Eastman Kodak, "Kodacolor Demonstration Party," 1928. Kodacolor. Still from digital video. George Eastman (left) and Thomas Edison (right). Image courtesy of the George Eastman Museum, Rochester, New York.

Coming Attraction: The Event of Color, Techniques of Screening and Filtering in Early "Natural" Color Film and Photography

RACHEL LEE HUTCHESON

*This is a realization of a dream of many years. I can not [*sic*] remember how many years I have dreamed of color photography.*
—George Eastman[1]

On July 30, 1928, Kodak debuted the new Kodacolor motion picture system at a garden party held at George Eastman's estate in Rochester, New York.[2] The attendees included many business leaders, industry pioneers, and other luminaries of the era, but also the doyen of motion pictures, Thomas Edison, who admitted, "Years ago I worked on color problems myself and made a complete failure of it."[3]

The new Kodacolor film process, which for the first time brought the "dream of natural color" to motion pictures, was especially well received. So-called "natural color" stood for camera-recorded color, not hand-applied, tinted, or toned color. Kodacolor used an optical filtering method to produce color instead of using dyed filmstrips or colorants. The filmstrip alone was black-and-white, and color would appear only during projection.

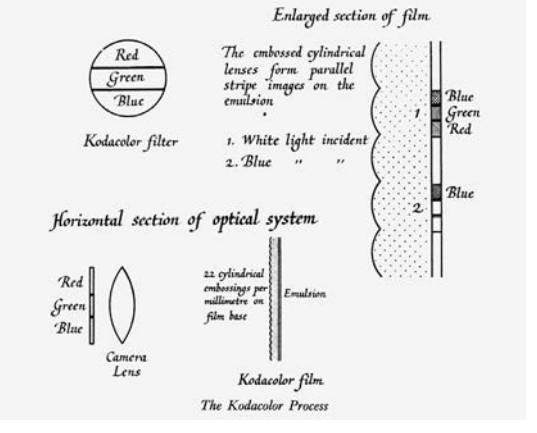
This is how Kodacolor worked: in the recording process, a camera outfitted with a Kodacolor recording lens filtered light into primary colors (red, blue, and green) onto a special lenticular filmstrip. Each lenticular filmstrip was made up of twenty-two cylindrical lenses per millimeter, with the three primary colors adjacent to one another. Then the projector (like the camera, outfitted with a three-color lens) recombined these primaries when the lenticular film was projected through the filter lens, synthesizing a full-color image for the viewer. That is, the full-color image existed only in the moment of projection as a result of the proper calibration of black-and-white filmstrips, optical filtering technologies, and human color perception. Color was therefore an ephemeral event conditioned

with and by the techniques and technologies of color production and viewing.

As anomalous as lenticular color film may seem, this basic technique of filtering color underpins a range of photographic and filmic technologies from the late nineteenth century into the first decades of the twentieth. In these decades—and this is the central argument advanced in this article—color photography and film were events generated through optical filtering. This article highlights several technologies to support this argument: the Krōmskōp color photograph, Kinemacolor color films, and Plastigram 3D films that, like Kodacolor, created color as a temporally and spatially conditioned event between the viewer and technical apparatus. These color events were widely implemented as attractions, some of which did not involve seeing color at all. Color as realism, color as spectacle, three-dimensional films, audience-activated narratives, and color as information compression are some examples. What unites these diverse color technologies and their applications is the technique of filtering color.

Eastman's well-heeled guests at the garden party were shown Kodacolor demonstration footage recorded by the company, including tightly framed shots of saffron goldfish in an inky aquarium green with plant life, close-ups of bright magenta and periwinkle flowers surrounded by emerald foliage, and the open wings of a yellow swallowtail butterfly perched on blush-pink azalea blooms. From these scenes of colorful plants and animals, the demonstration film shifts to women and children on the beach, their vibrant bathing suits in stark contrast to both their pale white skin and the equally bleached sand. The film cuts from the beach to a staged fashion show with clothes displaying the "latest women's summer fashions" at Bonwit Teller Department Store.

The Kodacolor montage is a condensed version of the "color revolution" that lays bare its particular conflation of "nature," fashion, and femininity and foregrounds the ambivalence of color as both an enticing spectacle and true-to-life. In the first decades of the twentieth century, the boundaries between natural and artificial, verisimilitude and spectacle, seemed



Right: F. B. Phillips, "The Kodacolor Process," *The Geographical Journal* 80, no. 3 (September 1932), 241. Diagram of lens filters and Kodacolor lenticular filmstrip.

Far right: *Yellowstone*, Kodacolor. Kodacolor filmstrip appears black and white without projection through color filters. Image courtesy of Jennifer Seitz at the National Archives and Records Administration, College Park, MD.

particularly uncertain, as everyday visual culture was increasingly suffused with synthetic pigments in consumer products and popular culture that rendered everyday life itself more bright, colorful, and artificial.[4] The Kodacolor film captures "all the gorgeous colors of nature" that make up this highly chromatic society.[5]

The dream of color and its manifested reality at the turn of the twentieth century characterized an era of expansive color diversity. The desire to reproduce "all the colors of nature" resulted in several color processes termed "natural color" in photography and film that used operations of optical filtering; that is, the filtering of and recombination of light using the primary colors: red, blue, and green. Today, two sets of transmedial color systems, called additive and subtractive, reproduce color in all print, photography, and film, as well as electronic and digital media. *Additive* refers to color produced by mixing light through the light-based ("additive") primaries: red, blue, and green. *Subtractive* refers to mixing colored materials rather than light itself. By the late-nineteenth century, the subtractive primaries—cyan, yellow, and magenta—were already in use for color printing and would soon become commonplace in analog color photography and film. Essentially, additive colors combine light; they exist only in the moment as an event when seen or viewed. As more additive colors are superimposed, the image gets lighter and brighter. By contrast, subtractive color mixes colorants (such as oil paints, watercolor, and the dyes used in dyed filmstrips of Kodachrome and Technicolor), and therefore it exists as a material more independent of the exigencies of the eye of the spectator.[6] As more subtractive colors are superimposed, the image gets darker and dimmer. Of particular focus for this article is the additive color photographic process called "Krōmskōp" and the additive film process known as "Kinemacolor." Plastigrams, by contrast, manipulated color vision to create the illusion of depth rather than mimetic color. All the technologies addressed in this article use techniques of optical filtering to affect the color perception of the human eye without recourse to pigments or dyes. Color was therefore an event cocreated with the viewer through technical apparatuses.

Photographic and filmic color were part of the drastic expansion of color possibilities from the second half of the nineteenth century that joined other

Top: Eastman Kodak, "Kodacolor Demonstration Party," 1928. Still from digital video. Image courtesy of the George Eastman Museum, Rochester, New York.

Bottom: Frederic E. Ives, *Kromogram Vase of Flowers*, ca. 1895. The Kromogram is used with a stereoscopic Krōmskōp viewer. Each pair of images corresponds with one color, the pair of images fuse for a stereoscopic, full-color image in the viewer. Image courtesy Source Museums Victoria, Australia.

mechanical or industrialized means of producing colors, such as chromolithography and chemical dye manufacture. Together, these transformations constituted a new era of burgeoning chromatic modernity that extended from 1850 to 1920.[7] "Natural color" was both an industry marketing term and a necessary term used to differentiate it from the many other available color methods, including color printing, hand coloring of photographs and films, and dyeing sections of film by tinting and toning. Although rarely stated explicitly in the contemporaneous literature, "natural color" referred to technologies that produced the impression of color as a temporary visual phenomenon, not color that was printed or applied to the surface of an image. Natural color methods were the dominant means of reproducing camera-recorded color from the 1880s to the 1920s. In subsequent decades, dye transfer methods, like Technicolor, that use subtractive color would predominate. For these processes, chemical dye colorants record a color negative and then produce a color-positive print image from that negative. Natural color technologies, however, capitalized on the transience of color as a sensorial phenomenon through spectacular attractions even as they emphasized new capacities for photographic realism.

The Rochester garden party had a dual function: to reveal the filmmaking system in a glamorous product launch and to demonstrate its capabilities by recording the event of the party itself, most forcefully by passing the camera along to the guests, which resulted in odd angles and lurching camera movements. Kodacolor adopted this demonstration technique from one of the first public displays of Auguste and Louis Lumière's Cinématographe. The Lumières recorded the meeting of the French Photographic Congress in Lyon in June 1895 and then projected the film to the same delegates the following day. The technique of the Kodacolor demonstration film draws attention to the beginnings of film history and emphasizes the filmic relationship to temporality, which is both past (as recording) and present (as a projection). The film's audience was simultaneously the film's subjects: specters of themselves from the previous day viewed in the moment as projected images. The Lumières stressed the capabilities of their Cinématographe to record and to project a moving image, while Kodacolor adapted this technique to show the capabilities of the moving image in full color, thereby emphasizing the film's proximity to the appearance of reality in motion and in living color.

Among the attendees of the garden party—documented in party photographs and seen at the beginning of the Kodacolor film—was a diminutive, bespectacled, balding man dressed in a dark suit: none other than Frederic Eugene Ives (1856–1937),

American inventor and color photography pioneer. Ives's work on color and lenticular lenses was foundational to Kodacolor and, more broadly, to the conceptualization of color reproduction in terms of human color vision.[8] His natural color technologies, although modeled on human color vision, fell far short of replicating that complex process. Instead, filtering and screening operations became embedded in each act of color image recording and display, creating and re-creating color as an event.

Crucial is the word *screen*. In the history of natural color and related technologies, the emphasis lies less on the "screen" (a stable surface for the display of projected images) than on the verb *screening* as it pertains to filtering techniques that assume creative force in space and time. Screens have historically connoted environmental characteristics, filtering, dividing, sheltering, or functioning as a barrier that is essentially "always shaping and shaped by the space in which it was located."[9] Filtering is a cultural technique. In media theory, cultural techniques describe the recursive interactions between a milieu and agent-objects; they "describe what media do, what they produce, and what kinds of actions they prompt."[10] Human beings and objects are inscribed within existing networks of cultural techniques on a variety of scales that produce the field in which the possibility of any action arises. Screening is a kind of filtering; it inhibits certain substances from passing through a surface while allowing others. As such, a filter is a threshold with constitutive force in time and space. The filter creates or controls an environment but only as long as it operates.

In the context of turn-of-the century light-based media, filtering was effectuated when an element modified the transfer of light, such as when colored glass was placed in front of the light source or through the more complex procedure of optical grating. An additive color image was the product of filtering at two distinct stages: first, at the site of image production; second, at the site of image creation, be it as a stereo-photographic image, film projection, or as one of a host of less-familiar devices and techniques. At the site of production, multiple photographic negatives were produced through colored filters, thereby separating the image into its additive color primaries. At the point of creation or projection, these primaries were recombined: white light was filtered simultaneously through multiple colored negatives to produce a composite, full-color image. This full-color image existed only for the duration and within the spatial context of viewing; that is, the full-color image was an event.

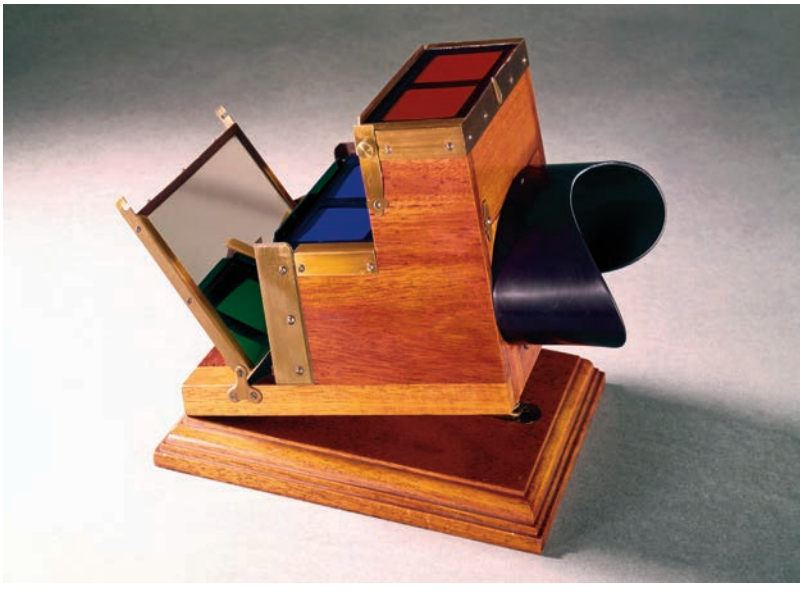
As an action, "screening" has constitutive force. The Krōmskōp and other natural color technologies spectacularize the operation of perceptual color such that color is not just a material

fact but a production, an event in time and space. Natural color technologies do not simply reproduce the world in color; they produce a wholly new world of color by which to be delighted and amazed. Color vision in the early decades of cinema was staged as an attraction, and color was reinvented as an event, induced with the viewing apparatus that configured the body in space, sometimes as a solitary viewing practice, as with the Krōmskōp; sometimes as public projections, as with lantern slide shows or films.

Mechanical to Optical V-Tool: Grating and Screening

In the late 1870s, Ives developed an early halftone printing process to reproduce photographs mechanically. To do so, he adapted techniques from engraving, specifically the V-tool, a wedge-shape gauge used to create lines of varied thickness or weight in the metal engraving plate. Rather than a human engraver using the V-tool to manually alter the weight of the line when representing spatial depth and tonal shading, Ives mechanized the operation by grating the image. "Grating" provided an overall grid that filtered the varying light and dark tonalities into patterns of line: the areas of greater darkness had a greater density of line, while the lightest portions were conveyed through a short dash. He then searched for an entirely photographic process that would transmit these gradations by filtering light through a perforated surface, or dot screen.[11] He called this the "Optical V-Tool," thus translating the manual practice of engraving to the realm of theoretical principles. Grating or screening provided the principle for transposing hand-engraving techniques to photographic half-tones. It would also provide the conceptual and practical shift from photographic half-tone prints to natural color.

The division and recombination of light through differently colored filters was a specific cultural technique derived from



Frederic E. Ives, Krōmskōp Stereoscopic Photochromoscope, 1898. Image courtesy of Science Museum Group, United Kingdom.

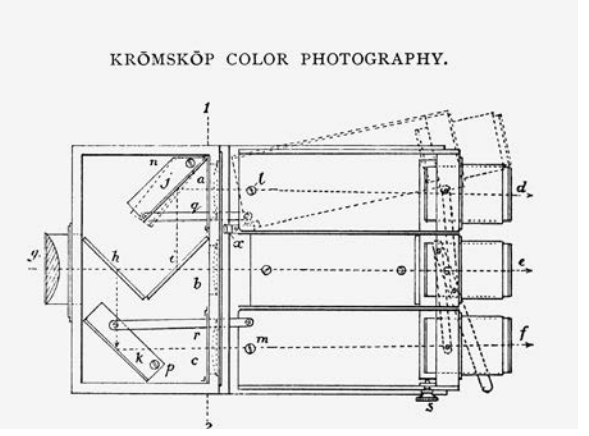
an epistemology of human vision established in the nineteenth century.[12] Optical history, therefore, intersected with the mechanical in the engraving V-tool and the halftone screen. What united them was the conceptual and practical aspects of the filter, or screen. Instead of filtering light and shadow for a black-and-white photographic half-tone print, filtering light into three primary colors could be used to create full-color images.

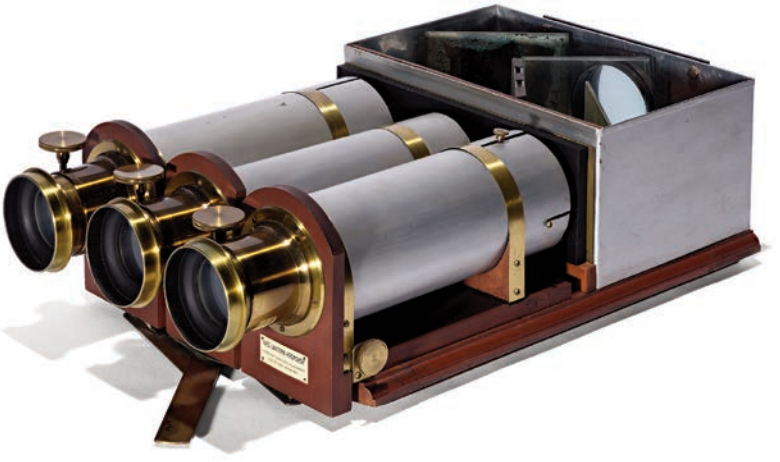
In 1891, Ives proposed a method of natural color photography based on James Clerk Maxwell's color primaries and the subjective sensation of color. As early as 1800, Thomas Young had theorized that the eye was sensitive to three primary colors or visible wavelengths that in specific ratios could be combined to produce any color within the visible spectrum, as well as white light when all three primaries were superimposed. This theory and the exact colors constituting these primaries were not proven until 1861, however, when Maxwell and Thomas Sutton produced a full-color projected image of a tartan ribbon. The three primary-color filters (red, green, blue-violet) were used to photograph the ribbon, producing three separate color records of the ribbon. These color records were then projected through corresponding red, green, and blue-violet color lenses attached to three lantern projectors. The projected images, filtered through their respective colors, were superimposed to create a single, full-color image. Full color was perceived only by stimulating and manipulating the physiognomy of the human eye through these colored filters. The full-color image therefore existed as a fugitive image perceived by the eye of the spectator only in the moment and at the site of projection.

Ives patented his natural color photographic process as a device called the "Krōmskōp." Using Maxwell and Sutton's experiments in color vision, it achieved both a convincing color image and added three-dimensionality through stereography. For Ives, the Krōmskōp was superior to any printed color process because it was, "perfectly free from surface texture and reflections, and is seen without distracting surroundings, and in solid relief, exactly as the object itself is seen by the eyes."[13] The stereoscopic color image, or "solid relief," was better than a printed image on paper because it was liberated from the two-dimensional plane and isolated from its surroundings. The Krōmskōp image ostensibly offered an experience of the photographed subject that was closer to that of viewing the object in life, not simply looking at a printed reproduction. The circumstances and contrivances of the viewing apparatus, whether a stereoscopic viewer or a lantern projection, were far from everyday life. For Ives, "as seen by the eyes" described not just how an object was perceived in life but how color vision was produced by the eye, which his devices sought to model.

The Krōmskōp process employed the same additive color filtering process demonstrated by Maxwell and Sutton—such that every color image-event required three black-and-white color records—as well as the binocular vision science of the stereoscope—which required two parallax images to construct the illusion of three-dimensionality—for a total of six images.[14] The Krōmskōp camera photographed a triple negative through the three color filters (red, green, blue), with one exposure producing all three black-and-white negatives. These black-and-white images held a unique record of the primary color and were developed as black-and-white positive transparencies on glass plates, with two images per "color." They were held together in an accordion fold by ribbon and were positioned on the device near a strong natural light source, providing illumination for the viewer who peered through the two eyeholes. Viewing was then an inversion of the production process: when placed on the Krōmskōp viewer, the six black-and-white images (three for each eye) were filtered through colored glass filters and combined by mirrors into a merged full-color image. The device manipulated the science of binocular and color vision for the temporary perception of a mimetic, full-color image.

Ives's colleague and fellow photographer William N. Jennings recalled his astonishment upon first looking "down the brass tube" of an early Krōmskōp model. He saw "not a color photograph—but a blue vase full of real flowers!!!"[15] In addition to the technology's demonstration of color accuracy or fidelity, subjects of color variability—such as changing light on water, crystals under light, or the colors of the aurora borealis—were of the greatest interest for





Top: Frederic E. Ives, Diagram of Lantern Krōmskōp, 1898. *Krōmskōp Color Photography with Chapters on the Nature of Light and Theory of Color* (London: The Photochromoscope Syndicate Limited, 1898).

Bottom: Frederic E. Ives, Lantern Krōmskōp Projector, 1890. National Museum of American History, Smithsonian Museums, Washington, DC.

audiences because they re-created the most transient experiences of color. While demonstrating the capabilities of the new color photographic technology, such subjects also emphasized the technology and color itself as a form of ephemeral, spectacular event.

Buoyed by the positive reception of the color photographs, Ives continued to improve upon his method of "Natural Color" photography throughout the 1890s. He was invited to the Royal Society, London, in April 1896 to demonstrate the Krōmskōp in a lecture titled "The Perfected Photochromoscope and Its Colour Photographs." In at least one of his demonstrations, real candies were displayed alongside the Krōmskōp images of them for comparison, leading some audience members to take the candies away when they suspected the picture was merely a reflection in a nearby mirror.[16] The strength of the Krōmskōp color image was in presenting still-life subjects that achieved highly saturated colors and a sense of three-dimensional "relief" when photographed against a dark or neutral background.

The Krōmskōp system was primarily situated as an experience in the home, thus drawing on what media theorist Erkki Huhtamo calls a "peeping practice."[17] The viewer peered into a device to co-construct the image in a concentrated, isolated viewing experience. Peeping practices, Huhtamo argues, occupied a parallel history with projection screening practices, and Ives created devices with which intensely private peeping could become public.[18] With the Lantern Krōmskōp and an exterior lamp attachment, the "peeped" color image could also be projected onto a screen for multiple viewers, creating the conditions for parallel domestic viewing and public projection.[19]

Top: Frederic E. Ives, *Bowl of Fruit*, 1898. Lantern Krōmskōp. Image courtesy Collection Cinémathèque française, Paris, France.

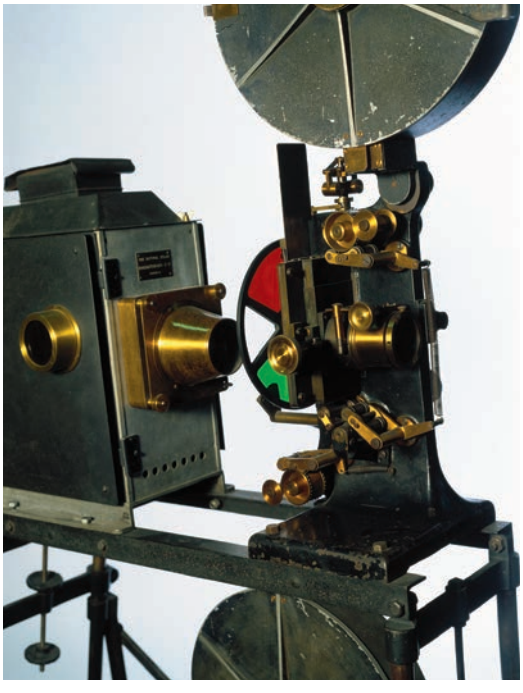
Bottom: Frederic E. Ives, *Bowl of Fruit*, 1898. Lantern Krōmskōp. Synthesized image when projected. Image courtesy Collection Cinémathèque française, Paris, France.

The color image was of interest not merely because the images were in color; hand-applied color had long been used in magic lantern shows. Part of the novelty for audiences was that the colors in Krōmskōp images were the "actual" colors of the world recorded by the camera. Camera-recorded color offered a model of objective color aligned with the camera as a machine. Color's relationship to photographic realism was grounded in its indexicality; that is, the idea that the image, including its color, was a chemical record of external

reality made by light. The chemical-mechanical reproduction of color functioned to signify the truth of the image. It created a record of a real place in its "real colors" and simultaneously participated in the ideological construction of this reality.

The understanding of natural color as an effect of "the real" joined with the experience of the color event as a spectator. The delight in the experience of the color illusion produced by the technology was an "aesthetic of astonishment" in which, as Tom Gunning theorizes, "the realism of the image is at the service of a dramatically unfolding spectator experience, vacillating between belief and incredulity."[20] Excitement derived from how the technology and the viewer were configured while the latter was viewing. The exploitation of human color perception by the technical device elicited astonishment from spectators. Ives specifically exploited the "unbelievable" quality of the color image—that it was made through a combination of red, blue, and green light—with a special mechanism he developed for his Lantern Krōmskōp and its horizontal lantern slides, marketing it as a feature for projectionists in the device's manual.[21]

During projection lectures, Ives demonstrated the principle of color separation and full-color synthesis. First, he showed the three images with the three primaries separated next to one another, a row of the same subject shown in monochrome red, blue, and green. Then, with a dramatic flick of the lantern's lever, Ives would snap the three primaries together in exact superimposed register to reveal the subject in full color. The demonstration effectively displayed the principles of color photography. Equally important, it delighted his audiences, Ives stated, "because the sudden appearance of a perfect color out of a jumble of crude colors affords a fresh surprise and delight with each subject."[22] "Crude colors" appeared, as if by magic, to assemble seamlessly into a full-color image, reinscribing each subject, no matter how familiar to the audience, as a novel illusion. The reception of color technologies was often tensed between, on the one hand, the real and objective and, on the other hand, artificiality and spectacle. Frequently, color technologies were understood to be both at once.



Kinemacolor 35 mm Projector, 1910. Detail with rotating red-and-green filter. Image courtesy of Science Museum Group, United Kingdom.

Natural Color Film: Kinemacolor

Kinema, n. Greek: kine, kineo. To move, motion evident in life.

Kinemacolor "stands for animated pictures in natural colours."[23]

Early cinema, dating roughly from 1895 until the First World War, was a period of novelty and experimentation that was not simply a precursor to narrative cinema but rather a miscellany of forms at the intersection of many existing visual and cultural practices.[24] Natural color technologies participated in a history rife with spectacular attractions that made direct appeals to the viewer and exhibited a new capacity for mimetic color.

The first demonstration of a natural color film, named "Kinemacolor," was a small showing for press on May 1, 1908, in the projection hall of the Urbanora House on Wardour Street in London, home of Anglo-American Charles Urban's (1867–1942) self-named film company, the Charles Urban Trading Company. This was followed by the first public screening at the Palace Theatre of Varieties on February 26, 1909. The latter screening showed a variety of films drawn from the actuality genre: short films of people, places, and events of general interest and everyday life, but also including colorful subjects: *Sweet Flowers*, *Carnival Scenes at Nice and Cannes*, *Children's Battle of Flowers*, *Nice and Church Parade of the 7th and 16th Lancers*. After these successful demonstrations, Urban formed the Natural Color Kinematograph Company for the production of Kinemacolor films. These films were then included as novelties in prominent variety theater lineups, including at the Wintergarten in Berlin, the Folies Bergère in Paris, Madison Square Garden in New York City, and Urban's own London-based Scala theater from 1911 until 1913.[25]

Kinemacolor was the first motion picture process to use filtering to reproduce natural color in its films. Kinemacolor films were shot at twice the usual speed in alternating green and red filters, then projected with a rotating disc of red and green in front of the projector lens. As with the later Kodacolor process, color was not recorded on the filmstrip, which remained black-and-white. The initial patent for the process describes the use of three colors, but the spinning disc on the projector could not reach a speed sufficient to synthesize the colors and image. Instead, a near full-color image could be achieved by using only two color filters, red and green. Nonetheless, the film's color was considered more true-to-nature because it was captured by the camera rather than being added by hand-coloring, tinting, or toning methods.[26] But the color reproduced remained far from fully mimetic, since it did not have an adequate blue range. Kinemacolor film subjects were largely drawn from the actuality and travelogue genres, in part because Kinemacolor required more light than monochrome films, thus making outdoor shooting preferable. But several fictional comedies and dramas were also made using the technique. More often than not, the most popular Kinemacolor subjects emphasized the natural color technology's dual claims

to reality and spectacle.

The first Kinemacolor screenings invariably showed the film *Sweet Flowers*.[27] The film would first be screened in black-and-white and then screened again with the Kinemacolor color filters, showing the film in "its natural hues and tints."[28] Like Ives's Krōmskōp lantern projector, Kinemacolor screenings are another example of the aesthetic of astonishment and also recall the early demonstrations of the Lumières' train films, which, to emphasize the motion of the train, started with a still image.[29] The demonstration of the technical apparatus heighted the awe and wonder at the creation of the illusion, while relying on a sophisticated audience with some knowledge of the science of color and vision.[30] The Kinemacolor film catalogue of 1909–1910 includes primarily subjects of everyday life that would have been familiar to audiences: flowers, barnyard animals, and waves at Brighton Beach, a popular weekend and holiday destination outside London. The appeal to audiences was the color and its relationship to the everyday, lived or remembered, as well as, in a collapse of space and time, the apparent firsthand experience of distant (real) places or events.

The historical potential of the medium was immediately recognized, as was the potential for the color film to function propagandistically, particularly for the British crown.[31] Actualities would not just replay an event but would be experienced in the theater as if they were live:

> All the State ceremonials, the notable events that make history, are ours to record for the benefit of posterity. Scenes of travel, sport in distant lands, the ways and customs of strange peoples, are open to us without the discomfort of long sea voyages. What a boon it would be if we only had the same colour records of the past as we shall have of the present and future![32]

Color, as mediated by novel technologies and produced in the viewing experience, powerfully connoted immediacy and presence, thereby drawing audiences closer in time and space to the events of the day.

Kinemacolor made several fictional films, but the viewing public was far more interested in seeing real places in real colors.[33] The realism of natural color was itself an attraction in early cinema. In Gunning's model of the cinema of attractions, the term *attraction* describes how the spectator engages with the cinematic image.[34] Images appeal directly to the audience, often distracting from the coherence of a narrative in favor of self-conscious display. Gunning's examples include tourist views, trick films, urban scenes, records of processions and public events, songs, dances, and acrobatic feats. To this list,

we can add natural color. Color operated independent of filmic narrative as another attraction with direct appeal to audiences. This is evident in the majority of Kinemacolor actualities, which were chosen specifically for their colorful subject matter, but can also be observed in reviews of fiction films whose viewers were more drawn to the color than the actual plot. Echoing the reception of the Lumières' *Repas de bébé* (*Baby's Dinner*, 1895), which left critics enthralled by the rustling leaves of the tree in the background, a review of the drama *By Order of Napoleon* (1910) focuses almost entirely on the color of the sets and the scenery background:

> We did not feel we were looking upon a piece of animated photography; we forgot to look for good photos or bad. No, the effect was of reality: this scene—the house, embowered in green trees waving in the breeze, its ancient walls (the actual colour of stone . . .) all gave the impression of actuality, an impression heightened by the depth and quality of the picture.[35]

The interest was not in the drama, the acting, or the narrative but in the incidental details (green trees, walls the color of actual stone) that happened to be captured by the camera. As with natural color photography, the relationship between actual, existing places and their depiction in "real" color was of greater importance than using color to further the film's narrative or construct fantastical color compositions. Color as a record of external reality constituted the cinematic attraction at the same time it spectacularized natural color as an event.

Anaglyph Filtering/Screening

Anaglyph, n. Greek: anagluphē. A work in low relief.

Filtering as a technique of screening color was not exclusive to achieving mimetic, natural color. Several visual novelties exploited color perception at the turn of the century, often with intermedial techniques. The technological reproduction of three-dimensionality, like that of natural color, was fundamentally dependent on a situated experience in space and time.[36] Anaglyph images use color complement separation and binocular vision to create a three-dimensional (3D) illusion. Anaglyph 3D images are formed by superimposing two images in opposing colors (such as red-blue or red-green) that are decoded by corresponding color glasses worn by a viewer who perceives an achromatic, 3D image. Anaglyph therefore uses color complement separation and binocular vision, functionalizing color vision to create an achromatic stereoscopic illusion rather than a mimetic, full-color image. Induced by the

viewing apparatus that configures the body in space, vision is staged as an attraction and color reinvented as an event. That is, the cultural technique of filtering is an operational use of color. In this case, it works to create the illusion of three-dimensionality rather than to reproduce colors. In both natural color and anaglyph 3D, the filtering of light involves the functional division of light into colors that manipulate specific characteristics of human vision.

Anaglyph lantern slides were used as early as the 1850s by the French physicist Joseph Charles d'Almeida (1822–1880) to demonstrate drawings in three dimensions. Others experimented with projected anaglyphs to provide a collective experience of such images.[37] A pioneer in early film and color photography, Louis Arthur Ducos du Hauron (1837–1920) printed photographic anaglyphs that achieved popularity in the 1890s as novelties. As early as 1903, the Lumières showed an anaglyph film at that year's World's Fair (although in an enclosed viewing apparatus for individual use). Their anaglyph film *L'arrivée d'un train* (*Arrival of a Train*) enhanced the perception of an oncoming train entering the spectator's visual space, a restaging of the Lumières' own mythic "first film," where spectators at the Café Indien allegedly fled to escape the oncoming train that threatens to barrel into the audience.[38] This apocryphal story is redeployed in the 3D film to show the train escaping into the viewer's space. The knowing viewer takes pleasure in the illusionary effect of the train and the rube's flinching reaction to it. The anaglyph *L'arrivée d'un train* reimagines the first film for cinema's anticipated next, 3D phase. In the early 1910s, 3D anaglyph still photographs were also being experimented with using the Autochrome

First National Pictures Advertisement with Ives-Leventhal Plastigram, 1924. Private Collection.

process, examples of which were included in the Society of Colour Photographers exhibition in London.[39]

Anaglyph—as an entertainment medium rather than a scientific novelty—would not really take off until the 1920s. In the late 1910s, film director Jacob Leventhal solicited Ives's help to create 3D film versions of popular vaudeville shadowgraphs.[40] Shadowgraphs derived from live shadow plays or silhouette plays of the hand in front of a light source on a screen. For 3D shadowgraphs, a translucent screen is lowered in front of live performers, who are then backlit using red/green illumination, producing a 3D effect on the performer's silhouettes when the audience wears red/green glasses. For the 3D films, Leventhal and Ives used newly available two-color Technicolor film to make anaglyph motion pictures (so-called Plastigrams, also called Stereoscopiks) that were exhibited in American theaters from 1924 to 1927.

As with other color technologies, these films were made using a two-step filtering process. Here, though, two cameras recorded simultaneously through light-filtering lenses (red-blue or red-green); the films were processed; then, when projected, the two filmstrips had to be synchronized so the images overlapped. When the spectator wore complementary colored glasses, the projected film appeared achromatic, since the complementary colors were neutralized by the glasses. As with the Krōmskōp and Kinemacolor, the filtering effect was contingent on the space and time in which it was viewed, configured as much by the physical apparatuses (film projector, projected image, color glasses) as by the human sensorium. In this case, however, color was not seen; the technology exploited color vision perception to produce the effect of 3D illusionism.

Plastigram films were described as "amusing shorts" that demonstrated the technology as a novelty. They are hallmark examples of the cinema of attractions in that they call attention to the act of viewing. Plastigrams largely took the form of short, nonnarrative gags adopted from Vaudeville theater (pies to the face, balls thrown out to the audience, and the like) that also emphasized the viewer's interaction with the illusionistic image.[41] According to one review, "It is much more than a picture in relief, as actors and articles approach the spectator in such lifelike manner that audiences instinctively recoil when, for instance, a stream of water is directed at them from the screen."[42] Within the film program, they presented the audience with a new sensation, that of 3D, which enhanced the overall cinema-going experience as one of optical and sensory thrills. Printed reviews of Plastigrams describe them favorably: "don't fail to see the Plastigrams, the latest and most startling invention in motion picture science, which makes actors and objects stand out in a startling manner."[43]

Most reviews of 1920s anaglyph films emphasize their novelty and the unique experience of "the third dimension movie."[44] One such review notes that the "unusual screen novelties," "which seem to leave the screen and come down into the audience[,] . . . have caused many laughs as well as a great deal of interest."[45] The scholarly discourse on 3D cinema primarily considers it in relation to Gunning's theorization of the cinema of attractions, in which the spectator's attention, rather than being sublimated into the film's diegesis, is appealed to directly.[46] Even in more sophisticated uses of cinematic 3D, the technology seemingly cannot achieve diegetic immersion because it continually emphasizes the act of vision.[47] Yet as Birk Weiberg highlights, anaglyph was used not only for the creation of illusionistic 3D but also in the service of new narrative and spectatorial modes, especially the "choose your own adventure" narrative.[48] The film *As You Like It (Not Shakespeare)* made by Ives and Leventhal in the same period they were producing Plastigram shorts, premiered at New York's Rivoli Theater in 1924.[49] It includes two endings shot on differently colored film stock so that "the viewer can choose whether he wants a sad or a happy ending to the short sketches, by looking through either the red or the green glass."[50] As with anaglyph 3D, the film requires viewers to wear two-color glasses, but in this case they must close one eye to see one scene through a single-color lens or close the other to see a completely different scene.

As You Like It selectively uses the possibilities of anaglyph to enhance the narrative structure, rather than produce 3D gags. The majority of the film was shot in black-and-white. It opens on a young wife who waits for her husband to come home from the sawmill. He is late because a villain at the sawmill has kidnapped him and strapped him to a board ready for milling; the villain then starts the saw blade. The wife drives to the sawmill. When she enters, a title card directs the audience to "put on your glasses." The cinematographer, William T. Crespinel, recounted the two endings:

> If one looked with the left eye [blue] here's what they saw: Exterior of cottage—[a] group of people standing around—

> front door opens—six men appear carrying a coffin on their shoulders. As they approach camera, the coffin separates lengthwise, down the middle, and is carried by three men—the villains [*sic*] scheme was successful. Through the right eye [red] we see the wife enter mill room—sees, in horror, her husband's predicament—fumbles around to locate turn-off switch—and then the embrace.[51]

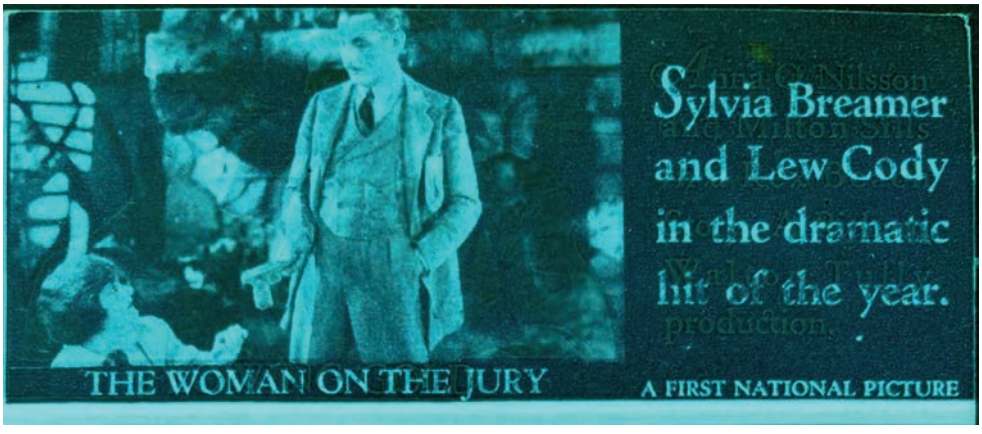
Color in this instance was used neither for 3D illusion nor for mimesis. Instead, *As You Like It* uses color strategically for narrative and calls on the viewer to enact their preferred ending. Narrative itself becomes part of the filmic attraction. Despite its positive reception, however, this use of anaglyph in support of narrative was not widely adopted.[52]

Early print advertisements also used anaglyph techniques, sometimes to produce 3D effects but more often as an operational technique to condense information.[53] These clever ads, from Plastigram distributor First National Pictures, familiarized film promoters and audiences with the optical principles of anaglyph while simultaneously emphasizing its novelty. The advertisements printed their new feature-length and short film releases (which were not anaglyph films) in superimposed red and blue colors. The images encoded twice the amount of information by overlapping two film advertisements within a single frame. Instead of the same image slightly offset, which would produce a 3D effect when viewed through two-colored glasses, the ads are "decoded" by viewing the image under a single color at a time ("use one eye only").

One advertisement from 1924 uses a combination of 3D anaglyph and non-3D techniques to advertise the films on the page. The title of the film underneath the image is viewed in 3D, while two superimposed film stills, printed in red and blue respectively, show completely different scenes from the film. For example, in an ad for *Lilies of the Field*, the red image depicts a close-up glamour shot of the protagonist, Mildred, a neglected high-society wife attending a ball without her philandering husband, while the blue image depicts a scene from later in the film showing the heroine collapsed from deprivation.

Opposite: First National Pictures Advertisement, Ives-Leventhal Plastigram, 1924. Private Collection.

Below: First National Pictures Advertisement, Ives-Leventhal Plastigram, 1924. Red image digitally separated. Private Collection.



Text printed beside the image superimposes color-coded textual information. Seen through a red filter, it reads, "Corrine Griffith Productions Inc. offer beautiful Corrine Griffith in 'Lilies of the Field.'" Viewed through a blue filter, it states, "A drama of the luxury-life of New York society." Like the superimposed scenes, textual information describing the film's production details and the film's tagline overlap. The ad encourages the viewer to use both eyes together and individually to "decode" the publicity information about the film, to preview still scenes, and to enact the title in 3D.

Another series of ads from First National Pictures further exploits the color coding of anaglyph by promoting two entirely different films. Blue filtering reveals the film *The Woman on the Jury*, while red filtering advertises *Flowing Gold*. The two juxtaposed still frames from the different films are nearly illegible without the decoding provided by the glasses. Red filtering reveals a close and tightly framed scene of the two protagonists of *Flowing Gold*, Allegheny Briskow and Calvin Gray (played by Anna Q. Nilsson and Milton Stills, respectively), in impassioned discussion. Blue filtering shows a medium shot from *The Woman on the Jury* in which the philandering character, George Montgomery (played by Lew Cody), offers a gun to the female protagonist, Betty Brown (played by Sylvia Breamer), who cowers in the lower left nearly out of the frame. The text corresponds to the scene being filtered, detailing the production information and listing the relevant film's enticing tagline. Color-coding the film advertisement allowed twice the amount of information to be conveyed.

Anaglyph was a highly adaptable novelty; it could be used in 3D illusions that hurdled off the screen and into the audience, in "choose your own ending" narratives, and to compress encoded visual and textual information. In each of these applications, color vision perception was staged as an effect of filtering processes in the moment of viewing.

Conclusion

Plastigrams went out of favor just as Kodacolor made its debut in the late 1920s, capitalizing on the growing amateur film

First National Pictures Advertisement, Ives-Leventhal Plastigram, 1924. Blue image digitally separated. Private Collection.

market.[54] Kodacolor, like the Krōmskōp and Kinemacolor before it, promoted natural color as a spectacle. But in the case of this home movie system, domestic, everyday life was the subject of the color spectacle. At Eastman's garden party, guests took up the camera themselves to experience its ease of use. After relinquishing the Kodacolor camera, they proceeded to dinner, during which time the film was processed. Footage shot that afternoon in the garden was then projected onto notably small 16.5-by-22-inch screens that transformed dinner guests into home movie spectators and stars as they viewed themselves in "gorgeous color tones."[55]

Returning to this early period of technologized color allows us to rethink the materialities and viewing modalities that constituted the "photographic" and "filmic" in the early twentieth century. Although highly mediated by technology, natural color images were radically "immaterial" in comparison to the printed color photographs and even the films that would come to dominate the twentieth century. The technologies and techniques of natural color photography and film emphasize color as an ephemeral phenomenon in which the technological media stages the visualization of color for the astonishment of the spectator. The spectator's perception, in turn, is configured by the technological device, amplifying the relationality between internal and external perceptual sensations. To see color in this context is to experience color as a screening event configured in space and time. Moreover, the experience of color as a screening event is not relegated to mimetic color reproduction. As in the example of anaglyph, color could be operationalized for three-dimensionality, for narrative novelty, and for coding and compressing visual information. The contingency, ephemerality, and device dependence of these color images perhaps leaps over the history of print photography and color-printed films to resonate with our contemporary experience of images on digital screens. Device or platform-dependent digital images return us to the image as event, as they are attached more closely to the contingent viewing conditions in the moment and the seemingly paradoxical associations between the real and the fantastic.

Notes

1. George Eastman, quoted in Russell Porter, "Home Movies in Colors, Long an Eastman Dream, Are Shown to Notables," *New York Times*, 31 July 1928, 1.

2. A partial guest list includes General George Pershing; Michael I. Pupin, Columbia University; G.K. Burgess, director of the United States Bureau of Standards; Hiram Percy Maxim, inventor and president of the Amateur Cinema League; Frederic E. Ives; Sir James Irvine, principal and vice chancellor of St. Andrew's University, Scotland; John J. Tigert, U.S. commissioner of education.

3. Stephen Pizzello, "Wrap Shot: The Introduction of Kodacolor," *American Cinematographer—The International Journal of Film and Digital Production Techniques* 84, no. 8 (August 2003): 104.

4. For a discussion of color in the art and popular culture of turn-of-the-century Paris, see Laura Anne Kalba, *Color in the Age of Impressionism: Commerce, Technology, and Art* (University Park: Pennsylvania State University Press, 2017). For color and consumer culture in North America, see Regina Lee Blaszczyk, *Bright Modernity: Color, Commerce, and Consumer Culture* (New York: Palgrave Macmillan, 2017); and Regina Lee Blaszczyk, *The Color Revolution* (Cambridge: MIT Press, 2012).

5. "The Eastman Kodak Company Presents Kodacolor," *Movie Makers* 3, no. 8 (August 1928): n.p.

6. The subjective perception of color impacts how one sees and describes a specific color.

7. Sarah Street and Joshua Yumibe, *Chromatic Modernity: Color, Cinema, and Media of the 1920s* (New York: Columbia University Press, 2019).

8. The most direct precedent for Kodacolor's lenticular film is the K-D-B process, the patent for which Eastman Kodak purchased in 1925. Albert Keller-Dorian first patented a lenticular photography process in 1908, but it was not made operational until 1922. Nevertheless, lenticular film is founded on parallax barrier technology patented by Ives in 1903.

9. Craig Buckley, Rüdiger Campe, and Francesco Casetti, "Introduction," in *Screen Genealogies: From Optical Device to Environmental Medium* (Amsterdam: Amsterdam University Press, 2019), 8.

10. "A pre-existing relation between media and cultural techniques already determines the way things are to be handled, even before they submit to the subject's will. . . . to inquire about cultural techniques is not to ask about the feasibility, success, chances and risks of certain innovations and inventions in the domain of the subject. Instead, it is to ask about the self-management or auto-praxis [*Eigenpraxis*] of media and things, which determines the scope of the subject's field of action." Cornelia Vismann, "Cultural Techniques and Sovereignty," *Theory Culture and Society* 30, no. 6 (2013): 83.

11. Edward Epstean and John A. Tennant, "Frederic Eugene Ives," *Journal of Applied Physics* 9, no. 4 (April 1938): 227–228. See also Sean Cubitt, *The Practice of Light: A Genealogy of Visual Technologies from Prints to Pixels* (Cambridge: MIT Press, 2014), 88.

12. For more on subjective vision, see Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge: MIT Press, 1992). On nineteenth-century color vision studies, see Paul D. Sherman, *Colour Vision in the Nineteenth Century: The Young-Helmholtz-Maxwell Theory* (Bristol: Adam Hilger, 1981).

13. Frederic E. Ives, *Krōmskōp Color Photography* (London: Photochromoscope Syndicate, 1898), 54.

14. Frederic E. Ives, "The Optics of Trichromatic Photography," *Photographic Journal*, January 1900, 99. "There are three spectrum colours, which

by admixture in suitable proportions will reproduce to the eye the sensation of every other spectrum colour."

15. Letter to F.E. Ives from W.N. Jennings, 18 December 1930 in Library of Congress, Washington, DC, Frederic Eugene Ives and Herbert Eugene Ives Papers, 1869–1957, Box 1: General Correspondence, Folder "1930."

16. Charles de Kay, "The Ives Parallax Stereogram and Its Uses," *Wilson's Photographic Magazine* 40, no. 287 (1903): 463. In another anecdote, Jennings recalled a demonstration for a disbelieving patron who thought the image was a trick of mirrors. Ives then photographed and displayed the man's own pipe, much to his amazement. Letter to F. E. Ives from W. N. Jennings, 25 November 1930, in Library of Congress, Washington, DC, Frederic Eugene Ives and Herbert Eugene Ives Papers, 1869–1957, Box 1: General Correspondence, Folder "1930."

17. Erkki Huhtamo, "The Four Practices? Challenges for an Archaeology of the Screen," in *Screens*, ed. Dominique Chateau, José Moure (Amsterdam: Amsterdam University Press, 2016), 116.

18. Huhtamo, "The Four Practices?," 116.

19. The color image was not stereoscopic when projected, however.

20. Tom Gunning, "An Aesthetic of Astonishment: Early Film and the (In)credulous Spectator," in *Viewing Positions: Ways of Seeing Film*, ed. Linda Williams (New Brunswick, NJ: Rutgers University Press, 1995), 117. See also Tom Gunning, "Colorful Metaphors: The Attraction of Color in Early Silent Cinema," *Fotogenia*, no. 1 (1995).

21. Ives, *Krōmskōp*, 26.

22. Ives, *Krōmskōp*, 25.

23. "Kinemacolor: New Bombay Venture," *Times of India*, 29 June 1911, 8.

24. André Gaudreault, *Film and Attraction: From Kinematography to Cinema* (Urbana: University of Illinois Press, 2011), 32–34.

25. Kinemacolor, which had wide distribution within the United Kingdom, also distributed films and licensed its equipment internationally. For more, see Luke McKernan, *Charles Urban: Pioneering the Non-fiction Film in Britain and America, 1897–1925* (Exeter, UK: University of Exeter Press, 2013); and Victoria Jackson, "The Distribution and Exhibition of Kinemacolor in the UK and the USA 1909–1916" (Ph.D. diss., University of Bristol, 2011).

26. Although "applied methods" have historically been associated with the earlier cinema of attractions, the relationship between applied color and narrative occupies a spectrum within which the myriad applied techniques function. Hand coloring, stenciling, tinting, toning, and combinations thereof can work to support or enhance narrative by "coding" various narratives emotionally and also disrupting narrative as an attraction in itself. See Joshua Yumibe, *Moving Color: Early Film, Mass Culture, Modernism* (New Brunswick, NJ: Rutgers University Press, 2012).

27. Palace Theatre of Varieties Program, 26 February 1909, in National Science and Media Museum, Bradford, UK, 2005–5002/8/1/14/1; and "The Spectator," *Outlook* 96, no. 14 (1910): 767. See also "Kinemacolor: The Scala," *Tatler and Bystander*, 2 August 1911, 128.

28. Palace Theatre of Varieties Program. The program notes that the film *Sweet Flowers* will first be shown "as an ordinary Black and White Bioscope view. After an interval of two seconds for adjusting Colour Filters to the Urban Bioscope Machine, this same picture will be shown in its natural hues and tints."

29. Emmanuelle Toulet, *Birth of the Motion Picture*, trans. Susan Emanuel (New York: H.N. Abrams, 1995), 16–17

30. Gunning, "An Aesthetic of Astonishment," 114–133.

31. Luke McKernan, "'The Modern Elixir of Life': Kinemacolor, Royalty and the Delhi Durbar," *Film History* 21, no. 2 (2009): 122–136. See also Simon Brown, "Colouring the Nation: Spectacle, Reality and British Natural Colour in Silent and Early Sound," *Film History* 21 (2009): 139–149.

32. "Kinemacolor: New Bombay Venture," 8.

33. Urban made several narrative films. Some notable examples include *By Order of Napoleon* [*The Story of Napoleon*] (1910), *The Scarlet Letter* (1913), and the feature-length *The World, the Flesh and the Devil* (1914).

34. Tom Gunning, "Attractions: How They Came into the World," in *The Cinema of Attractions Reloaded*, ed. Wanda Strauven (Amsterdam: Amsterdam University Press, 2006), 36–37.

35. Gunning, "Attractions."

36. Birk Weiberg, "Functional Colors: The Varied Applications of Complimentary Hues," *Film History* 29, no. 2 (2017): 91–107. According to Weiberg, the ambiguity of the term *stereoscopic* in the early decades of the twentieth century indicates the conflation of "the mimesis of natural colors and the mimesis of three-dimensional space," 92. See also Kim Timby, "Colour Photography and Stereoscopy: Parallel Histories," *History of Photography* 29, no. 2 (2005): 183–196.

37. Victor Flores, "The Animation of the Photographic: Stereoscopy and Cinema: The Experiments of Aurélio da Paz dos Reis," *Early Popular Visual Culture* 14, no. 2 (2016): 97.

38. Although *L'arrivée d'un train en gare de La Ciotat* did not screen during the first public exhibition of the Lumières' films at the Grand Salon in Paris on December 28, 1895, it was already legendary by 1900 and considered a "first film." Martin Loiperdinger, "Lumière's 'Arrival of the Train': Cinema's Founding Myth," *Moving Image* 4, no. 1 (Spring 2004): 89–118.

39. "The Exhibition of the Society of Colour Photographers," *British Journal of Photography* 57, no. 2616 (1910): 472. See also Leon Gimpel, "Making Anaglyphs by the Autochrome Process," *British Journal of Photography* 58, no. 2674 (1911): 51.

40. Ray Zone, *Stereoscopic Cinema and the Origins of 3-D Film, 1838–1952* (Lexington: University Press of Kentucky, 2007). See also William A. Crespinel and William T. Crespinel, "Pioneer Days in Colour Motion Pictures with William T. Crespinel," *Film History* 12, no. 1 (2000): 65.

41. Crespinel and Crespinel, 65. The authors describe anaglyph shadowgraphs performed in the Ziegfield Follies in which the audience wore blue-and-red glasses.

42. Crespinel and Crespinel, 66.

43. "Tarkington Picture at Strand Theater," *Hartford Courant*, 13 April 1924, 2C.

44. *Ives-Leventhal "Plastigrams": The Third Dimension Movie*, lobby card (Educational Film Exchanges, 1924), in Margaret Herrick Library, Academy of Motion Picture Arts and Sciences, Los Angeles, Core Collection, Production Files.

45. "New Plastigrams Will Be Offered at the Howard," *Atlanta Constitution*, 14 December 1924, 10.

46. Britt Salvenson, "A Stereoscope in Every Home," in *3D: Double Vision*, ed. Britt Salvenson (Los Angeles: Los Angeles County Museum of Art; New York: Delmonico Books; Munich: Prestel, 2018), 51–73; and Philip Sandifer, "Out of the Screen and into the Theater: 3-D Film as Demo," *Cinema Journal* 50, no. 3 (2011): 62–78.

47. Sandifer, 78.

48. Weiberg, "Functional Colors."

49. *The Power of Love* (1922), the first American feature anaglyph 3D film, possibly inspired Ives and Leventhal's own effort. The film, which uses both 3D effects and separate, color-coded two-dimensional endings, was screened only twice in anaglyph for exhibitors and press, achieving a wider theatrical release in 1923 as a black-and-white two-dimensional film under the title *Forbidden Lover*. It was the only film made with the two-projector Fairall-Elder process.

50. Crespinel and Crespinel, 66.

51. Ray Zone, *Stereoscopic Cinema and the Origins of 3-D Film, 1838–1952* (Lexington: University Press of Kentucky, 2014), 127.

52. Leventhal and John Norling experimented again with anaglyph 3D short films, called "Audioscopiks," in the 1930s. Feature-length 3D was most popular in the 1950s in B movies, which typically used polarization for 3D effects rather than anaglyph to create 3D illusions. Polarization techniques continued with spatial novelty uses of 3D. *13 Ghosts* (dir. William Castle, 1960), however, revived anaglyph for a novel narrative purpose. When the film is seen through the red filter (or "Ghost Viewer") of two-color glasses, the viewer sees a ghost. When the viewer looks through the blue filter (the "Ghost Remover"), the ghosts are not seen. Experimental filmmaker Ken Jacobs has been engaged in 3D and stereoscopic filmmaking for decades, employing anaglyph along with many other techniques. Jean-Luc Godard presents a complex engagement with the possibilities of 3D cinema in *Goodbye to Language* (2014).

53. Holograms also work by compressing information. See Taylor Walsh, "Virtual Space, Bodily Matter: Bruce Nauman's Holograms," *Grey Room*, no. 79 (2020): 6–39.

54. By 1930, as many as two hundred thousand amateur home filmmakers may have been active in the United States, creating a new mass market for home moviemaking, although weekly attendance at movie theaters in the same period was around 115 million. Ben Singer, "Early Home Cinema and the Edison Home Projecting Kinetoscope," *Film History* 2, no. 1 (1988): 48. For more on amateur film and Kodacolor, see also Marsha Gordon, "Lenticular Spectacles: Kodacolor's Fit in the Amateur Arsenal," *Film History* 25, no. 4 (2013): 36–61.

55. Porter, "Home Movies in Colors."