

IMAGE

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THE NEW COLOR EXHIBITION

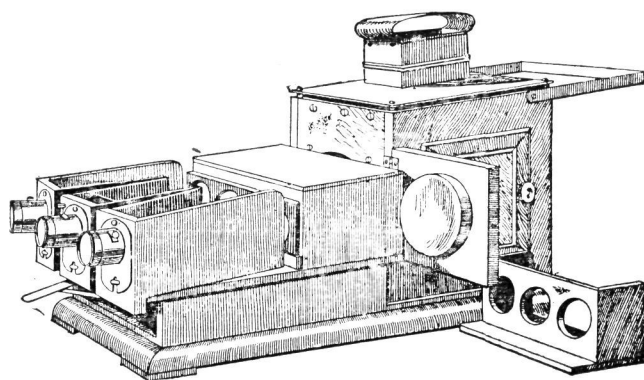
A PERMANENT exhibition of the principles and history of color photography has been installed at the George Eastman House. This important addition to the museum was made possible by the generosity of Leopold Godowsky and Leopold Mannes, the inventors of the Kodachrome process of color photography. Four rooms on the second floor have been completely redesigned for this purpose.

The first room contains demonstration apparatus, set up to be operated by the visitor on pressing a button. Newton's classic experiment is recreated by projecting a beam of white light through a prism, thus forming a brilliant spectrum with all the colors of the rainbow. Having seen this analysis of white light, the visitor next sees how white light can be created by mixing the three primary colors. On a translucent screen, overlapping red and green circles form yellow. They are replaced by overlapping circles of green and blue, and red and blue. Finally three circles, red, green, and blue overlap to form white light. A similar demonstration is arranged so that the visitor, by turning knobs, can add red, green, and blue light, in varying amounts, to make any desired color.

To show that the color of objects depends upon the light which they reflect, or transmit, a series of boxes are set up which contain colored objects. These are examined by light of various colors, and the changes are explained.

A scale model house, with landscaped grounds, is displayed as a test subject for the demonstration of additive color photography. Beside the model are black and white lantern slides of the model with the red, green and blue filters through which they were taken. Identical slides are projected on a translucent screen in the same cabinet, first singly in red, green, and blue, and then altogether.

The concept of the subtractive colors is shown by first presenting on a translucent screen white light formed by the mixture of red, green, and blue light. Then, one by one, the primary red, green, and blue lights are removed: the remaining colors are, by definition, subtractive. Pigments of these colors—cyan, magenta, and yellow—are mixed on an artist's palette; an explanation is given by means of crossed strips of transparent material. There follows a set of negatives, taken through red, green and blue filters. Positives from these negatives, dyed cyan, magenta, and yellow, are then shown singly and in register: the subject is the model house. Thus the visitor has the opportunity to compare color photographs made by the additive and subtractive techniques of the same subject.



PROJECTING KROMSKO color lantern slide projector, built in 1895 by Frederick Eugene Ives. The outside lanterns are pivoted, so that red, green, and blue pictures can be shown side by side on a screen. When they are brought together, a natural color photograph is seen. An example of the Kromsko, presented to the George Eastman House by Dr. Herbert E. Ives, has been set up in the new color exhibition so that it can be operated by visitors.

The meaning of spectrographic measurement of colors is demonstrated by a device which projects a spectrum onto a target. The beam is interrupted by a Fresnel lens, so that part of the spectrum is collected onto a second target, forming white light. When masks are introduced into the beam, only part of the spectrum is projected. The masks are superimposed on the spectrum on the first target, describing the familiar curves of spectrographs. The second target shows the color represented by the curves.

Through the generosity of Prof. R. W. Wood, one of the original diffraction photographs invented by him is shown in a special illuminator: this colorless slide becomes a vivid color photograph when observed through a peephole. Two rare interference color photographs, made by Gabriel Lippmann in 1900 and bearing his signature, show the brilliance of this unique but impractical technique, in which color is recreated physically.

The historical display begins in the second room, which is entirely dark. When the visitor presses a button, a spotlight shines on the original three-color lantern slide projector built for demonstration purposes by Frederick Eugene Ives in 1895, and presented to Eastman House by his son, Dr. Herbert E. Ives. This is operable: the outside lanterns swing out, the spotlight is extinguished, and red, green, and blue pictures appear beside one another on a screen. A spoken commentary describes what is going on. The three pictures then merge together, to form one of the earliest existing natural color photographs.

The third room, also dark, contains examples of the screen plate and mosaic transparencies—Joly, Finlay, Autochrome and Dufaycolor processes—as well as additive color projectors employing the triple lens principle and lenticulated film, which project images on pressing a button.

Stereoscopic photography in colors is presented by the Kromskop of Ives, set up in a case so that it can be viewed. Two-color techniques are illustrated by the Kinemacolor projector and subtractive transparencies.

Special illuminated panels in the fourth room are hung with color prints, made by the most important of the seemingly countless ingenious techniques which have been devised during the past fifty years. Special emphasis has been laid upon the carbonyl and the dye transfer processes. Through the courtesy of Technicolor Corporation, a scale model of one of their cameras is included.

The modern monopack color process, which was first made practical by the work of Leopold Godowsky and Leopold Mannes, is explained in detail by examples, diagrams, and a display of the actual chemicals used in the color development of Kodachrome film. Color negatives and color prints, made by the monopack systems, have been contributed by the Eastman Kodak Company and Ansco.

The new color exhibition has been designed so that it can be revised, in order that new material, both historical and current, may be added.

THE MISADVENTURES OF L. L. HILL

THE following paragraph appeared in a pamphlet published in 1850 by Levi L. Hill in Lexington, New York, titled *Treatise on Daguerreotype; The Magic Buff and other improvements*.

NATURAL COLORS

Several years experimentation have led us to the discovery of some remarkable facts, in reference to the process of daguerreotyping in the *colors of nature*. For instance, we can produce *red, blue, violet, and orange* on one plate, at one and the same time. We can also produce a landscape with these colors beautifully developed—and this we can do in only one-third more time than is required for daguerreotype. The great problem is fairly solved. In a short time it will be furnished to *all* who are willing to pay a moderate price for it. Our friends will please keep us apprized of their P. O. address.

For years daguerreotypists had been seeking just such a process, and the news was picked up at once by the photographic press. Samuel Dwight Humphrey, editor of the *Daguerreian Journal*, even traveled to the lonely mountain village of Westkill, N.Y., to see Hill. "Could Raphael," he wrote on his return, "have looked upon a *Hillotype* just before completing his Transfiguration, the palette and brush would have fallen from his hand, and this picture would have remained *unfinished*."

Daguerreotypists asked how they could learn the secret. Hill refused to deal with them until he had perfected his process. When Edward Anthony, head of the largest stockhouse, offered to raise subscriptions at \$100 apiece, Hill replied that he could

not commit himself and that he preferred to raise funds for further experimentation by the sale of his new book.

This led many to dismiss the color announcement as a publicity stunt. Hill's biography gave them every reason to believe so. Born in Athens, N.Y., in 1816, he first became an apprentice printer and then, at twenty, a preacher. To eke out his slender salary, he began to publish religious tracts, thousands of which he sold by mail order. Forced to give up preaching because of chronic bronchitis, he became a daguerreotypist. At that time trade secrets were imparted only for substantial consultation fees. Instruction manuals hardly existed. Here was a wide-open field for an enterprising publisher.

In 1849 Hill published the first edition of his *Treatise on the Daguerreotype*. The next year he issued a second edition, priced at \$3.00, three thousand copies of which were bought. *The Magic Buff*, in which the color process was announced, was a supplement to this *Treatise*.

When news came from France that a similar technique had been invented by Niepce de Saint Victor, the impatience of American daguerreotypists was heightened by national pride. Urged to demonstrate his process, Hill promised to exhibit results in September, but in the fall he stated that he was not yet ready. Humphrey, the editor of the *Daguerreian Journal*, again went to Westkill. He came back chagrined and disappointed: "We cannot see that Mr. H. has advanced a single step for the last six months." At a meeting of the New York State Daguerreian Association a committee of investigation was formed. After visiting Hill they reported that he "has not only deluded many professors of the Daguerrean Art, but he has deluded himself."

Hill produced testimonials. Experienced operators swore that they had seen him operate. The most impressive witness was Samuel F.B. Morse. "It gives me great pleasure," he wrote Hill, "to testify, from ocular demonstration, to the reality of your discovery.... You have laid the foundation on which will be built a splendid structure." The testimonials were printed in a pamphlet in which Hill announced the publication of yet another book. But when it came out, it was found to be a reprint of the *Treatise*, with not a word about color. Hill's complaint that he was having difficulty getting yellow, prompted a Philadelphian to suggest that daguerreotypists, clad in chrome breeches, should march in procession to Westkill.

Finally, in 1856, *A Treatise on Heliography* appeared. More than half the book was taken up by anecdotes and testimonials. The directions for making a Hillotype were so complicated and confusing that they must have meant nothing to practicing photographers. The publication of the book was followed by complete silence.

Hill died in New York in 1865. In an obituary it was stated that Hill "always affirmed... that he *did* take pictures in their natural colors, but it was done by an *accidental* combination of chemicals which he could not, for the life of him, again produce." There is evidence to support this explanation. Under certain conditions, colors appear on a daguerreotype plate. Overexposure, for example, produces a distinctly bluish tone—so that most galleries had blue shirt fronts on hand which sitters were asked to put on over their white ones. But most daguerreotypists believed that the whole thing was humbug, and that the pictures were hand colored. Not a single example is known to exist, and the truth is still not known.

GEORGE EASTMAN'S GELATINO-BROMIDE PLATES

By E. K. Hough

From *The Philadelphia Photographer*, January, 1880

In November, 1879, the dry plate was still a novelty. Only a few firms manufactured them, and all over the country experiments were being made, and new developments watched. This article is perhaps the first reference to the dry plates made by George Eastman. George Hibbard Monroe (1851-1916), who was using the new plates, taught George Eastman the wet plate process of photography in 1877, and Eastman conducted many experiments with gelatin plates in his studio.

IN THE November number of the *Philadelphia Photographer*, I noticed an allusion to the working of gelatin plates in Rochester, and being there a few days later, I made inquiry, and found it true that a young photographer there, celebrated for the excellence of his views in that beautiful city, was using gelatin plates with great success as to quality and certainty of results.

The plates I saw, negatives of both summer and winter scenes, were characterized by great delicacy of detail, yet vigorous and bright.

I especially noticed one of the Genesee Falls, taken with the recent snow covering the ground, which was without any hardness or loss of detail in either lights or shadows. This I considered a most difficult test.

He intends to use the plates in gallery work, and said that a day or two before he had taken a portrait indoors in two or three seconds, fully timed on a gelatin plate, which was under-timed under the same conditions with a good working regular bath and collodion, with twenty seconds, and that speaks volumes for its rapidity.

He works the modified Bennett process, but modestly disclaims any credit of his own, giving all the honor, whatever there may be, to Mr. George Eastman, an amateur there, who worked it all out in his own way, and gave it to Mr. Monroe.

I asked if he thought the lake had any influence. He laughed at the idea, and he does not believe that it makes a particle of difference. I asked if he found any difficulty in hot weather, as some have. He said, not any; some of his best negatives were prepared and made in the hottest part of the summer.

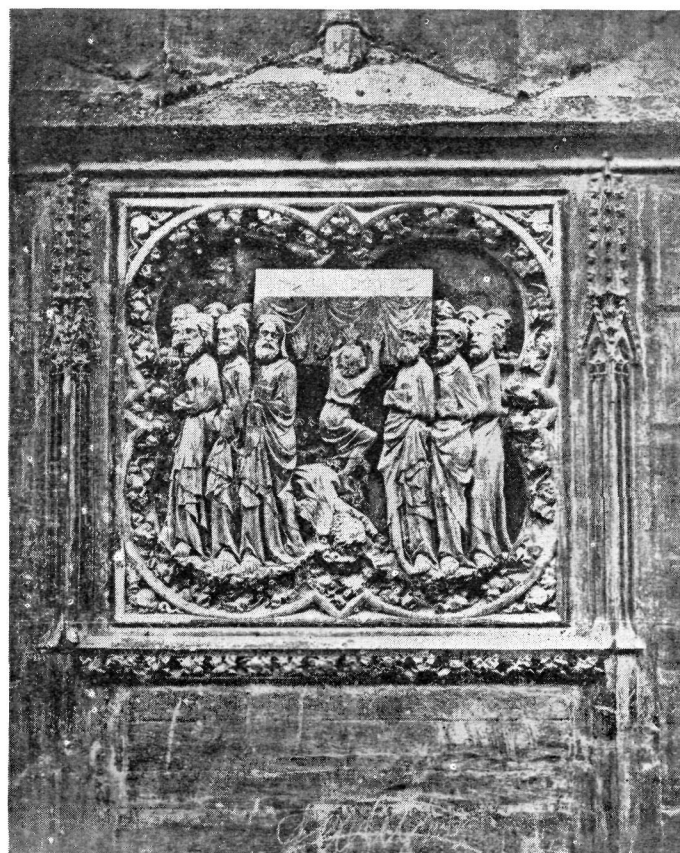
The power of controlling it thus is what Mr. Eastman has discovered, if I rightly understood him, and is what will make it generally practical.

FORGOTTEN PIONEERS

III: HIPPOLYTE-LOUIS FIZEAU (1819-1896)

ONE of the first scientists to turn his attention to the daguerreotype process was Hippolyte-Louis Fizeau, a French physicist, who pioneered in the measurement of light. In 1840 he devised a method of increasing the brilliance of the daguerreotype image by treating it with gold chloride, and in 1841 he showed how daguerreotypes could be printed on paper.

The daguerreotypes which Daguerre exhibited were grayish in tone and were difficult to look at. Furthermore the silver amalgam of which they were formed was extremely fragile.



EARLY PHOTOGRAVURE, etched by Fizeau in 1843 from a daguerreotype of a bas relief on the Cathedral of Notre Dame, Paris. Published in the album, "Excursions daguerriennes."

Fizeau proposed to convert the image to gold, and he described his technique to the French Academy of Sciences in 1840. After development in mercury, the metal plate was rinsed with water and fixed in a solution of sodium thiosulphate (then called hyposulphite of soda) containing gold chloride. The plate was then washed and put on a perfectly level support, called the "gliding stand." Enough gold chloride was poured over it to cover the surface, and then a flame was held beneath it for a minute or two—until the image turned purple-brown. The plate was then washed and dried.

Fizeau explained the reaction as follows: "Silver has been dissolved, and the gold has been precipitated upon the silver, and also upon the mercury; but with very different results. The silver which, by its polish, forms the dark parts of the picture, is in some degree browned by the thin coating of gold which covers it, whence results an increased intensity in the black parts; the mercury, on the contrary, which forms the whites, increases in strength and brilliancy by its amalgamation with the gold, whence results a greater degree of fixity, and a remarkable augmentation in the light parts of the image."

This toning technique, although devised for daguerreotypes, was universally used to obtain brown tones on printing paper in the 19th century, and is still a common technique.

Fizeau's second invention was one of the first attempts to reproduce photographs with printer's ink. The fact that the daguerreotype was a direct positive, which was unique, led at once to experimentation. Fizeau proposed to duplicate daguerreotypes images by converting the silvered plate to a printing plate.

He discovered that the silver and the silver amalgam which composed the image were acted upon differently by nitric and hydrochloric acids, and he could thus produce a slight relief. The etched areas he filled with linseed oil. He then deposited gold on the unprotected areas by electroplating. These gold plated areas resisted the acids used for etching the depressions still further. The result was an intaglio plate which could be printed like a visiting card: ink was smeared over the plate, then the surface was carefully wiped bare, leaving the ink only in the depressions. Paper, pressed over the plate, pulled ink from the open areas.

In the second volume of a picture book of reproductions from daguerreotypes titled *Excursions daguerriennes*, published in 1843, there are, among the hand-drawn copies of views taken all over the world, two pictures made by the Fizeau technique. Although crude, they retain the precision of the original daguerreotype image.

THE TRAGEDY OF "FAUST"

FAUST, the 1926 film of F.W. Murnau, was the last great venture in studio magic achieved by the German cinema.

It was a production rich in glittering European talent: Sweden's Gosta Ekman played the lead, Emil Jannings acted Mephisto and the cast included Yvette Guilbert, Camilla Horn and William Dieterle who has long been one of America's ace directors.

The memorable sets were designed by Robert Herlth and Walter Roehrig; Roehrig had worked on *Caligari* and both artists did the settings for *The Last Laugh*. The cameraman, Carl Hoffmann, is considered by such masters as Karl Freund to be the world's greatest cinematographer.

When the film was finished, Murnau, Jannings, Dieterle and Camilla Horn all came to America; Ekman returned to Sweden, Yvette Guilbert to Paris and the Golden Age of the German cinema was ended.

After only a quarter of a century, finding a complete version of *Faust* proved exceedingly difficult. From private collections incomplete copies of the film that had been released in France and Germany were obtained. Finally, a collector in Ohio, Jan B. Wahl, provided a Danish print—the most complete that had been seen thus far in the United States.

Each of these copies contained scenes not in the others. Attempting to assemble a complete version for Eastman House, it was discovered that in many instances scenes identical in action were slightly different in their interpretation.

In shooting a film the director makes several "takes" of each scene and later selects with great care the best. He then supervises the editing of the entire picture or, in very rare cases, edits the negative himself.

After the final negative has been assembled as indicated by the director, the film can be considered a complete realization by an individual artist.

But the *Faust* situation demonstrates a deplorable hazard.

Out-takes, those rejected by the director, were frequently assembled to provide second, third, or even fourth-rate negatives for export prints.

Such apochryphal versions account for the interpretive discrepancies in the various copies of *Faust* examined at Eastman House. The American version released in 1926 contains still other alterations.

In restoring a film of this sort, following an original scenario is of little help where one has a choice of several different aspects of the same scenes.

Now Murnau, Jannings, and Ekman are all dead. Who can presume to say which of these various versions represented Murnau's intention?

The problems of film scholarship are similar to those of the historian of literature confronted with mutilations and mutations of an author's work.

Critical analysis of a director's specific film should take into serious account this question: has the writer seen a genuine Murnau, an authentic Renoir, an actual Feyder, or has he looked instead at a compilation studded with scenes deliberately rejected by the artist?

NOTES

Aperture, a new magazine published quarterly by Minor White, 135 Jackson St., San Francisco 11, California, has made its first appearance. Beautifully printed, the first number contains two stimulating articles: "The Exploratory Camera," by Minor White — a discussion of the esthetics of the miniature camera — and "The Caption," by Nancy Newhall—an inquiry into the relationship of word and picture. The foreword, signed by a group of photographers including Ansel Adams, Dorothea Lange, Barbara Morgan, states that "*Aperture* is intended to be a mature journal in which photographers can talk straight to each other, discuss the problems that face photography as profession and art, share their experiences, comment on what goes on, descry the new potentials." *Aperture* fills an important need in photographic literature.

With this issue, *Image* suspends publication until September, 1952. It is the aim of *Image* to publish articles which will explain the development of photography as an art and a science, and will record its progress in every field of human endeavor. The response to the first four issues of this publication have been most encouraging, and the editors wish to express their thanks to the many readers who have written to us. We welcome contributions in any field, and will be glad to receive suggestions for future articles. Material which appears in these pages may be reprinted, providing credit is given to the George Eastman House.

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