technicolor.[25] Herbert Kalmus exploited his company's dominant position to insist that producers wanting to use Technicolor had to buy into an entire package of products and services. They had to rent a Technicolor camera, hire a Technicolor cameraman to work alongside the film's cinematographer, use special Eastman Kodak black-and-white film, use Technicolor make-up designed by Max Factor, and do all processing and printing at Technicolor's laboratories. They also had to employ the services of Natalie Kalmus (Herbert's ex-wife) as a "color consultant" (Haines 1993: 24).

Between the early 1930s and early 1950s, Kalmus's role as color consultant involved pretending to provide film-makers with creative expertise while actually suppressing "unnatural" uses of color. In conjunction with this imposed color consultation, Technicolor established its infamous "law of emphasis," first expounded in a 1935 article by Natalie Kalmus. Published less than two months after the release of *Becky Sharp*, in a trade journal that every film practitioner in Hollywood read, "Color Consciousness" was central to Technicolor's growth strategy. It was an ingenious piece of writing. The article's main argument is that color is the culmination of cinema's move toward perceptual realism, and "natural" color – i.e. Technicolor – is its future. At the same time, Technicolor was shrewd enough to realize that

directors might not be satisfied with mechanically reproducing the colors of nature. Given a new toy, they would want to play with it. So, having said its piece about the importance of "natural colors," the article also sought to establish a model for how directors should use them (Kalmus 1935: 141).

This model was the "law of emphasis," and it stated that, though the presence of color as a whole should be motivated realistically, individual colors should be motivated narratively. Overt color was allowable if, by drawing attention to itself, it drew attention to aspects of the film's narrative. Phrased negatively, as this was after all a law aimed at constraining directors' behavior: "Nothing of relative unimportance in a picture shall be emphasized" (Kalmus 1935: 146). An area of the frame could not be red unless its redness was narratively relevant, because it might distract from other areas of the frame of greater narrative relevance. As has been often noted, Technicolor thus tried to elbow its way into Hollywood by incorporating color into the pre-existing classical Hollywood ideology of narrative motivation. It prevented directors from using color in ways it disapproved of by making it easy for them to use color in ways it approved of. Accordingly, "Color Consciousness" provides examples of how individual colors can be motivated both realistically and narratively. When deciding how to fill the screen with color, directors should use realistic motivation and take "the colour schemes of natural objects" such as flowers (Kalmus 1935: 141). With respect to their choice of individual colors, directors should use narrative motivation. For each commonly used color, the article suggests a range of possible thematic associations: for example, red apparently suggests love, while "[t]he delicacy or strength of the shade of red will suggest the type of love" (Kalmus 1935: 143). Different colors are keyed to different emotions and moods.

Inevitably, some practitioners proved resistant to Kalmus's involvement; in Chapter 4, I discuss cinematographer Leonard Shamroy's repeated attempts to negotiate around the "law of emphasis." Others proved more conducive to Technicolor's assertions, which were after all formulated to be acceptable to the industry. Kalmus, in turn, was shrewd enough to allow interpretations of the "law" to vary. Scott Higgins suggests three distinct phases in 1930s Technicolor aesthetics (2007: 209). The first was a "demonstrational" use of color, typified by *Becky Sharp*, which indulged in experimentation and self-reflexivity. The second was a "restrained mode," typified by Richard Boleslawski's *The Garden of Allah* (1936), which minimized prominent color, restricting it to transitions and moments of emphasis. The third was an "assertive mode," typified by William Wellman's *A Star is Born*

(1937), which allowed color a more sustained and prominent presence within films. At the same time, there were overlaps between these three "modes"; all three, according to Higgins, featured uses of color that included "the spectacular embellishment of transitions, the gentle direction of attention, the momentary highlighting of actions, the development of motifs, and the general correlation of color with the mood or tone of the drama" (2007: 209). I question Higgins's methodology of extrapolating "modes" based on a small number of films made over only a few years. At the same time, his categories are still nominally useful inasmuch as they emphasize that, even within the short period of time discussed, different filmmakers used Technicolor in different ways.

Technicolor's goal that all Hollywood films should eventually use its color process was doomed to fail. It was doomed on at least three counts. The first factor weighing against Technicolor was that the results of its process fell far short of anything that might pass as realistic. In *The Naked and the Dead*, Normal Mailer refers to a nocturnal wartime air raid as "unreal like a technicolor movie" (1949: 13). Mailer's casual product placement is symptomatic of Technicolor's inability to become Hollywood's aesthetic default; throughout the 1940s, Technicolor remained a prominent brand presence within films, unable to achieve its ultimate goal of imperceptibility. As a result, it became popular in genres that placed relatively little value on realism, but was excluded from genres predicated on authenticity. Technicolor was typically used for musicals, westerns, costume romances, fantasies, and comedies, while newsreels, documentaries, war films, and crime films remained black-and-white (Buscombe 1985: 89). Thus the most common motivation for color in the 1940s was not realistic but generic. The second factor weighing against Technicolor was that it was not a production company; it was merely a supplier trying to influence how its product was used. The fact that Technicolor was able to influence Hollywood's color aesthetics to the extent that it did, and for as long as it did, is astonishing. However, despite its ingenious and brazen methods of muscling in on the studios' film productions, Technicolor was fighting a reactive battle. By the 1940s, the dominant attitude within the studios was summarized by veteran cinematographer Stanley Cortez as follows: "Everyone wanted to put more and more colour in" (Higham 1970: 98). If a producer or director had a strong preference for "more" color, then he would often find a way to get it. Michael Powell, for example, exploited the imperfect lines of communication between Technicolor's facilities near London and its headquarters in Los Angeles to make films – including

Black Narcissus (1947) and *The Red Shoes* (1948) – with overall levels of color far in excess of what would have been allowed in California.

The final obstacle to Technicolor's plans was the fact that its monopoly position was temporary. Throughout the 1940s, Technicolor milked film producers for money by offering its products and services in the form of a take-it-or-leave-it package. This led to resentment both from studios and potential competitors. The result was a 1948 anti-trust ruling that forced Technicolor to divulge a number of its patents (Haines 1993: 49). Far more damaging was the release over subsequent years of various subtractive 35mm color film stocks. Of particular significance was Kodak's 1953 release of Eastman Color (also known as Eastmancolor) type 5248, designed for use with artificial light (Dundon & Zwick 1959: 735). Subtractive color stock included three layers of color dyes within the negative, so color no longer needed to be added in the laboratory by means of Technicolor's dye-transfer process. Crucially, subtractive color negatives were also usable in standard black-and-white cameras, so making superfluous Technicolor's product and service packages. No longer did Hollywood producers need to use beam-splitter cameras and all the ancillary services that Technicolor had forced onto them. Conventional "black-and-white" cameras suddenly gained a new lease of life and became color cameras. The significance of Kodak's releases was immediately recognized within the industry, as demonstrated by a special section on Eastman Color in the *Journal of the Society of Motion Picture and Television Engineers* (Hanson & Kisner 1953). In it, practitioners explained in detail to their peers how to adapt their working practices so as to make the most of the new stocks. The implication was clear – everyone would soon be switching to subtractive film.

And indeed they did. The last three-strip Technicolor film, Joseph Pevney's *Foxfire*, was made in 1954 (Basten 1980: 146). By this time, Kodak, DuPont, Agfa, Ferrania, Gevaert, Ansco, and Fuji all had subtractive 35mm color stocks on offer. The problem for Technicolor was not simply that other manufacturers offered cheaper color, it was that its package deal had been rendered obsolete. The much-coveted patents divulged as a result of the anti-monopolistic 1948 Consent Decree had been made worthless before they could even be exploited (Haines 1993: 53). It was now film-stock manufacturers who provided screen color. Lacking the means to compete with them, Technicolor found itself with no choice but to remarket itself as a laboratory. The company downsized and developed a new dye-transfer process usable on all types of film stock, including the color stocks made by its former competitors. "Color by Technicolor" remained a

prominent label on the title credits of many Hollywood films until the 1970s, but from the mid-1950s onward the label referred only to the laboratory process used on the films. In an irony that could not have escaped Technicolor executives, "Technicolor" films were originated on the very stocks whose release had brought about the end of Technicolor's hegemony. Technicolor remains a film laboratory to the present day.

Following the end of Technicolor's monopoly, directors became free to use color without having a color consultant imposed on them. Inevitably, given Technicolor had just spent 15 years telling Hollywood how to use color, the "law of emphasis" remained a lingering influence. For example, as late as 1957, an industry guide to color by the Society of Motion Picture and Television Engineers (SMPTE) included two images aimed at demonstrating the benefits of emphasis (Holm et al. 1957: 38). A woman wearing colored clothes appears in front of a white background and a yellow one. The guide criticizes the image with the yellow background because it distracts from the narratively significant action of the woman smiling at a flower. Despite the residual influence of the "law of emphasis," many Hollywood film-makers – including Vincente Minnelli, Nicholas Ray, Max Ophüls, Alfred Hitchcock, and above all Douglas Sirk – responded to their new chromatic freedom by using more color.

Sirk's *All That Heaven Allows* (1955), for example, is drenched in the intense yellows, oranges, and reds of its autumnal New England setting. At the same time, individual colors still fulfil conventional narrative functions within the film. Sirk's film follows the developing relationship between repressed middle-class housewife Cary (Jane Wyman) and her earthy gardener Ron (Rock Hudson). As Mary Beth Haralovich observes, Cary lives in a house filled with cool colors and tasteful furniture, while Ron lives among warmer colors and rougher furniture (2006: 149). The two characters' choices of interior design are thus indicative of their different positions within society. Nonetheless, as Haralovich notes further, the sheer amount and intensity of color in *All That Heaven Allows* cannot be explained narratively. Even though the reds of Ron's house elaborate the narrative's themes by hinting at his sensual nature, they are *so* sensual that they exceed this basic thematic function. Like the red flag in *Potemkin*, they become affective.

Like Sirk, Hitchcock also intensified the law of emphasis until it transcended character psychology. In *Vertigo* (1958), a jealous husband hires retired cop Scotty (James Stewart) to follow and report on his beautiful wife Madeleine (Kim Novak). Scotty begins his observation in a plush red

restaurant. As the future object of Scotty's obsession walks past, the light momentarily surges. The intense redness that results fulfils a narrative function: it evokes a rush of blood to Scotty's head, hinting that his response to Madeleine exceeds his duties as a private detective. At the same time, the surging red also exceeds the narrative, burning directly into our retinas. Seen in a cinema, the effect is overwhelmingly sensual. Derek Jarman referred to the sensuality of 1950s Hollywood color as "better than the real thing" (1995: 3). Perhaps, as a cinephilic teenager in the late 1950s, Jarman already sensed in these films a latent camp aesthetic. Ten years older than Jarman, Sylvia Plath was less easily seduced:

> I hate technicolour. Everybody in a technicolour movie seems to feel obliged to wear a lurid new costume in each new scene and to stand around like a clothes-horse with a lot of very green trees or very yellow wheat or very blue ocean rolling away for miles and miles in every direction. (Plath 1996 [1963]: 39)

Plath's use of the term "technicolour," with its lower case "t" and anglicized spelling, is of particular interest. In the 1950s, Technicolor became technicolor, and technicolour: the brand name became an adjective that described a particular aesthetic of heightened color. For example, American press advertisements for Frederico Fellini's *Juliet of the Spirits* (1965) described it as "Fellini's dazzling technicolor masterpiece." Technicolor's inability to achieve realistic motivation lives on in the English language.

Chromatic Thaw: Hollywood's Transition to Color, 1950–67

Despite Technicolor's insistence that its product reproduced "natural" colors, throughout the 1940s and early 1950s genre continued to play a crucial role in producers' and directors' decisions about whether or not to use color. Different genres tended toward different chromatic poles. As Edward Buscombe notes, musicals, westerns, historical epics, fantasies, and comedies tended toward color; newsreels, documentaries, war films, and crime films in turn tended toward black-and-white (1985: 89).[26] The spread of color within Hollywood did not at this time manifest itself in a wider range of films using color. Rather, it manifested itself in an increasing number of color films within the genres that already tended toward color. As a result,

the distinction between "color" genres and "black-and-white" genres became more prominent. Unsurprisingly, this distinction left little room for the chromatic hybridity that had occurred in the 1930s and early 1940s. Generic motivation overwhelmed narrative motivation: either a film was black-and-white or it was color. Even when a film involved oppositions that could feasibly be signified by shifts between black-and-white and color, this technique was rarely used. For example, despite the fact that crime melodramas routinely involved narratives structured around flashbacks, and so provided plenty of opportunities for chromatic hybridity, they typically remained entirely black-and-white. The opposition between black-and-white and color was so pronounced that they could no longer even co-exist within the same film. A generic wall now separated them.

Movements between black-and-white and color no longer took place within films. Instead, they took place from film to film. Throughout the 1940s and 1950s, Hollywood directors moved between black-and-white and color according to a number of factors including their inclination, their status, the budget of their films, and – above all – the genre of their films. Even the films of Hollywood maverick Nicholas Ray typically used color according to genre. Ray's black-and-white films include two crime melodramas (*In a Lonely Place* [1950]; *On Dangerous Ground* [1952]), and a war film (*Bitter Victory* [1957]). His color work includes three westerns (*The True Story of Jesse James* [1957]; *Run for Cover* [1955]; *Johnny Guitar* [1956]), and a musical melodrama (*Hot Blood* [1956]). Inevitably, as generic segregation was a norm rather than an explicit rule, there existed counter-examples. Directors sometimes made chromatic choices at variance with Hollywood's generic norm. For example, Ray's social realist *Rebel Without a Cause* (1955) was color. Conversely, as late as 1963, John Ford made a western (*The Man Who Shot Liberty Valance*) in black-and-white. The film's narrative takes the form of an extended flashback to the pioneering days of the Wild West, and its use of black-and-white looks back to the monochrome of Ford's early westerns.

Even when generic ideology was not at the forefront of a director's decision about which direction to jump, it still typically exerted an indirect influence. For example, diverse explanations have been given for Alfred Hitchcock's choice to make *Psycho* (1960) in black-and-white. Hitchcock's own explanation was that it was pragmatic: having red blood in the shower sequence would have caused problems with the Motion Picture Association of America (MPAA), the industry body responsible for enforcing Hollywood's strict self-censorship (Gottlieb 1995: 311). Other explanations

hint at an aesthetic agenda. Jack Barron, one of the film's make-up artists, recounts Hitchcock asserting that the film "will have so much more impact in black and white" (Rebello 1990: 82). Economics also played a part. *Psycho* was conceived as a low-budget film, funded by Hitchcock himself. Black-and-white moderated the film's budget in a number of ways. The stock itself was cheaper than color, as were the processing costs. In addition, using color stock would have necessitated far more elaborate lighting. This would have cost more in itself, and would have substantially slowed down the film's production schedule. It is impossible to know which of these explanations are true. Some may be true, none may be true. All may be true, to varying degrees. But among this complex of factors there is one so obvious as to be almost invisible – genre. *Psycho* is first, if not foremost, a horror film; it also contains elements of social realism. Both these genres pulled toward black-and-white. This tendency was clearly not sufficient to make Hitchcock choose black-and-white, but it did make possible his choice. Hitchcock's pragmatic and/or artistic reasons for using black-and-white in *Psycho* were generically sanctioned. Had *Psycho* been a musical, it would have been color.

For a brief period, between the late 1940s and mid-1950s, it appeared that Hollywood's aesthetic ideology had facilitated a stable co-existence between black-and-white and color, granting spheres of dominance to each. Hitchcock's 1950s filmography provides clear examples of this territorial divide. Religious drama *I Confess* (1953) and quasi-documentary *The Wrong Man* (1956) are black-and-white; star vehicle *To Catch a Thief* (1955) and black comedy *The Trouble With Harry* (1955) are color. At the same time, this apparent generic stability was increasingly undermined from the mid-1950s onward by the spread of color. This too is evident in Hitchcock's filmography: though most contemporaneous reviews of *Psycho* did not consider the film's monochrome cinematography to be worth more than a passing mention, viewed in the context of Hitchcock's already substantial corpus of color work, the film's chromatic lack is anomalous. Hitchcock's filmography from *Rope* (1948), his first color film, to *Psycho* (1960), his last black-and-white film, shows an initial vacillation between black-and-white and color followed by a clear shift in the mid-1950s toward color.

As Hollywood's color film output continued to expand, color itself finally began to expand beyond its generic boundaries. One of the earliest commentators to notice this change was *Cahiers du cinéma* critic Eric Rohmer. Writing in 1956, he contrasted the generic codification of "fifteen, ten, even five years ago" with recent developments:

> Today who would maintain that color is less at home in a modern setting than in an ancient one, in a civilized setting than in an exotic one, in a serious setting than in a comic one, in realism than in the fantastic? Go see *Rear Window*, *The Barefoot Contessa*, *A Star is Born*, to name only recent films. (1989: 67)

Despite a temporary decline in color production in 1957 and 1958, the trend continued. By the early 1960s, color had even encroached into film noir, a genre once defined by the blacks of its cinematography: Don Siegel's *The Killers* (1964) and John Boorman's *Point Blank* (1967) demonstrated that thematic darkness no longer required shadows. As color approached the status of cinema's visual default, it moved toward being motivated realistically rather than generically. What Technicolor had wanted to happen in the late 1930s at last took place: color came to be perceived as an element of films' photographic indexicality, something that functioned simply by being there. This change can be seen in the pages of *American Cinematographer*, a barometer of Hollywood's aesthetic preoccupations. From the late 1950s, references to color became less frequent. New preoccupations included the use of available light, handheld camerawork, and how to shoot for television. For example, an article on *The Great Escape* contains not a single mention of the film's use of color, apart from a vague observation in the headline that color film "can enhance a factual picture" (Gavin 1963: 336).

Of course, as Peter Wollen reminds us, "when a colour film is seen projected, the colour is not in the Bazinian sense a direct indexical registration of colour in the natural world; it is a dye" (1980: 24). Wollen's reminder draws attention to film color's chemical nature, and to how easy it is to ignore the chemistry of color. The first decades of cinema saw the progressive effacement from color moving images of the processes that created them. From hand painting and stenciling, through tinting and toning, to "natural" cinematographic color, the means of production incrementally became less overt. Over subsequent decades, with the release of each new color film stock, the chemical basis of cinematographic color also became less overt. The widespread realistic motivation of color in Hollywood films of the 1960s was a culmination of this process of chromatic de-emphasis. Color had achieved invisibility through ubiquity. This is not, however, to say that the history of screen color can be regarded as a linear progression toward a "realist" destiny. The "realistic" color of 1960s Hollywood was just one visual code among many. In the next chapter, I explore the counter-current of European art cinema, in which film-makers re-emphasized color in diverse ways.

A crucial question remains unanswered. Why did Hollywood's move to color occur when it did? According to Gorham Kindem (1979), factors that variously accelerated and retarded cinema's move to color include the following:

Simplicity. Making a film in color was a complex procedure. Early color processes including Kinemacolor (1908) and Technicolor Number I (1917) required special cameras and projection equipment. After the release of Technicolor Number II in 1922, color prints could be screened using standard black-and-white projectors, but special cameras and services were still required. In addition, for most of the 1920s, cinematographic color remained technologically flawed. Technicolor Number II involved cementing together red and green colored prints to create a single show print. After a number of screenings, the cemented prints tended to slip, and had to be returned to Technicolor on a regular basis for "decupping" (Kalmus 1967: 54). It was not until the late 1920s, with the development of dye-transfer, that Technicolor became a reliable process.

Production and distribution costs. Even following the development of its dye-transfer process, Technicolor remained prohibitively expensive for all but high-budget features. The equipment and services supplied by Technicolor entailed major additional expense. In addition, the extra lighting equipment required by color cost more to buy and took longer to rig, resulting in longer shooting schedules and increased budgets.[27] It was only in the 1950s, again following the release of subtractive film stocks, that full color became affordable for films without Hollywood A-movie budgets, and only in the 1960s that the speeds of color film stock increased, and lighting requirements decreased, to levels close to those of black-and-white stocks (see Cushman 1958; Foster 1959).

Availability. The total footage printed by Technicolor in the 1940s exceeded the combined footage printed in the same period by its two closest competitors, Cinecolor and Magnacolor (Parker 1973: 26). Inevitably, Technicolor's stranglehold on the market served to limit the output of color films. The company had limited processing capacity, resulting in much potential demand for color remaining unsatisfied. Technicolor routinely refused to supply independents, and even studio productions often found that they could not immediately be scheduled in (Gomery 1992: 236). The effect of Technicolor's limited production capacity manifested itself most acutely in the early 1930s and late 1940s, but there remained a backlog of orders throughout these two decades (Chisholm 1990: 217). It was only with the rise of a free market in color film in the 1950s that supply and demand reached equilibrium.

Verisimilitude. For color to become cinema's aesthetic default, the results of film color needed to appear similar to color as it is typically perceived. This took several decades to occur. The intensely saturated images produced by early "natural" color processes made color an obvious means of creating heightened, sensual effects (Buscombe 1985: 87). Even the rise of subtractive film stocks in the 1950s did not immediately lead to an improvement in color film's perceptual realism. Many 1950s musicals were shot on Eastman Kodak negatives. However, over subsequent years technological improvements resulted in the release of stocks which registered profilmic color ever more accurately. The release of Eastman Kodak 5251 in 1962 provided a particularly significant advance in color reproduction (Simmons 1962).

Ideology. More important than the question of whether or not color was verisimilar was the question of whether or not it was *perceived* as verisimilar. As seen, black-and-white had for a long time been associated with reality, and color with spectacle. For color to become cinema's aesthetic default, it needed to be perceived as an essential element of filmic reality. This happened gradually over the course of the 1950s and 1960s. The faster color film stock became and the more accurately it represented natural color, the more it was used for "realistic" subject matter; the more it was used in this way, the more it was perceived as realistic. By the mid-1960s, these uses and perceptions had reinforced each other to a sufficient degree to allow color to become cinema's chromatic default.

Kindem also mentions the rise of television, which I discuss in more detail below. Though there is general agreement that most of these factors were relevant to Hollywood's move to color in the 1950s and 1960s, it is far from clear how precisely they interrelated. Kindem combines them in the form of a table, with each factor listed in a separate column on the x-axis and each decade from the 1920s to the 1960s listed in a separate column on the y-axis (1979: 29). In each of the table's cells he notes whether a particular factor in a particular decade favored black-and-white, color, or neither; for example, according to Kindem, availability favored the use of black-and-white up to and including the 1940s and subsequently favored neither. In his combined emphasis on technology, economics, and ideology, Kindem highlights the crucial fact that the move to color was the result of a multiplicity of processes working simultaneously. But his analysis has one major limitation: though the text of his article contains reasonably detailed discussion of each of the above factors, it is only in the table that these factors are brought together. As a result, the implication is that each factor was

self-contained and had equal relevance: in the 1960s, enough factors favored color over black-and-white, and so cinema completed its transition.

Though Kindem's chart is a useful simplification, its explanatory power is limited. The factors at work in any historical development do not take the form of discrete causal motivators, each with a quantifiable degree of influence. Rather, they are interdependent, existing in a complex matrix featuring causalities running in multiple directions. For example, color's influential association with reality was itself influenced by aesthetic factors: the more accurately films were able to represent color, the more they were perceived as realistic. These aesthetic factors were in turn influenced by technological factors, especially increases in the speed of film stocks and lenses. Technological development was driven by economic motivations – specifically, revenue maximization via product differentiation. Yet economics was an effect as well as a cause. For example, the economic factors that restricted the uptake of color in the 1930s were themselves in part a result of the complexity of the Technicolor process. And so on.

The only way to make sense of this multiplicity of causal relationships is to focus on some more closely than on others. Which relationships should we privilege? Brad Chisholm (1990) privileges the influence of television. He starts by reiterating the common view that Hollywood perceived the spread of television in the early 1950s as a threat and responded with various attempts at product differentiation (Chisholm 1990: 222). Product differentiation was implemented both through subject matter – for example, historical epics – and through the uptake of the new(ish) technologies of widescreen, 3-D, and color. Despite these various developments, box-office returns declined throughout the early to mid-1950s (1990: 224). In addition, as film companies began to distribute their films on television, which in the mid-1950s was still black-and-white, the marginal benefit of using color for a time actually *declined*. Meanwhile, television networks were not in a hurry to initiate the expensive process of switching to color broadcasting unless there were clear economic benefits to be gained (1990: 225). So color production became less of a priority in Hollywood, and black-and-white experienced a brief revival. Between 1956 and 1957, the number of black-and-white Hollywood releases increased by 70 percent (1990: 224). However, this revival was short-lived. By the early 1960s, the number of black-and-white television sets owned by American households was nearing market saturation. In 1950, less than 10 percent of American homes owned a television; by 1962, only 10 percent did not own one (1990: 227). To sustain their profits, television manufacturers needed new products. As a result, in 1959, in conjunction with television

manufacturer RCA's decision to push the sale of color televisions, NBC initiated a switch to color programming (1990: 227). A surge in color television sales in 1964 resulted in an accelerated move to color by NBC, culminating in an autumn 1965 prime-time schedule in which only two shows remained black-and-white (Castleman & Podrazik 1982: 181). NBC's lead was followed the same year by CBS and a year later by ABC (Chisholm 1990: 227). Hollywood also responded rapidly, with its largest single-year decrease in black-and-white production (1990: 228). In 1967, in acknowledgment that there was no longer enough black-and-white film production to warrant specific attention, the Academy of Motion Picture Arts and Sciences merged its Oscars for "Best Black-and-White Cinematography" and "Best Color Cinematography" into "Best Cinematography."

It is difficult to dispute Chisholm's carefully researched findings. Yet clearly his is only a partial answer to the question of why Hollywood's move to color accelerated in the 1950s and 1960s. Moreover, this question is itself a subdivision of a broader question: why did cinema move to color *at all*? In his seminal article "Sound and Color," Edward Buscombe addresses this broader question. Chisholm treats economics as a cause. By contrast, Buscombe treats it as an effect, privileging the influence of ideology on economic decision-making:

> Economic theories can only partially explain technological innovations, since economics cannot say why innovations take the form they do, only why they are an essential part of the system. Economics can explain the necessary but not the sufficient conditions for innovation. No new technology can be introduced unless the economic system requires it. But a new technology cannot be successful unless it fulfils some kind of need. The specific form of this need will be ideologically determined; in the case of cinema the ideological determinant most frequently identified has been realism. (1985: 87)

According to Buscombe, it was the film industry's obsession with realism that prompted the economic choices that moved it to color. Yet as well as initiating the move to color, ideology also obstructed it: color did not approach the status of cinema's chromatic default until the mid-1950s because it was not perceived as verisimilar until then (1985: 88). Buscombe's article moves lightly over historical details, and a number of his claims – for example that color could not be accommodated in early cinema – have been contradicted by subsequent research. Nevertheless, Buscombe's first step in placing ideology at the heart of a history that had previously only been approached from technological and anecdotal perspectives was a

significant one. The only reason that I do not here discuss Buscombe's ideas directly, with the attention that they deserve, is that they have already been interrogated, elaborated, and qualified indirectly throughout this chapter.

So which of the above best explains cinema's transition to color? In my view, they all do. Though Kindem's, Chisholm's, and Buscombe's answers are independent of each other, they are not incompatible. Kindem lists the most important factors. Chisholm focuses specifically on the cluster of causalities associated with the rise of television, exploring factors whose timeframes are measurable in months and years. Buscombe asks the broader question of why cinema moved to color, highlighting factors whose timeframe was decades. Other articles focusing on other influences could hypothetically be added to these answers *ad infinitum*, to create a progressively more sophisticated explanation of cinema's chromatic transition. Indeed, the coexistence of these three approaches draws attention to the crucial fact, that cinema's transition to color was not one transition but many. Cinema's transition to color was the sum of the moves to color within various genres, sectors of the film industry, and countries. Each of these moves followed a different timeline and was influenced by different combinations of causal factors. The most significant factors underlying cinema's transitions to color (the availability of color film stock, the rise of television, etc.) were relevant to all genres, industry sectors, and countries. However, they interacted differently in each – different factors had different causal weight according to the context within which they operated. The question of why cinema's transition to color occurred when it did can thus be seen not as one question but as a multiplicity of questions. Accordingly, it requires a multiplicity of answers. In the following chapter, I provide a few additional answers.