Color

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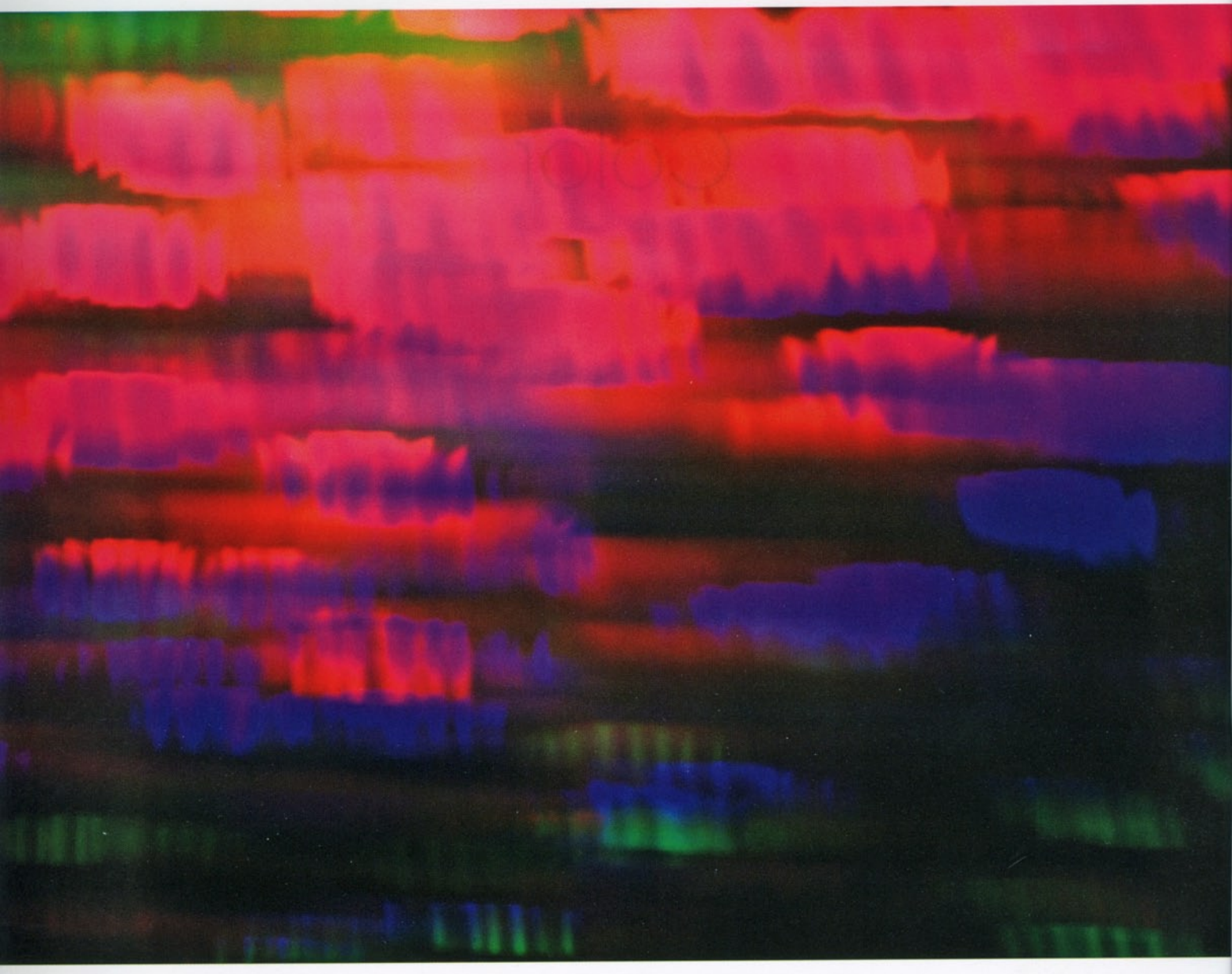
Sixth edition



Color Photography

Black-and-white photography records differences in value, but color photography must also record differences in hue and saturation. The procedures and chemistry used to do so are complex and involve both additive and subtractive color mixing systems.

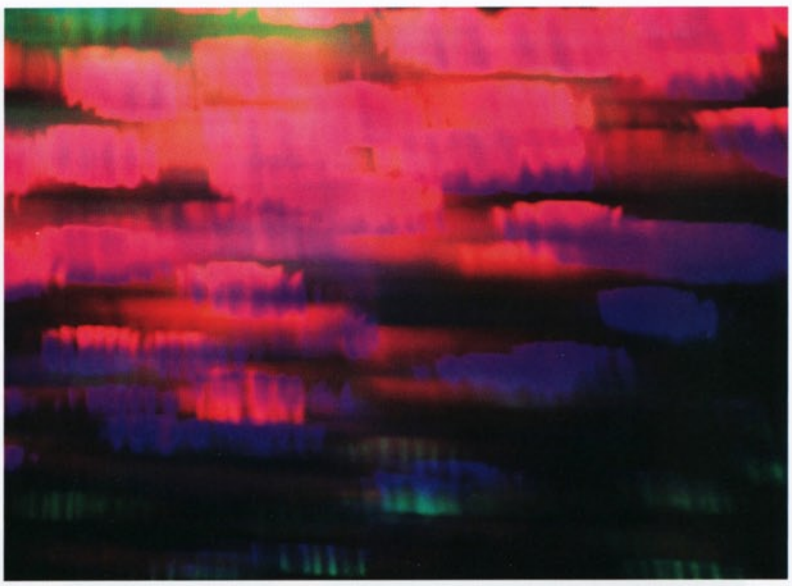
For both color prints and transparencies, the recording of colored images on film typically begins with an **integral tripack**: film with three thin layers of gelatin with sensitizing dyes. These dyes are now so sensitive that they can register light beyond the limits of the visible spectrum, from about 200 nanometers at the ultraviolet end to more than 1,300 nanometers at the infrared end. When the tripack is exposed to an image, it registers the image in the light primaries—blue, green, and red—by separating metallic silver grains from the silver halides. The result is invisible, however, until it is developed.

In the **color positive** or **reversal process**, used largely for transparencies such as slides, each layer is developed with chemical couplers that cause dyes to be released in unexposed areas in the subtractive primaries yellow, magenta, and cyan. When all three are superimposed, the area will appear black, the result of subtractive mixing. Areas of yellow and magenta will appear orange; yellow and cyan will make green; and magenta and cyan create blue.

In a **color negative process**, typically used for making color prints, dye-forming couplers are in the tripack itself. The first developer brings out the complementary colors in the exposed areas as a color negative. This color negative may then be printed onto special paper containing more dye-forming couplers in color-sensitized layers. The couplers in the paper will turn cyan, magenta, and yellow into their additive complements: red, green, and blue.

Many elaborate chemical adjustments and refinements are made to enable color reproduction by these methods to be as accurate as possible, without bias toward any particular area of the spectrum. This accuracy is often aesthetically desirable, for many photographers seek out interesting or beautiful color effects in the world around them and then attempt to record them on film, as in Eliot Porter's capturing of a fleeting moment of the vivid effects of sunlight on water (**7.16**).

◀ **7.16 Eliot Porter, *Pool in Brook, Pond Brook, New Hampshire*, 1953**
Dye-transfer print, 10 1/16 × 8 5/16 ins (27.1 × 21.1 cm).
© 1990, Amon Carter Museum, Fort Worth, Texas, Bequest of Eliot Porter (P1989.19.23).



▲ **7.17 Yves Ullens, *The Imaginary Garden*, Brussels, 2004**
C-type print, edition of three. 150 × 210 cm (59.1 × 82.71 in).
This photographer has mixed colors by moving his camera, shooting out of focus, and using a long exposure time so that local colors overlap and softly blend, and the scene before him becomes what it is not.

However, sometimes the artist's purposes are better served by distortion of the colors of the original image. Belgian photographer Yves Ullens develops shimmering color effects by using a long exposure time, shooting out of focus, and deliberately moving his camera, creating new hue blends that obscure the original subject (**7.17**).

As a photograph is taken, manipulation of exposure time and choice of film will affect value and contrast but hue will remain largely unchanged. Colored filters placed over the lens will bias the results toward a certain color; diffraction filters will bend light into prismatic effects. Dramatic alterations in color may also be made in the darkroom, using techniques such as chemical toning, **solarization** (whereby the development process is briefly interrupted by exposure to low-intensity colored light, reversing the colors especially in high-value areas), and **posterization** (whereby continuous tone images are converted into distinct flat tones, in any color).

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