

About the Offset-Printed, PDF, and PDF/A Digital Editions of This Book

This publication was originally published as a high-quality offset-printed Smyth sown hardbound book on June 16, 1993. Printed at Arcata Graphics in Kingsport, Tennessee, the press run was 13,000 copies and the book has long been out of print.

A high-resolution Acrobat PDF of the complete book and each of its twenty chapters was posted on the Wilhelm Imaging Research, Inc. website <www.wilhelm-research.com> on June 6, 2003. Available without charge, more than one-half million copies of the PDF edition of the book have been downloaded worldwide since it was posted in 2003.

Henry Wilhelm and Carol Brower wrote, edited, and designed the page layout for the entire book using Aldus PageMaker software running on Apple Macintosh computers (Aldus Corporation merged with Adobe Systems, Inc. in 1994). PageMaker allowed for the export of a PostScript version of the page layout and, with all of the photographs rescanned, sized, and placed in the layout, it later became possible to produce a compact, authentic PDF file of the entire book, complete with searchable, vector-mapped type, and with high-resolution color and black-and-white photographs.

In order to produce the first PDF edition – a complex task that was undertaken fully ten years after the book was originally published in 1993 – it was necessary to preserve and maintain in operational condition the original Macintosh computers, Mac OS 7.1, the original Aldus PageMaker 4.2 software and associated files, all of the original Bitstream and Monotype digital type fonts used for the book (none of which are now commercially available), as well as the original PageMaker 4.2 text and page layout files, monochrome and color PPD and preference files, and sets of kerning and hyphenation tables for each of the twenty chapters, the book’s cover and introduction materials. All of the original color and black-and-white photographs reproduced in the book have also been carefully preserved in humidity-controlled freezer storage at minus 20°C (4 below zero degrees F).

Migrating the original PDF files prepared in 2003 to the PDF/A-1b format [ISO 19005-1 Level B Conformance] was also difficult, and it proved necessary to reconstruct PostScript files for the entire book and to make changes in the color management scheme in order to comply with the file structure requirements of PDF/A-1b while at the same time preserving the original color and density of the color and black-and-white photographs in the book. PDF/A is standardized within the International Organization for Standardization (ISO), headquartered in Geneva, Switzerland <<http://www.iso.org/iso/home.html>>. Adobe states: “PDF/A stands for PDF for Archiving. It is a set of ISO Standards (ISO 19005) using a subset of the PDF format that leave out PDF features not suited for long-term preservation.” PDF/A is designed for long-term digital preservation and access in archives, libraries, museums, universities, colleges, and other collections <<http://en.wikipedia.org/wiki/PDF/A>> and <<http://www.adobe.com/enterprise/standards/pdfa/>> and <<http://www.adobe.com/enterprise/pdfs/pdfaforAcrobat.pdf>>.

Posted on <www.wilhelm-research.com> on March 18, 2013, the new PDF/A edition of the complete book – and separately, each of the book’s twenty chapters – replaces the original security-protected 2003 PDF edition and it continues to be available worldwide without charge. Historically, it is of interest to note that Adobe released the first version of Acrobat software and Acrobat PDF on June 15, 1993, just one day before this book was originally published on paper on June 16, 1993. Only six weeks earlier, on April 30, 1993, the underlying technology of the network that posted the world’s first Web page was put into the public domain and made free and open to all. Designed by British computer scientist Tim Berners-Lee and a team of physicists and engineers working at CERN (the European Organization for Nuclear Research) in Geneva, Switzerland, Berners-Lee named the new network the “World Wide Web” (www). The first sentence of the first web page read: “The World Wide Web [aims] to give universal access to a large universe of documents.”

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Reviewers Write About the World's First and Only Book On The Preservation of Color Photographs and Motion Pictures

Since its publication in 1993, *The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures*, by Henry Wilhelm and contributing author Carol Brower, has received critical acclaim in more than 100 reviews and articles in newspapers, photography magazines, and museum publications. In September 1994, the book was awarded a special commendation by the Society of American Archivists for “. . .writing of superior excellence and usefulness, which advances the theory and practice of preservation in archival institutions.” Although this fully-illustrated 744-page hardbound book focuses on color photography, it also gives the most comprehensive set of recommendations ever published on the storage and display of black-and-white photographs, and is the first book published in the world on the stability and preservation of color photographs and motion pictures. A free high-resolution PDF digital edition of the complete book was posted on the Wilhelm Imaging Research, Inc. website <www.wilhelm-research.com> in June 2003, and since that time more than one-half million copies of the PDF book have been downloaded. A newly-prepared PDF/A edition of the book was posted on March 18, 2013.

- “The phrases ‘instant classic,’ ‘definitive work’ and ‘standard reference work’ may be somewhat abused these days but if they were ever appropriate it would be to describe the 740 plus pages of *The Permanence and Care of Color Photographs*”
— Joseph Meehan (*Photo District News*, July 1994)
- “ ‘Finally,’ sighs National Geographic Society’s Robin Siegel, conservator of some 12 million photographs. ‘We’ve been waiting for documentation like this from a reputable source.’ Adds Peter Galassi, director of photography for New York’s Museum of Modern Art: ‘Henry’s work has been enormously valuable to us for protecting our collection.’ ”
— Wendy Bounds (*The Wall Street Journal*, August 9, 1994)
- “*The Permanence and Care of Color Photographs* is the most significant photography book to be published in recent years. The book ties together the history of color photography, as well as the latest developments in digital imaging, providing a fascinating overview of where photography has been – and its projected future. As a resource book it is unsurpassed.”
— Scott Teaford (*Communication Arts – 1994 Photography Annual*, August 1994)
- “This book is a must for anyone concerned about archiving color images, and should be required reading for all stock agencies, picture libraries, and corporate archivists”
— George Schaub (*Outdoor & Travel Photography*, November 1993)
- “. . . a front-line report on the fierce battle between the consumers of photographic materials – filmmakers, photographers, archivists, even the public – and the manufacturers, especially Eastman Kodak.”
— A. D. Coleman (*Photography in New York*, January/February 1994)
- “This is the most important book on the craft of photography to have been published in ages. I rank the significance of this book up there with Ansel Adams’ books on basic photography.”
— Ctein (*Photo-Electronic Imaging*, September 1993)
- “I cannot imagine anyone responsible for a collection of color photographic images who will not be richly rewarded by having a copy of this book, for background information and ready reference. I know of no other such comprehensive survey of this whole field, all its information scrupulously researched, clearly and attractively presented.”
— Daniel W. Jones, Jr. (*Peabody Museum, Harvard University*, September 1993)
- “Mr. Wilhelm’s work is a valuable guide for everyone who uses a camera seriously. It is packed with tips on what color film to use, how to find the right processing [labs] and how to mount and store pictures.”
— John Durniak (*The New York Times*, July 18, 1993)
- “With 20 years of intensive research behind it . . . *The Permanence and Care of Color Photographs* reads more like an encyclopedia than a general textbook on the care of color photographs. It is not just about color photography. This book is really the definitive reference book on the preservation of 20th-century photographic materials, and it tells an intriguing story. It does not flinch from identifying the aging characteristics of specific brand names, and in doing so, Wilhelm has helped the photographic community set higher standards for image permanence. This book is also important because it will greatly serve future historians as they examine the transitional years from the dominance of photography based on silver halide chemistry to the emergence and eventual succession of digital electronic imaging.”
— Mark H. McCormick-Goodhart (*Journal of the American Institute for Conservation*, Spring, 1996)

CAMERA

John Durniak

Making Color Last: An Expert Speaks

NOT many photographers walk into a photo shop and ask, "Will the film you're selling me and the prints you make last a hundred years?"

But Henry Wilhelm has spent most of his life in the world of photography testing how long photographic films and prints — both black-and-white and color — can last, and what can be done to make them last longer.

He has just written a book on the subject, "The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides and Motion Pictures." It has long been awaited in the field and is a welcome guide to quality and permanence of photographic and electronic images.

The author is well known as a tester of film and equipment. He was a founding member of the American National Standards Institute subcommittee that created testing methods for measuring the stability of color photographs. He was also a founding member of the photographic materials group of the American Institute for Conservation.

Mr. Wilhelm thinks the transition from black-and-white to color photography has been a rough one. "The change to color," he writes, "resulted in the loss of the essentially permanent images provided by black-and-white photography that had long been taken for granted by photographers and the general public alike."

The major problem with color is that it fades. Just as clothes, car finishes, flags and paint fade, so does color in photographs. The main villains are heat, moisture and light,

In the photographic industry, fading is a major problem, more whispered about than discussed openly. But it is a serious matter for the consumer who sees images growing dim in their frames and for museum curators who must care for perishable treasures. Increasing stability is a high priority in the development, manufacturing and marketing of photographic color films, color papers and processing systems.

The scope of the book is encyclope-

John Durniak is a freelance writer, editor and consultant on photography.

dic. Its 20 chapters cover the past, present and future of knowledge of image deterioration and stability. There are over 2,600 items in the index, and 543 pictures, including many examples of just how color fades. (The book covers products and tests through late 1992.)

Mr. Wilhelm's work is a valuable guide for everyone who uses a camera seriously. It is packed with tips on what color film to use, how to find the right processing centers and how to mount and store pictures.

Carol Brower, his wife, also an expert on preserving images, is listed as a contributing author. She wrote a chapter on the handling, presentation and conservation matting of photographs, a subject of great importance since the chemicals in some mounting materials contribute to image deterioration.

Generously scattered throughout the 744 pages are large, boxed-off blocks of text in which the author names names, describing faults and praising strengths in films, papers, storage systems and processes.

In one such box, he answers one of the most frequently asked questions: What are the overall longest-lasting color transparency films?

Four of the answers come from Fujichrome: the company's professional, Velvia professional, amateur and CDU duplicating films. If projection can be avoided (for example, by showing duplicates instead), Kodachrome professional and amateur films will last just as long. He gives similar information for color negative films in four speeds and for paper to be used in making prints.

These sections, "Recommendations," are the parts most photographers will probably read first.

It may take all summer to get through this large, detail-packed book. But the time to think about lasting quality of color and lasting images is *before* shooting and processing film.

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"The Permanence and Care of Color Photographs" costs \$69.95, plus \$4.95 for shipping and handling, from Preservation Publishing Company, Box 567, 719 State Street, Grinnell, Iowa 50112; telephone (800) 335-6647; fax: (515) 236-0800.

Reviews

Henry Wilhelm with Carol Brower, contributing author, *The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures*. Grinnell, Iowa: Preservation Publishing Company, 1993. ISBN: 0-911515-00-3. (744 pp) \$69.95.

Reviewed by M. Susan Barger

Dr. Barger is at the University of New Mexico's Department of Earth and Planetary Sciences, in Albuquerque, NM 87131. She is perhaps best known for her research on daguerreotypes.

Nineteen years ago, when I was a graduate student in photographic science, a small group of us put in our order for a dozen copies of Henry Wilhelm's upcoming book on the stability of color photographs. At the prepublication price of around \$2.00, how could we go wrong?

There is no question that Henry Wilhelm is largely responsible for initiating the rising consciousness of the importance of photographic image stability that we have seen over the last twenty-five years. Many of us still have yellowing copies of his first book, *Procedures for Processing and Storing Black and White Photographs for Maximum Possible Permanence*, which was first published in 1969. It was printed on newsprint and sold for the grand sum of 50¢. That small book is, as far as I have been able to tell, the first publication for a lay audience that directly addressed photographic processing for maximum permanence. There are older publications on good processing practice, but none of them ties processing to image permanence in such a direct way.

Anyone who has been paying attention to photography during the last twenty-five years knows that, in many ways, Henry Wilhelm has been the David to the photo industry's Goliath. Tweaks from Wilhelm's direction have pushed the photo industry to address the problem of image stability, particularly color image stability, in a much more public and active way than they had done previously.

Indeed, the Image Permanence Institute at Rochester Institute of Technology was established by the Society of Photographic Scientists and Engineers and members of the photo industry partly because of concerns raised by Wilhelm about industrial bias and secrecy. Thus, the Institute, as a nonindustrial center, would address issues of photographic image stability. Further, because Wilhelm was working away in Grinnell, Iowa on color stability, those working in other areas of photographic conservation were able to say with some authority that although color was an almost insurmountable problem, the information that curators, collectors, and archivists needed in order to care for these ephemeral objects would finally be available when Wilhelm's book was published. The book was coming any minute.

Long ago, we gave up waiting for the book, but I was very pleased to see that this past fall Wilhelm's great work was finally published. The question that needs to be asked here is, "Was it worth the wait?"

The Permanence and Care of Color Photographs is full of information, much of which has never been available or has never been gathered together in one place. The research described in the book is ongoing and the results are current to the end of 1992, the time the book went to press. For those that find the book overwhelming, it is possible to get the "take-home message" by reading just the Recommendations found in most of the chapters. The items that have grabbed the most press attention in the wake of the book's appearance are from the list in Chapter 1 of recommended products for obtaining the most stable photographic images. Wilhelm names names and spares no company in his critical evaluations of the stability of various color photographic products. While he may seem heavy-handed towards Kodak, this probably has more to do with the dominant market position that Kodak has enjoyed, especially in the United States. There is also a measure of glee that we take when the veil of industrial secrecy is pierced and we see that an industrial giant did not always operate in the most honest way. For instance, in his history of modern color imaging materials (i.e., Kodachrome® and subsequent products), Wilhelm points out that Kodak has issued products knowing that they were not stable and has deliberately replaced more stable products with less stable products. The situation was amplified by advertising rhetoric that calls us to preserve our precious moments on film. Several chapters, especially the one on wedding and portrait photographers, point out the often poignant and tragic loss that occurs when photographic images have faded away. This loss is emphasized in many of the illustrations throughout the book.

If the reader is interested in how Wilhelm arrived at his product recommendations, the first third of the book provides detailed descriptions of his tests and testing procedures. I found the delineation of his approach to testing imaging stability absorbing and quite pertinent to both the common use of photographs and to how we see. The section on accelerated aging procedures for color materials is very detailed and brings up issues that should be considered by anyone who uses accelerated aging testing for any type of materials. Wilhelm provides a good history of image stability testing and carefully describes the contributions made by the entire photo industry, especially Kodak, in this area.

There are two chapters devoted to the color films used in the motion picture industry. This includes recommendations for preserving what is now in archives and describes the best available current products for the production of new films. One entire chapter is devoted to Technicolor®, its history and properties.

Finally, the last ten chapters of the book are devoted to the care, storage, and display not only of color photographic materials of all types, but also of black and white materials. There are lengthy discussions of adhesives and mounting, marking methods, conservation matting, mat boards, storage envelopes, sleeves, boxes, and the like. This portion of the book brings together much of the work on the care and conservation of photographic materials which has evolved over the last twenty-five years and puts it in one place for the reader.

This book, in spite of its mostly positive qualities, should have been edited for continuity. The book was obviously written at different times, because much of the same information is repeated over and over again in the various sections. As persistent readers approach the back of the book, they may become confused and think they are reading some previous section. A good editor could have made the book more compact and easier to read and would have enhanced access to the valuable information and message that this book carries. I was also struck by a comment made by a photo curator when I said I was writing a review of this book. He said that the book looked so much like a chemistry text that although it is a "must-have" addition to any photo library, it was probably too difficult for him to attempt to read. This is not a chemistry book, for there is little or no information that could be called chemistry. Despite its appearance and technical content, this book can be profitably read by anyone with an interest in photographic preservation.

This book will not be widely available through your local bookstore, so those interested in purchasing it should contact the publisher directly. The address is: Preservation Publishing Co., 719 State St., Grinnell, Iowa 50112-0567. The cost is \$69.95 per copy plus \$4.95 shipping.