FUGITIVE COLOR

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A National Invitational Show
of Color Photography

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The Problems of the Kodak Ektacolor Print System.

Note: Kodak Ektacolor prints, such as those in this exhibition, are sometimes — incorrectly — referred to as *Type C Prints.* The name Type C is now a generic term which has come to mean *any* type of color print made on a negative-printing color print material produced by Kodak or any other manufacturer in which color image dyes are formed by a process known as chromogenic development. When Kodak first began to market a user-processed paper for printing color negatives in August of 1955, the company called the paper *Kodak Color Print Material, Type C;* in May of 1958 Kodak changed the name to *Kodak Ektacolor Paper.* Even though a "Type C" paper is no longer being made, use of the term has persisted, however, among some photographers and commercial processing labs. Since there are, of course, real Type C prints — those made in the several year period following the paper's introduction in 1955, the use of the term for contemporary *Ektacolor* prints is not technically correct.

The problem with Kodak Ektacolor prints is simple: they fade. The prints not only fade when they are on display and exposed to light (one might even be tempted to forgive the product if this were its only fault): much worse, Ektacolor prints also fade in the *dark.* How fast they fade in dark keeping depends on the storage temperature and relative humidity. Data recently published by Kodak indicates that Ektacolor prints kept in the dark in a low humidity, air-conditioned environment (75°F at 40% RH) will suffer a small but noticeable amount of fading in only eight years. In 25 to 30 years the prints will have suffered a visible loss of contrast and a serious color shift toward red-yellow because of cyan dye fading; the whites in the prints will have significantly yellowed. And that is when the prints are kept in the *dark* except for occasional viewing; if the prints have the misfortune of being displayed for 25 to 30 years, the condition of the images could be far worse. Fading and staining aside, another potential problem with Ektacolor RC prints, indeed *all* RC prints, is that in 25 to 30 years the resin-coated paper support may have cracked. To be sure, there will still be recognizable images there, but they will not be the same images the artist had created. In the tradition of the art world, where one can find Rembrandts in pristine condition after hundreds of years of constant display, 25 to 30 years is not a very long time. In diverse medium collections such as that of the Museum of Modern Art, one would be unlikely to find *any* type of artistic media with worse dark keeping properties than Kodak Ektacolor RC prints. Even 18th century watercolors, some of which fade quite rapidly on exposure to light, generally have very good dark keeping stability.

A period of 25 to 30 years also is not very long compared to the potentially very long life of black-and-white photographs. The images of black-and-white photographs are composed of finely divided silver particles dispersed in a gelatin emulsion (because of the surface characteristics and microscopic size of the silver grains, they absorb light and appear black instead of exhibiting the bright reflective properties we usually associate with silver). As such, silver is not subject to fading as a result of exposure to light nor is it adversely affected by normal storage temperatures and relative humidity. Silver images can, of course, discolor and fade as a result of improper processing or exposure to atmospheric pollutants; black-and-white prints made on RC supports have a whole set of potential stability problems. But, as the many black-and-white prints which have remained in excellent condition for more than one hundred years will attest, correctly processed and washed prints made on conventional fiber-base supports can have an exceedingly long life. We are fortunate Mathew Brady did not print his Civil War photographs on Ektacolor paper!

Do all color photographs fade? With the exceptions of the difficult to manipulate pigment processes such as tricolor carbon/carbro and Fresson Quadrichromie, which usually have excellent light fading and dark keeping characteristics, color photographs have images composed of cyan, magenta and yellow *dyes.* And unfortunately, to a greater or lesser degree, all dyes are subject to light fading. With the exceptions of the types of dyes used in Ektacolor and related print processes (which are synthesized in the thin print emulsion layers during processing by a chemical process known as chromogenic development) virtually all of the dyes in commercial use are very stable in dark keeping. The preformed image dyes used in some color print processes, of which Cibachrome and Kodak Dye Transfer are the most important, have extremely good dark keeping properties; in fact, such prints stored in the dark under typical temperature and humidity conditions are essentially permanent and may well outlast many black-and-white prints. Data published in April, 1981 by Kodak estimates that in dark keeping a Dye Transfer print will last 300 years or more before a small, "just noticeable"

amount of fading takes place. Accelerated aging studies done by the author and others would suggest that Cibachrome prints have similar excellent dark keeping stability. (Note that Cibachrome is supplied on two distinctly different supports, glossy white polyester and semi-gloss resin-coated (RC) paper, but only the glossy polyester version should be used for applications requiring long-term keeping. While the image dyes are the same with both types of Cibachrome, the potential stability problems of the lower-cost resin-coated support render it unsuitable for serious photography.) While it is desirable to have color prints with light fading characteristics that are much better than the current Dye Transfer and Cibachrome processes, the stability of these prints is sufficient to permit display under the proper lighting conditions for a number of years before any visible change will take place.

It is perhaps simple enough to preserve a Cibachrome or Dye Transfer print by limiting its display time (and if need be, making an expendable copy for long-term display purposes); but if it is an Ektacolor print which rapidly fades in the dark, the only known method of preserving it is to place it in a humidity controlled, refrigerated storage facility. While installing a cold storage vault may not be very appealing to, or practical for, the average photographer or collector, it is *necessary* if one wishes to preserve already existing prints made with Ektacolor and related chromogenic processes. Under the direction of photography curator David Travis, the Art Institute of Chicago is building a sophisticated zero degree F cold storage facility for its expanding collection of unstable Ektacolor prints; the vault is scheduled for completion in early 1982. The Art Institute will be the first fine art museum in the world to have such a facility. Travis believes that the Art Institute, which already has one of the best collections of contemporary color photography in the country, will, in about 20 years, possess one of the most valuable Ektacolor print collections in the world, since by that time, most of the other Ektacolor prints from the current era will have significantly deteriorated as the inevitable consequence of normal room temperature storage.

Low temperature cold storage vaults have also recently been constructed at the John F. Kennedy Presidential Library in Boston, Harvard's Peabody Museum, [Gerald R. Ford Library in Ann Arbor], and at Time-Life in New York for its extensive picture collection. One company, Iron Mountain Group, Inc., headquarted in Boston, will even be offering rental cold storage space for color film and photograph collections at its high security underground facilities in New York State. A few photographers working in color, such as Joel Meyerowitz and Stephen Shore, have their own refrigerators for the preservation of their original color negatives; Meyerowitz plans very soon to put at least two copies of each of his Ektacolor prints into cold storage, and he has also begun to issue some of his prints in Dye Transfer. A few fine art institutions have tried to avoid the problem of unstable Ektacolor prints by simply not collecting them in the first place. James Enyeart, Director of the Center for Creative Photography at the University of Arizona, states that the Center will ". . . no longer purchase Type C (Ektacolor-type) prints because of what seems to be irrefutable evidence that Type C prints do fade, however arbitrarily." The Center will, however, accept Cibachrome, Dye Transfer, tricolor carbro-carbon, and Polaroid prints. Until a few years ago, George Eastman House in Rochester, New York also avoided the acquisition of Ektacolor prints as a stated policy. In October, 1975 Eastman House held a colloquium in which preservation experts and photographers working in color assembled from all over the country to discuss the problem. The renowned portrait photographer, Arnold Newman, who attended the meeting, said: "Millions and millions of people have taken color wedding pictures, vacation pictures, and family snapshots. What's going to happen to these pictures in 25 years? They're going to disappear." Newman, who showed the group a number of severely faded Ektacolor transparencies he had taken of President John F. Kennedy, also made the following statement when talking about color portraits (virtually all of which are printed on Ektacolor or similar papers): "These things are hung on walls and they are expected to last. The great American public doesn't know it, but it is buying junk." Junk or not, Eastman House later changed its policy of not collecting Ektacolor prints (a potentially embarrassing situation in light of the fact that this is by far the largest selling print material produced by Kodak, the museum's most important benefactor, contributing more than a million dollars a year to the museum in recent yars). Use of refrigerated storage was one of the major recommendations to emerge from the 1975 conference.

With the acquisition of the 3M-Sipley Collection in 1976, Eastman House has the most valuable collection of historical color processes in the United

States, and probably the world. Many of these early color photographs have already seriously deteriorated because of improper storage in the past and the damage is becoming worse with each passing year. In spite of the immense value of these photographs, many of which were made by color processes (including the early processes which led to the present Ektacolor paper) of which examples exist in no other collection in the U.S., Eastman House has yet to install cold storage facilities; the new Director, Robert Mayer, recently stated that construction of a refrigerated storage vault was not "a top priority."

If Kodak Ektacolor paper is "junk," then why is it used by so many competent and well-meaning photographers, such as those represented in this exhibition? Do they know that it fades? Even in the dark? Do they care? Why don't they make Cibachrome or Dye Transfer prints? Do the people to whom they sell their Ektacolor prints know about these fading problems? Do the *buyers* care? Can't Kodak make a better paper? Can't Fuji of Japan, or Agfa of Germany? Most of these questions defy simple answers, but a few observations can be made about the current state of affairs.

First, is Ektacolor RC paper really junk? Is it the best — and most stable — negative-printing color paper Kodak could make? To answer these questions, it is helpful to go back in Kodak's history to 1935 when Kodachrome 16mm movie film was introduced; this was the world's first successful chromogenic subtractive color film. The following year, in 1936, Kodak marketed Kodachrome in the 35mm format for color slides and thus began the modern era of color photography. While most people found the transparencies to be quite beautiful, there was an obvious desire for prints to hang on the wall and stuff in the backs of wallets. In 1936 it *was* possible to make prints from original Kodachrome transparencies using tricolor carbro or Kodak Wash-Off Relief (a dye-imbibition process that was improved and renamed the Kodak Dye Transfer process in 1946, which, in an essentially unchanged form, is still on the market today). But both of these print processes were too cumbersome and expensive to be suitable for the mass-production of the millions of prints needed for the amateur snapshot market (at this point the general public was quite satisfied with just being amazed that color photography was even possible — hardly anyone gave a thought to the potential problems of color fading!). In 1941 Kodak introduced a low cost process to make prints from Kodachrome slides; the prints were originally called *Minicolor Prints,* with this name later changed to *Kodachrome Prints.* The prints were produced by essentially the same process used with Kodachrome film, the only real difference being that the print emulsions were coated on a pigmented white film base instead of the transparent film base used with films. While Minicolor prints held very poor light fading stability, they had fairly good dark keeping characteristics — much better, in fact, than current Ektacolor prints!

While Kodachrome films and prints were very successful products for Kodak, the company, which from its very beginnings has always been oriented toward the mass market, believed the Kodachrome system had several serious drawbacks. First, in common with all color transparency films designed to be viewed by projection, Kodachrome films had a very narrow exposure latitude, which prevented the film from being usable in simple fixed-exposure box cameras. This limitation alone effectively closed Kodak out of the bulk of the potentially huge amateur snapshot market. Other drawbacks, from Kodak's point of view, were that Kodachrome processing was a complex procedure requiring elaborate equipment and that, for several technical reasons, the Kodachrome prints had to be made on a white plastic film base, much more expensive to produce than conventional paper supports (it was many years later, in 1968, before a low-cost resin-coated support was introduced as a substitute for more expensive film base print supports).

With the Kodacolor process, introduced in 1942, Kodak believed it had solved most of the marketing limitations of the Kodachrome. Kodacolor was a wide-latitude chromogenic color negative material intended for use in box cameras; both the film and prints were relatively simple to process and the prints were made on a low cost conventional paper support. The fact that both Kodacolor films and prints were a stability disaster compared to the Kodachrome materials (a fact that was known to Kodak at the time) did not dissuade Kodak from marketing the products. It was during these very early days of color photography that Kodak adopted a policy of tight secrecy on matters of color stability; the company decided it would not be in its best interests to inform the public of the extreme stability advantages of Kodachrome compared to Kodacolor. Kodak apparently feared that if the general public knew that Kodacolor prints would fade and turn a rather bright shade of orange

in only a few years time, even if kept in an album in the dark, the market for Kodacolor might be seriously restricted. As it turned out, *all* of the billions of Kodacolor prints made from 1942 to 1953 have by now turned to faded orange shadows of their original images, the first great era of color photography to be totally lost due to color fading and discoloration.

In 1953 Kodak introduced an improved version of Kodacolor paper which largely eliminated the problem of orange discoloration; during this period the dye stability characteristics of the prints had also been improved, but the overall stability of the prints remained far from satisfactory. The Ektacolor RC paper of today is the *direct* descendant of those original, now destroyed, Kodacolor prints.

During the early 1940's Kodak apparently made a decision that was to have far-reaching consequences in terms of color stability: the company decided that it should try to satisfy the requirements of nearly *every* branch of photography with one basic color print material. This allowed considerable economies of production and a concentration of research activities. The design, processing speed, and cost requirements of this color print material were unfortunately dictated by its principal market: drugstore photofinishing. This is a hotly competitive market where every fraction of a cent in print costs is considered important. Thus, we have arrived at the present, with many serious photographic artists using a color print material whose every design aspect was dictated by the drugstore photofinishing business. The Kodacolor prints you pick up at the corner drugstore are printed on the *very same* Ektacolor paper used by the artists in this exhibition! A sad state of affairs. Very few people know that the most expensive print they can buy from their local portrait studio is also printed on this same drugstore paper; in fact, because of the stability problems associated with the lacquering and retouching commonly done in the portrait field, there is a good possibility that the drugstore Kodacolor print, made on Ektacolor paper, is *more* stable than these expensive portrait and wedding photographs.

Could Kodak have made a better paper for printing color negatives? The answer is *yes.* Back in 1941 the Kodak research laboratories had perfected a silver dye-bleach material called *Azochrome,* which was rather similar in concept to the present-day Cibachrome. It has been reported that Kodak planned to introduce the Azochrome process in 1941, but the outbreak of World War II postponed the introduction of the materials. By the end of the war, Kodak decided to concentrate its efforts on the basic Kodacolor process for the general market and let the already existing Dye Transfer process supply the needs of the specialized, and small, advertising reproduction market. Azochrome was never to be heard from again (it was early in 1981 before Kodak would admit that Azochrome even existed). A number of exquisite examples of prints made with the Azochrome process can be found in the collection of George Eastman House; their images have remained in essentially unchanged condition since they were made in 1941. Azochrome was probably the most stable print process ever devised by Kodak; at the very least the process was capable of being essentially permanent in dark keeping. It was also probably the highest resolution print material ever made by Kodak. While in its original form Azochrome was a direct positive material for printing color transparencies, technology developed by Kodak for other products some years later (and currently used in Kodak Instant Color Film PR10) would have allowed the production of a direct printing high-stability material for making prints from color negatives. Kodak's decision to abandon Azochrome in favor of the lower cost and easier to process Kodacolor-related materials was an unfortunate consequence of the company's policy of attempting to satisfy all market requirements for a negative-printing material with a single product. It has been reported that even Dye Transfer was almost taken off the market in the 1960's. If, in the early 1940's, Kodak had considered good color stability to be an important design requirement, we would now have an alternative Kodak print material *far* superior to present-day Ektacolor RC paper.

What is needed from Kodak, obviously is a *new* product: a premium quality high-stability color paper for printing color negatives to supplement the current Ektacolor paper. In view of the seriously inadequate stability of current chromogenic print materials such as Ektacolor, despite over 40 years of intensive research efforts to improve them, it is apparent that other technologies will have to be used to produce a new high-stability color paper. Of available color image forming technologies, the silver dye-bleach process (Azochrome!) appears to be the most logical approach to design a better negative-printing paper; this process would certainly yield a color print which is essentially permanent in dark keeping, and is potentially capable

of vastly improved light fading stability compared to current Ektacolor. As Kodak holds many patents in silver dye-bleach technology and has continued to do at least some research in this area since abandoning Azochrome in the early 1940's, it is entirely possible that Kodak could introduce such a material in the next few years, if for no other reason than it would produce much favorable publicity for Kodak. The availability of a high-stability product would spare Kodak much of the criticism concerning the poor stability of its print materials directed toward the company; a better color print material would eliminate the ever more frequent public comment on the unfavorable comparison of the stability of Kodak's Ektacolor paper with Cibachrome. For a company that has always prided itself on making the world's best color films and papers, the very existence of Cibachrome must be discomforting to Kodak.

Regardless of what Kodak might decide to do, Fuji of Japan has indicated that it is planning to market just such a high-stability silver dye-bleach material for printing color negatives in the next four or five years. In addition, Ciba-Geigy, the Swiss manufacturer of Cibachrome, may well decide to introduce a negative-printing version of Cibachrome; the company even showed just such a material, called *Cibacolor,* at the same time Cibachrome was put on the market in 1963. The fact that Cibacolor was never marketed was apprently due to Ciba-Geigy's belief at the time that good image stability was not of sufficient importance in the marketplace to allow Cibacolor to compete successfully with the less expensive and much easier to process Ektacolor papers.

Unquestionably the technology now exists to make an excellent and easy to process negative-printing silver-dye bleach material; whether or not such a material will actually be introduced by Kodak, Fuji, or Agfa will depend on how these companies come to view the importance of good color image stability and how much of a market is believed to exist for a high-stability — and high priced — negative-printing product. The fine art market is not large enough to justify the production of a special high-stabiity product; however, there is a potentially huge market for such a material in the portrait and wedding photography fields. Professional portrait photographers are just now starting to realize that the stability of Ektacolor paper is not adequate for their needs. Members of the Wisconsin Professional Photographers Association have formed a group called the "Committee on Faded and Cracked Photographs" which is trying to organize a nationwide class action suit against Kodak, alleging that Kodak has engaged in deceptive advertising by indicating to consumers that their color photographs would last forever, and also claiming that Kodak sold them defective and very rapid fading Ektacolor RC paper during the period of 1969 to 1976. The Committee has also asked Kodak to produce a premium quality color paper for their use, with dark keeping stability at least equal to that of Kodachrome film and with light fading stability at least ten times better than current Ektacolor paper. The State of Wisconsin Department of Justice, at the Committee's request, also looked into the matter and on July 17, 1980, Mark Smith, Assistant Attorney General of Wisconsin, wrote Kodak a letter informing the company that some of its advertising claims (such as Kodak's statements that its color prints would last "forever" or "a lifetime") were in probable violation of Wisconsin's consumer fraud laws. Smith asked Kodak to supply ". . . written assurance of discontinuance of any claims, statements or advertisements which represent that pictures made from your company's materials will last longer than you are aware is the case." Kodak complied and in a letter to Smith, promised to no longer make deceptive claims about the life of its color materials. In 1976, an Iowa professional photographer, Max Brown, filed a one-million dollar suit against Kodak, also claiming that the Ektacolor RC paper used to make his prints was defective (it seriously faded after only two or three years of display, and in many cases the resin-coated support cracked) and that Kodak had made deceptive claims about the paper in product literature and advertisements. This case, expected to come to trial in early 1982, is believed to be the first lawsuit against Kodak concerning the poor stability of Ektacolor RC paper; the outcome of the suit will probably have world-wide implications for Kodak and other manufacturers.

A second possible approach to producing a high-stability color print material is the dye diffusion-transfer process, variations of which are currently used in all the color instant photography processes. Kodak's recent introduction of the Ektaflex PCT print process is an encouraging step in this direction. Ektaflex is an "instant" darkroom material for printing color negatives (a second Ektaflex material for printing color slides will be available in early 1982); its light fading properties are roughly similar to those of Ektacolor, but in dark keeping, Ektaflex is about seven times more stable than Ektacolor

paper. While this is a significant improvement over Ektacolor, the dark keeping stability of Ektaflex is not as good as one would like and not nearly so good as Cibachrome or Dye Transfer prints; in addition, unfortunately, Ektaflex prints are being made with a resin-coated support which under some conditions may limit their potential life in dark keeping.

As Ektaflex materials have been on the market only since October, 1981, none of the photographers represented in this exhibition had been able to make prints with the process at the time the photographs for this show were selected. Also, at present, the maximum print size that can be made with Ektaflex materials is 8 x 10 inches, a limitation that might discourage some photographers from using the process (there is no technical reason why Kodak cannot supply the Ektaflex materials and processor in much larger sizes, and the company may decide to do so in the future). On the other hand, the relatively good dark keeping characteristics of Ektaflex prints may convince many photographers who presently print on Ektacolor to change to the new process and limit themselves to 8 x 10 inches prints for the time being.

Considering the extremely good dark keeping stability of Kodak Dye Transfer and Cibachrome prints, one might wonder why artistic photographers do not restrict themselves to these processes. There is no easy answer to this question, but one thing is certain: it has been only within the last two or three years that very many photographers were even aware of the magnitude of the color stability problems with Ektacolor paper, or had access to specific information about the fading characteristics of the other color print materials on the market. In fact, the very title of this exhibition, *Fugitive Color,* is a reflection of the sudden realization in the art community that Ektacolor prints are doomed to self-destruction in the not too distant future (the word "fugitive" has long been used in the art world to denote very unstable dyes, paints, or other colorants). This author first published comparative stability information, based on his own accelerated aging tests, on color print materials in 1978; the information did not get widespread distribution until February 1979, when *Modern Photography* magazine published an article by this author entitled, "Color Print Instability." A discussion of the stability problems of Ektacolor paper in the article concluded with the comment: "It is not recommended for applications where non-refrigerated long-term keeping is required." It has been only since early 1981, after Kodak decided to change its long-standing policy of secrecy on color stability data, that Kodak began to publish specific information on the light fading and dark keeping characteristics of its color materials; stability data sheets for Ektacolor paper were published in January, 1981, and data sheets for Dye Transfer were issued in April 1981. Kodak's decision to drop its color stability secrecy policy came after intense pressure from professional photographers, archivists, and Hollywood film makers to make the information public. It is also believed that Kodak hopes that by publishing color stability data, it can better insulate the company from future lawsuits like the million-dollar suit filed by the Iowa photographer; Kodak will be able to say that since basic stability information was available for the asking, photographers should not have unreasonable expectations about how long their color photographs will last. Apparently in an effort to avoid undue publicity about the stability data, Kodak has not yet announced the availability of the data sheets in any of its regular company publications; however, anyone interested can obtain the data sheets at no charge by writing to: Sheldon Phillips, Consumer/Professional & Finishing Markets, Eastman Kodak Company, 343 State Street, Rochester, New York 14650.

When writing to Kodak, request a copy of Kodak Publication E-30 and a copy of Publication CIS-50; in addition, individually list each color transparency film, negative film, color paper, etc. for which stability data sheets are desired. Kodak will supply a data sheet along with an actual color print showing the effects of accelerated light fading and dark keeping tests for each product. At this writing, no other photographic manufacturer was willing to publish similar detailed stability information, but it is likely that Polaroid, Agfa, Fuji and the other manufacturers will eventually feel compelled to follow Kodak's lead and make their own secret data public. With the availability of Kodak's fading data, and the increasing number of articles such as this which are concerned with color stability, photographers and collectors alike will become much more aware of the inadequacies of Ektacolor prints. There will almost certainly be increasing market resistance to Ektacolor prints in the fine art field, and this will compel many photographers to look for a more stable alternative. Galleries will have increasing difficulty selling Ektacolor prints as clients reject the idea that their expensive purchases are expendable. In the future one will rarely hear comments

such as the following, quoted in the July 1, 1981 issue of *The Wall Street Journal:* "'The concept of permanence is a human vanity that can become absurd,' philosophizes Lee Witkin, whose New York gallery often exhibits photographs. 'If someone gets a few decades pleasure from a $500 color print, it seems to me they have gotten their money out of it,' he says."

Making photographs with color negative films like Kodak Vericolor II and Kodacolor 400 appeals to many serious photographers for most of the same reasons that amateurs usually find color negative films preferable to color transparency films (it has been estimated that over 80% of the approximately 10 billion color photographs made by amateurs in 1980 were taken with color negative films). Color negatives have wide exposure latitude which allows good prints to be made even if the negatives have been slightly over or underexposed. The built-in colored-coupler masking system (this is what gives negatives their reddish-tan appearance) permits very good color reproduction; prints made from color negatives also generally have very pleasing contrast and tone-scale reproduction. Modern color negative films are very fine-grained and have good image sharpness. Printing color negatives on Ektacolor is a simple procedure, with the material costs less than in any other type of color process (this is of course what makes the system so attractive to drugstore photofinishers). In short, if a visually satisfying color print is the desired end product, the most straightforward approach is to use color negative films and print the negatives on Ektacolor paper. As is obvious from the color photographs in this exhibition, Ektacolor prints can indeed be quite beautiful. The only problem is: they fade. They fade in the dark, and they may crack as well.

For photographers who work with color negatives, there is, unfortunately, no ready alternative to making prints with Ektacolor paper. Cibachrome cannot be used directly, as it is a positive material intended for making prints from color transparencies. There are, however, two approaches that can be used to make Cibachrome prints from negatives: one is to prepare black-and-white separation positives of the proper gamma and print them in registration on Cibachrome. While this is a fairly complex procedure, it does give the photographer complete control over print contrast and color saturation; the prints also have much higher image resolution than Ektacolor prints. The one major problem with this approach is that, due to the separation steps, it is not possible to dodge and burn (lighten or darken by adjusting exposure in selected areas of a print) in the usual manner; one has to make a separate dodging mask. Another way to make Cibachrome prints from color negatives is to print the negatives on Kodak Vericolor Print Film; the resulting transparencies are printed on Cibachrome. This is a simple process, though it does not give the photographer the contrast and saturation controls possible with the separation positive procedure and the results generally will not be quite as good. Increasing numbers of photographers who have traditionally used color negative films have given them up and begun to use color transparency films so they can print directly on Cibachrome; this is a trend that is likely to continue now that the new Cibachrome II materials with improved color and tone reproduction are available. Many photographers felt that previous Cibachrome materials had excessive contrast for most types of color originals. It is, of course, possible to make contrast-reduction masks for printing transparencies, and some photographers use masks as a regular procedure; photographers who have grown accustomed to turning out Ektacolor prints rapidly often object to the idea of masking as an unwanted complexity.

Color negatives can also be used to make Dye Transfer prints; in fact, in 1947, when Kodak introduced Ektacolor Film, its first user-processed color negative film, the *only* way to make prints was with the Dye Transfer process. Kodak Color Print Material, Type C was not available until 1955. Dye Transfer prints can be made from color negatives with either of two approaches. The easiest and most straightforward is to print the negative on Kodak Pan Matrix Film, using the resulting gelatin-relief separations to make the prints; this method eliminates the need for a set of separation negatives, and masks are not usually required. The process affords extensive contrast and color saturation controls; however, in common with all separation processes, it is not possible to dodge and burn without making a separate dodging mask. Another approach which may prove more satisfactory for many photographers is first to make an Ektacolor print from the color negative; this print is used as a guide in printing the negative on Kodak Vericolor Print Film — the idea being to make a transparency that matches the print as closely as possible. Then, the transparency is treated as an "original" and is printed by the conventional Dye Transfer Process,

making a set of separation negatives, masks, etc. One advantage of this method is that dodging, burning, and local filtration changes are all possible when making the Vericolor Print Film transparency. This also allows photographers who prefer to make their own Ektacolor prints, to supply the original color negative and print to a commercial lab, with the simple instructions to match the Ektacolor print as closely as possible when making the Dye Transfer print; this avoids the common problem of the production by a commercial lab of an image which is quite different from that which the photographer intended. Joel Meyerowitz has adopted this procedure for making Dye Transfer prints from some of his color negative originals; he supplies a commercial lab with his original negative and a painstakingly made Ektacolor print; the lab then makes a matching 8x10 Vericolor Print Film transparency and uses this for producing the final Dye Transfer print. In the early days of color, many photographers were content to send their work out to labs and accept whatever print was produced; however, most photographers now realize the necessity of making their own prints in order to have complete creative control over the final product.

Compared with the making of an Ektacolor print, the Dye Transfer Process is a rather complex procedure, and this has limited its widespread use. While material costs are fairly reasonable, making prints is a time-consuming procedure; a Dye Transfer print made by a commercial lab can cost more than $300 for the first print (subsequent prints from the same original are much less expensive). Once a satisfactory first print is made, subsequent prints are easily and inexpensively made; this makes the process particularly appealing for multiple-edition portfolio printing. Because of the essentially permanent dark keeping stability of Dye Transfer prints, the excellent color reproduction and the extensive creative controls possible with the process, Dye Transfer will almost certainly find increasing use by photographers in the fine art field. Kodak has recently indicated that in the not too distant future it will make available a new dye set which will produce prints with much better light fading stability than current Dye Transfer prints (though their dark keeping stability is vastly better than that of Ektacolor prints, the two processes currently have roughly similar light fading characteristics.

When a premium quality high-stability negative-printing color material comes on the market, Ektacolor paper will become obsolete in the portrait and fine art fields with photographers quickly converting to the new product. Like the totally lost eleven year period of faded and orange-stained Kodacolor prints, the Ektacolor RC era will be looked upon as an unfortunate and soon to be forgotten chapter in the history of color photography. Humidity-controlled sub-zero cold storage vaults at the Art Institute of Chicago and a few other institutions will preserve selected relics from the era for thousands of years to come. From time to time, the prints wil be removed from the cold and dry darkness for a short-term exhibition in cool rooms with very low level filtered tungsten illumination. Perhaps one of the shows will be called *Fugutive Color.* People will come from all over the world to see it.

Henry Wilhelm

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