

12. The Handling, Presentation, and Conservation Matting of Photographs

By Carol Brower

Introduction

The survival of original photographs requires a solid appreciation of their value. This begins with the photographic manufacturers, who must produce inherently stable color and black-and-white materials. It is then the photographer's responsibility to select the most stable materials available and to process them correctly. Thereafter, proper display and storage, and careful handling, will be required throughout a photograph's existence to prevent otherwise inevitable damage and deterioration.

Making top-quality photographic prints is an exacting process. This chapter is concerned with the intimate physical care of such prints: It tells why it is necessary to provide individual physical protection for valued photographs and illustrates how conservation matting can make an important contribution to both their preservation and presentation. The text is divided into four sections which deal with "Attitudes and Practices," "Aesthetic Considerations," "Mount Boards," and "Mat Construction."

Although general recommendations can be made for the handling, mounting, display, and storage of artistic and historical works on any type of paper, photographic papers require special consideration because of their unique physical characteristics. For example, most photographs cannot be flexed without risking damage to the emulsion, and fingerprints leave their mark more readily on photographs than on most other kinds of paper. Photographic images are very sensitive to contamination by certain kinds of chemicals; therefore, the materials that will come into contact with photographs, or will be used in their vicinity, must be selected very carefully.

Photographic conservation is a relatively new field, and because of the many unanswered questions about the interactions between the various types of photographic materials and mount boards, papers, adhesives, tapes, polyesters, and so forth, few absolute statements can be made as to which materials and practices are best. Sufficient information is available, however, to allow certain recommendations which, when followed with an ever-vigilant attitude of care and caution, can contribute much to preserving photographs.

This chapter is addressed to a wide range of people active in fine art, historical, and professional photography fields; this includes the manufacturers and distributors of the many products used by photographers and those who collect and care for photographs. Unless otherwise noted, quotes are taken from among the 65 individuals who responded in full to this author's survey, "The Care and Pre-

sentation of Photographic Prints" (see **Appendix 12.1**). Although many outside references are cited, this chapter draws chiefly on this author's experience during the past 21 years in providing conservation matting for a colorful segment of the photographic art community centered in New York City.¹

Section One: Attitudes and Practices Regarding the Care of Photographs

To a great extent, the value of an object, whether artistic or historical, depends on its physical condition. Obviously, historical photographs are more valuable when in perfect condition, but it is usually possible to obtain from them the desired information despite cracked emulsions, scratches, or fingerprints. With a work of art, however, deterioration changes its very essence, and defects of condition cannot be overlooked.

This author's experiences with fine art photographers, curators, collectors, and dealers have, with some exceptions, revealed a high level of concern about the physical condition of photographic prints and their proper care. More than three out of four respondents to this author's survey said that print condition is usually very important when they are purchasing photographs; another 20% replied that it is very important "sometimes." Only 3 individuals (less than 5%) wrote that it is not very important; those 3 were photographers. Writing in the June 1986 issue of *American Photographer*, Bonnie Barrett Stretch noted the connection between rising prices, print "connoisseurship," and increased concern regarding photographic preservation in the photography art market: "Top dealers are no longer satisfied to get a great image; they want a print to be exceptionally well made, in excellent condition."²

In response to another survey question, a significant majority felt that all people who are involved with historical and artistic photographs have a responsibility for their preservation. About 10% said that collectors and museums alone should bear this responsibility. Peter MacGill, Director of the Pace/MacGill Gallery in New York City and a dealer with experience in many areas related to fine art photography, said, "Each time a photograph changes hands, the responsibility for its preservation is passed along with it. All of our photographs receive the best possible care, and every major photograph we sell is accompanied by a written evaluation of its condition, prepared for us by one of the foremost experts in paper conservation, Betty Fiske. Important works must be preserved, otherwise we're not doing our jobs."³

Unfortunately, the eventual importance of a photograph or other artwork is usually not evident when it is made. Artist Peter Wilsey commented, "In Leonardo's case, he

See page 441 for Recommendations

Photographs in this chapter were taken by Carol Brower, except where noted.



July 1987

People of all ages, walks of life, and nationalities visit The Edward Steichen Photography Center at the Museum of Modern Art in New York City. The exhibition above, **William Rau and the Railroad**, was on view from July 2 to September 29, 1987. As was the case with this exhibit, most photographs displayed in museums are conservation matted and framed under glass or Plexiglas acrylic sheet.

probably didn't know that people would still be amazed by *The Last Supper* 500 years after his death. . . . [Also,] sometimes things which were created casually become important later on."

Growing Concern About the Conservation of Photographs

Photographers alive today benefit from the fact that many people, including photographic manufacturers, are showing increased concern for the stability and preservation of photographs. Museums have become aware of the special procedures necessary to preserve color photographs and some farsighted institutions, including the John F. Kennedy Library, the Jimmy Carter Library, the Art Institute of Chicago, the Historic New Orleans Collection, the Museum of Modern Art in New York City, and the National Gallery of Canada, have installed cold storage facilities to assure the long-term survival of the ever-increasing numbers of color photographs in their collections.

For the first time in history, significant information is now available regarding the long-term stability characteristics of most photographic materials, and many photogra-

phers have become aware that among available color print materials some products are much longer lasting than others and that there are significant differences in light fading and dark fading stability. For example, it is well documented that color photographs printed on Kodak Ektacolor 74 RC Paper can fade perceptibly if displayed under common conditions in as little as 3 or 4 years; worse, they suffer significant cyan dye loss and start to shift toward red in less than 10 years even when stored in the dark at room temperatures. (Ektacolor 74 RC Paper was replaced in 1985 with Ektacolor Professional Paper, a product that has significantly better stability in dark storage, but only marginally improved light fading stability — see Chapters 3 and 5.)

It has also been noted that Polaroid Spectra instant prints (called Image prints in Europe), SX-70 prints, Polaroid 2, and Polacolor ER prints have comparatively poor image stability when exposed to light on display.

In recent years many articles in the photographic press have helped publicize the previously little-known fact that Cibachrome (renamed Ilfochrome in 1991) and Kodak Dye Transfer prints are essentially permanent in room-temperature dark storage, and that it is *not* true, as some people think, that "all color photographs fade." UltraStable

Permanent Color Prints and Polaroid Permanent-Color Prints, both of which employ extremely stable pigments instead of the organic dyes used in most other color processes, may be displayed for hundreds of years under typical conditions without noticeable fading.

When individuals were asked in the survey, “In general, do you feel that a photographer should be informed in advance about the stability aspects of the materials he or she intends to use (e.g., potential problems with black-and-white RC papers; potential fading of colored mat boards)?” more than 90% said yes. All 10 individuals representing the conservation field said yes. All 65 respondents had an opinion on the subject, including such written comments as “Of course!” and “Always!” Arnold Newman, the well-known portrait photographer, wrote “Absolutely!”

These feelings were elaborated by Susan Harder, a print curator, dealer, and former Director of the Susan Harder Gallery in New York City, who wrote, “I feel strongly that manufacturers *must* inform accurately (or bear the consequences of misinformation) the purchasers of their products, and give them information as to ‘archival’ qualities. I also feel strongly that artists, dealers and collectors *must* inform potential buyers, or recipients, about the archival qualities of the pictures, their chemical history, so to say.”

Peter Wilsey pointed out, “I think we all wish that Leonardo had painted *The Last Supper* on canvas instead of a wall, but he didn’t know what would eventually happen to it.”

Henry Wilhelm voiced his conviction that it is vitally important for photographers to be informed of stability factors in advance, but added:

Aesthetic considerations are very important too. If Vericolor III negatives printed on Fujicolor paper give the kind of luminous color and long-scale tone reproduction the photographer wants, then these materials are probably what should be used. Fujichrome, Ektachrome, or Kodachrome transparencies printed on Cibachrome [Ilfochrome] afford more stable images, but the visual result may not be what the photographer prefers. The photographer should make the final decision as to which materials to use, but it should be an *informed* decision.⁴

Among photographers the degree of concern about stability varies considerably. According to photographer and Professor of Art Thomas Barrow,⁵ information about the stability characteristics of the materials used by photographers “does not make much difference to many of them.” Miles Barth, Curator of Archives and Collections at the International Center of Photography in New York City, wrote, “Artists and photographers can be stubborn, even when informed.” Three-quarters of the people questioned said they know photographers who are not concerned with the quality of mats and other aspects of presentation. *All* photographers participating in the survey, however, said that they wanted to be informed of stability characteristics of the materials they select to use.

Artist Don Rodan shared his thoughts on the subject:

It is first the artist’s responsibility to consider the most permanent materials available

and to store, conserve, and present his or her prints in the most protective manner possible. If the artist takes these concerns seriously, probably his dealer and possibly his collectors will. It has been my experience that many collectors are more concerned with edition size than with the permanence of the image while more recently more (or at least a few) art dealers are encouraging their artists to print on more permanent materials when using color. These issues are related to both business and posterity in varying degrees to each concerned.

Writer, curator, and collector Pepe Karmel expressed similar thoughts:

As long as a photographer works in a stable medium and follows archival processing procedures, he or she should be free to create without constraints. The collector or curator should try to follow the artist’s desires regarding presentation as far as possible and archivally preferable. I think photographers should, however, give more forethought than they perhaps do to the question of unstable media. They have a responsibility — both to themselves and to museums and collectors — to create images that are worth preserving and also capable of being preserved.

Handling Photographs

After a print has been made, the quality of its presentation and the prospect for its long-term survival ultimately depend on the attitudes of its caretakers. The best and worst of attitudes, as well as ignorance, are reflected in the ways in which photographs are handled.

For example, only 6% of the survey’s respondents observed that most people viewing historical and artistic photographs *always* wash their hands before handling prints. This 6% represented major institutions and galleries whose curatorial policies require staff and visitors to do so when using their collections. Unfortunately, most people do not independently elect to wash their hands or to put on gloves before touching photographs. Therefore, where such a curatorial policy exists, it must be actively enforced to be effective. Nearly 80% of survey respondents said that they thought most people were not even conscious of the way they hold photographic prints, matted or unmatted.

Fingerprints, creases, cracks, and scratches are among the most commonly seen forms of physical damage to photographs. Nearly all of these could be prevented by conservation matting, or by enclosing the prints in polyester sleeves, and by always handling them very carefully and only with freshly washed hands. Clean, well-fitting gloves should also be available at all times.

Unfortunately, only five surveyed individuals said that in their experience most people usually wear gloves while handling unprotected prints. Roy L. Perkinson, Conservator at the Museum of Fine Arts in Boston, offered an explanation: “People often feel that gloves make it difficult to handle prints, to study them, and to write information down

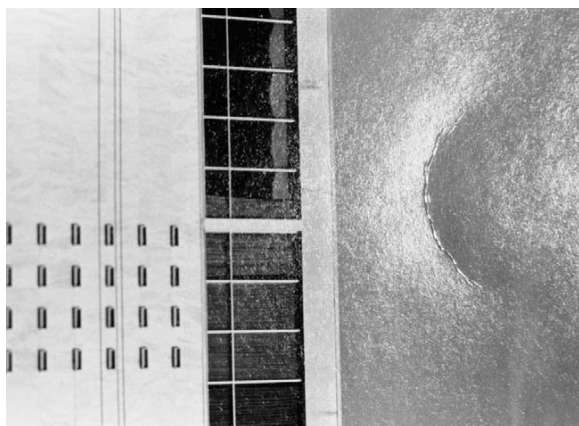
Physical Damage

Photographers spend painstaking energy and enormous amounts of time making fine prints. When a finished print is damaged through careless handling or improper packaging, the photographer suffers regardless of who owns the print. The most common forms of damage include fingerprints, cracked corners, and creases. The all-too-familiar semicircular thumb-crease is caused by holding a print in the wrong place with only one hand or with too much force; single-weight, fiber-base prints and RC prints are particularly vulnerable to this form of damage.

© Lee Friedlander



Cracked Emulsion. Detail of a double-weight, fiber-base black-and-white print by Lee Friedlander that was damaged in transit when one gallery loaned the unmatted, unmounted print to another gallery.



© Harry Callahan

Semicircular Thumb-crease. Detail of an 8x10-inch, double-weight, fiber-base black-and-white print by Harry Callahan that was handled improperly.

© Tod Papageorge



Cracked and Torn Print. Front and back views of an unmounted double-weight, fiber-base black-and-white print by Tod Papageorge that was damaged inside a standard print drawer in a gallery.



at the same time.”⁶ Perkinson reported that visitors to the Museum are instructed in advance on the proper handling of prints. More than 95% of the photography collection is overmatted, and no print may be handled directly if it is not overmatted. The Museum uses polyester enclosures for temporary storage of its photographic prints and for permanent housing of a small percentage of the collection.

The habit and skill of wearing properly fitted gloves while handling photographs can be learned and should be a normal procedure in institutions, particularly when working in files where prints are not physically protected by

polyester sleeves or mats. Henry Wilhelm said:

Many people hate to wear these gloves. . . . You have to consider how many times the photograph may be handled if it is going to be kept for the next 500 years. All of the damage adds up very slowly, but eventually it will severely harm the photograph. Unfortunately, the photographs that get handled the most are the most valuable ones, the ones people want to see and use the most.⁷

Causes and Prevention of Print Damage

When individuals were asked about their experiences with the *causes* and *prevention* of print damage, problems arising from improper handling were significant. For example, Peter Wilsey, artist and a former Light Gallery associate, noted that “customers at Light rendered several prints unsaleable because of their improper handling (No names!) and impatience when viewing.” Victor Schragger, photographer and a former director of Light Gallery, said, “People hold prints improperly. . . by the corners, and with one hand.” Photographer and educator Harold Jones⁸ emphasized: “People should always use *two hands* to handle *all* photographs.”

Ignorance was considered the greatest potential threat to photographs after *improper processing* and *improper storage conditions*. “People generally do not know how to handle prints — *plain* and *simple*,” wrote artists’ representative Rick Wester. Curator Marvin Heiferman advocates “giving people specific instructions before allowing them to handle prints,”⁹ and photographer Allen Schill believes that a good approach to preventing damage involves establishing “environments (galleries, conservation studios, etc.) wherein proper care is the rule, expected of everyone.”

This attitude is shared by many people, but, unfortunately, such expectations and “rules” are still unstated or unenforced in most situations. Sculptor, painter, and photographer William Christenberry said, “Insensitivity in handling on the part of most people who deal with photographs causes print damage. I have had less problems with fellow photographers than with curators, dealers, etc.” An extreme example of carelessness was cited by publisher Caldecot Chubb: “Someone sat on a Dye Transfer print *in my sight* in a gallery.”¹⁰

The making of a fine print is a painstaking experience for many photographers, but they too can be guilty of mishandling photographs. Photographer Ani Rivera remarked, “As soon as the photographic paper is taken out of its box for exposure under the enlarger, creases, bends, fingerprints, and cracks can occur.” After completing prints to their satisfaction, some photographers, such as Dorothea von Haefen and Marie-Claire Montanari, arrange to have the work conservation matted before any other person may handle it. Unfortunately, most people are not as conscientious, and few photographs are in perfect condition by the time they are matted. The vast majority of prints, both old and new, are marred in some way, whether they come from photographers, printers, dealers, or collectors.

Damage to Prints Sent Out for Publication

In response to one survey question, Helen Levitt replied that when some of her prints were loaned to publishers for reproduction, they came back to her with cracked emulsions but that when the prints were matted beforehand they were returned in their original good condition, although some of the mats were damaged. Harry Callahan indicated that “magazines” had damaged some of his prints. Other photographers shared similar experiences.

Andy Grundberg, writer and a photography critic for *The New York Times*, recognizes the potential hazards of loaning and borrowing prints; for reproduction purposes he makes copy prints and transparencies. Grundberg said,

“At *Modern Photography* where I was picture editor for eleven years, we sometimes had problems with prints sent out for reproduction. Once a batch of originals borrowed from a gallery was ruined when a photostat house made notations on each print with a ballpoint pen. Other prints suffered physical damage from printers, who seemed generally unaware of the value of photographic originals. In recent years I have avoided these problems by not reproducing originals. Quality may suffer but the prints don’t.”¹¹

Unfortunately, it is not always possible to use copies. For example, book publishers often prefer to make halftones and separations directly from original prints. In 1977 and 1978, Michael Hoffman and Carole Kismaric, acting on behalf of the Paul Strand Estate and Aperture, Inc., sent both vintage and modern Paul Strand photographs to this author to be conservation matted before they were sent out to have halftones made for publication. It was believed that the mats would probably be damaged and need replacing but that conservation matting should be done in the usual manner in order to protect the prints from direct handling and potential damage.

Fine art consultant and writer Peter C. Jones pointed out, in addition to the above concerns, that a great many pictures are damaged in shipment, which is “the most vulnerable time for any work of art.”

Since highly valued photographs will probably be handled frequently and can also be expected to travel, the expense involved in protecting them is a necessary and worthwhile investment. Use of a collection generally contributes to a greater appreciation of it, but handling and traveling will decrease its value when prints are damaged. Even if they have been duplicated, original prints must be safeguarded at all times because of the loss of image quality and the physical changes inherent in any duplication process. The long-term effects of handling must be considered *well in advance*, and every collector and institution should protect their valued holdings against the hazards of use.

Conservation Matting as One Way To Protect Prints

Conservation matting is often a good initial step in the overall plan for protecting valuable prints from direct handling and also from some of the consequences of cycling relative humidity, such as print curling and warping. When a collection contains thousands of prints that have not been collected with the primary intention of exhibiting them, however, matting is not practical. Gary Albright, Conservator at the Northeast Document Conservation Center in Andover, Massachusetts, noted, “Mats are only one storage possibility. For many institutions mats are financially out of the question as well as unfeasible for other reasons (large amounts of space required, etc.)” As an alternative to matting, institutions may prefer polyester enclosures which are more economical in terms of cost and space.

Even for temporary and infrequent display of selected prints and documents from within such an archive, however, conservation matting will sometimes be necessary. Every collecting institution should have a conservation matting and framing department or enlist the services of qualified people who can help care for its collection and for prints it has obtained on loan.¹²

Most major museums today have conservation departments staffed by individuals who provide matting and framing for the institutions' holdings and for prints obtained on loan for exhibition purposes. Pictured right is James Iska, Preparator for the Department of Photography at the Art Institute of Chicago, demonstrating archival matcutting in the photographic conservation lab.



February 1983

The Individual Collector

The individual or “private” collector may elect to have many, if not all, prints matted since the collection will be handled, displayed, loaned, and sold without the restraints common in institutions. For example, the owner may show photographs to guests on a moment’s notice, change the selection of framed images displayed on walls in the home or office, lend prints to a curator for exhibition, submit prints to an auction for sale, or supply original and irreplaceable material for publication. In all situations, the collector needs to protect his or her property.

Matting prints, compared with other methods of physical protection, such as enclosing them in polyester, is particularly desirable for the individual collector. Matting can enhance the joy of ownership by encouraging the intimate visual study of the print as a physical object: the print’s surface texture and finish, its tones, and its image details may be appreciated without the inevitable loss of clarity caused by polyester enclosures, by the milky translucence of polyethylene bags, or by the normally reflective covering of glass or Plexiglas that is necessary in frames. The viewing of prints is a sensual experience for many people, and mats permit easy visual access to the print while also providing physical protection.

For some people, however, even an open mat hinders full enjoyment. For them, unobstructed viewing must include unobstructed handling, and neither conservation matting nor any other form of physical protection is appropriate. For example, although well-known collector Samuel Wagstaff admitted being more comfortable holding a print protected by a mat or a polyester sleeve than he was holding an unprotected print, he remarked that “it’s *much* more fun the naked way.” Many people share his view that photographs require tactile as well as visual appreciation.

Every manner of intimate handling is, of course, a privilege which carries with it a responsibility to safeguard the condition of the print. A good approach to satisfying collectors, whose feelings are similar to Wagstaff’s, as well as their prints’ need for physical protection, is to design and construct mats or enclosures in ways which facilitate the safe removal and replacement of prints.

Matting and Framing a Personal Collection

Ideally, a print should already be conservation matted at the time it is purchased or borrowed, and more than three-quarters of the survey’s respondents who buy photographs said they wanted to receive their prints in mats at the time of purchase.

It cannot be assumed, however, that every professional framer is familiar with the materials or methods required for the proper mounting of photographs, or that framers will always know when mounting is correct and when it is potentially dangerous. In fact, even in museums and galleries, the people responsible for matting and framing can be equally uninformed, or may not be able to apply their expertise in every situation. For example, several private collectors who lend their prints to museums for public display remarked that their conservation mats were discarded and replaced with “new” but poorly constructed mats by borrowers who set out to standardize the presentation of their exhibitions.

Significant time and money are often spent by institutions in well-intentioned efforts to care for prints on loan. However, deadlines, difficulty obtaining proper materials, special requirements, inadequate facilities, and insufficient funding, as well as ignorance, will contribute to poor-quality matting and framing. Furthermore, when there is a high turnover of works, staffs may not be able to correctly mat and frame every print. For example, the following statement appeared in an exhibition and auction announcement distributed by the Milwaukee Center for Photography: “Photographs are sold in the mats in which they exist. MCP does not take any responsibility for the appearance of the mats or for their conformity to proper standards of conservation.”¹³

In the general marketplace, countless fine prints have been entrusted to well-meaning framers who have sealed the prints in attractive but unintentionally (and invisibly) destructive units constructed of harmful glues, tapes, and groundwood or other high-lignin-content papers that have led to the works’ deterioration, discoloration, or disfigurement. Many framers, gallery personnel, and others have also damaged prints by trimming photographic paper and

original mounts that contained historical information, being tempted for economic reasons to fit prints into existing frames. Damage can also result if hinges are applied to photographs incorrectly or when they are inappropriate. To better judge whether a print has been mounted and overmatted properly, it should be inspected *before* it is framed.

Fortunately, framers are becoming increasingly aware of the need for conservation materials and methods. Most professional framers are willing to discuss their approach to conservation mounting and framing, and will offer their customers a choice from a variety of materials and methods that might be used to mount photographs. The following thoughts were expressed by Thomas Barrow:

Every artist should have a good knowledge of how his work can be prepared for exhibition. This is particularly true for those in the area of works on paper. The next best thing is to have someone. . . [who] can be trusted implicitly to take the work and make it ready for exhibition. I am certain this will have to be the direction of the future — failing this a great deal of art will be lost to the masking tape-chipboard framers. And the sad thing about that is that the private collector is the biggest loser — the one area that artists really need to have their works thrive, since they support living art more strongly than any institution.

Private Collections: Two Approaches

Various approaches have been taken to caring for photographic art. The owners of the Jedermann Collection have demonstrated exceptional care for their photographs by matting and framing every print individually, with concern for overall aesthetics as well as for conservation, after studying each photographer's history and intentions. Their house has become a private museum for their photographs, which are carefully integrated with other works of art, including paintings, drawings, sculpture, ceramics, and rare books. The collection is displayed in a combination of controlled incandescent tungsten and UV-filtered indirect daylight illumination. In addition, their house is equipped with elaborate temperature, humidity, and dust controls.

In a different approach, another family of collectors, who also wish to remain anonymous, have conservation matted their large collection of historical and contemporary photographs in nearly all standard sizes. This enables them to keep a minimum number of frames and facilitates the exchange of prints on display for prints in storage. It also encourages the owners to lend their prints frequently to museum curators for public exhibition. Their system ensures that their prints are not only well protected, but are also easily stored, quickly accessed, and promptly displayed when desired — creating, in the rooms of their house, numerous “galleries” of ever-changing exhibits. In their words: “We would like to simplify our system even more. If it were possible to mat and frame every print in *one* suitable standard size, we would do so.”



Home of the Jedermann Collection . . .

May 1983

Section Two: Aesthetic Considerations and Conservation Requirements

The Function of Presentation

Respect for a photograph is nowhere more evident than in its presentation. To a significant extent, presentation influences the viewer's perception of a picture. Poor presentation can undermine proper appreciation of a photograph as well as of the photographer's intent. In fact, sometimes a picture may not even be noticed or an exhibition may not be viewed in its entirety if the presentation is not carefully planned and skillfully executed. In addition, the kind and degree of attention that a photograph receives often depends on how and where the viewer encounters it. The taking of a photograph is conditioned by the environment in which the photographer lives and works; similarly, an audience's perception of a photograph is affected by the viewing environment. For example, lighting may be inadequate, the pictures may be hung too low on the wall for most viewers, the mats and frames may appear too large, or the pictures may be spaced too closely or too far apart. The glass may be greenish, the mats may have discolored, and the frames may fail to complement the pictures or simply overwhelm them.

Ideas, information, and expressions of beauty that are communicated through the photographic medium are also shaped by the particular process by which the photograph

is made. Just as a watercolor painting of a pear will be different from an oil painting of the same pear, so too will the pear look different if it has been photographed with color negative film and printed on Ektacolor paper or photographed with a transparency film and printed on Ilfochrome. A Polaroid instant color print will produce yet another rendition of the pear. Finally, whatever the selected print material, it will have a different appearance when overmatted, framed, and displayed on a museum wall than when mounted in a photograph album.

Perhaps this should not be the case, but life is full of visually persuasive factors that are introduced intentionally and unintentionally — by creators and caretakers — and affect people both consciously and subconsciously. Without discussing all the various ways in which we are influenced, it should suffice to point out that the manner and form in which a created work is presented preconditions how (and how well) the viewer perceives the image and, to some extent, reshapes the original meaning. In addition, interest in any photograph can be sustained, increased, or diminished depending on how frequently it is viewed. It makes no difference whether it is a privately or publicly held work of art, a historical document, a journalistic photograph, or a family portrait. One has only to ask the following questions to measure the value of a given picture at a given time: Is the work displayed, or is it in storage? What is its physical condition? Who sees it? How often? Does anyone know where it is — or that it even still exists?

In short, if a work is carefully presented, it is more likely to receive proper attention. The attitudes of photographers, curators, and caretakers, therefore, profoundly affect how faithfully preserved are the photographer's original intentions, how a photograph is perceived and received by its audience, and, ultimately, how long a print will remain in satisfactory condition.

The Photographer's Intent and Curatorial Decisions

Before any specific measures are taken to preserve individual fine art photographs, the photographer's intentions about the presentation of his or her work should be understood. Photographers often have specific ideas on the subject of mounting, and these ideas should be followed whenever possible — particularly because matting and other aspects of presentation may vary considerably when the decisions are left to curators or collectors, among whom a print will change hands many times during its existence.

In addition, because aesthetics and conservation are often interdependent, the photographer who is informed about the stability aspects of different mounting materials and procedures, as well as the stability characteristics of the print materials themselves, would naturally be the preferred final judge regarding both the preservation and the presentation of his work. "Michelangelo and his cohorts knew a great deal about materials — it is part of an artist's *craft*. It does not have to hinder creativity or invention," writer Irene Borger reminds us.

Unfortunately, most photographers are not well enough informed to make aesthetic decisions that will also promote the long-term preservation of their work. Product



May 1983

... Johanna in the hallway.



June 1987

View of the Laurence Miller Gallery in New York City as visitors began to arrive to preview the group exhibition **Exposed and Enveloped**, curated by Matthew Postal, in June 1987. Laurence Miller, Director of the gallery, said, “This space was designed to be inviting and to enhance the art I show. Exhibitions such as **Exposed and Enveloped** give us the opportunity to explore the many ways in which a photograph can be used for meaningful expression . . . works that range from the journalistic — for example, Larry Burrows’s color photographs of the Vietnam War — to the manipulated and fabricated, such as Gary Brotmeyer’s one-of-a-kind photographic collages. This diversity of work and the personalities of the artists that make it are what give me the greatest pleasure in running the gallery.”

manufacturers are largely responsible for this because of the frequent absence of accurate and complete information about the stability characteristics of their products. In addition, many people fail to communicate what they know about preservation to others. For example, curators and conservators who safeguard prints and prepare exhibitions are usually aware of a number of suitable mounting methods. They often, however unintentionally, impose their own highly defined values on the mounting by not discussing alternative approaches with the photographer. Not even the photographer can know in advance without careful consideration what will look best and be best for a print. Information about conservation practices and procedures, stability data, available types and sizes of mount boards and frames, restrictions imposed in an exhibition area, financial considerations, and so on should be made available to exhibiting photographers. Collaboration gives everyone an opportunity to share his and/or her particular expertise and can be of value to all. After a plan for mounting, matting, and framing a work has been agreed upon, it should not be altered by anyone without further consultation.

Once in a great while, a curator will create a situation

for which the rules have to be rewritten. One such person is Doris C. O’Neil, Director of Vintage Prints and former Chief of the Life Picture Collection. Starting in 1979 with *LIFE: The First Decade*, O’Neil began organizing museum exhibitions of photographs carefully selected from the many outstanding images taken on assignment for *LIFE* magazine since its beginning in 1936. By having these pictures matted, framed, and displayed in a manner previously reserved for fine art, O’Neil succeeded not only in returning the images to the public and reviving interest in them but also in creating a new audience and a fresh perspective.

Collaboration

There are many viewpoints regarding the photographer’s responsibility toward the presentation of his or her work. Harold Jones remarked, “He or she [the photographer] should be the person to make the decisions. It is the curator’s or director’s job to work it out from there.” Susan Harder felt strongly that “the presentation is the ultimate concern of the owner.” Another dealer said, “The artist has to be able to *release* his work to the care and responsibility of



June 1987

While the Mark Klett exhibition of Kodak Dye Transfer, Ektacolor, and black-and-white prints was still hanging at New York's Pace/MacGill Gallery in June 1987, Director Peter MacGill and his staff started planning the next show of Dye Transfer and Ektacolor prints by photographer Joe Maloney. Exhibitions here and at most New York galleries typically run for about one month. MacGill (right) lays out each exhibit at least three times before the actual hanging begins, saying: "We want to arrange the pictures so that there's a visual continuity but not a visual passivity. There shouldn't be a lull in the viewing. The grouping should have impact, like the way Muhammad Ali used to box. He is absolutely my inspiration for hanging shows."

others who know their business. This is *my* gallery and I want to hang exhibitions without interference. I'm not here to be the artist's servant." (This statement was not made in the survey.)

Photographer and photography historian Beaumont Newhall wrote on the subject:

Edward Weston preferred to present his work simply mounted on good quality board, and when we exhibited them at The Museum of Modern Art they were framed without mats. Our Stieglitz collection was originally in the very frames that Stieglitz designed. I built clothlined boxes in which to store them. I think it is the curator's responsibility to respect the artist's judgment. I know how upset Alfred Stieglitz was [some 45 years ago] when the Boston Museum of Fine Arts put all his photographs under uniform size mounts. The very size of a mount was always specified by Paul Strand, down to the millimeter. On the other hand, Cartier-Bresson prefers unmounted prints, and his archive in the

DeMenil Foundation in Houston preserves them in this form.¹⁴

(Curators and conservators currently associated with the Museum of Fine Arts in Boston informed this author that the Museum's Stieglitz collection is, and has been for at least 20 years, given the individual attention that Stieglitz demanded.)

Portfolios

If the photographer is directly involved in the production of his or her work, the various elements of a portfolio including the case, the mounts, the overmats, the interleaving paper, the text, and so forth become an authentic extension of the work contained within. Emily Aronson of DEP Editions in New York City recognized this and let the photographers make nearly all decisions regarding the design and format of their own portfolios. For example, in late 1982, she produced the *Trilogy Portfolio* by Ralph Gibson according to the photographer's wishes. It consisted of three individual portfolios of pictures selected from Gib-

son's three books: *The Somnambulist* (1970), *Deja-Vu* (1973), and *Days at Sea* (1975). Gibson made all the aesthetic decisions, including the selection of fabric in three different colors to cover the portfolios. The titles were printed on the spine of the cases as if they, too, were books.

In another example of collaboration, a compromise was reached between photographer Larry Fink, publisher Sidney Singer, and this author regarding the mounting of Fink's portfolio, *Social Graces*.¹⁵ Most of the image sizes are about 14x14 inches on 16x20-inch photographic paper. Because the weight, thickness, and size of each individual portfolio was a critical factor, everyone agreed that the size of the mounts should not exceed 16x20 inches and that the prints would be dry mounted on 16x20-inch pieces of 4-ply 100% cotton fiber board without overmatting. This author recommended that the photographic paper be trimmed approximately 1/2 inch on each side before dry mounting to provide a recess from the edges of the mount board, thereby protecting the edges of the photographic paper.

Both Fink and Singer objected to the "look." Singer preferred the dry mounting format used by Ansel Adams, Bill Brandt, Edward Weston, and a great many other photographers, so he would have liked Fink's prints mounted in the same manner. This traditional style of dry mounting involves trimming off all the blank borders so that only the image area remains, and then mounting the print in the desired position on a piece of board. The result can be very attractive; however, it exposes the edges of the image and makes them much more vulnerable to damage.

Larry Fink did not accept either format. He disliked the "frame" created by the board around the edges of the photographic paper, and also said that his placement of the image on the photographic paper was important. To remove more than 1/4 inch of the "blank" photographic paper, which has a unique surface and is also an integral part of the print, would violate his overall aesthetics.

We all compromised. The prints were trimmed approximately 1/8 inch for the following reasons: (1) to match the size of the photographic paper and the dry mounting tissue (manufacturers' standard sizes often vary slightly); (2) to prevent the photographic paper from extending beyond the edges of the mounts; and (3) to help prevent damage to the edges of the photographic paper.

This style of mounting created more work for Fink because, inevitably, the wide borders surrounding the images of some prints had slight stains, creases, or scratches. Fewer prints would have needed reprinting if they had been trimmed to the edges of the image. It also created more work for Arnon Ben-David and Ani Rivera who did the trimming and mounting, because the narrower the border, the more difficult it is to evenly align all the edges. Fortunately, Singer approaches art with concern for its survival and with the attitude that artists' intentions should be respected and followed whenever possible — and, in Singer's words, "Sometimes when impossible."

Clearly, many people in addition to the artist are usually needed to bring about a project of lasting value.

Presentation Design and Format

Presentation design and format reflect an individual's, a community's, or a culture's aesthetic preferences at a

given time and, like other fashions, are subject to change. For example, before 1970 most displayed artistic photographs were unframed and mounted on card stock or thick hardboards, such as those in Edward Steichen's exhibit, *The Family of Man*, which was shown at the Museum of Modern Art in 1955. During that same period, however, exhibitions at Helen Gee's Limelight gallery also reflected the ideas of individual photographers as well as Gee's own approach to displaying prints. For example, when Gee designed the installation for an exhibition of Ansel Adams's photographs in 1956, the prints were overmatted and displayed under glass, according to Adams's usual practice.

Since the mid-1970's, most photographs in museums and galleries have been exhibited in undecorated cotton fiber board overmats (usually white or off-white) within relatively simple metal or wood frames. In addition, most dry mounted photographs are displayed in the same style frames with overmats or with fillets, which help prevent contact between the prints and the glazing when overmatting is not possible or desired. However, far too many prints continue to be placed directly under glazing without mats or fillets, which is usually the result of a lack of knowledge rather than artistic preference.

Arbiters of matting "style" have debated thin borders around the image versus wide borders, floating the image versus covering the edges of the image, showing a signature versus covering it, bulky mats versus no mats versus delicate mats, single-window mats versus multiple-window mats, white mats versus toned mats, textured mats, tiered mats, ornate mats, and so on — and the variations continue. Even the oval picture in an oval mat and oval frame reappears periodically. As time passes, artists' preferences may also change regarding their earlier mounting formats, or an artist may concede to the style of a period. For example, W. Eugene Smith traditionally preferred his photographs dry mounted to black or dark grey illustration boards, but in the 1970's he followed the advice of gallery director Lee Witkin and allowed his prints to be mounted and overmatted with white museum board.

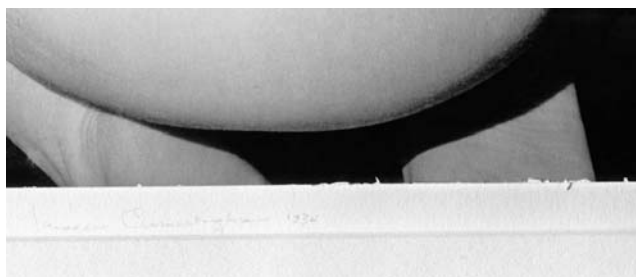
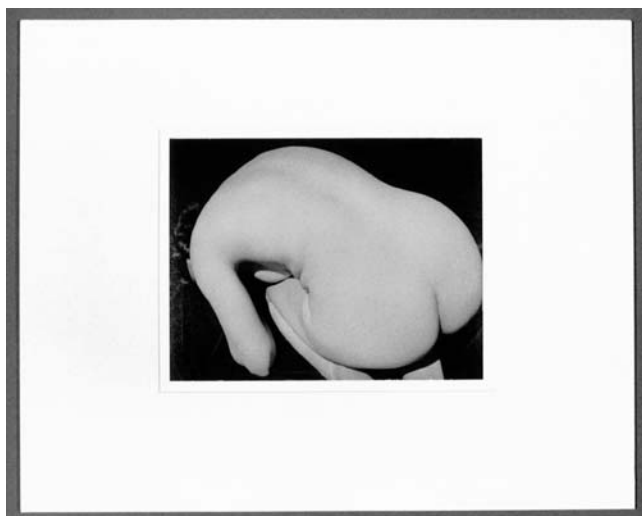
Philip Katcher wrote that the design of a mat can give a good clue to the age of an image,¹⁶ and William Adair made the following comment on the significance of frames:

Picture frames may be seen to reflect not only the unique attributes and preferences of individual carvers and, in some instances, individual painters, but the prevailing artistic trends of the period. In so doing, frames merit study for their own sake as a barometer of artistic taste and form, providing a further means to recreate and appreciate the past.¹⁷

The Practice of Dry Mounting

The practice of dry mounting is also subject to changing fashions and ideas influenced by concerns both for aesthetic effect and longevity. Respondents to this author's survey were divided between those who liked the way dry mounting looks (23%), those who did not (28%), those who liked it sometimes (43%), and those who had no opinion (5%). Over half thought that dry mounted prints are more vulnerable to damage, whereas 28% thought they are less

© Imogen Cunningham



The edges of dry mounted photographs are especially vulnerable to damage. This 1934 black-and-white fiber-base print by Imogen Cunningham has been overmatted to prevent additional chipping of the emulsion. When the photographic paper is trimmed to the edges of the image, it is usually better to float the print within the overmat's window rather than cover the edges. This print is floating approximately ¼ inch to prevent putting pressure on the already damaged edges and to show the photographer's signature.

vulnerable and 21% had no opinion. Those active in the field of photographic conservation were as divided on this issue as were photographers, curators, collectors, dealers, and others.

Several individuals who had dry mounted their photographs in the past said that they no longer do. The consensus was that dry mounted prints are more difficult to take care of and that dry mounting obscures many of the physical qualities which distinguish the different print materials (such as paper thickness and flexibility). Dry mounting is generally discouraged by photographic conservators, in part because most dry mounting adhesives are not easily reversible and little is currently known about their long-term effects upon photographs. In addition, dry mounted prints cannot be wrapped around laser scanner drums to make halftones, duotones, and color separations for publications printing — a serious consideration in museum or other important collections. Since laser scanners have come into widespread use only during the last decade, this is a “new” drawback to dry mounting. (See Chapter 11.)

There were, however, many comments in favor of dry mounting. Laurence G. Miller, Director of the Laurence Miller Gallery in New York City, said, “Dry mounting works, such as Ray Metzker’s 1966 composite ‘Nude [Flashed] Torso,’ which is composed of 140 separate prints mounted to a Plexiglas panel, is an excellent way to combine parts into a whole.” Peter Wilsey made this remark with regard to edge control: “When cropping is *really* crucial, it helps to dry mount and float, rather than risk losing 1/16th of an inch behind the mat.” The dry mounting format of Arnold Newman’s photographs is familiar to people who know his work firsthand. Newman said, “I have prints I mounted back as far as 1938–39 and on — there has been *no* damage. When dry mounted and trimmed to the edge of the image, the print is subject to edge damage unless matted; better to print with a wide enough white border to sign on and then overmat.” Photographer and writer David Vestal wrote, “I’ve had no bad experiences with dry mounting in . . . thirty years.”¹⁸

In this author’s opinion, a dry mounted print usually requires a mat to help protect the edges of the photo-

graphic paper from chipping. Matting is especially important if the print is trimmed to the edge of the image. In addition to protecting the edges, a mat minimizes the possibility of surface abrasion and fingerprints, can prevent the emulsion on the raised print from ferrotyping and even adhering to the glass in a frame, and protects the mount itself from damage.

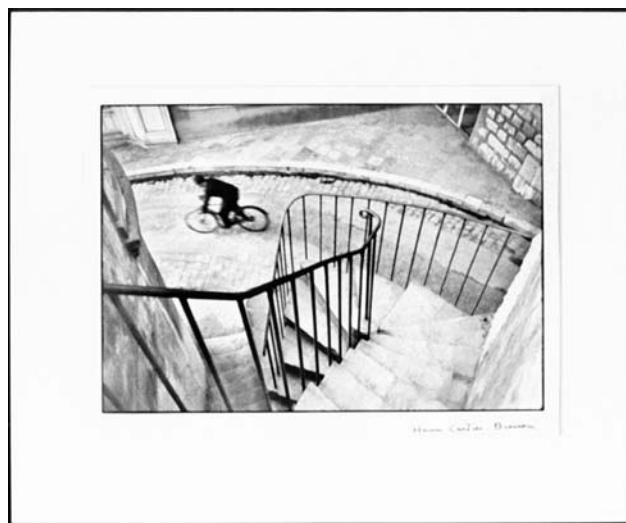
Whatever method of mounting is selected, it will change the appearance of a finished print and affect practical decisions made by the photographer. For instance, prints that are properly dry mounted remain flatter than prints that are not dry mounted. This may be one reason that dry mounted prints are signed on the front more often than unmounted prints.

The Signature

“A signature is generally regarded as an artist’s approval of the final product, and as an indication of authenticity. I only sign things as they leave my hands so that I may edit freely up to that point,” said Peter Wilsey.

Although in recent years more photographers have begun to place their signatures directly on the image (e.g., Mark Klett), the majority of photographs are signed just below the image on the blank border, or on the back. In general, it can be assumed that a photographer who signs his or her prints on the front intends the signature to be seen along with the print. Signatures on photographs are often treated differently, however, than signatures on other kinds of art works on paper. For example, when a signature is prominent, such as those of photographers Bill Brandt, Larry Fink, Barbara Morgan, and Edward Weston, curators and collectors frequently cover it with a mat, preferring to see only the photographic image. This seldom happens to a lithograph or a drawing because those media are generally thought to be more compatible with signatures.

A photographer’s bold signature can affect the composition of a photograph and often shifts the viewer’s focus from the image or adorns it without the photographer having intended to do so. On the other hand, many people find some dominant signatures attractive. For example, pho-



© Henri Cartier-Bresson, Magnum

Some photographers print their pictures with narrow black borders surrounding the image. Such prints can be matted in a variety of ways: (1) float the entire image and black borders to show a narrow, moderate, or wide portion of the white photographic paper; (2) cut the overmat window so that its inner borders are flush with the outer edges of the black borders; (3) cover the black borders with the overmat. When the prints are signed, showing or covering the signature becomes the first consideration. The examples show a black-and-white fiber-base print by Henri Cartier-Bresson overmatted to a standard size with the signature and black border covered (left) and with the signature showing (right).

tographer and collector Susan Unterberg said that she prefers, when given the choice, to see a photograph without a visible signature, “unless the signature goes well with the image (i.e., Bill Brandt).”

Ansel Adams’s small, lightly drawn signature which appears directly below his large-format photographs of monumental landscapes does not stand out and so it is rarely covered by an overmat. The same is true for Arnold Newman’s photographs. Newman, who is best known for his photographic portraits, often dry mounts his black-and-white fiber-base prints on 2- or 4-ply 100% cotton fiber board and then carefully signs them in ink or with a graphite pencil directly below the image on the blank, untrimmed photographic paper, or on the mount board if the paper is trimmed to the edge of the image. Newman places his signature on the right side and the name of the subject and year the photograph was taken on the left. The writing is usually shown when his prints are matted both because it is small and attractive and because it frequently identifies portraits of famous people.

The personal stamps and seals of photographers are often regarded much as signatures. Hans Namuth’s seal (applied with white, black, gold, or silver ink) appears either upon or just below the image of his color and black-and-white prints and is adjacent to his signature, which is also upon or directly below the image. In general, Namuth preferred to show these identifying marks; in a situation where the stamp was very close to the edge of the photographic paper, however, he allowed it to be covered in order to protect the edges of the print. Most of Namuth’s color work was printed by Michael Wilder on the high-gloss, polyester-base version of professional Cibachrome II, Process P-3 (renamed Ilfochrome in 1990).

Photographers may have strong feelings about whether their signatures should be visible when their prints are

exhibited. Photographer Louis Faurer commented:

Dependent on esthetic factors and on the artist’s script, some signatures flow beautifully and some are ugly. Placing a signature on a photograph and or mat is crucial and important. For example, india ink I found on the white portion beneath the image often is distracting and spoils the entire image. Soft pencil on the photograph or beneath and or on the mat often “works.” Grey ink could be experimented with. These suggestions indicate (to me) the vast differences between paintings and photographs.

Beaumont Newhall wrote, “The matter of the signing of prints is most interesting. I agree with [Faurer] that if a print is to be signed, it should be done with a hard pencil that will leave a very light grey impression.”¹⁹

Newhall’s interest in this area is also evident in his Aperture monograph *Frederick H. Evans*, in which Evans’s great concern with presentation is discussed at length. Most of Evans’s prints were mounted on multiple layers of toned or colored drawing papers, which were bordered with carefully ruled lines of light, sepia-colored ink or watercolor. In 1903, when Alfred Stieglitz expressed his disappointment with a shipment of Evans’s unmounted prints, Evans replied, “When you come to see them trimmed, all the white margins off, and the picture in a sympathetic colour mount, you will think better of them.”²⁰ The signature and title often appear below the picture within these borders, sometimes accompanied by Evans’s familiar impressed monogram.

In such cases, no part of the design which the photographer intended to be seen should be omitted. However,

when a monogram appears isolated on the supporting paper away from the signature and outside the ruled borders, or when a monogram is located in an area that is visually distant from the print (such as those that were mounted on single-weight white weave paper after Evans's death), the monogram may be covered without violating the photographer's intentions, unless originally stated otherwise by the photographer.

Signatures are sometimes covered for consistency when matting prints made by different photographers whose works will be exhibited side by side. For example, one museum curator decided to cover Edward Weston's signature when preparing an exhibition in which none of the other prints were signed on the front. Individual wall labels provided the necessary information.

In general, historians and curators view signatures somewhat differently than dealers. Most historians and curators questioned in this author's survey, said that they wanted to see the photographer's signature when looking at prints in a study collection, although they did not object to the covering of signatures when prints are exhibited. Dealers, however, commonly prefer to show the signatures of prints they display for sale, particularly those of well-known photographers. Marthe M. Smith, former Director of the LIFE Gallery of Photography in New York City, encouraged photographers to sign the photographs she exhibited, most of which were famous images that appeared on the pages of *LIFE* magazine in decades past, thereby giving the photographer due recognition.

Beaumont Newhall wrote, "Personally, as a photographer, I sign my prints only at the request of the client if they are offered for sale. All my exhibition prints are unsigned because it seems to be redundant to appear over and over in one man exhibitions."²¹ Newhall also commented, "Occasionally for historical purposes. . . a mat can have one window for the image and one window for the signature. We at George Eastman House did this with the vintage print of H. P. Robinson's 'Fading Away.' Beneath the photograph, about six inches or so below it, someone, presumably the photographer himself, had transcribed a poem by Shelley and this of course was an important part of his presentation."²²

Some photographers' pictures are accompanied by written material which should never be covered. For example, the titles and texts that Duane Michals creates for (or before?) many of his photographs are not supplementary. They are each, words and picture, an integral part of the other; the writing sometimes even occupies more space than the photographic image. When presenting these pictures, the entire object should be shown.

Before signing (especially if there is uncertainty as to how and where to sign), photographers should give some consideration to how a print will look when matted and framed, especially if it is important that the signature be seen at all times. For example, if a signature is very large, the window opening may need to be made larger than ideal, which sometimes requires an increase in the desired overall size of the mat to allow for adequate borders. This affects the composition of the mounted work and may even disrupt a sequence of prints displayed together on a wall.

In addition, if a photograph is not printed with perfect 90° angles at all four corners, it is especially difficult to cut

a mat window with parallel borders all around the image; this may necessitate covering a signature that would otherwise be shown. When the photographer insists on showing a large signature on a dry mounted print, it may be better to frame the work in a fillet frame without a mat. However, this may require altering the original or preferred mounting procedure. (See Chapter 11 for a discussion of print markers.)

The decision to show or to cover a signature should be made by the photographer — who would ideally be advised by a curator or conservator beforehand of potential problems in matting and framing. This author often recommends "opening" the mat window to show both the signature and the four edges of the photographic image.

Image Cropping

Image cropping should be initiated and done by the photographer only. The reason for this is obvious. The very act of taking a photograph involves cropping through the lens. While image format is predetermined by the camera, the photographer decides just what to include and what to omit in the frame. After that, a full-frame negative may be cropped in a variety of ways if the photographer wants to further refine the composition of the picture; it can be done at the time of printing, by trimming the finished print (e.g., when dry mounting), and by covering a portion of the image with an overmat.

Every detail of mounting, matting, and framing affects the visual impression of a picture. Cropping, however, actually changes a picture's composition and content. Unfortunately, cropping by people other than the photographer is common practice. For instance, framers are sometimes careless about measuring the windows in overmats. Publishers often prefer to print only a portion of a picture. Damaged and faded borders are frequently covered by overmats at the instructions of curators and collectors, and sometimes such borders are actually trimmed off.

Prints made for exhibition or publication have also been cropped to conform to prevailing moral attitudes. For example, more than 50 years after its exhibition at the Museum of Modern Art, there continued to be controversy over an Andre Kertesz photograph of a nude woman in which the pubic area was cropped out. Writing in 1982 in *The Wall Street Journal*, Raymond Sokolov said, "In Paris in 1933, [Kertesz] experimented with purposely distorted female nudes, surreal masterpieces with a mysteriously erotic charge. Beaumont Newhall would not exhibit one of them at New York's Museum of Modern Art in 1937 until he had bowdlerized it with some depilatory cropping. 'He mutilated my work,' says Kertesz."²³

Kertesz often recalled the story. Questioned by this author in 1983, Kertesz gave the following details:²⁴ In 1936 he and his wife, Elizabeth, moved to New York City from Paris, where his reputation as an artist was well established. A few months after their arrival, they were visited at their hotel by Beaumont Newhall, Curator of Photography at the Museum of Modern Art at the time, who wanted to exhibit some of Kertesz's photographs. Kertesz replied, "Very natural. Take your choice." Newhall selected several photographs, among which was *Distortion #172*. "I wanted long before to exhibit in America. But it was diffi-



Distortion #172 by Andre Kertesz in its original composition (left) and a cropped version (right).

© Estate of Andre Kertesz

cult to find the possibility. Newhall made the possibility. I said, 'I am very glad you are choosing them. In Paris, Germany, and Central Europe they like the Distortions. I hope America likes, too.'" In Kertesz's words, Newhall then asked, "Can I cut down the pornographic parts?"²⁵ Kertesz told this author he was confused by Newhall's question and said that cropping out the pubic area violated the picture as much as it would to crop out the woman's head or hands. "The woman's form is sculptural," stated the artist. Newhall continued to express his wish to exhibit the print. After more than an hour of discussion, Kertesz agreed to provide the museum with a cropped version of Distortion #172. Recalling his feelings during the meeting with Newhall, Kertesz said, "The representative of the big Museum of Modern Art in America talking this way? What can I do? In Paris I was accepted not 100 percent but 1000 percent. But this is America. I feel that I am cutting down my whole possibility here if I say no."

Sources familiar with the situation indicated that the cropping of the Kertesz print was the result of the Museum of Modern Art's policy in the 1930's which prohibited the exhibition of photographs that depicted pubic hair. According to one source who wishes to remain anonymous, the policy was initiated by the trustees of the Museum and was understood by the curators although it may not have existed in written form. Richard Oldenburg, present Director of the Museum, declined to comment on the matter. John Szarkowski, Director of the Department of Photography at the Museum, said, "I was 11 years old, going on twelve, when Beaumont Newhall allegedly 'mutilated' one

of Andre Kertesz's photographs, and it is pointless for me to speculate as to what really happened. I am confident that Newhall would not have changed the cropping of the photograph without Kertesz's permission."²⁶

Asked about the incident, Beaumont Newhall said, "As to what you call 'the cropping of the Andre Kertesz photograph' is something I know nothing about. I have no recollection whatsoever of having 'mutilated' one of his prints. There is no way I can prove this, but I can certainly assure you that had such an action been taken in protest I would certainly have recollected it. . ."²⁷ Newhall went on to say:

I hardly know a single photographer who does not object to the random cropping of his prints in publications, or for that matter in exhibitions. Cropping by the photographer himself, however, is a different matter. You probably know that Alfred Stieglitz actually advised photographers to crop their prints, and his famous photograph 'Winter on Fifth Avenue' of 1893 shows hardly one-third of the original negative image. . . I feel about cropping just as I do about mounting and framing. It is all important.²⁸

Kertesz's Distortion #172 continues to exist in both cropped and uncropped versions; at the time of this writing (1983), according to print dealer Susan Harder, both were available for sale and for exhibition. Some of Kertesz's other negatives, such as Distortions #2, #6, and #76, were also cropped to create more than one variation, and each

of these three images appears in two different compositions among the 126 photographs in Kertesz's book *Distortions*.²⁹ Distortion #172 appears only once in the book, however, in its uncropped version.

In November 1983, the Pace/MacGill Gallery in New York City mounted an exhibition of Kertesz's *Distortions*. The show consisted of vintage prints, modern prints made specifically for the exhibit (some newly cropped by Kertesz as recently as September 1983), and of full-frame contact prints which were marked by Kertesz to indicate how they should be cropped. Also included was a modern print of the uncropped version of Distortion #172. Peter MacGill, Director of the Gallery, described the show as "a celebration of Kertesz's joy in working with his *Distortions* over half a century."³⁰

Cropping a picture not only changes its content and alters it aesthetically but, when done by someone other than the artist, it can even legally invalidate a picture. In August 1983, New York State passed a law giving an artist the right to object to the alteration of his or her work and to legally disclaim authorship.³¹ The bill stated that:

. . . no person other than the artist or person acting with the artist's consent shall knowingly display in a place accessible to the public or publish a work of fine art of that artist or a reproduction thereof in an altered, defaced, mutilated or modified form if the work is displayed, published or reproduced as being the work of the artist. . . .³²

Josh Barbanel reported in *The New York Times*:

Some experts said the legislation could result in litigation over how a work is framed, how an exhibition is set up and how works are reproduced in a catalog. . . . The law was opposed by the major New York museums, including the Metropolitan Museum of Art and the Museum of Modern Art. It was supported by artists, some of whom complained that it did not go far enough.³³

Clearly, the right to crop belongs only to the photographer who may, as Kertesz showed us, exercise that right more than once for a given picture and at any time in his life. While a photographer may be influenced or inspired by others throughout the process of making, re-making, or mounting a print — and that includes cropping — the photographer should always feel that he or she has made the decisions that put the work into its final form.

Preparing Prints for Mounting — Aesthetic Considerations

Mounting materials should be selected not only for correct chemical and material composition but also for their aesthetic qualities. In addition to providing physical protection for the prints, the design and construction of the mounts should be visually harmonizing.

Carefully planned and well-designed presentation contributes to the appreciation of photographic prints, as it does for other media. In general, good presentation design enhances an image without embellishing it, and draws a viewer's attention to the content of the work without at-

tracting attention to itself. In the case of Frederick Evans, however, he *chose* to embellish his work. As mentioned earlier, presentation was of great concern to Evans, who imbued every nuance of it with his attention. For example, he decided to mount one of his portraits of Aubrey Beardsley within a decorative border that Beardsley had drawn for the book *Le Morte d'Arthur*.³⁴ In his book *Frederick H. Evans*, Beaumont Newhall pointed to Evans's involvement in exhibition design:

The vertical division of the walls into panels was shocking at a time when little thought was given to the arrangement of photographs on exhibition beyond fitting as many as possible on the allotted wall space. [Ward] Muir was greatly impressed: "The amount of trouble he has taken over the hanging alone is hardly credible. Each picture had to be considered in relation to the others. Its tint, its size, its frame, its mount, its subject — all these were kept in view. Again and again a frame was tried in a certain spot, only to be rejected because the eye of the designer adjudged it to be unsatisfactory. In consequence of this extreme fastidiousness in grouping, every picture has an equal chance to look effective. Not a few of the photographs show up better on the Salon walls than they did when received one by one on selection day. This means that a master-brain has been at work. Each section of the wall is itself a sermon in massing and composition."³⁵

Sometimes overstated presentation design can have a negative effect on a viewer. Referring to pioneering images in the 1987 exhibition *Gordon Parks: A Retrospective*, Andy Grundberg wrote in *The New York Times*:

The show commits. . . crimes in the name of art. Perhaps to make the black-and-white pictures from Life look more imposing, many have been enlarged to 20-by-30 inches, surrounded by black mat board and signed on the image in silver ink. To try to inflate the images to esthetic proportions in this way misses what made them interesting as photographs in the first place, and seriously distorts their original meanings.³⁶

When it is not part of the photographer's "creation," presentation design and format should be understated. In any case, it should not compete with a print. That is to say, for example, that a mat and frame are most successful when they are barely noticed — *unless the photographer wants them to be noticed*. Good presentation requires a sensitivity to the individual image and the photographer's intentions, to the print material and the mounting materials, and to the fine details of each as well as to the compatible or incompatible relationships between the various tones, finishes, textures, proportions, and overall composition. Naturally, personal taste is always an important factor. Also, what is noticed at one time or in one place may not be noticed at another time or somewhere else. Furthermore, the exhibition or viewing environment will have a signifi-

cant effect on every other decision. Finally, it is important to remember that there are no absolutes when it comes to the presentation of art.

The following paragraphs illustrate how visual sensitivity to the presentation of photographs can be expressed in the matting and mounting.

Many of Helen Levitt's black-and-white photographs are printed on Agfa Portriga-Rapid Paper. The rich, warm tones and fine details in these prints, qualities that are particularly evident in the dark areas of the images, are enhanced in modest-sized overmats (about 3-inch borders) that are made with a warm-white or beige-toned board which has a smooth, matte finish. A narrow bevel at the edges of the windows — that is, about a 60° bevel cut into a thin board such as 2-ply, or a medium board such as 4-ply, rather than a thick bevel cut into 8-ply board — lessens the contrast between the mat and the image. (The primary function of the bevelled edge is to avoid casting shadows on the photograph where the edges of the image meet the mat. The highlight or shadow on the bevel itself may be narrow or wide depending on the thickness of the board, the angle of the bevel, and the angle of the lighting.)

Ralph Gibson's black-and-white prints made on Agfa Brovira Paper, on the other hand, are often complemented by oversized (borders 4 inches or wider), bright white, smooth-surfaced mats which reflect Gibson's aesthetics. The beveled edges in 4-ply or thicker mats do not conflict with the high-contrast black and white areas that predominate in many of these prints, and, in this author's opinion, provide a better visual balance than 2-ply mats.

Eikoh Hosoe's high-contrast black-and-white photographs are also complemented when matted with a bright white, minimally textured board. Many of his prints, composed of crystalline details between solid expanses of striking blacks and whites, are effectively presented when seen within moderate-size borders in well-crafted window mats.

Two-ply board in a light, warm tone is often the most suitable choice for matting Emmet Gowin's 8x10-inch, contact-printed, toned black-and-white silver-gelatin prints. Four-ply is sometimes too heavy visually, and bright white looks harsh beside the hushed tones in his fine prints. Here again, as with the majority of photographic prints, the mount board should have a smooth, matte finish.

Gowin has strong feelings about what are the correct proportions for mounting his prints and decides just when to deviate from a standard format. For example, many of his prints which look attractive in standard 14x17-inch mats look even better in non-standard mats that are 14x15½ inches. Gowin exercises control in this area both by making many of his own mats and by carefully instructing others who do the matting.

An example of photographs that were successfully presented in a deliberately decorative style, tipped by hand onto mounts of colored card and Japanese tissue, were the facsimile reproductions contained in Alfred Stieglitz's quarterly publication *Camera Work* (1903–17).

When finished prints are not mounted or individually housed in any way, and the photographer — or another person who understands and is intimately involved with the work — is not available, decisions regarding mats, mounts, print cases, and so on will need to be made by other people, who should try to learn the intentions of the photographer.

For example, print dealers might seek the advice of historians and conservators. It is often helpful to study the materials that the photographer had been known to use and to compare them with artists' papers and boards that are currently available.

Sometimes a dealer or curator will go so far as to try to recreate a historical paper. Such was the case when Susan Harder called upon papermakers at Dieu Donne Press & Paper in New York City to prepare an "antique vellum" for mounting the Andre Kertesz contact-printed photographs in the 1982 portfolio published by Harder and the Ormindia Corporation.

Selecting a Board Texture

When preparing artistic photographs for display, it is important to be aware of the surface textures and finishes (e.g., high gloss, semi-gloss, matte, rough, or smooth) of both print materials and mount boards. In general, papers and boards for mounting most photographs should have minimal or subtle surface texture — or texture that is not noticeable — for both aesthetic and conservation reasons.

The surfaces of most photographs are smooth, and a smooth-surfaced mount board is usually more harmonious visually. In fact, most respondents to this author's survey, who notice the surface texture of boards, prefer smooth-textured board for matting and mounting photographs.³⁷ However, contrasting textures may be exactly what a photographer wants. For example, high-gloss surfaces of print materials such as Ilfochrome polyester-base are simultaneously accentuated by and conflict with a rough-surfaced board. Also, many 19th-century prints are complemented in highly textured mats.

Another factor should be considered when selecting board texture: Smooth-surfaced boards are less likely to scratch or physically alter the surfaces of print materials. Exaggerated board texture can even interfere with the proper mounting of prints, particularly total-surface mounting.

The surface textures of 100% cotton fiber board are generally smooth but vary somewhat among different manufacturers. An experienced worker can often identify a manufacturer's board by its texture alone; it is common, however, for a particular board from the same manufacturer to change slightly from batch to batch. Occasionally, some boards vary significantly from batch to batch.

The visual characteristics of nonbuffered 100% cotton fiber mount boards are comparable to alkaline-buffered 100% cotton fiber mount boards. Generally speaking, for example, the surface textures of nonbuffered and alkaline-buffered Rising Museum Mounting Boards are the same, whereas their texture is usually slightly smoother than the very lightly textured Process Materials Archivart Museum Board and Archivart Photographic Board, both buffered and nonbuffered.

Chemically processed acid-free wood pulp board (e.g., Conservation Board, Conservamat) usually differs very little visually from manufacturer to manufacturer — unless it belongs to one of the lines of composite or markedly textured boards such as Bainbridge Alphamount and Andrews/Nelson/Whitehead Phase 7 (which was discontinued when the company merged with Crestwood Paper Company to become ANW-Crestwood). So-called conservation board is

usually quite smooth with a matte finish that may have a slight sheen. Light Impressions Exeter Conservation Board has a more pronounced texture with a “lustrous” finish. Neither 100% cotton fiber mount board nor purified wood pulp board manufactured in this country is shiny (as are some high surface bristol boards). However, Atlantis Paper Company in England distributes a specially designed nonbuffered museum board which has a surface closer to a plate-finish bristol.

Several composite boards on the market offer a wide range of textures, most of which are similar to pastel papers; Bainbridge Alphamat and Crescent Rag Mat are examples. Canson Fine Art boards are surfaced with pastel and drawing papers imported from France, and available in the United States from ANW-Crestwood, Morilla Company, Winsor & Newton, Inc., and others.

You will see texture most clearly defined by holding a piece of board perpendicular to a directional light source (at least 4 inches away) so that shadows are cast by the surface formations on the board. Turn the board three times in order to see the texture from four directions. Then inspect the reverse side to see whether the texture looks different. This method of examination exaggerates the texture and facilitates comparisons between different boards.

Selecting a Board Tone or Color

As discussed in Chapter 13, research indicates that some photographs may be harmed by an alkaline environment. Although this author recommends that nonbuffered boards of neutral pH be used with most photographs, nonbuffered board is not yet manufactured in enough sizes, thicknesses, and tones to satisfy the various requirements of all the people involved in the care and presentation of photographs and certainly not enough to satisfy photographers.

For example, Roy L. Perkinson, Conservator at the Museum of Fine Arts in Boston, said, “The off-white tone of nonbuffered board is not suitable for everything. We are back to the problem faced by artists and curators when there was only one color of museum board available. The Museum uses nonbuffered board for its color prints (less than 5% of the total collection) and wherever off-white is suitable.”³⁸ (Process Materials Archivart Photographic Board was available only in off-white in 1982. Since then, several nonbuffered boards have been introduced in white and/or antique tones by Archivart, Parsons, Rising, and other companies.)

Andre Kertesz also stated the challenge clearly: “Pure white is not good for everything. Pure white is too strong for many pictures. Pictures should go out of the frame, not stay in the frame imprisoned in the white.”³⁹

Nonbuffered boards must be available in a greater variety of tones and thicknesses if they are to be used more widely to mount photographs. Aesthetic concerns frequently overwhelm concerns for preservation, and buffered boards (and even low-quality boards) are often selected because they provide the desired visual effect. When time and money allow, mats may be lined with thin polyester sheets, as discussed later in this chapter, or the prints themselves may be enclosed in polyester sheets to separate them from potentially harmful board.

The colors and tones of a print are affected by the tones

or colors that surround it. Ansel Adams said, “The problem is not necessarily to *match* the color and value of the print, but to select a mount of harmonizing or complementary tonality.”⁴⁰ In 1965, in preparing his prints for exhibition at Huntington Hartford’s Gallery of Modern Art in New York City, Irving Penn “examined every type of mat board available on the market and found that none met his standards for correct color; so all the mats were covered with a white gesso of Penn’s choice.”⁴¹ (See Chapter 13 for a discussion of the color stability of white, toned, and colored mount boards.)

In general, photographs are not enhanced by brightly colored mount boards. The neutral tones of white, off-white, ivory, beige, and gray are much preferred, although there may be occasions when photographers and even museum curators are attracted to highly colored mount boards for their exhibitions. On the other hand, snapshots and personal photos are often enhanced by lively colored mats and frames.

Most white and neutral tones have some color. For example, off-white can look slightly yellow or slightly pink. An antique-toned board, such as Rising’s, can be “pinkish,” or, in the case of Parsons’ antique board, it can be “greenish.” A gray can look “greenish,” “bluish,” “purplish,” “reddish,” and so on. The exact tone selected to mount a particular print usually depends on personal preference. A few general guidelines, however, should be noted. For example, untoned black-and-white silver-gelatin prints often appear to take on a blue or green tone when mounted on cream-colored boards. Such boards can also muddle the highlights in black-and-white prints.

Many modern black-and-white prints need a bright white board such as the following cotton fiber boards: *Parsons Brite White Photographic*; *Archivart White Photographic*; *Rising White Photomount*; ANW-Crestwood Lenox; James River White; Archivart Extra White; or Strathmore White. Other black-and-white prints look better mounted on neutral gray board, or on a slightly off-white board such as ANW-Crestwood Gemini; *Archivart Off-white Photographic Board*; Miller Shell White; Rising Warm White; or Strathmore Natural. (Note: All the above boards are alkaline-buffered except the four printed in italics, which are non-buffered.)

Fresson Quadrichromie prints are characterized by their muted colors and low-resolution, “soft-focus” images. An off-white board normally complements their colors whereas a stark white can be noticeably in contrast to them.

When asked what tone of board was preferred for matting and mounting most photographic prints, conservator Mary Kay Porter said that it would depend on the degree of highlight yellowing of the print. This is an important consideration. If the highlight areas of a print are already yellow or will yellow with the passage of time, an off-white or darker board will look better than a bright white board. For example, unlike Dye Transfer and Ilfochrome prints, Ektacolor and Polaroid prints will yellow to varying degrees as they age. In addition, the highlight areas of newly processed Ektacolor prints are not as white as the highlight areas of most Dye Transfer prints.

Color perception by the human eye varies with the type and intensity of lighting. The colors of a print will look brighter as the light intensity increases; in addition, the

colors will look *different* under tungsten, fluorescent, or daylight illumination. Colors and tones may also differ if they are viewed with the light source directly in front, from an oblique side angle, directly from above, or by indirect illumination.

Boards and papers which contain fluorescent brighteners will look different under different lighting conditions in comparison to materials that do not have such brighteners. (Most current photographic papers contain fluorescent brighteners, whereas most cotton fiber museum boards do not.) Under tungsten illumination, however, fluorescent brighteners have very little effect. When photographs themselves contain fluorescent brighteners — as all modern black-and-white prints do — it is more difficult to select the proper tone of mount board.

It is always best to view mounting materials alongside the print to be mounted and, whenever possible, together under the same lighting conditions in which the print will be displayed. (See Chapter 17.)

Another consideration when selecting the most appropriate tone of board is the translucence of the print material. Albumen prints, photogravures on Japanese tissue, and other lightweight prints should be mounted on a backing of very white, smooth board to maximize the brightness of the prints and to enhance the degree to which the details and various tones are visible. An ivory or gray-toned board will make a slightly translucent print appear dull, diminish highlights, and obscure subtle details. However, if writing or printing exists on the back of the print and shows through when the print is placed on white board, the print should usually be mounted on a darker board.

Unfortunately, common framing glass casts a slight green tint and Plexiglas UF-3 (an ultra-violet filtering grade) casts a pale yellow tint over the print and mat. Normal grades of Plexiglas are water-clear without a tint. (See Chapter 15.)

In addition to textures and tones, the tactile qualities, such as structural behavior and responses, tensile and bending strength, further define the character of a given paper or board.

Becoming Acquainted with a Variety Of Mount Boards and Artists' Papers

Mount boards and artists' papers (for interleaving, making mounting corners, etc.) can be purchased from art supply stores and mail-order companies (see **Suppliers List: High-Quality Boards and Papers** at the end of this chapter). One may become acquainted with the variety of available products and their different weights, thicknesses, surface textures, tones, and colors by obtaining samples and sample booklets. Samples are rarely large enough, however, to make an accurate judgment before mounting an individual print or body of work. Whenever possible, boards and papers should be seen, studied, and touched — and compared directly with the work to be mounted — before a final decision is made. As previously discussed, every decision made by the photographer becomes a part of the total work and, if the materials chosen are long-lasting, the mat and/or mount may accompany the photograph throughout its existence.

The quality and selection of mounting materials should be determined at least in part by the stability characteris-

tics of the print itself. For example, with an unstable print material the finest matting materials may not be necessary unless plans are made to replace the displayed print with a duplicate when it has faded or otherwise deteriorated significantly. Unfortunately, in the case of many color photographs, the mounting materials are likely to outlast the useful life of the prints.

Section Three: The Composition, Marketing, and Use of Mount Boards

The mounting and enclosure papers,⁴² plastics, and adhesives that are in contact with photographs during storage and display should be selected with many considerations in mind. From a conservation point of view, the long-term effects of a material on a given photographic material are most important. In addition, knowledge of the composition of each material is essential. Following these, the physical characteristics of the enclosure and mounting materials (such as size, weight, strength, stiffness, and so on) should be evaluated with regard to the individual physical requirements of the print.

Other factors to consider when selecting enclosure and mounting materials and the most appropriate form of physical protection for photographs are:

1. Intended use of the prints (e.g., museum and public exhibition, private display, study collection, traveling exhibition, storage, sale)
2. Short-term vs. long-term conditions (e.g., temporary display vs. permanent display)
3. Available funds
4. Inherent stability characteristics of the photographic material(s)
5. Desired life expectancy of the photographs
6. Aesthetic preferences
7. Estimated frequency of handling
8. Size and location of the display area
9. Available storage space
10. Anticipated expansion of the collection

Not enough is presently known about how most mounting materials affect photographic images, emulsions, and support materials, and it is difficult therefore to know how to best choose from among the many products available. That a mount board or enclosure paper is well made according to the highest standards of the paper industry does not automatically qualify it for safeguarding photographs. In addition, the few existing standards that do apply to the manufacture of papers used with photographs⁴³ have been subject to debate by conservators and photographic scientists. For example, questions remain about what pH value is optimal for mount boards and enclosure papers for the many different color and black-and-white photographic materials. (See Chapter 13.)

Board Composition — Cotton Fiber And Wood Fiber

Most high-quality mount boards that are specifically intended for photographs are distinguished from other high-quality mount boards only by the absence of alkaline-buffering agents (calcium carbonate and/or magnesium carbonate). These boards are made from the same raw materials as are other solid (i.e., not composite) high-quality mount boards, of which there are two primary types: “museum” board and “conservation” board.⁴⁴ Museum board is made from 100% cotton fiber pulp, which usually consists of cotton linters fibers but may be made of rags or of a combination of both (see Chapter 13, page 468).

Conservation board is made from wood fiber pulp which has been cooked, bleached, washed, and extensively refined to remove lignin and other impurities. There are currently no standards defining what is a conservation board. Some composite boards, such as Bainbridge Alphamat, Cardcrafts Astromat, Crescent Rag Mat, and Miller Ultimat, which are alkaline-buffered and made with at least three different papers each, are also referred to in the marketplace as conservation boards.

Physical Requirements and Other Considerations

Board for mounting pictures should meet the following *physical* requirements:

1. Be rigid enough to support its own weight without bending (e.g., standing on any of its four edges against a wall)
2. Have adequate strength to support the selected print(s) without bowing more than slightly when held with two hands at opposite edges
3. Have both the required and desired degree of surface smoothness
4. Have a compact density which favors smooth cutting and sharp, clean bevelling
5. Be reasonably resistant to impact without breaking
6. Be free from warpage

Depending on size, ply, and the intended application, most high-quality mount boards made of rags, cotton linters, and wood pulp usually meet these requirements. Closer examination is required, therefore, to make meaningful comparisons. The best 100% cotton fiber papers and boards are strong yet flexible, whereas the best wood pulp boards are usually less so. (In the case of mount boards, however, superior flexible strength is not as critical as are such factors as chemical inertness, hardness, and smoothness.)⁴⁵

Most currently available conservation boards made of chemically purified wood cellulose are usually quite stiff and can adequately support most prints. These boards, however, do not withstand pressure as well as most 100% cotton fiber boards. During handling and shipping, the corners of conservation boards are somewhat more vulnerable to being crushed on impact. When they are, the damaged area loses all stiffness. Of course, 100% cotton

fiber boards are also vulnerable to crushing, but in general, wood pulp board lacks the resilient strength of board made from cotton.

Boards made of chemically purified wood pulp cost approximately $\frac{1}{3}$ less than cotton fiber boards; generally, conservation boards can provide the necessary physical protection for many collections and are quite suitable for mounting unstable types of photographs such as most polyethylene-resin-coated (RC) color prints intended for display. For longer-lasting prints, such as correctly processed black-and-white fiber-base prints, cotton fiber boards are recommended.

Descriptive Terms

Learning the material composition of a mount board and deciding its most appropriate application can be difficult, particularly on the consumer level, because boards are described by many different terms, such as “museum board,” “rag board,” “mount board,” and “conservation board.” Chi C. Chen, former Technical Director of Rising Paper Company, ascribed the variety of terms and names for artists’ papers and boards in part to the manufacturers’ attempts to describe the intended use or a suitable use of a product by naming it, for example, “museum mounting board.”

Still, it is often difficult to know what one is purchasing because descriptive names are sometimes not accurate. For instance, James River Ragmount was not made from rags during its last several years on the market. Light Impressions incorrectly describes its mount board by labeling it “Museum Quality 100% Rag Board” when, in fact, the board is made from cotton linters. In another example, Crescent Cardboard Company calls its 100% cotton fiber board, which is made from cotton linters, “Rag Mat 100.” Employing the term “rag” to describe a product that does not contain any rags is misleading.

Addressing this concern, Alden W. Hamilton, former Manager of Commercial Development for James River Corporation, remarked that his company did not maintain that its Ragmount was always made from rags. The company simply continued to use the name by which its first 100% cotton fiber mount board became known (when it was made from cotton rags).⁴⁶ For several years, until 1985 when the company discontinued marketing boards under its own name, James River Ragmount was made from 100% cotton linters fibers without any rag content.

Contrary to the widespread industry practice of using cotton linters fibers to make museum mount boards, Bainbridge has claimed to be using rags:

If you prefer working with rag board, then Alphasag board is for you. These archival boards are made with Cotton Rag materials. They are carefully manufactured to an alkaline pH to provide maximum conservation protection. The 100% Cotton Rag composition of Alphasag board is carefully controlled to ensure the greatest strength and cleanest appearance. This board is unique in its use of a high percentage of actual cotton rags, rather than cotton linters.⁴⁷

Is Alphasag board made from 100% cotton rags or a high percentage of 100% cotton rags? According to Bainbridge

Product Manager, Kate McCarthy, Alphasag specifications require 100% cotton rags, but that when suitable rags are in short supply a small percentage of cotton linters may be used. McCarthy said, “We prefer rags to linters because, in our minds, a rag paper is a better product. It is stronger and more durable. The rags used to make our board are purified to the point that there are no dangerous residual chemicals in the final product.”⁴⁸

While board made from rags can be superior, because of the additional processing required when rags are used, this author doubts that currently available cotton rags are better than linters in the manufacture of museum boards for photographic applications.

Cotton and Rag Content

Each company has its own “standards” regarding board composition, which may change because of normal limitations in the industry. For example, many paper companies state that their sources of cotton fiber vary and that they depend on the supply available at a particular time. It is possible, in other words, for a given paper product to be made in January from paper pulps that differ from those used in July. When this author asked paper manufacturers if their cotton sources vary, some said yes and some said no (see Chapter 13, Appendix 2: *Letter to Paper Companies*). Speaking for Rising Paper Company, Chi C. Chen helped to clarify this matter:

Our suppliers do not vary. *Their* sources, however, vary. We use the same suppliers every time we order cotton. There are a limited number of suppliers — also called “jobbers” — for the paper manufacturing industry and these suppliers go to the same market for their materials. One month they may buy North Carolina cotton, the next time they may buy Texas cotton. Availability of cotton depends upon numerous factors in the market. Nearly all 100% cotton fiber mount boards have been made at some time from combinations of cotton rags and cotton linters fibers although most, if not all, are now made from linters only. The grades of rags and cotton linters can and do vary. For instance, rags come from numerous sources: textile mills, clothing manufacturers, and waste dealers including sources outside the United States. In Africa, rags are collected today by peddlers similar to those with horse drawn wagons in the 19th century that traveled from house to house asking for old clothes. When enough rags and old clothes have been gathered, they are brought to a warehouse where they are sorted and then shipped to various places, including European and United States markets, for use in the paper industry. . . .

If you think papermaking is purely science, it's not. Papermaking is still a great art. There are variables that change every day, every season, every year. The availability and quality of materials, technical information, equipment, skill,

economic conditions, environmental factors, market supply and demand, amount of control over these conditions and factors, aesthetics, time, and inspiration all affect the quality of the final product.⁴⁹

Kurt R. Schaefer, former Manager of Product Development for Strathmore Products Group of the Strathmore Paper Company, remarked: “All Strathmore Museum Mounting Boards and papers are manufactured, tested, and inspected in Strathmore Paper Company Mills. . . . Occasionally our cotton fiber sources vary. . . . Strathmore maintains strict standards for the quality of cotton to be used in its papers, and uses only the best available.”⁵⁰ According to Marketing and Product Development Manager David Pottenger,⁵¹ Strathmore once processed its own rags. It now purchases cotton rags and cotton linters from the same primary sources as other paper mills. Pottenger explained that cotton rags are rarely used exclusively because they are in such short supply and are generally supplementary to other forms of cotton fibers in paper manufacturing. He said that Strathmore Museum Mounting Board is currently made from 100% cotton linters fibers. Although both cotton rags and cotton linters are used by the company, Strathmore does not use the word “rag” to describe any of its products in its advertising literature. Even Strathmore Bristol, which is always made of cotton rags (because, as Pottenger explained, it is not possible to produce bristol with the same physical characteristics when other forms of cotton are used), is described in its product literature as “100% cotton paper.”⁵²

The American Paper Institute (API) concurs with the term “100% cotton fiber” for describing papers made entirely from cellulose derived from cotton regardless of the cotton's origin (e.g., linters, textile waste, rags).⁵³ It is certainly better to use the term “100% cotton fiber” when describing any all cotton fiber paper — even one that is made from cotton rags — than to call a 100% cotton linters paper “all rag”; however, API contributes to the terminological confusion by also sanctioning the term “rag” to describe papers made from cotton linters fibers.^{54,55}

The World Print Council draws attention to the problem of terminology regarding cotton fiber paper. It defined “rag content” as:

A term describing the amount of cotton fiber relative to the total amount of material used in the making of certain kinds of paper. It is expressed as a percentage, such as 100% rag content or 80% rag content. The term, though popular, is losing its meaning since more and more high quality paper is made, not from rag, but from linters.⁵⁶

Except in this last source, use of the term “rag” to describe papers made with non-rag forms of cotton fibers is used throughout the published literature reviewed by this author. With respect to its former place in papermaking terminology, however, the term is archaic. The time has come for paper manufacturers, distributors, and consumers to abandon the term “rag” except for papers actually and consistently made from rags.

The Museum Board Manufacturing Industry

This author's research revealed that there are only five companies in the United States that manufacture museum mount board. They are: Parsons Paper Company, Rising Paper Company, Strathmore Paper Company, Monadnock Paper Mills, and James River Corporation.

(Note: Until November 1989, coinciding with the merger of Andrews/Nelson/Whitehead and Crestwood Paper Company, Beckett Paper Company also was a manufacturer of mount board. In 1990, Process Materials Corporation became known as Archivart Division of Heller & Usdan, Inc. and, in April 1991, James River mount board and art papers division came under the control of Custom Papers Group, Inc. The bulk of the writing of this chapter was done in 1983, and references to A/N/W, Beckett, Crestwood, James River, and Process Materials in the following discussion are for the most part left unchanged.)

Of the five manufacturers, only Parsons, Rising, and Strathmore distribute mount board under their own names. James River and Monadnock operate mills but market their products only through major distributors, who in turn sell to smaller distributors and retailers. It is startling to discover that all of the hundreds of other companies in the mount board business — operating as convertors, distributors, or retailers — sell board produced by one or more of these five manufacturers. Rising and Strathmore are the only two companies among the five whose products are widely recognized by name within the consumer market.

In addition to the five manufacturers, there are several major distributors who label mount board and who are mistakenly thought to be manufacturers. These include: Andrews/Nelson/Whitehead-Crestwood; Archivart Division of Heller & Usdan, Inc.; Cardcrafts, Inc.; The Columbia Corporation; Crescent Cardboard Company; Hurlock Company, Inc.; Light Impressions Corporation; Miller Cardboard Corporation; Morilla, Inc.; Nielsen & Bainbridge; Rupaco Paper Corporation; and University Products, Inc.

Three of the manufacturers (Parsons, Rising, and Strathmore) and four of the major distributors (ANW-Crestwood, Process Materials [Archivart], Light Impressions, and University Products) sell their boards primarily to the museum and fine art markets. Nielsen & Bainbridge, Cardcrafts, Columbia, Crescent, Hurlock, Miller, Morilla, and Rupaco also sell their boards in the museum marketplace but sell more of their products to high-volume framing shops, retail stores, and interior design establishments; these eight distributors are also convertors, which means that they purchase base board from one or more paper manufacturers and then “convert” it into another product, such as a textured composite mat board, by laminating fabric or paper to the two sides of the base board.

There are other companies, such as Howard Paper Mills, Inc. and Mohawk Paper Company, that do not sell boards but manufacture a variety of papers, some of which are laminated to base boards to create matboards and some that are used in conservation work. The importance of knowing which company makes what product becomes more apparent when papers and mount boards are routinely tested to determine their suitability for long-term use with photographs, and the results of the tests are published.

Proprietary Labeling

Given the terminological confusion and variations in raw materials, the solution to the problem of knowing what constitutes a particular product — and what effect that product can be expected to have on photographs — might seem to be simply to contact the manufacturers and ask them how and with what their boards are made. Unfortunately, the manufacturer may be difficult to identify or reluctant to provide information. For example, many paper companies purchase a particular paper product made by one or more mills and then label it with a name not associated with the true manufacturer(s). This practice, known as “private labeling,” is common.

Some convertor-distributors imply in their advertisements that they make board, although in fact they do not. While several distributors “produce” board by assigning specifications (“specs”) to a manufacturer, other companies simply purchase board ready-made and sell it as their own; often the same board is given different names by different distributors. At times it is impossible to know with certainty what board is being sold and of what materials the board is composed. Many distributors and retail outlets sell a given type of board made by more than one manufacturer, and when it is cut to small sizes and re-wrapped in plain brown paper, it may even be impossible for them to know which board is what.

Rising Paper Company has a policy of not selling board to distributors who would obscure the Rising label by re-naming, or “de-naming,” it. According to Dennis O'Connor, former Marketing Manager of the company, “Rising does not sell board to any convertors or distributors who ‘private label’ the product or sell it under their own name. If the carton doesn't say ‘Rising’ then it's not.”⁵⁷ This policy may be difficult to enforce. For example, samples of board examined by this author showed that Hurlock Company and Miller Cardboard Corporation have both offered Rising boards under their own names, in addition to selling other boards made by other manufacturers. (Hurlock and Miller are convertors and so some of the composite boards they market are their own products in that the “combinations” are unique.)

The conversion of papers and boards into composite products and the shared distribution of one company's product are legitimate activities. The unavailability of accurate product information from the many different companies, however, creates confusion in the marketplace, particularly among photographers and conservators, and those doing research in conservation, who need to know exactly what product they are using, where it is available, and under what name or names.

None of the manufacturers (i.e., Beckett, James River, Monadnock, Parsons, Rising, and Strathmore) were willing to provide this author with information about the distributing companies that market their mount boards under proprietary brand names. Speaking for James River, Alden Hamilton explained that although his company is concerned with needs on the consumer level, as a major manufacturer that operates many mills and produces many paper products, it is primarily merchant-oriented and must, necessarily, protect its customers. In other words, its market

consists almost entirely of convertors and authorized distributors who may and do label, with industry approval, the paper products as their own without identifying the manufacturer. Similar statements were made by spokespersons for the other manufacturers in the United States.

All distributors expressed concern about the publication of such information. One feared that customers would contact the manufacturers directly, thereby cutting into their business. Another worried that customers might doubt the quality of their products. Although these are valid concerns, such information would not displace the traditional and valuable position that distributors maintain in the marketing of boards to retailers.

Although proprietary information could not be obtained from the manufacturers, industry sources revealed that this is a volatile market and one in which many distributors not only put their own labels on mount boards but also readily change mills or employ various mills for the manufacture of a particular paper product — without notifying customers — depending on which company offers the lowest bid, can meet delivery schedules, and can satisfy product specifications at a given time.

Dennis Inch, who has headed the development of archival products at Light Impressions Corporation since 1975, spoke on behalf of his and other companies that engage different mills: “It is necessary to change mills at times because rising prices create competition. In addition, if we stay with one supplier, we have no back-up when the need arises.”⁵⁸ At various times, therefore, the “same” board will have been made by different manufacturers. Although the basic formula and the applied standards for manufacture may remain the same, when the manufacturing company is different, it is inevitable that there will be some variation in the final product caused by the different machinery, water supply, and other factors.

Until approximately January 1985, the nonbuffered off-white photographic boards sold by both Process Materials (now Archivart) and Light Impressions were made for the two companies by James River. This author believes that Strathmore began to make Process Materials nonbuffered boards some time in 1985; Strathmore had been the manufacturer of Process Materials solid-color museum boards for many years.

In the Light Impressions 1985 catalog, the company no longer listed the off-white photographic board; instead, two “Non-Buffered 100% Rag Boards” (Bright White and Cream) were offered. Examination of a sample of the Bright White board in June 1985 indicated that it was made by either Parsons or Rising, although the company would neither confirm nor deny this. In 1986, the board appeared to be manufactured by Parsons. Industry sources indicated that some of Light Impressions’ mount boards were not even bought from manufacturers, but rather from other distributors. Ron Emerson, Technical Assistant and Accounts Manager for Light Impressions, explained the predicament: “We are not trying to hide information from our customers. We are simply unwilling to make a commitment in a situation that is constantly changing.”⁵⁹

Other examples of proprietary labeling: the 100% cotton fiber mount boards distributed by Nielsen & Bainbridge and by Crescent Cardboard Company have been made, ac-

ording to each company’s specifications, by Parsons in Holyoke, Massachusetts, while Bainbridge Alphamount has been made by James River in Fitchburg, Massachusetts.

Composite boards are frequently assembled from products made by two or more manufacturers. The base boards (core) and surface papers are commonly made at different mills, while the backing papers may be made at yet another mill. The convertor then laminates the three products together, or assigns the task to an outside laminating company. Informed sources reported that James River has manufactured the high-quality white core board for Bainbridge Alphamat, Cardcrafts Astromat, and Miller Ultimat, while Parsons has made the cotton fiber core board for Crescent Rag Mat. This author did not learn who manufactures the surface and backing papers for these boards, but believes the high-stability surface papers on Bainbridge Alphamat and Crescent Rag Mat are made by Strathmore.

There are, meanwhile, different degrees of obfuscation in the area of proprietary labeling. For example, some companies such as A/N/W openly stated that they did not operate paper mills and were, in fact, distributors for papers and boards, some of which were manufactured according to their specifications. Andrews/Nelson/Whitehead distributed many artists’ and specialty papers, both domestic and imported, and in nearly every case the papers retained their original names and labels, and their paper samples were accompanied by a listing of over 65 paper mills and manufacturers, titled “Heralding Our Mills.” Among the exceptions, unfortunately, were its mount boards and the A/N/W Interleaving Paper.

Looking back, Andrews/Nelson/Whitehead was the first paper company to develop a 100% cotton fiber mount board. In 1928, the company gave their first set of specifications to the Valley Paper Company, which manufactured the board until the late 1960’s. For several years after that, the 100% cotton fiber mount boards known as *Gemini* and *W & A* were made at the Rising paper mill. When demand for mount board increased in the early 1970’s, Rising Paper Company discontinued making board for Andrews/Nelson/Whitehead and focused on producing its own line of museum boards. Andrews/Nelson/Whitehead retained both the names and the formulas for the two boards — which have, at various times, been made by Beckett Paper Company, James River Corporation, and Monadnock Paper Mills. A/N/W said that their museum board was consistent in quality and composition, and that there were no alterations of the formulas, regardless of the fact that they worked with more than one paper mill, because, according to the company, “each mill adheres strictly to the Andrews/Nelson/Whitehead specifications.”⁶⁰

Crestwood Paper Company (which merged with A/N/W in 1989) sells museum, photographic, and conservation boards made by Rising and identifies the boards as such. It also sells other museum-quality boards under the Crestwood brand name. Asked about their board, Vice President Michael S. Ginsburg replied that Parsons was the manufacturer of Crestwood-labeled boards, and said that if customers requested such information, he would provide it: “I’m interested in the customer relationship — not only the sale — and in building a reputation as someone who can be trusted for information about the products I sell.”⁶¹

It is possible that different mills may be manufacturing the above distributors' boards by the time this book has gone to press in late 1992, and that there will continue to be changes afterward.

In contrast to this, there are a few companies, such as Talas (Division of Technical Library Service, Inc.), that do not assign proprietary names to any boards they carry. Talas, an important resource for information about materials and people involved in museum and library conservation work, and the long-time supplier of many related products, sells mount boards made by Parsons and Rising paper companies and identifies the boards as such.

Arno Roessler, President of Paper Technologies, Inc., believes that the consumer should be informed of a board's ingredients and expected performance, but he feels that it is more important to know *with what* and *how* a board is made than it is to know *who* made it. He also pointed out that not only can a distributor change mills and formulas without notifying the consumer, but that mills can also make significant changes within their own range of varying conditions without notifying the distributors. Roessler stressed that experience, expertise, and maximum control over the many stages of papermaking are most important — from setting the specifications to determining composition and special techniques, which may have to be employed to meet all of the requirements for the intended end use. Roessler, who is well-known for his service to the museum and archive community, commented that independent producers such as his company and Process Materials (Archivart) usually have more latitude than manufacturers in setting up specifications and in designing products for specialty markets such as the field of photographic conservation.⁶²

Operations in the paper industry are obviously complex and, in some cases, it may be difficult to denounce the practice of private labeling, particularly when the labeled product is unique and not available from any other company under any other name. Proprietary labeling at its worst, however, is a form of deception that usually springs from a fear of competition. Companies should concern themselves less with maintaining exclusivity in the marketplace and concentrate on providing a consistently high quality of services, products, and information and with establishing a credible market for the good of the whole industry. Private labeling in the paper industry — as well as in other industries — does not benefit the consumer and, in the long run, may actually cause considerable harm.

Knowing the specific composition of a paper product is required by those doing conservation research if they are to understand the mechanisms by which a product affects a photographic material. For example, if a particular laminating adhesive proves to be harmful to certain kinds of photographs, it would be essential to know which boards contain that adhesive. In addition, the manufacturer must be identifiable because the information obtained in testing a distributor's board is almost useless if the distributor changes mills. Finally, when complete product information is provided, a photographer is better able to set exacting standards for the materials used in his or her work.

This author recommends, in the case of high-quality mount boards and papers, that every manufacturer and

distributor follow the example set by Atlantis Paper Company in England and identify not only the particular paper mill and the converting company (if any) but also provide a list of the product's contents, manufacturing specifications (including a *clearly identifiable* lot number), and photographic reactivity tests. The list should be included with every package. This is discussed at length in Chapter 13.



A print held in a conservation mat with mounting corners.

Section Four: Constructing a Conservation Mat

Conservation mounting⁶³ is distinguished from other types of mounting in that its primary purpose is to help preserve the photograph it supports. A conservation mount usually requires an overmat to fulfill this purpose. The unit consisting of the overmat and the mount is called a "conservation mat." This flat enclosure can be opened like a book and contains one or more properly mounted prints; it is made of carefully selected materials including stable, nonreactive adhesives and two or more pieces of high-quality mount board or artists' paper in which one or more windows have been cut to facilitate viewing of the enclosed print or prints.

The making of a conservation mat requires knowledge, attention, skill, and taste in the areas of (1) materials, (2) construction, (3) design, and (4) craftsmanship.

1. The **materials** should be chosen first for their composition, which should promote the long-term preservation of the photograph; the boards and adhesives for mounting a print cannot properly be selected until the specific physical, chemical, and aesthetic requirements of the individual print are known.
2. The **construction** of a mat should be determined by the print material's specific structural requirements, so that adequate physical support and protection will be provided during handling, storage, display, and transportation; in addition, the construction should facilitate handling without being cumbersome.
3. The **design** of the mounting should enhance the picture without altering it or being decorative unless this is part of the photographer's intention; in addition, the design should separate the photograph from (or, in some



Mario Santiago of Crestwood Paper Company (New York/New Jersey) operates one of the company's two large computerized paper cutting machines. Most major paper distributors have at least one such machine to cut down large sheets and/or thick stacks of mount board and paper to customers' required sizes. (In October 1989, Crestwood merged with Andrews/Nelson/Whitehead to become ANW-Crestwood Paper Company.)

May 1988

cases, deliberately connect it to) the surrounding environment. In general, a mat is visually most successful when it is barely noticed.

4. Finally, the quality of the **craftsmanship** should express the feelings and the respect that the photographer and caretaker have for the work.

Although the selection of materials and the construction of a conservation mat are often primarily determined by the need for image preservation and physical protection, and although design and craftsmanship are usually primarily related to presentation aesthetics, *all four areas are interdependent.*

Purchasing Mount Board

Mount board can be purchased from art supply stores, mail-order companies, and wholesale paper distributors. Board purchased by the individual sheet may cost twice as much or more as that purchased by the carton but, unless the customer is representing an institution or business and purchases a large quantity (average minimum: 25–50 sheets, or one carton), a wholesale distributor is unlikely to accept an order.

Prices are normally discounted according to the quantity ordered. Customers requiring fewer than 25 sheets may purchase board through retail art supply stores and mail-order companies such as Conservation Resources International, Inc., Light Impressions Corporation, Talas, Inc., and University Products, Inc. These companies also accept orders for large quantities of boards and, for some products, may require a minimum order. Manufacturers can supply a list of wholesale distributors (and sometimes of retailers) that sell their products in a particular geographic area. Distributors can provide lists of local retailers. (See **Suppliers List** at the end of this chapter.)

Full cartons of mount board contain 10, 25, 50, or 100

sheets depending on size, ply (thickness), and tone. In the United States, the most common full-sheet sizes of mount board are 32x40 inches and 40x60 inches. Full-sheet sizes are generally determined by the manufacturer or distributor, although in special situations board can be made in sizes specified by the customer. The most common thicknesses available are 2-ply and 4-ply, although some companies offer 1-ply, 6-ply, and 8-ply. One-ply museum board is usually about 12.5 points, or approximately $\frac{1}{80}$ – $\frac{1}{64}$ inch thick.⁶⁴ The exact thickness measurement of 1-ply varies between different boards and different manufacturers (see **Appendix 12.2: Mount Board Thickness**).

Ordering Board Cut to Size

Mount board is most often sold in full sheets which have to be cut into smaller pieces for use. The term “sheet” refers to full, uncut board or paper as it arrives from the manufacturer or “sheeter” (one who cuts board and paper into industry standard or specified sizes directly from the roll or web). The term “piece” refers to sections of board extracted from full sheets.

Archivart, Light Impressions, Paper Technologies, University Products, and some other distributors sell packages of pre-cut board in standard sizes. Most distributors and mail-order companies have equipment to cut sheets into pieces of requested sizes for a fee based on either quantity or weight of the total order. This service is valuable to users who do not have the capability to cut large sheets or large quantities of board. The quality of their cutting is usually superior to that done by the user. It is not uncommon, however, to receive board that is $\frac{1}{16}$ inch larger or smaller in one or both directions and that is cut at an angle which deviates slightly from the 90° standard. Even so, precise cutting of this type is still more likely done by a machine than by hand.

Mount board commonly expands and shrinks in variable-humidity environments, so the cutter may or may not

be responsible for dimensional errors. When requesting the cutting of board to size, state that the board pieces should be “square and exact” and “well-wrapped.”

Also specify at the time of ordering that you want the off-cuts, which are sometimes referred to as “waste.” Large off-cuts (e.g., 8x20 inches, 10x40 inches) are excellent tabletop protectors and better suited as a cutting surface than most materials. (For example, Masonite is too hard and dense, and chipboard is too soft. One of the keys to consistently clean, sharp cutting is to cut into the same material that is being cut through.) Small off-cuts are useful as “blotter” surfaces upon which binding tape can be moistened. Some off-cuts may be large enough to be made into small mats.

If more off-cuts (and window cut-outs) accumulate than can be used, contact a local school or an organization such as Materials for the Arts in New York City. Materials for the Arts welcomes all kinds of supplies and distributes the donations to nonprofit educational and cultural organizations that in turn give the materials to children, students, and artists.⁶⁵ Whether your surplus is small or large, pass it along to someone who can use it.

Cutting Board to Size

When planning a “cutting map” (see **Figure 12.1**) and before marking measurements on a full sheet, confirm the overall size of the board. Board may deviate from its designated size by as much as ¼ inch and occasionally more. It is particularly important to check the exact width and length at all four corners — not only in the middle — when cutting a full sheet into equal-sized pieces, such as when dividing one 32x40-inch sheet in half twice to make four 16x20-inch pieces. Planning ahead can prevent unnecessary work and expense later.

Board Grain

It is sometimes possible to draw up a cutting map that takes grain direction into account. It is widely known that it is easier to cut, tear, and fold paper along its grain than to do so against (across) its grain. The reason for considering grain direction in matmaking, however, is that a board’s flexibility is usually greater in one direction, and this will help determine the overall strength of the mount and/or mat. The degree of flexibility for a given piece of board depends on the direction of the grain relative to the board’s size and proportions, as well as on the board’s thickness, density, and material composition. (High-humidity environments will cause boards to bend more easily.)

Until recently most full sheets of high-quality boards were cut “grain long” by the manufacturer. This means that the grain runs parallel to the longer side. A board that has been cut “grain long” will bend and warp less than the same board with its grain running parallel to the shorter side. In this author’s experience, the grain direction of full sheets of 32x40-inch mount board has usually been parallel to the 40-inch side, while the grain direction of 40x60-inch mount board has been consistently parallel to the 60-inch side.⁶⁶ Check with the distributor or manufacturer to confirm this, each time board is ordered.

In general, whenever possible, the longer sides of the cut-out board pieces should be parallel to the grain. Con-

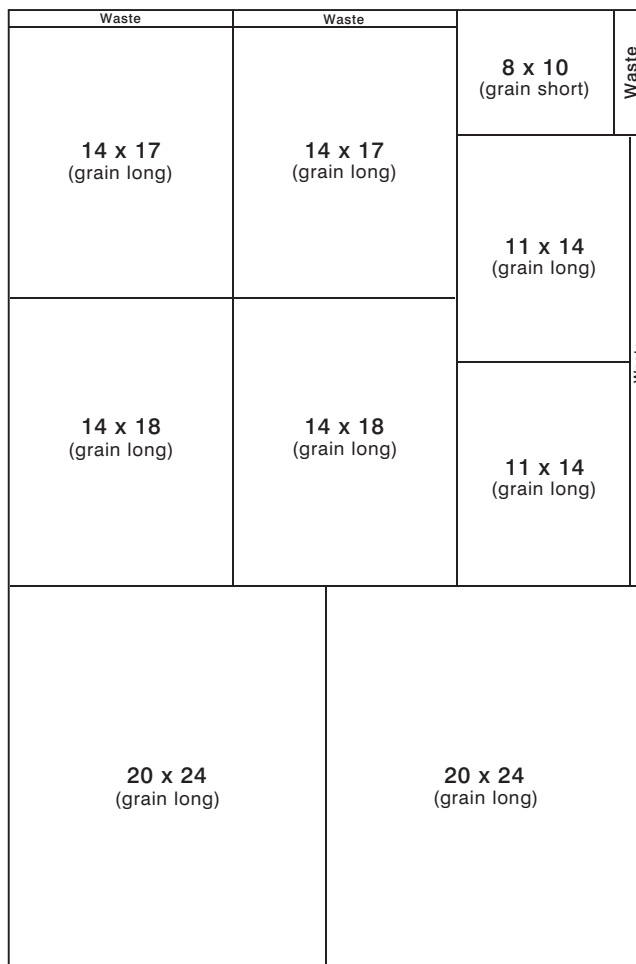


Figure 12.1: An example of a board map made prior to cutting a sheet of 40x60-inch board. Small pencil marks should be made in two locations for each cut, and not full length lines as pictured above.

sideration of grain direction is especially important when cutting large mats and mats with narrow borders. Sometimes, the strongest construction requires a combination of grain directions, with the backing being “grain long” and the overmat “grain short.” This depends on the shape of the mat, the thickness and density of the board, the width of the borders, the placement of the window, as well as the physical characteristics of the print. Unfortunately, in most institutions and frame shops, grain direction cannot usually be taken into account when cutting board to size.

Standard Sizes

Standard sizes are those that are used most frequently and are most commonly available. In time, some standard sizes may change as dictated both by aesthetics and by economic considerations in the marketplace.

Knowledge of standard sizes is helpful for a variety of reasons. Standardization simplifies storing, packaging, shipping, and display requirements, and usually reduces costs and waste. In addition, standard sizes can play an important role in presentation. For example, it is gener-

ally easier to study a series of related prints that are the same or nearly the same size than it is to study prints of a combination of markedly different sizes and proportions. Claude Minotto, Chief of the Archives Division of the Archives Nationales du Quebec in Montreal, wrote:

Through careful design and interpretation, an exhibition or a publication can offer the intimacy, the integrity, and the exclusivity of well-selected photographs. “Into the Silent Land” thus proved an amazingly successful journey. Another feature, however, may have accounted partly for the success of that early western photography exhibition: coherence and continuity of image and frame sizes — a standardization of format well understood now by cinematography and television.⁶⁷

On the other hand, some people do not believe that standard sizes are as desirable. Photographer Victor Schragger made the following remark:

In general, I think it is an excellent thing that care and intelligence contribute to more sensitive and knowledgeable presentation and preservation of photographs. However, there has been a tendency for a “standard” presentation of pictures — from printing and size decisions to matting to exhibition design and conception — which is unimaginative. . . . Preservation does not have to be conservative.

Checking Board Shipments

Board should be inspected when it arrives to assure that it is in good condition and that it is exactly what was ordered. Board with serious manufacturing defects discovered later will almost always be accepted for exchange, but returns of stock that has been damaged by improper handling will most likely not be accepted by a distributor more than a week or so after delivery.

The same type and brand of board will be slightly different each time it is purchased (if it has been made at different times) because of minor inconsistencies inherent in the paper manufacturing process. There will be subtle variations in surface texture and finish, color, tone, density, flexibility, thickness, and so forth. The differences, however, should not be significant. When absolute consistency is necessary (e.g., portfolio mounting), the entire amount of board needed for a project should be purchased at one time; specify that the board should all come from the same manufactured lot — *not* according to the distributor’s lot. Distributors’ lots often consist of more than one manufactured lot.

When purchasing board at full retail prices, each sheet should be nearly perfect. When buying board on the wholesale level, expect 1–5% of the stock to have some noticeable *handling* flaws such as minor surface impressions, dents, scratches, clamp marks, fingerprints, occasional stains, and other imperfections caused during handling, cutting to size, packaging, and shipping. Boards with these type of defects are usually the first and last ones in the packages.

What Sizes Are Standard for Photography?

The standard sizes of mats, frames, and storage cases for photographic prints evolved from the sizes that have long been used in museums for collections of drawings, watercolors, lithographs, and so forth. It was not until the 1970’s that widespread consideration was given to the particular sizes and proportions of photographic prints. The standard size of 16x22 inches, which continues to be used by many museums primarily for works of art other than photographs, has been nearly replaced by photographers, curators of photographic collections, and photography dealers with the size of 16x20 inches. Another museum standard size, 14x18 inches, continues to be used to mat and mount photographs, particularly those made from full-frame 35mm negatives and transparencies. In the mid-1970’s, 14x17 inches, a size which was not common before 1970, was often requested and is now a common size for matting 8x10-inch contact prints in particular. The 20x24-inch size is usually substituted for the museum standard size of 19x24 inches.

The most frequently used standard sizes for mounting and framing photographic prints are the following:⁶⁸

8x10 inches
11x14 inches
14x17 inches
14x18 inches
16x20 inches
20x24 inches
22x26 inches
22x28 inches
24x30 inches
30x40 inches
40x60 inches

The following standard sizes are used less frequently:

9x12 inches
12x14½ inches
13x15 inches
16x22 inches
18x22 inches
18x24 inches
19x24 inches
20x26 inches

In addition, there will occasionally be *manufacturing* defects, which can include splinters, insects, discoloration, separation of plies, defective lamination, structural warping, flaking, feathering, lumps or flocculation (i.e., high-density areas), air pockets, fissures, uneven dye or pigment distribution, and extreme color variations from batch to batch. When more than 10–15% (i.e., 15 or more sheets out of 100) of a shipment is seriously flawed — handling damages and manufacturing defects combined — the entire shipment should be returned to the distributor as soon as possible for exchange or credit. Flawed board should not be used because it compromises the quality of the finished work, whether it shows or not.

Paper companies generally appreciate customers' comments, both favorable and critical, because discussing the problems helps them to provide better quality control, better products, and better service. Chi C. Chen, former Technical Director of Rising Paper Company, said, "Comments, criticism and recommendations from our customers help us to produce mount board that can better satisfy the consumers' needs. The more customers understand about paper, the more comfortable they will feel about using it."⁶⁹

Opening Packages of Board

If the outside of a newly received package of board is damaged, remove the wrapping entirely. If the board has been significantly damaged, rewrap it in the original wrapping and return it. If the board is not damaged, thoroughly wash your hands and remove at least two sheets or pieces of board from the middle of the package to check its condition, to identify the front and back sides, and to confirm the size, ply, finish, texture, and tone. Then inspect the two outside sheets. Compare the surfaces of sheets in different packages for consistency.

Board should be held to a light source to examine color and clarity (absence or presence of insects, bubbles, etc.). Foreign matter trapped between plies is usually found only when the board is cut through at the defect or if light is projected through the board. A large light box or light table is excellent for finding flaws before cutting. Defects will also show up immediately if one holds a board perpendicular and very close to the open side of a Luxor or similar lamp containing a 100-watt bulb.

Marking Board to Assure Correct Alignment When Assembling Mats

If the board has passed its first examination, return it to its original position in the package. (Other defects will become evident when the board is selected for use, at which time another inspection should be done. Soiled or damaged wrappings should always be replaced with clean paper.) Using a drafting pencil with a medium-hard lead (i.e., H or 2H is best) that does not have a sharp point, press lightly while drawing a straight line along one side of the open package of board, marking only the outside edge of every piece from the top to the bottom in the same location, which should be either to the left or to the right of the center, or near one corner. Each package of board within a given type, tone, and size should be marked at a slightly different location (but *not* in the center).

The line serves as a guide in matching the overmat board to the backing when the two pieces are taken from the same package. This is often necessary because board is rarely cut with perfect 90° angles at the four corners; a difference between two boards is instantly noticeable when one piece is reversed — or after the binding tape has been applied and the mat is closed. When board is pre-cut to size, a mat should ideally be made of two consecutive pieces from one package. In portfolios, it is important to match the front and back boards closely for the sake of appearance, to speed the process of alignment, and to eliminate potential problems of fitting the mounted prints into cases and frames. One must also make certain that each mat

matches every other mat in size as closely as possible, and no two mats in the same portfolio case should vary in size by more than 1/16 inch.

For general purposes, the refinement of matching fronts and backs in a single mat is not essential provided that the difference between the two boards is not instantly noticeable, or does not exceed 1/16 inch. Also, larger size differences between the overmat and backing board should not exist in mats intended for framing — unless those mats fit properly into the frames and the overmat and backing are aligned along the *bottom* edge of the mat. Individuals with exacting standards, however, will not tolerate more than a 1/32-inch difference between the overmat and the backing in any case, both for aesthetic reasons and because the construction may be compromised, risking damage to certain types of prints in certain situations.

Labeling Board

Packages of board should be identified on the wrapping paper or on a shelf label. The label should carry a date (e.g., order date or delivery date), the corresponding distributor's invoice number, the manufacturer's lot number, if known, and should identify the manufacturer and distributor as well as the type, size, ply, and color of the board (see **Figure 12.2: Diagram of Board Label**).

When board is removed from its packaging, it should be protected in closed cabinets on shelving made of a non-reactive material such as steel with a baked-enamel coating, and its label should appear on its shelf or door. Do not stack boards of different sizes directly on top of each other because surface impressions or bowing may result.

This author's preferred grouping is as follows: First separate board according to type (e.g., alkaline-buffered 100% cotton fiber board, nonbuffered photographic board, conservation board, etc.). Each type should then be separated into tones and colors. Within each tone or color, different sizes should be grouped together and then, within each size, different thicknesses should be separated. If more than one manufacturer is represented, that distinction should be clearly indicated.

All packages of paper and board (whether for printing, mounting, hinging, interleaving, or other purposes) should be stored horizontally on a flat surface at least 2 inches from the floor to keep the packages clean and safe from accidental spills or flooding and to reduce moisture absorption and warping. When horizontal storage is not possible for large cartons of board (32x40 inches and larger), it is recommended that the cartons stand so that the grain runs vertically; to minimize warping, the cartons should be rotated at least every 3 months so that the sides facing the supporting wall are turned around to face outward.

6/16/92 #312A-CW / Rising Photomount 20x24 4-W

Figure 12.2: Sample diagram of a board label. It is helpful in many stages of working to use abbreviations and symbols for identification. For example, the designation "4-W" refers to "4-ply white." Off-white board can be designated "OW."

Making a Conservation Mat

To make a conservation mat, you will need:

1. A clean, well-lighted area
2. The appropriate boards and papers
3. The appropriate adhesives and tapes
4. A flat, sturdy table or counter
5. Tabletop protection (e.g., expendable mount board)
6. A heavy-gauge, stainless-steel straightedge or T-square
7. A thin, very finely incremented plastic or stainless-steel ruler (preferably Gaebel Model 1057)⁷¹
8. One or more cutting instruments with sharp blades
9. Extra blades
10. Sharp scissors
11. Drafting pencils with 2H and H leads
12. A pencil sharpener
13. Clean erasers (such as Eberhard Faber Kneaded Rubber and Faber Castell Magic Rub 1954)⁷²
14. Clean, soft, undyed, lint-free, cotton wiping cloths or white paper towels
15. An undyed cellulose sponge
16. Clean water in a shallow glass bowl
17. A burnisher
18. A paperweight
19. Interleaving paper
20. Polyethylene bags and packaging materials,⁷³ or storage case
21. An open mind so that "inventions can develop naturally with the work"⁷⁴

The Basic Steps

1. Wash hands
2. Apply a fresh, tabletop protector
3. Sharpen pencils and clean tools
4. Clean blades with a disposable paper towel
5. Wash hands again
6. Select the mount board, paper, and tape
7. Inspect the mount board for flaws
8. Measure the print
9. Apply the measurements to the board with a pencil
10. Remove the print from the work area
11. Cut the outer dimensions, if necessary
12. Cut the window in the overmat
13. Erase all measurement markings
14. Burnish all edges, inside and outside, front and back
15. Compare the window with the print for mistakes
16. If necessary, repeat steps 5 through 15
17. Bind the overmat to the backing with the proper tape
18. Copy all information appearing on the back of the print
19. Position the print inside the mat
20. Close the mat to double-check the print's position
21. Place a protective paper on top of the print
22. Place a suitable weight on top of the protective paper
23. Install the print with mounting corners and/or hinges
24. Trim the mounting corners, if necessary
25. Write down the date and what materials were used
26. Either frame the mounted print, or insert interleaving paper between the print and the overmat and place it into a polyethylene bag, a storage case, or a drawer
27. Clean up

The Working Environment

It is important to separate the two activities of matting and framing since they involve two different and incompatible work environments. Dry mounting is another activity that should be done in its own meticulously clean area. Most paper and board dust created when mats are made does not present a serious threat to photographs since it is not inherently abrasive and is usually easy to remove. (Photographs to be matted or framed should be covered at all times except when they are being inspected, measured, mounted, and installed.) This dust interferes, however, when it clings to glass or Plexiglas during the cleaning and assembling of frames, and during dry mounting procedures.

Frames should be constructed in a well-ventilated and spacious area away from prints and mounting materials. The wood, aluminum, plastic, and glass dust, splinters, and chips that are created when frames are made are extremely harmful to the surfaces of photographic prints, which are very easily scratched. Mount board is also easily damaged in a framing environment. Frames and prints should not be brought together until the frames are completely cleaned, partially assembled, and ready to receive the properly mounted and/or matted prints.

The areas in which matting and framing are done and where materials are stored should be vacuumed every working day. Ideally, they should have a controlled temperature of about 70°F (21°C) with the relative humidity maintained at about 50%. Prints and mounts can warp when they are displayed or stored in an environment with relative humidity that is either higher or lower than the one in which the prints were mounted and framed. The same can occur when prints are mounted and then framed under two different environments.

In 1984, Bark Frameworks, Inc. in New York City installed a climate-controlling system to help maintain moderate temperature and relative humidity levels in its workshop. In 1986, A.P.F., Inc. moved to a new 78,000 square foot facility in the Bronx, New York, which was equipped with environmental controls in the finishing and fitting departments.⁷⁰

Work areas should be well illuminated. If possible, both fluorescent lighting and tungsten incandescent lighting should be available to more accurately determine how each mounted print will look in its intended display environment. Smoking, drinking, and eating in the mounting and framing vicinities should be prohibited at all times.

Board Size and Thickness: 2-Ply versus 4-Ply, or More

The size, thickness, weight, and flexibility of a print determine the necessary size, thickness, weight, and stiffness of the materials needed to mount and mat it. Also included among the many factors to be considered in selecting board *thickness* are:

1. The print condition
2. The board's ability to properly support a print either as a mount or as an overmat combined with a mount
3. Intended use of the mounted print
4. Available funds
5. Aesthetic preferences
6. Available storage space
7. Overall storing, carrying, and shipping weight

In every case of matting an unmounted print, the backing or support section of the mat should be stiffer and larger than the print material. That is, the mount should be rigid enough — when held at its outer edges with two hands — to hold the print without bending under the weight of the print; the mount should also be rigid enough to support the overmat. In addition, the overmat and mount should always be large enough so that the edges of the print material are not exposed and subject to handling.

For identification purposes, a print on paper that is 8x10 inches to 16x20 inches is considered *medium-size* and a print on paper with measurements outside that range is considered *large* or *small*. (*Mats* that are 11x14 inches to 20x24 inches are considered “medium-size.”)

Photographic prints larger than 16x20 inches should not be matted with 2-ply board. Prints that are 16x20 inches should usually be matted with 4-ply board; however, a 2-ply overmat attached to a 4-ply backing on the *long* side is usually secure and unyielding to most sorts of bending which could harm the print. Warped prints of any size should not be matted with 2-ply board on either side.

Many people want a 4-ply overmat because they like the way it looks but try to save money and/or space by using 2-ply board for the backing. A 4-ply overmat should not be attached to a 2-ply backing for any size print because the backing will bend under the weight of the print *because* it is attached to a stiffer and heavier overmat — even during careful handling — and preclude proper support, possibly causing damage to the print inside. In certain situations, however, such as when a print is dry mounted to a board that is the same size as the mat and the three boards will be framed together, a 2-ply backing with a 4-ply overmat may be acceptable.

Most prints that are loaned or sent out on traveling exhibition should be overmatted and backed with 4-ply boards, although sometimes 2-ply overmats attached to 4-ply backings are adequate. A 4-ply overmat is nearly always preferred if a print is to be framed. The thicker overmat will lessen the chance of the print surface contacting, and possibly “ferrotyping,” or sticking to, the framing glass. Also, the thicker the mat the greater its effectiveness in minimizing print curl which can result with fiber-base prints over a period of years as a consequence of cycling relative humidity.

Lightweight Mats

Lightweight mats made with 1- or 2-ply board are often desired for economic, practical, or aesthetic reasons. Board that is 2-ply costs about half as much and is half as thick as the same board which is 4-ply, and it requires less storage space. Lightweight mats may be preferred when weight is a critical factor; they are particularly desirable in cased portfolios and in very large collections.

Sometimes small prints can be matted with a variety of heavyweight artists' papers, which also have the advantage of being available in a very wide range of surface finishes, textures, and tones.

Designing a Mat

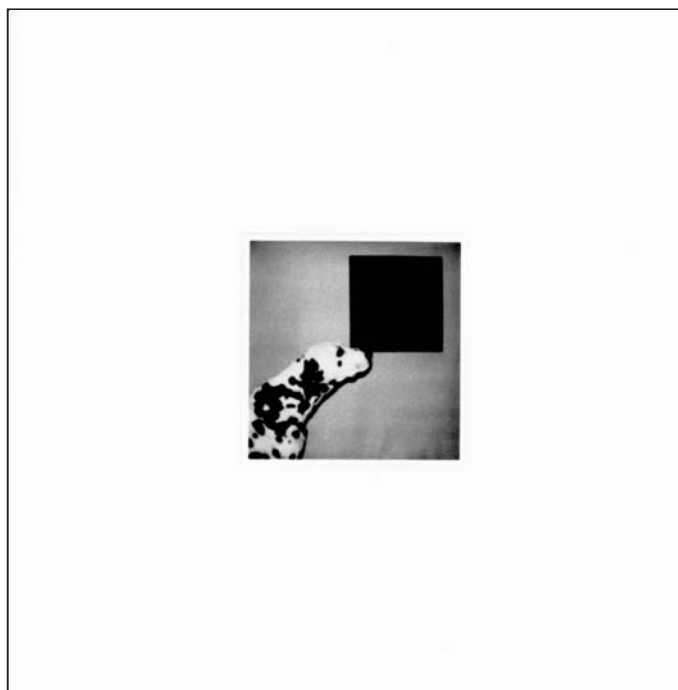
Many measurements must be taken in the course of designing a mat. Before the overall size of the mat can be determined, the following dimensions must be known:

1. The size of the *photographic paper*
2. The size of the *image* on the photographic paper

Given these minimal constraints — that the mat will be larger than the photographic paper and that the mat window will be either smaller, the same size, or larger than the image — there is much room in which to exercise judgment and to express personal taste.

It is important to keep in mind that the composition of a picture can be affected by the design of the mat. Therefore, before any additional measuring is done, the following factors should be considered:

1. The composition of the picture
2. The proportion of the print (e.g., square, square-horizontal, long-horizontal, vertical)
3. Showing or covering the signature
4. Covering the edges of the image, floating the image, or floating the entire sheet of photographic paper
5. If the print will float, the width of the float considered in relation to the composition of the picture and to all vertical and horizontal “bars” in the image (such as poles, doors, stripes, lines, and so forth) as well as to the mat borders
6. If the print will float, whether the print is perfectly square at its four corners
7. The possible overall sizes of the mat
8. The possible mat proportions and directions (i.e., horizontal mat, vertical mat, or square mat)
9. The potential placement of the print (e.g., horizontal print on horizontal mat, horizontal print on vertical mat)
10. The window size relative to the possible mat sizes (e.g., small window in large mat)
11. The potential width of the right and left side borders (which should be equal to each other for mats that have only one window) relative to the potential top and bottom borders



© Don Rodan, courtesy of Castelli Graphics

Don Rodan's Polaroid SX-70 color photograph "Cerberus" (of Leo and Toiny Castelli's beloved dalmation, Patrick) was matted twice to better judge the effect of each design. The version on the left is a standard 8x10-inch size, while the version on the right is a 10x10-inch square conforming to the proportions of the original print. (Photograph from **The Greek Myths** [1976–78])

Selecting a Mat Size

If a standard mat size is desired, the print should be viewed on the three or four most likely standard sizes. For example, an 8x10-inch print could be placed on 11x14-, 14x17-, and 16x20-inch pieces of board. Simply center the print on each of the pieces and see what looks best to you.

If the mat can be a custom size (that is, determined by the unique composition of the particular photographic image and by the personal preferences of the photographer or caretaker), place the print on a board that is about four times larger than the print. Move the print from side to side and from top to bottom to determine the ideal border widths. For the inexperienced eye, it can be difficult to judge the effect, particularly if some part of the photographic paper or image is to be covered in the final design. L-shaped pieces of board, a few inches wide and several inches long, are sometimes helpful as guides.

Another approach is to place the print on the closest "best" standard size board and then make the desired alterations.

When not predetermined by a factor such as an existing frame, the size of the mat is usually a matter of personal taste. Even when selecting from among standard sizes, the photographer or caretaker may prefer narrow borders or ample borders, tall, slender mats or short, wide mats, square mats or vertical mats, and so on.

As indicated, mat size and proportion can affect the composition of an image, and it is possible to maintain the overall balance of a picture, unbalance it, or change the balance simply by increasing or decreasing overall mat size and/or increasing or decreasing individual borders.

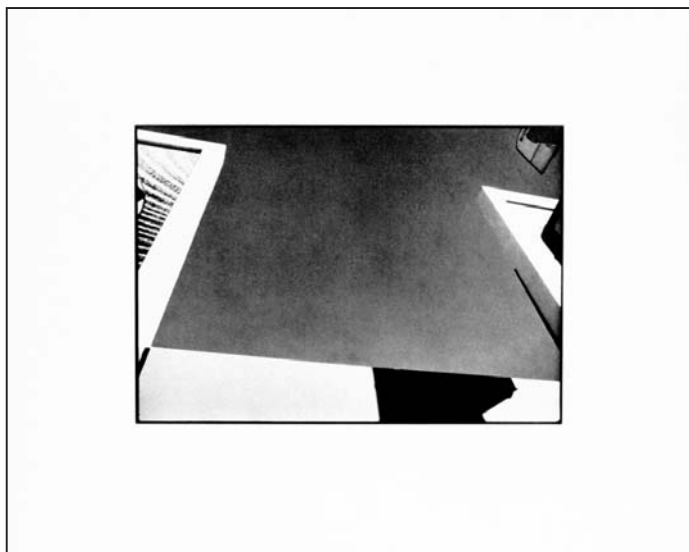
Placement of the Window

After the overall size of the mat has been decided, the location of the window will need to be determined. The border of the mat below the picture will usually appear to be slightly narrower than the top and side borders if all borders are equal in width. To establish a visual balance, therefore, the bottom border should be somewhat wider than the top border. Some people always make the bottom border $\frac{1}{2}$ inch wider than the top border. A perfect balance cannot, however, be set by such rules.

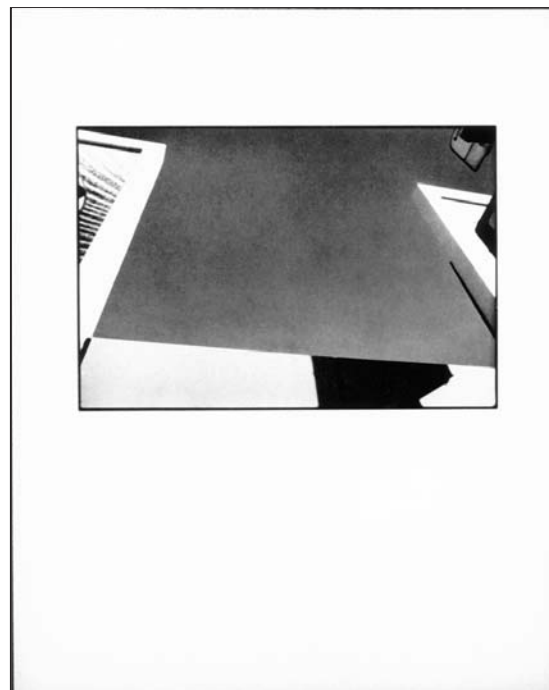
Precise placement always depends on the individual picture image, the already-mentioned considerations, and the ideas of the person(s) involved with the mounting. In addition, two entirely or somewhat different designs may be equally pleasing. For example, some people prefer vertical mats regardless of whether the print is vertical, square, or horizontal. (Paul Strand's horizontal prints are almost always mounted on vertical boards.) No formulas can prescribe invariably ideal placement or perfect design. There may, however, be an existing condition that predetermines or partially controls the design.

For example, a photograph printed on paper that is the same or nearly the same size as the mat predetermines the location of the window. This is always the case if trimming the photographic paper is to be avoided. For this and other reasons, placement of the image on the photographic paper at the time of printing should be determined very carefully.

This is especially important when the photographs have been printed on artists' papers that have distinctive edges. For example, the owners of a portfolio of Edward Steichen



Thomas Walther's abstraction was photographed in the streets of London and printed by the Fresson Quadrichromie pigment color process. Walther considered two different formats for the print, which was matted to the standard size of 16x20 inches. The horizontal mat emphasizes the image's horizontal composition, while the vertical mat emphasizes the vertical directions of the forms. In one viewer's opinion, the image in the horizontal format appears "content to just



sit," while the image in the vertical format appears to be more restless and "ready to move."

© 1976 Thomas Walther

photographs, printed by the gravure process on Rives BFK paper with deckled edges, requested that the prints be matted for physical protection. The size of the paper varied from 15⁵/₈x19³/₄ inches to 15⁵/₈x19⁷/₈ inches. Image sizes varied from small to large, and they were both vertical and horizontal in direction. This author decided to mat the prints with 16x20-inch 4-ply Rising Warm White museum board.⁷⁵ It was possible to mat the prints in a standard size close to the paper sizes because all the images were printed in a precise and straight position on the paper.

Print Borders

When a photograph has not been positioned properly on the paper at the time of printing, it may be possible to compensate for the error when matting. For example, the image can be raised or lowered or straightened in its mat if the photographic paper is smaller than the mat or if trimming of the photographic paper is permitted.

In general, the trimming of print borders should be discouraged.⁷⁶ This author recommends that photographers print their pictures so that moderate paper borders of approximately 1–3 inches, and not less than ³/₄ inch, surround the image area. For example, 8x10-inch images should be printed on 11x14-inch paper. On the other hand, excessive borders — such as, borders wider than 6 inches for large prints — should be avoided. One reason for this is that the larger the paper, the more difficult it is to handle safely. In addition, matting prints which have very large borders often requires trimming off the excess, an operation that risks damaging the print. Dye Transfer prints, however, should have borders that are at least 2 inches wide because approximately ¹/₂ inch usually needs to be trimmed

off to remove warped edges. (See further discussion of borders in the section on "Mounting Corner Design.")

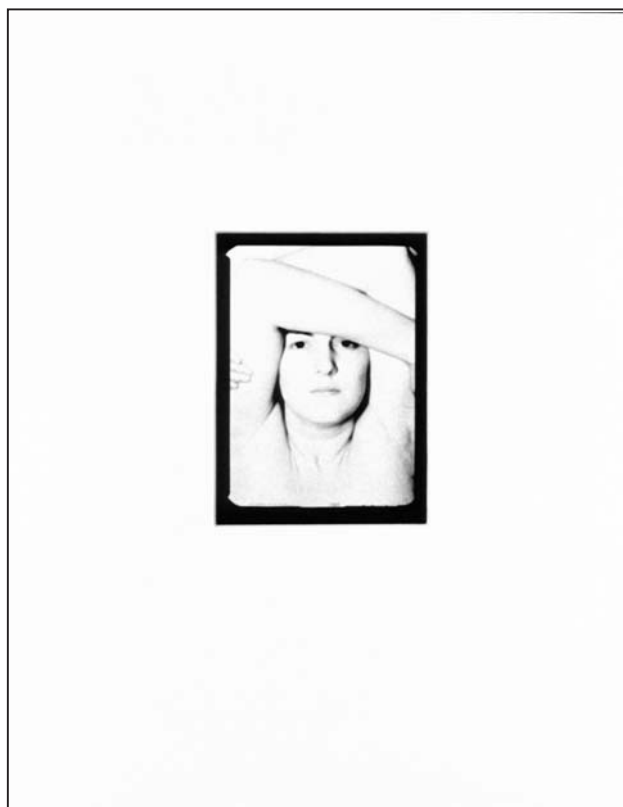
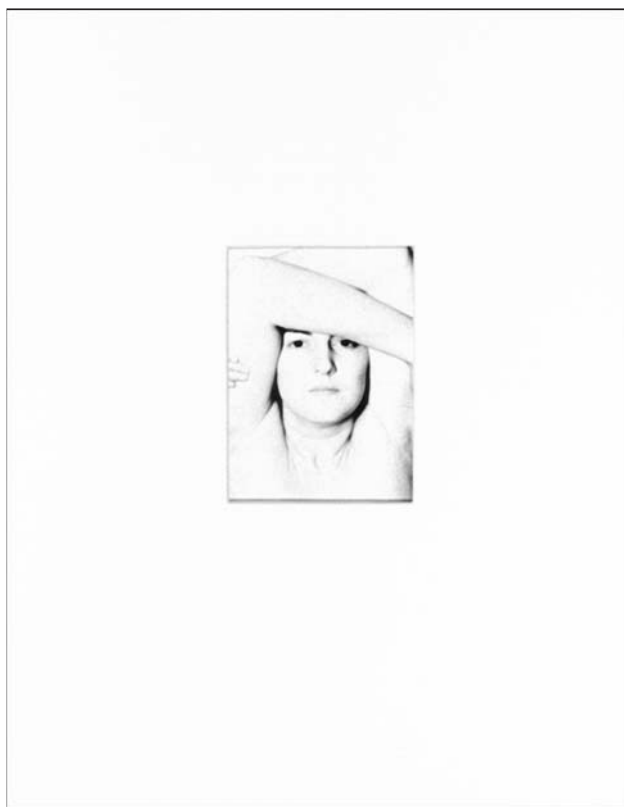
Photographs that are to be matted should ideally be printed on paper which is *at least* ¹/₂ inch smaller all around than the mat to prevent it from extending outside the mat and to provide space inside the mat for taping down mounting corners. For example, an 11x14-inch image printed on 16x20-inch paper, which will have a 16x20-inch mat will require trimming to safely mat it. Trimming off only ¹/₈ inch is sometimes sufficient; however, a 1- to 2-inch margin of space between the edges of the print paper and the edges of the mat is much better.

Most enlarging easels have limited or no capability for printing images precisely centered on a sheet of photographic paper; suitable easels which have fully adjustable margins on *all four sides* of the paper are available from The Saunders Group and Omega/Arkay (Kostiner Div.).⁷⁷

In addition to centering photographs, extra care should be taken to assure that the four corners of the print are perfectly square. This is especially important if the print will float in the overmat window or if a minimal amount of cropping is desired.

Positioning and Measuring the Print

A good ruler is essential for measuring prints. It should be made of stainless steel or plastic, be very thin (shallow depth), have rounded corners, and have finely marked, exact increments. In addition, the ruler should have a small space to the left and right sides of the calibrated scale to facilitate placing and lifting it. An excellent ruler for measuring most window mats is the 24-inch Gaebel Model 1057. (See **Suppliers List** at the end of this chapter.)



© 1947 Harry Callahan, courtesy of Tennyson Schrad, and LIGHT Gallery

The visual impression of a picture can be changed by the matting. Harry Callahan's photograph of his wife Eleanor can look "delicate, low-key, and light," or "strong, bold, and full of contrast," due simply to covering or showing the black borders around the image. A totally black border or a very narrow black border would create two other impressions.

Place the front of the board face down in a horizontal or vertical direction depending on which way the mat will be viewed. Then position the print on the board, either horizontally or vertically. Do not rest the ruler on the surface of the image but rather place it so that its edge will be alongside an outside edge of the image. Now measure the width of the image from the left to the right — both at the top of the print and at the bottom. If any additional area around the print should be visible within the overmat window, add this to the measurements. Subtract the width of the window from the width of the mat. Divide the sum by two. The resulting figure is the width of the right and the left mat borders, which should be equal.

For example, an 8x10-inch horizontal image in a 14x17-inch horizontal mat will have 3½-inch borders at the right and left sides, plus whatever is to be cropped out at the edges of the image (or minus whatever is desired for a float around the image). If the image will not float and the least amount of cropping is desired, about 1/32 to 1/16 inch should be subtracted from the window size — that is, 1/64 to 1/32 inch will be taken off each of the four sides of the image (and added to the mat borders) when all four corners are at perfect right angles. It may be necessary to crop out more of the image when corners of the print are not square.

The next measurements, based on the height of the window, are more difficult to determine, as the top and bottom borders should rarely be equal.⁷⁸ Place the print on the board again. Move the print slightly above center

and compare the two side borders with the top and bottom borders. Does the top border appear narrow or wide? Does the bottom border appear narrow or wide? Ideally no border should appear narrow or wide, either considered alone or in relation to the other three sides. When matting a square print in a vertical mat, however, the bottom border of the mat should obviously be wide, but it should not be disproportionate to the size of the picture or the other three mat borders. When the top and side borders are correctly proportioned in relation to the print and to the wider bottom border, the overall composition should appear balanced. The above-described 8x10-inch horizontal image will have a top border of approximately 2¾ inches and a bottom border of approximately 3¼ inches.

Marking Measurements

It is usually necessary to use pencil marks as a guide for cutting.⁷⁹ All measurements should be marked on the back of the overmat. Cutting the window should also be done from the back. A 2H lead (available, in both wooden pencils or in individual leads for lead holders, where artists' and drafting supplies are sold) is good because it maintains a sharp point without being too hard or too soft. A sharp point is essential when marking measurements on board because the broad line made by a rounded lead is not an accurate guide for the cutting blade. Soft leads, such as B and softer, do not maintain a point, smear easily, and may leave graphite dust on the board which can be

transferred to fingers and prints. In this author's experience, it is easier to maintain a consistent point with a 2H lead in a mechanical pencil, such as Koh-I-Noor Technigraph 5611 and A.W. Faber Castell Locktite 9500, that are sharpened with a sharpener designed for these pencils. Do not press too hard when marking the board. All measurements should be erased and all eraser crumbs should be brushed off the mat and counter after cutting and before installing the print.

Cutting the Window

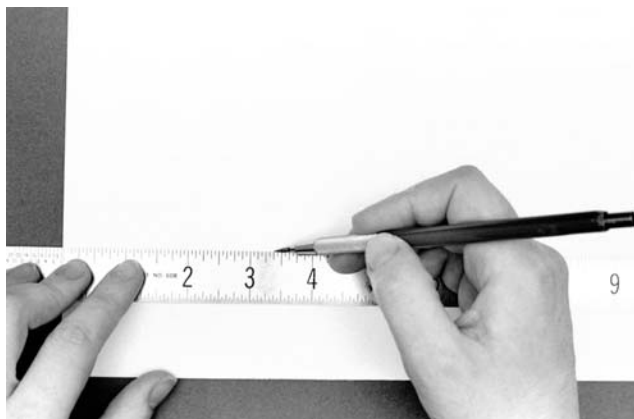
However true it may be that a fine instrument can work well only in the hands of an expert, it is equally true that even an expert cannot perfect his or her craft using inferior tools. To be an expert matmaker, one not only must be patient, exacting, and skilled but also must have well-made and properly maintained equipment, however simple or elaborate.

There are numerous mat cutting instruments and machines on the market. Specific instructions for different cutters are supplied by the respective manufacturers. Some distributors provide individual assistance in setting up elaborate and costly equipment. Unfortunately, it is beyond the scope of this chapter to do a comparative analysis of the many different instruments and machines. The following pages contain practical and detailed information that can be applied in most matting situations. This author bases this writing on extensive experience with the Dexter Mat Cutter and limited experience with a C&H Mat Cutter.

A hand-held mat cutter, such as the Dexter, can cost as little as \$15, whereas a mat cutting machine can cost well over \$1,000. With an inexpensive cutter such as the Dexter, it is possible to cut excellent mats which can be as good or better than those cut with a more expensive machine. For the individual who wants to make mats on a regular but limited basis with a minimum amount of equipment, the principal investment will be the time and the materials needed to learn the skill.



Never rest an instrument on the surface of a photograph. When measuring a print, place the ruler alongside *without touching* the outer edges of the image. A small extension on each side of the calibrated scale facilitates placing and lifting the ruler.



An excellent ruler for measuring most prints and mats is the 24-inch Gaebel Model 1057 (formerly #608), which is made of stainless steel, is very thin, and has finely marked increments, rounded corners, and the recommended extensions for handling. To take full advantage of this ruler's features, use a mechanical pencil with a very sharp lead.

While getting acquainted with the tools, wasted materials can be minimized by cutting single strokes into narrow scraps of 100% cotton fiber board that is 2- or 4-ply thick (whichever ply you intend to use). When practicing the cutting of windows, start with a piece of board that is at least 16x20 inches. In the center of the board, mark the four corner measurements of a very small window (e.g., 1x4 inches) and cut it. Gradually increase the size of the window by cutting around the previous window in successive 1/2- or 1-inch increments (e.g., 3x6 inches, 4x7 inches, 5x8 inches, 6x9 inches, 7x10 inches, etc.). Replace the cut-out piece each time so that the cutting instrument will have an even surface upon which to travel.

Because every board responds differently to pressure and to cutting, practice cutting into board that is identical to the one which will be used in making an actual mat. In general, cotton fiber board is more difficult to cut through than wood pulp board. In addition, cutting against (i.e., across) the grain of a board requires more effort than cutting in the direction of the grain. A board's density and thickness also determine the ease of cutting. It is often more difficult to achieve a perfect cut in board which is dehydrated (more common in winter months) or somewhat hydrated (due to storage in a damp environment).

The Blade

Perhaps the single most important item required to produce a perfectly smooth cut is a sharp blade. Regardless of what cutting instrument is chosen, a dull or broken blade will produce ragged edges, an incomplete incision, an uneven cut, frilling, or tearing — or a combination of these.

The useful life of a blade is determined by many factors, including:

1. Its position in the cutting instrument
2. The density and material content of the board being cut
3. The thickness of the board being cut
4. The amount of pressure exerted in the act of cutting

5. The composition, density, and hardness of the counter-top or table surface
6. The degree of the matmaker's skill
7. The board's moisture content, which is determined by the relative humidity of the environments in which the board is transported, stored, and cut
8. The sizes of the window openings
9. The manufacturing specifications of the blade

Fresh blades, which are usually coated with a film of oil, should be cleaned before use by wiping them with a soft, dry cloth or paper towel. After positioning the wiped blade in the cutter, slowly and carefully pierce a piece of scrap board to remove residual oil and dirt. (If a blade is not cleaned before its first use, the oil and dirt will transfer to the first corner of the mat window and may stain the print resting underneath.) Then test the blade in the scrap board by pushing the cutter several inches both to see how it cuts and to remove any remaining oil. If a properly positioned blade does not make a smooth cut after three runs, discard it. Some new blades are not correctly sharpened and it is impossible to cut perfect mats with them. Hands should be washed immediately after handling a new blade.

Although it is possible to make over 50 windows with just one blade, a blade can be damaged before completing the cutting of just one window. The tip of a blade most commonly breaks because it has been too quickly inserted into the board, or because it hits a hard-surfaced tabletop such as wood, Masonite, or Formica, after cutting through the mount board. As mentioned earlier, mount board off-cuts provide the ideal cutting surface.⁸⁰ Cotton fiber boards are usually quite dense, however, and the tip of a blade may break the instant it touches the board if it is not inserted at the correct angle. Therefore, it is important to insert the blade gently and slowly *and* in the direction in which it is pointed.

Care or lack of care in positioning a blade greatly affects its useful life. The best way to calculate protrusion of the blade beyond the thickness of the board before cutting it is to place the cutting instrument, or the cutting section of the equipment, along (outside) one edge of the board. The tip of the blade should extend $\frac{1}{64}$ to $\frac{1}{32}$ inch beyond the thickness of the board it is intended to cut through. If the cutting surface is not absolutely firm and flat, $\frac{1}{32}$ inch will not be sufficient. For example, the tabletop may yield to pressure — moving up and down — changing the relationships between the blade in the cutter and the board, and between the board and the tabletop; as a result, the blade will not cut entirely through the board. If the tabletop is expected to yield to pressure, the blade must be positioned to protrude more than the ideal distance. (This concern does not apply in the case of cutting instruments and machines that have their own attached bases, such as those made by Alto, Art Mate, C & H, Esterly, Fletcher, Holdfast, Logan, Starr-Springfield, and others.)

On the other hand, if a blade extends too far, it either will prevent the mount board from resting evenly on the table or will too deeply penetrate the cutting board under the mat; in the latter case, the tip of the blade may break or it may jam, causing the cutting instrument to jump ahead

or swerve away from the marked measurement. It is nearly impossible to direct the movement of a blade when it is held too firmly and too deeply in the cutting board; it is also extremely difficult to control the cutting and to hold a board in place when the board is not lying perfectly flat on the table. The mount board should be cut through and the cutting board underneath should be only slightly scored. (Avoid cutting into grooves in the cutting surface that have been made previously because they can prevent the blade from cutting a sharp and straight edge in the mat.) When the blade does not completely cut through the mount board, readjust the blade depth — extending it an additional $\frac{1}{64}$ inch or farther — and try to reinsert it exactly as before into the mat's groove. Then “re-cut” the mat, moving the cutter along the *full length* of each partially cut side.

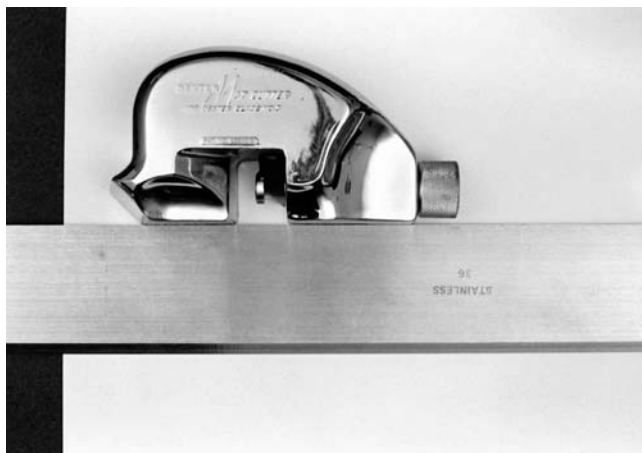
There is a precise point at which the blade should meet the pencil marks both at the beginning and at the end of the cutting. This location varies with each cutting instrument — even within a single manufacturer's model — and also depends on the thickness of a board. When cutting into 4-ply board, the blade of a hand-held cutting instrument should not be inserted exactly where the two lines of the corner meet, but rather approximately $\frac{1}{32}$ inch in front of (before) the line which is perpendicular to the line about to be cut along. Do not stop cutting when you meet the marked corner but go beyond it approximately $\frac{1}{16}$ inch. (Two-ply board requires about half these allowances at both ends.) On the last of four sides, the cutting instrument should be stopped precisely when the tip of the blade enters the starting point of the first cut. A sensitive hand will feel this immediately. Because it can be difficult to know exactly where to stop without underestimating or overestimating the location, it is faster to rely on feeling, aided by observation, while cutting than to try to calculate it in advance.

When an incision is incomplete, some practitioners recommend using a single- or double-edged razor to open it; this is done by turning the board over and working on the front of the overmat.⁸¹ When such working over is necessary, this author prefers to repeat the entire incision starting at the corner and using the original cutting instrument.

The Metal Straightedge

In addition to sharp blades, a good straightedge is essential to cut mats properly. It should be made of stainless steel, not aluminum or plastic, and it should be longer than most of the mats that will be cut. This author recommends a 36-inch heavy-gauge straightedge (available through most art supply stores) which is relatively easy to handle and control when making mats in a variety of sizes. When it is not lined on the bottom with a thin layer of cork, apply two parallel, full-length strips of tape such as Filmoplast P90 to the underside to help prevent it from skidding.

The straightedge must be placed perfectly parallel to the marked measurements. Care, steadiness, and skill are needed to prevent it from sliding during the cutting. Push the cutter gently along the straightedge; proceed slowly at first to avoid changing the direction of the cut. One can maximize control over both the movement of the cutter and the stationary position of the straightedge by pushing them *against each other* while moving the cutter forward.



A Dexter Mat Cutter rests alongside a stainless steel straight-edge between sides during the cutting of a mat window.

Maintain contact between the cutter and the straightedge at all times — and do not lift the cutter off the board — until the cut is completed.⁸²

When an instrument is operated by pushing it forward (e.g., Dexter Mat Cutter) rather than pulling it, the cutting should proceed clockwise for right-handed people. When pulling (e.g., C & H), the cutting direction is counter-clockwise for right-handed people. The Dexter Mini mat cutter, the Dahle Cube Cutter, and the Japanese Olfa mat cutter are small, hand-held bi-directional cutters that can be used by both left- and right-handed people; the Cube and the Olfa can be pushed and pulled because the Cube is square and the Olfa has double-edged “V”-type blades. Many cutters with attached bases and/or straightedges require pulling of the blade, which this author has found to be somewhat more difficult than the pushing required with instruments such as the Dexter.⁸³ However, those machines usually have metal bars which hold the mat board in place and control the course of the blade; they are usually equipped with two different cutting heads — one for beveled cuts and one for straight right-angle cuts.

The angle of the bevel (commonly 45° or 60°) is usually predetermined by the cutting instrument. Some machines are adjustable to achieve two different bevels. In the Dexter Mat Cutter, the 60° bevel changes slightly with the thickness of the mount board (the thicker the board, the wider and less acute is the bevel) and may also vary very slightly from instrument to instrument.

The Binding of a Mat

The tape which connects the front of a mat (the overmat) to the back of the mat (the backing) is usually called the binding or binding hinge. In most circumstances, the overmat should be attached to the backing along the full length of one side with a hinge that folds so that the mat can be opened and closed like a book. Methods which trap a print by adhering the overmat to the backing should be avoided in most cases.

The binding should be on the long side of the mat. The side on the viewer's left should be connected if the mat is vertical, or the top side should be connected if the mat is

horizontal. Square mats may be connected either at the top or along the left side, depending on their size and the grain direction of the board. The tape should be slightly shorter than the length of the mat: the smaller the mat, the more closely the tape should match the mat length. When the mat is larger, the tape should not match the length of the mat as closely. For example, an 8x10-inch mat should have a binding hinge that is approximately 9¾ inches long. A 16x20-inch mat should be bound by tape that is approximately 19 to 19½ inches long. A 22x28-inch mat requires a binding hinge that is approximately 26 to 27 inches long.

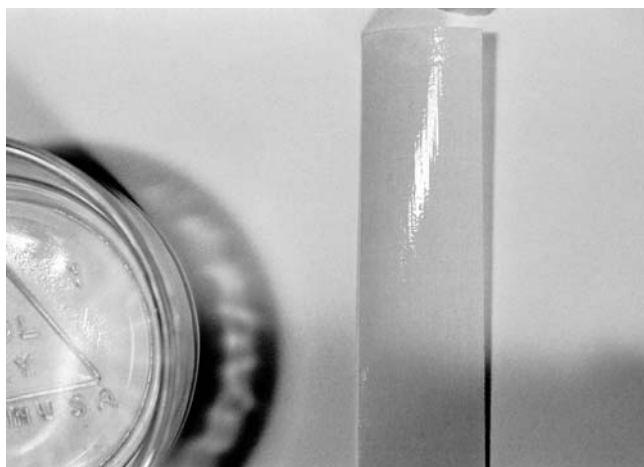
During repeated opening and closing of large mats, greater stress is placed on the ends of the tape where the two boards are connected. If the binding covers the entire length of a large mat, the tape will likely become loose or detached at either or both ends. When a large mat is opened frequently, it may be necessary to apply a 2- or 3-inch strip of tape perpendicular to and over each of the two sides of the joint to prevent the binding tape from coming apart. A mat bound along the short side or bound by a hinge that is too short will not maintain its alignment and may also become detached from the backing. Alignment is critically important when matting dry mounted prints that are trimmed to the edges of the image, particularly when the edges are showing in the window area.

This author primarily uses gummed cambric cloth tape (sometimes called “linen” tape, or Holland tape) for the bindings of 4-ply mats, and Filmoplast P90 tape for the bindings of 2-ply mats.

Moistening and Applying Gummed Cloth Tape

In the beginning, learning to apply water-activated tape involves learning how to activate the adhesive, how to control the various stages of accretion, and how to determine the strength of the bond. It is also learning how to touch and how to feel. Every adhesive responds differently in different situations with different materials. For example, various batches of a given brand of gummed cloth tape may react differently to water. The adhesive layer may be slightly thinner or thicker, the threads of the cloth may be more or less tightly woven, and the cloth may have slightly more or less sizing. Every variation in the manufacture of a material affects its working behavior. It is easier to master the craft by working consistently with one specific brand of tape; however, experience with one tape and the acquired knowledge of its behavioral characteristics cannot automatically be assumed to apply to other similar tapes used in the same situation.

The most common high-quality tape for binding 4-ply museum board mats is gummed cloth tape which requires moistening with water. Moistening is regulated by the quantity and temperature of water in the applicator (e.g., a sponge) and by the amount of pressure applied. The perfect amount is best determined by touch. Freshly moistened tape should be tacky and should adhere within a few seconds after applying water. At the precise moment it becomes tacky, the tape should “grab” the board as it is placed. It is important to evenly moisten only the surface of the adhesive; the water will then combine with the adhesive layer and activate it without greatly diluting it. The cloth side should not be allowed to get wet. If the tape is



Properly moistened tape.



Dry, unmoistened tape.



Overly moistened tape.

Learning to apply gummed tape requires familiarity with its appearance and feel before, during, and after it has been moistened.

moistened too much, the tape will become limp and the adhesive may be absorbed by the sponge and/or board; tape which is too wet can cause mount boards to warp or deform. If the tape is moistened too little, the adhesive will not combine properly with the water and will not become adherent. The ease or difficulty with which tape adheres is also affected by the temperature and moisture content of the board and the temperature and relative humidity of the working environment.

Before starting to tape, you will need the following:

1. Clean water, preferably distilled; room-temperature or tepid, not cold, water is best for activating the adhesive
2. A shallow, heavy, glass bowl to hold the water (about 1½ inches deep) with sides perpendicular to a flat bottom so that it will not tip over
3. A triangular section of sterile, undyed cellulose sponge that is approximately 50% wider at the base than the width of the tape
4. A clean, dry surface upon which to wet the tape
5. A clean, lint-free, cotton cloth, or sturdy, white paper towel
6. A pointed burnisher

When everything is ready, proceed as follows:

1. With the adhesive side face up and the cloth side face down, place the tape upon a clean surface, at least 1 foot away from the open mat. Some people prefer to moisten tape on a water-resistant surface such as glass, Formica, or Plexiglas; this author prefers small 4-ply mount board off-cuts because they absorb excess water. If right-handed, hold the tape down by placing one finger of the left hand about 1 inch from the top edge of the tape. Squeeze the wet sponge over the bowl to release excess water. Press the sponge upon the top inch of tape. Then lift and pull the tape by its moistened tip, holding the sponge against the tape with moderate pressure to moisten the entire length in one continuous movement. To do this efficiently, pull the tape upward and away from the sponge with one hand while the other hand is pushing the sponge down against the tape. If the pressure varies while the tape is being pulled through, the amount of moisture on the tape will vary, which will prevent it from adhering evenly to the mat. It is usually necessary to immediately remoisten the entire tape, both to add water to sections where the tape is dry and to absorb excess droplets of water before they have diluted the adhesive. A piece of tape that has been moistened so much that the edges of the cloth side are dampened should be discarded. Practicing with one specific type and brand of tape over a period of time will help to develop a better understanding of the skill.
2. The two boards should be positioned side by side, touching, with their inner surfaces facing up and ready to receive the tape at the moment the wet sponge completes its final stroke. Weights can be used to keep the boards in place. With two fingers of each hand, quickly place the

tape lengthwise over the edges where the two boards meet, checking to make sure the width of the tape is equally divided between the two boards. The fingers of the right hand should hold the tape close to the right corner and the fingers of the left hand should hold the tape close to the left corner so that they are diagonally across from each other. Use the visible sections of board which extend at the top and bottom beyond the length of the tape as a guide to correct and parallel placement. As the tape is put down, a slight pull in opposite directions will help to ensure a flat placement and smooth adherence. If the tape is not put down quickly, it may twist, fold, and warp, which will prevent a proper parallel placement.

3. A lintless wiping cloth, such as cotton gauze or S&W Catalog No. 1900 cloth, or a sturdy, white paper towel (such as Bounty or ScotTowel) should be available to immediately apply a firm and even pressure along the length of the tape twice before applying the burnisher. Do not burnish or stroke the tape with your hands.
4. *While closing the mat*, press the point of the burnishing tool against the center of the binding, running it along the inside to help crease the tape. Then check the alignment of the two boards. It is important to complete this operation before the tape dries.

Alignment of the Overmat and Backing Board

The alignment of the overmat and backing board cannot be changed after the tape “sets” without weakening the mat’s binding. A weak binding can cause damage to the print inside the mat in a number of ways. If the print is on very thin paper, the overmat will slide against the print and may cause it to fold or crease at its edges or in the middle. If the print is held in the mat with tab hinges, the shifting overmat may detach the print from its mount. If a fiber-base print is dry mounted and floating within the window, the inside edges of the window may touch the edges of the print and chip the delicate photographic emulsion.

If the overmat and backing boards have not come from the same package of pre-cut board, or when the two pieces are not *exactly* the same size, it is usually necessary to adjust their relative positions before applying tape. Make certain that the overmat and backing are evenly matched along the bottom side — that is, the side upon which the mat would rest if it were framed.

When the larger of the two boards is at least $\frac{1}{16}$ inch *larger* than the correct size, the excess should be trimmed off. If the matted print is to be framed and the smaller of the two boards is *less* than the designated frame size by more than $\frac{1}{16}$ inch, and the larger board is the correct size, the larger board should *not* be trimmed to match the size of the smaller board because the mat might then be free to move inside the frame. In addition, if the larger board is trimmed, the mat may not fill the entire area that is visible through the glass of the frame.

After aligning the connected boards and before any necessary trimming is done, burnish the outside edges where the mat is hinged both on the front and on the back with a burnisher — such as a printmaker’s polished agate or



When binding the overmat to the backing, hold each end of the moist tape by its corners (upper left corner with the left hand, lower right corner with the right hand, or reversed) and give it a slight tug in opposite directions to ensure smooth adherence. Use the visible sections of board that extend beyond the tape ends as guides to parallel placement.

metal burnisher — or with the rounded top edge of a Dexter Mat Cutter. Next, if necessary, trim the uneven border(s). Then burnish the three unhinged outer edges of the mat on the front and on the back, inside and outside.

It is also necessary to burnish the four inside and four outside edges of the *window* because slight ridges are created there during the cutting. Some people like the edges of the window to be rounded; this can be accomplished either by gentle sanding, which results in a flat, “soft” finish, or by strong burnishing, which may cause the rim to be shiny. Care must be taken not to burnish too forcefully if a shiny edge is not desired.

Bindings as They Relate to Board Thickness

It is best to apply gummed cloth tape to only 4-ply or thicker mount boards because thinner boards usually respond to water-activated tapes by warping. Mats made with lightweight boards may be joined with a high-quality pressure-sensitive tape such as Neschen Filmoplast P90. Make certain there is no space between the boards when they are placed side by side. When connecting or binding a 2-ply overmat to a 4-ply backing, compensate for the difference by resting the 2-ply board upon another piece of 2-ply board to assure an even horizontal plane and to enable the edge of the 2-ply board to rest directly against the higher edge of the 4-ply board. Otherwise, when the mat is closed, a strip of the tape will be exposed which will accumulate dust particles. Pressure-sensitive tapes must be completely and evenly burnished with an *instrument* after they are placed or they will not adhere properly to the board. Never burnish tape with your fingers.

Compensating for differences in board thickness when attaching two pieces of board is necessary regardless of what tape is used. If compensation is not made, the binding will be loose and the overmat may move upon the surface of the mounted print.

Spaced Bindings for Pre-Mounted Prints

Pre-mounted prints (such as those dry mounted to 4-ply board) require specially constructed mats. First of all, an overmat should not be attached directly to the print's mount, unless it is the photographer's wish to do so. Taping an overmat to the print's mount rather than to a backing board spoils the front of the mount. A backing board also serves to protect the back of the print's mount.

When a pre-mounted print is to be matted the same size as the print's mount — a decision normally made for the sake of maintaining the original proportions — it will be necessary to leave space equal to the thickness of the mount between the two boards when connecting them. For example, Ansel Adams's black-and-white prints are usually dry mounted on standard-size pieces of 4-ply 100% cotton fiber board (e.g., 14x18, 16x20, 22x28 inches), and the mats for Adams's prints are usually matched, as he recommended, to the sizes of the mounts.⁸⁴

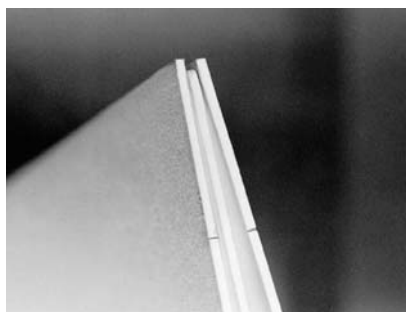
To assure that a print dry mounted to a piece of 4-ply board will fit into a mat that is the same size, the overmat and the backing must be separated by a space of approximately $\frac{1}{16}$ inch before the binding tape is applied (about $\frac{1}{64}$ inch more than the thickness of the mount to allow for the tape). This enables the mat to open and close without stress and creates a *flat* three-level tier when the mounted print is inside the closed mat. To prevent the mat from sliding toward the edges of the dry mounted print, it is essential that the space provided at the joint (binding) not be any wider than necessary.

Pressure-sensitive tapes are not suitable for making spaced-bindings because dust particles and dirt will become attached to the exposed section.

Sectional Fillers

When a mat must be a standard size and the print is pre-mounted on 4-ply or thicker board which matches the mat size in one direction only (e.g., a 13x20-inch mount to be placed in a 16x20-inch mat), a sectional filler must be placed between the overmat and the backing to compensate for the empty space. The binding tape should be applied to the side where the filler is attached to the backing, preferably one of the longer sides, and should be applied to the top of the filler. Sectional fillers may be attached to the backing (before taping) with a variety of materials including Scotch Brand No. 415 tape (a double-sided, pressure-sensitive polyester tape), 3M Positionable Mounting Adhesive No. 568 (also pressure sensitive), or with a stable liquid PVA (polyvinyl acetate) adhesive.

Close-up of a 4-ply mat with a spaced binding accommodating a pre-mounted print.



The Middle-Mat

When matting a print which is pre-mounted on a piece of 4-ply board that is all around smaller than the mat, a 4-ply "middle-mat" is required to compensate for the size difference. If the overmat and the middle-mat are both attached to the backing with full-length binding hinges, the hinge of the middle-mat should be applied on the side which is opposite the overmat's hinge; in other words, if the mat is vertical, the overmat's hinge to the backing is on the left and the middle-mat's hinge to the backing is on the right. This construction allows the two windows (overmat and middle-mat) to have a complementary closure (i.e., \backslash / $_$) rather than a book-format closure. Remember to allow enough space for the middle-mat filling before taping the overmat to the backing. The middle-mat should be the same size as the overmat less approximately $\frac{1}{32}$ inch near the overmat's binding to assure a secure closure of the entire mat. If the middle-mat is completely adhered to the backing (i.e., to form a "sink" mat), it should match the size of the overmat; the overmat may then be hinged directly to the "sink" mat rather than to the backing.

The "Sink" Mat

If the print's mount is 4-ply or thicker (greater than $\frac{1}{16}$ inch), it is usually necessary to construct a "sink" mat. The term "sink" refers to the recess in which the print will rest, which is surrounded by board attached to the backing. This recessed space is made by cutting an opening in one or more pieces of board, or by applying board strips around the four sides of the print. The depth of the space created should be slightly more than the thickness of the pre-mounted print. The overmat's binding hinge should be attached to the top surface of the "sink," which should be exactly the same overall size as the overmat and backing.

Some prints may be installed into a "sink" mat with pendant hinges that are connected to the backing *under* the middle-mat, "sink" mat, or sectional filler, to permit lifting of the print to view the reverse side. When measuring the overall size of the pre-mounted print, allow an additional space above the print where the hinges will be attached. This space should be at least $\frac{1}{16}$ inch wider than the thickness of the print mount. For example, if a vertical print is 5x7 inches and is mounted on a vertical 8x10-inch 4-ply board, the "sink" should be approximately $8\frac{1}{8} \times 10\frac{1}{8}$ inches; that provides a $\frac{1}{8}$ -inch allowance at the top and a $\frac{1}{16}$ -inch allowance at both the right and left sides. The bottom edge of the print mount should rest evenly on the bottom edge of the "sink," which should be cut 90° to the surface of the board and then burnished smooth and slightly rounded. The top, right, and left inner edges of the "sink" should be beveled, burnished smooth, and rounded to prevent the edges of the mount from catching, particularly when the print emulsion layer is exposed on the sides (as in the case of flush-mounted prints) and to allow the print to be lifted without resistance at the top edge of the "sink" where the hinges are located. A small inlet may be cut at the bottom edge of the "sink" to more easily lift the pre-mounted print. Sometimes a thin ribbon can be attached to the backing to run under the print and through the inlet to allow the print to be lifted without touching its edge.



Burnishers are necessary both to blunt sharp edges in cut board that can damage delicate print emulsions and to improve the appearance of the finished mat. Pictured above are two examples of printmakers' burnishers: curved, rounded, and polished agate (left) and curved, pointed, and polished metal (right). Bone burnishers are not recommended because they create more friction during movement than either polished agate or metal.

Paperweights

Before a print is mounted onto the backing, it must be correctly positioned beneath the overmat. When a print is to be corner-mounted, position the print by viewing it through the closed window. Then place a protective piece of 2-ply board or heavy paper — with one of its corners folded up — on top of the print; this protective board or paper should be about ½ inch smaller all around than the window opening so that the overmat can be lifted up without removing it. Now place a clean and smooth weight on top of the protective paper to hold it and the print in place. The weight should have no sharp edges. It should be easy to lift and move, being neither too large nor too heavy (1 to 2 pounds, depending on size). Metal paperweights should be covered with thick, soft, undyed cloth.

Some people use stainless-steel positioning clasps to hold prints in place. Clasps of this type are commonly sold in office supply stores. Although clasps are recommended by some, this author strongly advises against their use because they can easily scratch delicate emulsion surfaces. Fragile prints can be creased, marked, and even folded by these clasps. Those sold by Light Impressions Corporation have well-rounded corners but they can still cause damage if one is not very experienced in using them.

Installing a Print into a Mat

A photographic print must be held securely in its mat. Traditional methods of securing prints include total-surface adhesion (dry mounting, cold mounting, wet mounting), partial or local attachment (hinges, double-sided tapes, glue), and “free attachment” (mounting corners, Frame Strips, polyester slings, or folders). Every method has its proper application, depending on a multitude of factors.

In the fine art field, many paper conservators recommend hinges to secure a work to the backing of a conservation mat. These are frequently suitable for watercolor paintings, lithographs, pastel and graphite drawings, and some photographic prints on fiber-base paper. The RC (polyethylene-resin-coated) paper or polyester support upon which many photographs are printed, however, cannot be ap-

proached in the same manner as other works of art on paper; many water-activated adhesives and tapes may not properly adhere to these types of photographs.

This author recommends, whenever possible, that photographic prints be installed into conservation mats by a method that does not adhere the print, either partially or totally, to the mount or backing board. While this author has not seen examples of carefully done dry mounting that has harmed photographs, it is not generally recommended by photographic conservators. In addition, dry mounted prints cannot be laser-scanned for reproduction purposes. In spite of its shortcomings, however, dry mounting is often desired by photographers for purely aesthetic reasons. (See Chapter 11.)

Possible expansion and contraction of mount boards, combined with the physical responses of different photographic print materials, should be considered before selecting any mounting method. A photograph may buckle, bow, stretch, or tear if it is hinged or installed incorrectly; consideration must also be given to the humidity-induced dimensional changes characteristic of the print and mounting materials when kept in most uncontrolled environments.

Corner Mounting

Two methods of installing prints into mats are discussed in this chapter: corner mounting and hinge mounting. This author's preferred method of installing most photographic prints into mats is corner mounting. Among the advantages of corner mounting are that the print is not “permanently” attached to the mat, the mat can be replaced more easily if soiled or damaged, the use of adhesives directly on a print is avoided, prints are less likely to slide, and color prints can be removed from mats before being placed in cold storage. Sometimes it is necessary to combine mounting corners with hinges.

Most mounting corners should not fit the print corners too tightly but be placed to allow approximately 1/64 to 1/32 inch — or more for large prints — outside the edges of the prints for slight expansion and contraction of the prints and/or mounts. (Polyester-base photographs, such as glossy

Ifochrome, Polaroid ArchivalColor, and UltraStable prints, are dimensionally stable and do not change size in response to changes in relative humidity, but allowances should still be made for expansion and contraction of mount boards.) The bottom edges of the two bottom mounting corners, however, should be closer to the bottom edge of the photograph to prevent the print from sliding down during display and handling. Relative humidity conditions and the board's grain direction should also be taken into account.

Mounting corners should be made of high-quality materials appropriate in composition, pH value, weight, texture, and tensile strength, and that have been approved for use as photographic enclosures. (See Chapter 13.) They should be pH neutral, strong, somewhat moisture resistant, lightweight, without color, and not alkaline buffered. The corners should also be designed specifically for the individual print size and type and should be securely attached to the backing of the mat with an adhesive or adhesive tape that also is stable, strong, inert, and has a neutral pH.

Atlantis Silversafe Photostore, available in the United States from Archivart and from Paper Technologies, Inc., is probably the best paper for this purpose.⁸⁵ Two other excellent choices are Archivart Storage Paper and Light Impressions Renaissance Paper.⁸⁶ Howard Paper Mills alkaline-buffered Permalife papers are not recommended because of continuing questions about the long-term effects of alkaline-buffered papers on photographs.⁸⁷

Transparent corners made of polyester are occasionally suitable for floating prints that would otherwise require hinges. Those distributed by Light Impressions Corporation are pre-scored for folding, but care must be taken to assure both an exact and straight 45° folding in the right direction so that the adhesive is facing out and away from the print. They are narrow in width ($\frac{7}{16}$ inch), and are thus restricted in use to flat, nonbuckling, small to medium-size prints that are not lightweight, delicate, or flimsy.

University Products, Inc. sells a nearly identical product, See-Thru Archival Mounting Corners, available in three widths ($\frac{1}{2}$ inch, $\frac{5}{8}$ inch, and $\frac{7}{8}$ inch). The University Products polyester mounting corners are also restricted in their use to sturdy, flat, medium-weight prints.

Pre-fabricated, easy to use mounting corners named ClearHold, made of transparent polyester with a high-stability pressure-sensitive adhesive backing, are available from Light Impressions.

Frame Strips also hold photographs without applying any adhesive to the prints. Type 423 (flat) and Type 107 (S-shaped), made of "conservation grade" clear polyester, is suitable for mounting lightweight and medium-weight flat prints that do not travel and are not subject to repeated handling. Among the advantages of Frame Strips are that the strips can be cut into very small sizes, they are not visually obtrusive, and prints are easily removed. Among the disadvantages are that Type 423 can scratch delicate print emulsions if one is not *extremely* careful to avoid doing so, and prints too easily shift position when moved. To help prevent scratches when using Type 423, place a piece of thin paper between the Frame Strip and the print emulsion when attaching the strips and before removing the print. Type 107 may be used when mounting prints into 8-ply or thicker mats.

Mounting Corner Design

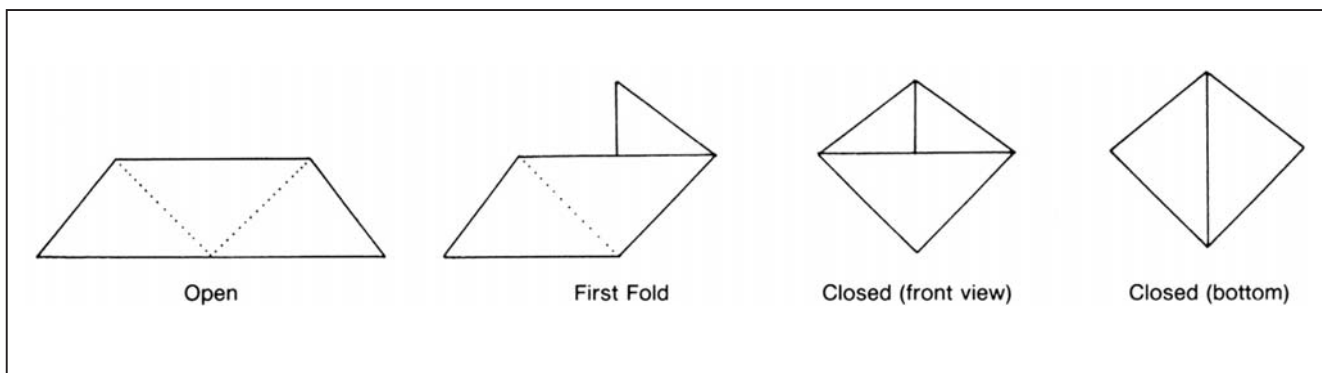
The appropriate material, design, and size of a set of mounting corners should be determined by the particular photographic material, the size of the photographic image, and the width of the photographic paper's border around the image. In addition, the thicknesses of the overmat and backing should be taken into account. Any changes in a print's intended display, circulation, and/or storage conditions may create a new combination of requirements.

One important design feature that distinguishes the conservation mounting corner, which this author recommends, from other mounting corners is the *extended base*. (Figure 12.3 illustrates the correct design and some faulty designs.) When the corners are very large or when a photograph is printed on somewhat translucent paper, or when the image nearly touches the edges of the print material, the extended base should be shorter than usual. The extended base, or "landing pad," ensures proper entry of the print into the mounting corner; without it, the corner of the photograph may slide under the mounting corner. In addition, absence of an extended base creates two other risks: (1) if the photograph is printed on fiber-base paper, the emulsion and baryta layers may become separated from the paper base when the print hits the edge of the corner, and (2) the corners of the print are too easily cracked during insertion because they usually require more bending.

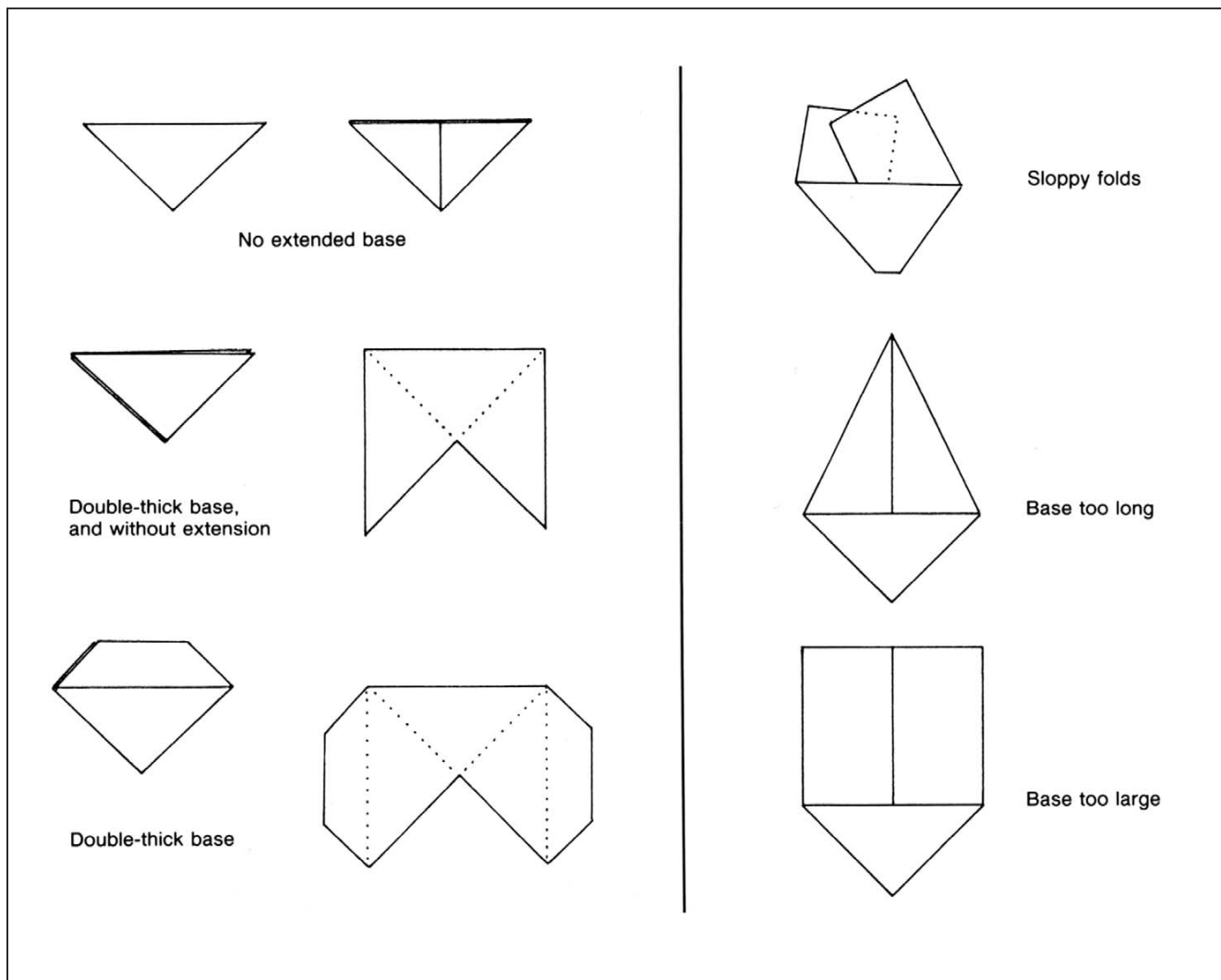
Most handmade and commercially produced mounting corners examined by this author do not have extended bases and/or have a double-thick base created by two overlapping flaps. Such corners are not recommended because of the difficulty reinserting a print after removing it. Those mounting corners that do have extended bases — described and illustrated in various publications — are usually not well designed in that the two "wings," or two sides of the base, are too long and extend into the area directly behind or near the image. If a mounting corner is made of thick paper it may become embossed in the border of the photographic paper or in the image itself. Because of this, mounting corners should be made with paper distinctly thinner than the photographic material, and the corners should not have double-thick bases.

All mounting corners should be designed with consideration for the bending that occurs when inserting and removing prints, as this is the most serious drawback to mounting corners. The size and design of the mounting corner in relation to the size and proportion of the print will determine the location of the bend and its angle. When a mounting corner is too large (i.e., more than $\frac{1}{2}$ to 1 percent of the area of the photographic paper), the print may have to be severely bent during removal and re-insertion, thus stressing the various layers of the print. The bending angle should be as obtuse as possible. Mounting corners should not, however, be made smaller than they need to be to properly hold the print. They should be large enough to hold the print securely but small enough to facilitate print removal.

For example, a mounting corner made with 1- to $1\frac{1}{8}$ -inch wide strips of paper (resulting in a corner with a side measurement of approximately $1\frac{1}{2}$ inches, creating a $1\frac{1}{2}$ -inch "square" with the extended base included) is recommended for most 16x20-inch prints which have a border



Correct Design



Incorrect Designs

Figure 12.3: Examples of Mounting Corners

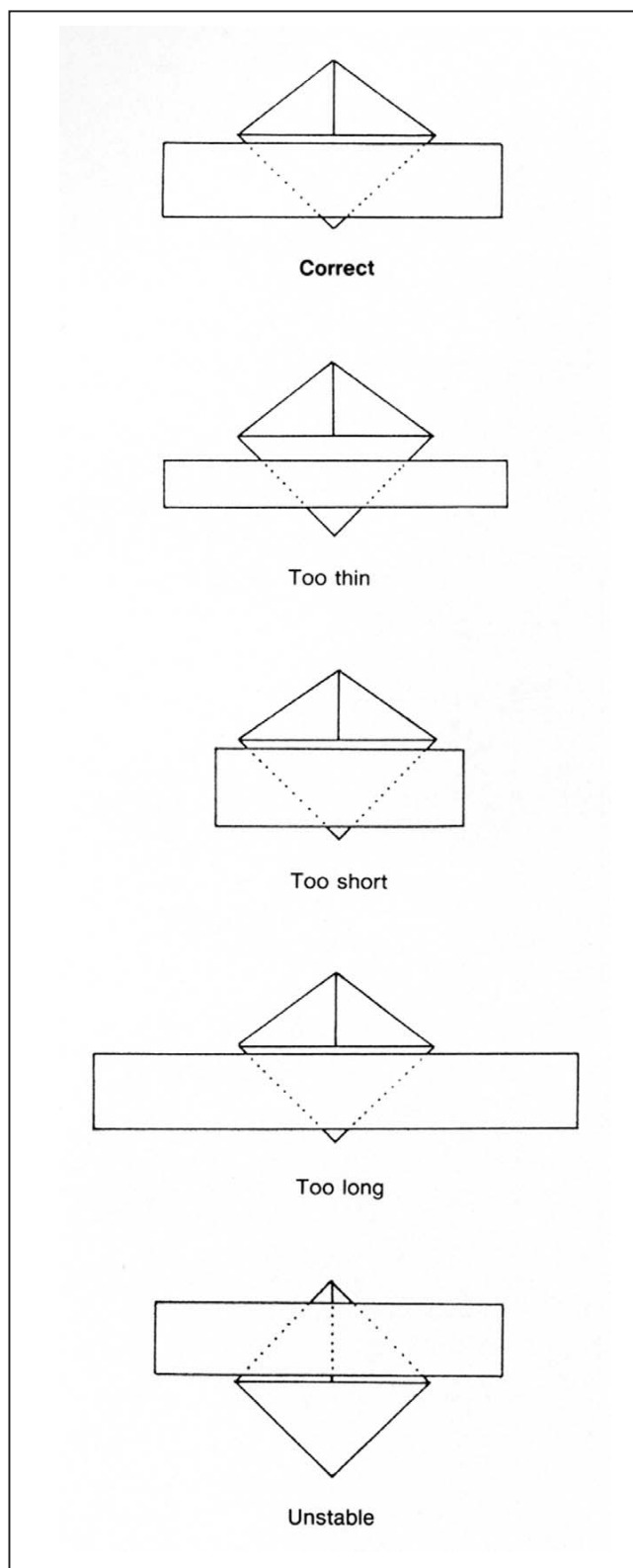


Figure 12.4: Tape placement over mounting corners. To secure the position of mounting corners in mats, strips of tape should not be too thin, too short, attached to the base rather than the top of the corner, nor should they be divided as shown in **Figure 12.5**.

at least 1-inch wide all around. Strips of paper that are $\frac{3}{4}$ -inch wide will make mounting corners that form an approximately 1-inch “square,” a size recommended for most prints on 11x14-inch paper. Mounting corners made with $\frac{1}{2}$ to $\frac{5}{8}$ -inch wide strips of paper (forming a $\frac{3}{4}$ to $\frac{7}{8}$ -inch “square”) are recommended for prints on 8x10-inch paper. Polyester prints may require slightly larger corners.

The problem of bending is another reason why photographs should be printed with ample borders. This author recommends border areas that are approximately one-quarter the width and length of the photographic paper for medium-size prints and approximately one-fifth for large prints.

For example, a 1- to 2-inch border is recommended for each side of a small print made on 8x10-inch paper and a border of 3 to 4 inches for a large print made on 30x40-inch paper. Borders of $1\frac{1}{2}$ to 2 inches are recommended for prints on 11x14-inch paper (a good size paper on which to make 8x10-inch contact prints). Borders of 2 to $2\frac{1}{2}$ inches are recommended for prints on 16x20-inch paper.^{88,89}

In most situations, mounting corners should be attached to the backing board with small strips of tape (see **Figure 12.4**). This author most often uses gummed cloth tape for attaching paper mounting corners to 4-ply mats, and Filmoplast P90 or other high-quality pressure sensitive tape for attaching paper corners to 2-ply mats.

The “Tailored” Mounting Corner

When the image touches or nearly touches the edges of the photographic paper, special alterations must be made in the design of the mounting corner to create what this author calls a “tailored” mounting corner (see **Figure 12.5**). In other words, a small triangular section is cut out of the corner to allow a full view. Tape should be applied over the corner before the cutting out is done, and should be placed so that it will not be divided by the cutting; at least a small section of the tape should be continuous and unbroken, connecting the two sides of the corner. A mounting corner that has tape attached *on the top*, rather than on the base, is stronger and less likely to fall apart. In some situations, tape should be applied in both places.

Before determining how much of the mounting corners need to be cut out, remove the print. Bending of the print can be minimized by removing the first two print corners from two adjacent mounting corners, thereby enabling the remaining print corners to slide out without any bending. Otherwise, three corners must be bent to remove the print. (Caution: Low relative humidity embrittles print emulsions and increases the risk of print damage during bending.)

Close the overmat and mark on the sections of the mounting corners that show near the window corners with a pencil or pin as close as possible to the overmat — about $\frac{1}{32}$ inch — without marring the overmat. One small dot on each mounting corner is enough. Naturally, in those rare situations when the print should not be removed from the corners, a pencil — and *not* a pin — must be used to mark the mounting corners. Be careful not to rest any part of your hand on the print. It is essential to protect the surface of the print at all times.

Now open the mat, and place a piece of board into the mounting corner to protect the base during trimming; the beveled corners of 2-ply window cut-outs are ideal for this

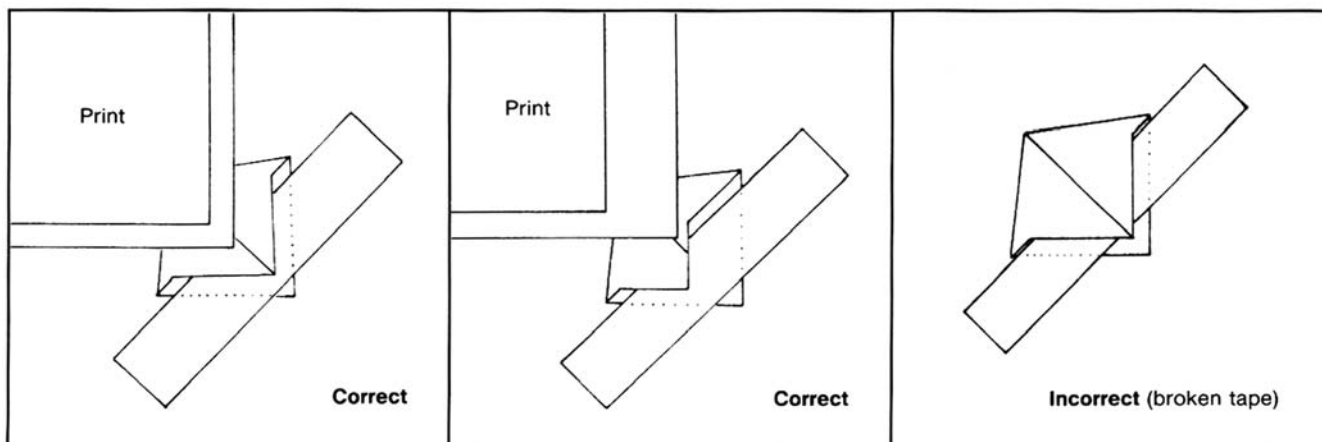


Figure 12.5: Examples of tailored mounting corners. These corners are trimmed to permit full viewing of a photograph that has been printed with narrow borders.

purpose. Without pushing it, insert the piece of 2-ply board, with the bevel-side up, as far into the mounting corner as possible. Then cut two strokes into the mounting corner about $\frac{1}{16}$ inch outside the mark. This will assure that after the mounting corner has been trimmed the remaining section will be hidden under the overmat. Because most people have more control cutting in one direction (e.g., top to bottom, or left to right), it is often a good idea to rotate the mat before trimming the next corner. Use a fresh protective board each time to reduce the chance of cutting through and into the back of the mounting corner.

When an image has not been centered on the photographic paper during printing but an ample border exists on one to three sides, at least two of the mounting corners will not need to be tailored. Trim as many mounting corners as necessary and re-insert the print.

To more safely guide a print into its mounting corners, a smaller piece of smooth, thin, and somewhat stiff paper may be placed on top of the corner of the print. The “guiding paper” should extend beyond the edges of the print corner by about $\frac{1}{8}$ inch, thereby entering the mounting corner first. With a very light push, the corner of the print under the guiding paper will slide into place.

When the print paper is the same or nearly the same size as the mat, and should not be trimmed, the strips of tape which hold the mounting corners down will need to be attached to the back of the mat. These strips should be about twice as long as usual. It is easier to apply the tape if the backing extends a few inches beyond the edge of the tabletop; this extension facilitates immediate folding of the moistened tape around the edge of the board so that it can be attached to the reverse side without lifting the mat.

Special Procedures with Mounting Corners

When a print is mounted on 4-ply or thicker board, an extra fold should be made on each flap of the mounting corner to form a “box corner.” The thickness of the print mount determines just where the two extra folds should be. When tape is applied to attach the box corner to the backing, the tape should follow the folds of the corner against the top and two sides, whether or not the mounted print is flush with the edges of the mat.

If the mount is thick, or if the print and mount are in poor condition, and if flexing presents a serious threat to the print emulsion layer or support — as in the case of varnished or coated prints, Polaroid Spectra prints (called Image prints in Europe), High Speed 600 prints, and SX-70 prints, or prints dry mounted to an embrittled wood pulp board — and the print must be removed from its corners, detach two adjacent mounting corners before removing the print.

In some instances, one or two “doors” which open and close (with pressure-sensitive tape) may be cut into the top mounting corners to facilitate removing the print. It is also possible to provide additional support at the top or bottom edge of a pre-mounted or brittle print with a “pocket” made of a folded strip of polyester, which is shorter than the length of the print or mount.

Removing a fragile print from its corners can be avoided by copying all information that appears on the back onto a separate piece of paper or onto the mat before the mounting corners are taped down. When possible, make two double-sided photocopies on high-quality paper of the front and back of every print. Put one copy in a polyester folder attached to the back of the mat or frame and keep the other copy on file.

Hinges

Hinging is a common method of installing pictures into mats. While this author prefers to corner-mount most photographs, hinges are sometimes necessary or desired.

For example, when one wants to float a print so that the edges of the paper are visible in the mat, folded hinges that are hidden behind the print are often preferable to clear polyester corners. Also, prints on polyester materials and large prints often require one or more hinges at the top edge of the print in addition to two or four mounting corners, to prevent them from rippling at the bottom corners. (Michael Wilder, a well-known Ilfochrome [formerly called Cibachrome] printer, recommends this method when mounting Ilfochrome glossy polyester prints.)⁹⁰

Although thorough instructions for applying hinges are not given here, some considerations are discussed. First, selection of hinging materials for photographs depends on

the individual print material, the print size, and the intended use of the print. Hinges should have good folding endurance and strength, be thinner than the thickness of the photograph, be sulfur-free and lignin-free, have a neutral pH, and contain no alkaline-buffering chemicals, dyes, or other compounds that might react with the print.

Gummed cloth tape is not suitable for hinging most photographs, most particularly single-weight or other light-weight photographic papers. Japanese tissue paper such as Goyu, Mulberry, and Sekishu are commonly used because they are lightweight and strong. However, these hinging papers are generally attached with water-activated adhesives such as wheat-starch paste and methyl cellulose, which must be applied with extra care because most photographs are physically very sensitive to moisture and, in this author's experience, they can be easily deformed by wet adhesives.

In addition, water-activated tapes and pastes may not properly adhere to polyester and RC prints; special high-stability, pressure-sensitive tapes are often better suited to hinging these prints. Although there are currently no pressure-sensitive tapes or adhesives that have been certified to meet ANSI standards for use with photographs, among the most popular better quality pressure-sensitive tapes are Archival Aids Document Repair Tape, Filmoplast P90, and Scotch Brand No. 415 Double-Sided Polyester Tape. Only time and further research will tell whether these tapes are suitable in long-term photographic applications.⁹¹

Many conservators recommend the use of liquid adhesives (e.g., wheat-starch paste, rice-starch paste, polyvinyl acetate [PVA], and methyl cellulose) for attaching hinges to photographs and mount boards. Pending further research on their long-term chemical and physical effects on photographs, this author has continued to use pressure-sensitive tapes which, because they are applied without the use of water, avoid potential problems with localized physical deformation in the prints.

T. J. Collings has suggested the use of a heat-set acrylic adhesive to attach paper hinges to prints, thereby avoiding the problems caused by wet adhesives (this author has not had an opportunity to evaluate this method).⁹²

The size, weight, and shape of hinges depend largely on the size, weight, shape, and grain direction of the print. Naturally, hinges should be as small as possible to hold the print properly. Hinges that are long and narrow, as well as those that are large and wide, should be avoided. Their shape should be rectangular with no more than one-third of the hinge attached to the back of the print and no less than two-thirds attached to the backing board. Folded hinges should generally be applied vertically at the top of the print. The grain direction(s) of the mount board and the photographic paper, relative both to each other and to the hinges, should be taken into account when making and applying hinges because the board and print may expand and contract, causing the hinges and the print to be stressed.

The advantage of folded hinges is that they are not visible and in most cases they allow easy access to the back of the print. (Hinges also affix a print to its backing so that the print cannot readily be removed.) The disadvantages of folded hinges include:

1. They introduce a double (or triple, if reinforced) layer behind the print which may cause visible physical deformation of the print.
2. They may partially or wholly detach from the print and/or the backing if the print is lifted incorrectly or hastily, or if the mat falls, risking damage to the loose print.
3. They may not allow for complete lifting of the print if they are not properly applied or if the print has warped edges. (The fold of the hinge should extend about $\frac{1}{64}$ inch or less beyond the edge of the print to facilitate lifting.)

Pendant T-hinges that are adhered correctly are far more secure than folded hinges but can be applied only when the overmat covers the edges of the photographic paper. With a T-hinge there is usually only one layer of hinge material behind the print; this continues above the print to where it is fastened by a cross-piece. The cross-piece should not be more than $\frac{1}{32}$ inch away from the print (unless the print material is at least $\frac{1}{32}$ inch thick). When the cross-piece is farther away, the print is free to move from side to side; this could cause damage to the edges or surface of the print as well as weaken the attachment.

To relieve stress on the edge of a photograph at the T-hinges, 2 small (about $\frac{1}{8}$ -inch) incisions should be cut into the cross-piece at each side of the vertical part of the hinge at the sides closest to the print. It is especially important to do this when a print has curled edges.

All hinges should be attached to the top of prints unless the prints are part of a study collection of standard-size mats that are stored in one direction. For example, if the collection is mounted in 16x20-inch mats which are stored standing horizontally (mats resting on the 20-inch sides) and the prints comprise both horizontal and vertical images, vertical prints will require hinging on their left sides. Horizontal prints would be hinged on top as usual.

Hinges should be strategically placed — they should be neither too close to nor too far from the corners of the print; placement depends on the individual print material, its physical characteristics, and its condition. They should be applied first to the back of the print and allowed to set for a brief period under a smooth weight. The adhesive should be “reversible,” which means that the hinge and adhesive should be removable without physically or chemically harming the print. *Important:* A print should not be hinged to the window section of a mat nor should hinges be applied to the front of a print except in very special circumstances.

For detailed instructions about hinging documents and works of art on fiber-base papers to mount board, consult the following publications (see also **Additional References**):

1. *The Hinging and Mounting of Paper Objects* (HMS-6), published by the Office of Museum Programs, Smithsonian Institution, 2235 Arts and Industries Building, Washington, D.C. 20560, June 1976.
2. *Conserving Works of Art on Paper*, Roy L. Perkinson, American Association of Museums, 1055 Thomas Jefferson Street, N.W., Suite 428, Washington, D.C. 20007, 1977.

Mounting and Matting Delicate Prints

Many prints must be handled with “extra care,” both when they are unprotected and when they are matted. For example, the paper support of most albumen prints is very thin and direct handling of these prints should be avoided because they may be creased even in the most careful hands.

Albumen prints and other similarly delicate prints that may be subject to curling have been mounted in various ways. One method of safely installing an unmounted albumen print into a conservation mat is to suspend the print inside a polyester folder or sleeve that has been attached to the backing of the mat with hinges and/or mounting corners.⁹³ Properly done, this method of enclosing the print without “encapsulating” it protects the surface, the support, the edges, the corners, and the image of the print, and facilitates its removal, if desired.

It is also possible to mount a piece of polyester to the backing board behind the print, and then “attach” the print’s four corners by inserting them into small, approximately 1/8-inch sections of Frame Strips, Type 423 or Type 107, which self-adhere to the polyester backing. When using Frame Strips, the polyester sheet behind the print should be larger, the same size, or *very slightly* smaller (if the print floats in the mat window) than the print and fully mounted to the backing with a pressure-sensitive adhesive, such as Gudy O or 3M Positionable Mounting Adhesive. This method is best suited for framed prints that will not travel; frequently handled prints should not be mounted this way.

Mounting corners are usually unsuitable for securing delicate prints into mats, unless the prints are enclosed in polyester. When such prints are not mounted by total-surface adhesion, they are often attached to a mat with small folded or pendant hinges. Extra care must be exercised when mounting delicate prints onto lightweight boards. For example, the flexibility of 2-ply mounts can present a problem for very delicate prints (such as albumen prints and photogravures on thin paper). If the backing of a mat is not rigid and is allowed to bend against the photograph, the print may tear in the middle and/or at either or both hinges; or the print may detach and risk being folded or crushed when it moves.

Paper conservators usually recommend that a hinging material not exceed the weight and strength of the paper being hinged into the mat. This author agrees with that and believes that a hinge should be as thin and lightweight as possible, but that a stronger hinge is generally safer than a weaker one, particularly with photographs. In either case, however, no hinging material can prevent damage to a print that is adhered to an unstable, flimsy, or poorly constructed mount.

When very delicate prints must be attached to lightweight mounts, they should be hinged or mounted onto an intermediate support that is somewhat larger than the print — such as 1-ply board, 1 inch larger all around than the print — which will then be secured with mounting corners onto the lightweight backing of the mat. If the mat is flexed, it is unlikely that the mounted print will be released from the corners; more important is that the photograph will not be stressed.

Polyester Enclosures and Barriers Inside Mats

Folders and sleeves made of thin uncoated polyester sheet (e.g., DuPont Mylar D, or ICI Melinex 516) can isolate prints in their mats and guard against damage. For example, a print can be placed in a 2 or 3 mil polyester folder that is the same size as the print, which may then be installed into a mat with four mounting corners; the unit can be removed and replaced with relative ease and reduced risk of damage to the print.

Another way of protecting prints that should be isolated from their mat environment, when mounting corners are used, is the “sandwich” method. This involves placing the print between two thin sheets of uncoated polyester that are the same size as the print. The polyester sheets and photographic print should be inserted (and removed) *together* into the four mounting corners.

As an alternative to covering the print with a second sheet of polyester that fits into the mounting corners, the print can be covered by overlapping the entire area by 1/2 inch or more with a polyester sheet that is attached to the backing with a continuous hinge across its top edge. The sheet falls over the print, can easily be lifted, and is held down by the closed overmat. Or, the overlapping sheet may be installed with its own set of mounting corners placed outside the print, thereby facilitating the sheet’s complete removal and replacement without handling the print. A window slightly larger than the mat window (and smaller than the print) may be cut into the Mylar cover sheet to create an inner “Mylar mat.”

An alternative to isolating the print from its mat, is to isolate the overmat. Before November 1981, when *nonbuffered* 100% cotton fiber mount boards first became available, this seemed to be the most suitable way of separating pH-sensitive color prints from alkaline-buffered boards. In 1980, more than a year before high-quality photographic mount boards were being manufactured, photographer Mitch Epstein’s concern for the proper care of his low-pH Kodak Dye Transfer prints prompted him to encourage this author to devise a method of preventing contact between his prints and his alkaline-buffered museum board mats. Four strips of 5 or 3 mil Mylar D were adhered with Scotch Brand Double-Sided Polyester No. 415 Tape to the inside surface of the overmat where it rested against the edges of print. The tape was recessed approximately 1/32-1/16 inch from the inside and outside edges of the mat to minimize the collection of dust particles.

The above methods preventing direct contact between prints and mats are recommended when using boards that do not meet the requirements for photographic storage enclosures; this can occur when a board is selected for purely aesthetic reasons.

Portfolio Matting

In general, the design and format of a portfolio should be uniform throughout the edition, with a possible exception for the artist’s proof prints. Any variance from the overall plan — such as a change of image size or mat size, a difference in materials, an alteration of mat proportions or construction design, and so forth — may be interpreted



June 1987

Laurence Miller, owner of the Laurence Miller Gallery in New York City, and his associate Matthew Postal prepare the **Larry Burrows: Vietnam** portfolio of Kodak Dye Transfer prints for a traveling exhibition. (See Note 96.)

as a mistake or, worse, as lack of care. It is common for photographers to deviate from a rigid standard of print consistency when they allow for some subtle variations of the colors and tones while printing. The publishers of portfolios, however, are usually expected to be consistent insofar as the matting and print cases are concerned.

In some respects, portfolio publication can be compared to limited-edition book publishing, where the quality of the presentation is sometimes as noteworthy as the contents. Presentation can enhance a work of art when its function is considered important or may devalue it when it is viewed simply as necessary packaging. Addressing the Photographic Materials Group of the American Institute for Conservation, Joan Pedzich said, “When a print is carefully presented, we are expressing an attitude which says ‘we value this object.’”⁹⁴

Portfolios, like picture books, should permit intimate viewing and should be mounted to facilitate handling and turning of the prints which are, after all, intended to be seen together as a group. Whenever possible, lightweight mounting materials are recommended because the weight of the mounts can greatly increase the weight of the ensemble (see **Appendix 12.2**).⁹⁵

The overall weight of the assemblage is an important

consideration whether the edition is large, small, or one-of-a-kind, such as the carefully arranged selection of prints that a photographer shows to gallery directors. A bulky, heavy, oversized presentation can interfere with appreciation of the photographs by being difficult to handle. On the other hand, it may increase appreciation by demanding more attention, as does the 18-photograph portfolio by Larry Burrows: *Vietnam, The American Intervention 1962–1968*, which weighs over 35 pounds.⁹⁶

When matting and mounting prints for portfolios, consistency in the following areas should be maintained:

1. The board should be exactly the same for every set unless the photographer and publisher have stated otherwise; this means that all board should be ordered at one time and that the distributor should take all of the board from the same manufactured lot so that its overall texture and tone will not vary even slightly.
2. The mat proportions should be the same for multiple prints of the same image.
3. The method by which the prints are installed (e.g., folded hinges, mounting corners) should be the same for all sets; when a change is necessary, the change should not occur within one set (case) of prints in the edition.
4. The overmats and mounts should match each other in size so that they will fit correctly into the portfolio cases.
5. The interior dimensions of cases should be about $\frac{1}{8}$ to $\frac{1}{4}$ inch larger than the overall size of the mounted prints. When the cases are the right size, the prints will be neither difficult to remove nor will they be inclined to move around inside the cases. The required size of the space within a print case depends to some extent on the case’s design.

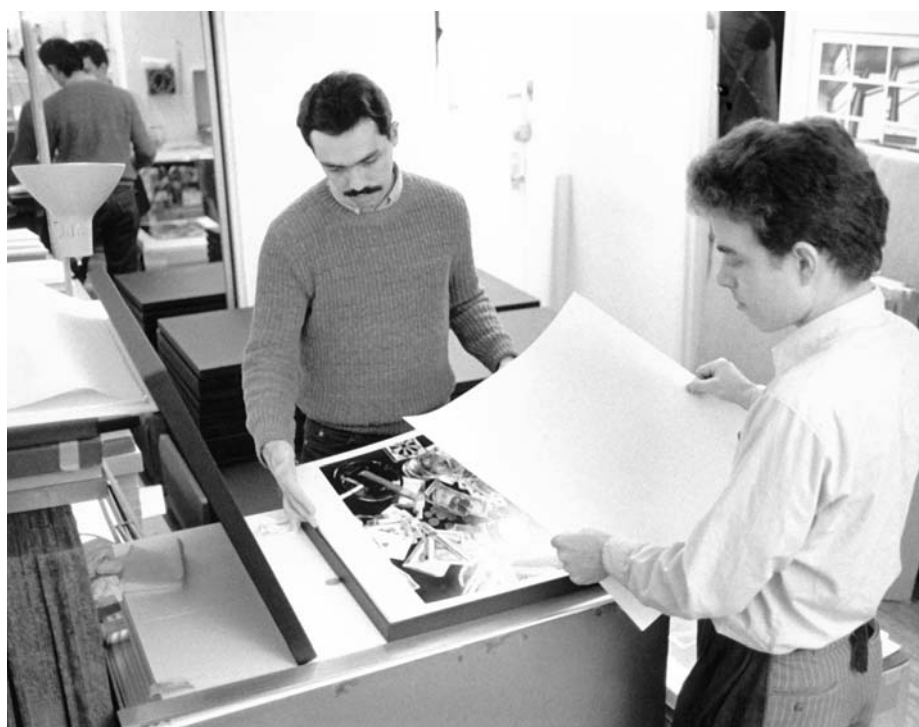
Interleaving Paper

It is necessary to cover prints in storage with interleaving paper when they are unprotected as well as when they are matted.⁹⁷ A proper and clean interleaving paper reduces the possibility of grit and other foreign matter settling on the surface of a print and also helps prevent scratches that can occur when a print and a mount or other print slide against each other. It is especially important to provide interleaving for a mounted print that floats and whose edges are not covered by the borders of a mat. Interleaving paper must be soft and smooth without any abrasive characteristics, which is why certain types of fine tissue are highly suitable.

When cutting interleaving paper for matted prints, it is essential that it be cut to a size that is smaller than the mat but larger than the mat window. The interleaf should be at least $\frac{1}{4}$ inch smaller on all four sides, but not smaller than the size of the window opening plus the width of $1\frac{1}{2}$ mat borders. This prevents the interleaving paper from slipping toward the mat binding and exposing one or more sides of the print. Ideally, an interleaving paper should be about 1-inch smaller than the mat all around.

In this author’s experience, one of the best interleaving papers for photographic prints is #40 Manning 600 Tissue Paper.⁹⁸ For years, until 1982, it was available as Troya

Ani Rivera and Arnon Ben-David placing Troya #40 interleaving tissue over each print in Audrey Flack's portfolio of twelve Kodak Dye Transfer photographs published by Sidney Singer in 1983.



1983

#40 Tissue Paper from Andrews/Nelson/Whitehead.⁹⁹ The Manning tissue is suitable for interleaving photographs because it is soft, thin, nonabrasive, flexible, strong, non-buffered, undyed, and semi-transparent (permitting the shapes although not the details in photographs to be identified without lifting the tissue). It is made of cellulose derived from Manila hemp fiber. According to Frank R. Hart, former Marketing Representative for Manning Paper Company (a Division of Hammermill Paper Company), "This is a high hemp containing grade, which has a high degree of purity. Our paper is not alkaline buffered, but is manufactured in a neutral pH range."¹⁰⁰

In addition to its physical qualities, Troya #40 was reasonable in price. When purchased in a large quantity, each 16x20-inch piece cost less than 25 cents. As with many products, however, prices varied considerably, depending on the source from which the paper was purchased and the costs involved in cutting it.

There are other Manila hemp papers manufactured in England by Barcham Green & Company, Ltd. One is a very fine, semi-transparent, lightweight, nonbuffered paper, called "L" Tissue, that is particularly desirable for interleaving collections where it is important to be able to see details through the interleaf. Distributed in the United States by Andrews/Nelson/Whitehead, "L" Tissue has been sold on the retail level bearing the same name by Light Impressions, and also by Talas under the name of "Green's Tissue." "L" Tissue is similar to Troya #40 except that it is considerably lighter in weight; because of its tendency to slip when not held in place, it is better for matted prints than for loose prints. According to Simon Barcham Green, "L" stands for "lightweight;" his company also makes a "medium-weight" version of "L" Tissue called "M" Tissue, which appears to be a suitable replacement for Troya #40.¹⁰¹

Another outstanding interleaving paper made in England and distributed in the U.S. by Archivart and by Paper Technologies, is Atlantis Silversafe Photostore 100% Cotton Fiber paper, available in 27-lb., 54-lb., and 81-lb. basis weight. The 27-lb. weight is preferred by this author for matted prints because it is slightly translucent. The paper was developed "to meet the highest quality standards for the storage of photography [and] is neutral in pH, unbuffered and sulfur-free."¹⁰² When interleaving unmatted prints, the 54-lb. or the 81-lb. weights are generally preferable.

Archivart supplies another fine interleaving tissue called Archivart Photo-Tex Tissue, which is made with 100% cotton fibers, is nonbuffered, and is available in a 40 lb. weight; the company reports that this paper has passed the ANSI Photographic Activity Test. Archivart Photographic Storage Paper is also an excellent product suitable as an interleaf in some situations, although the paper is more commonly used to make negative and print envelopes and folders.¹⁰³ Most medium-weight or heavyweight interleaving papers must be handled more carefully because their edges can more easily scratch delicate print surfaces.

Light Impressions Renaissance Paper (80 lb.) and Renaissance Tissue (2.5 mil; 60 g/m²) are two excellent papers also manufactured specifically for use with photographs and textiles that require a neutral pH without any alkaline buffers. The company's catalog advertises that Renaissance "Passes [the] Photographic Activities Test."¹⁰⁴

Conservation Resources and University Products also sell high-quality nonbuffered interleaving papers. See the **Suppliers List** at the end of this chapter for the addresses of the above companies.

Note: *ANSI standards related to the storage of photographs advise against the use of glassine, including so-called "acid-free" glassine.* (See Chapter 13.)



Henry Wilhelm – May 1981

Photographer Mitch Epstein and Carol Brower working together and discussing the details of mounting Epstein's Kodak Dye Transfer prints in 1981 before nonbuffered, neutral pH, museum boards became available.

Recommendations to Photographers and Caretakers of Photographs

1. Use the most stable photographic materials available and process them correctly.
2. Print all photographs with wide borders and do not trim them, unless absolutely necessary.
3. Print photographs in the center of the paper.
4. Use an enlarger that gives precise 90° print corners with exactly parallel image borders and that centers the image properly on the paper.
5. Dry all prints carefully to avoid warping.
6. Before signing a print, consider how the print will look if matted and framed with the signature showing or covered.
7. Use a graphite pencil or India ink to sign prints.
8. To photographers: Deviate from the above recommendations when it is required by the nature of your work.
9. Mount and overmat valued photographs as soon as possible.
10. Whenever possible, use mounting corners rather than hinges to secure photographs inside mats.
11. Handle all photographs, matted and unmatted, with clean hands; wear clean cotton gloves, if possible.
12. Interleave all stored prints, whether mounted or unmounted, to protect their surfaces.
13. Hold unmounted large and easily bending prints at two corners diagonally opposite from each other, not along the edges at the center.
14. Hold mats with two hands at the outer edges.
15. Do not touch the front of a photograph or a mat.
16. Never open a mat by lifting the inside edge of the window.
17. Open and close mats *slowly*.
18. Do not slide prints or mats against each other.
19. Do not remove a print from its mounting corners if not experienced in doing so.
20. Do not remove a print from its mount and/or corners and leave it loose in the mat.
21. Do not store prints in unsafe envelopes or boxes.
22. Store prints and mats flat on a horizontal surface.
23. Store prints and mats according to size.
24. Do not store large prints or mats on top of small prints or mats.
25. Do not store unmounted and mounted prints together in the same case or envelope.
26. Do not store unmounted color and black-and-white prints in the same case or envelope.
27. Request (and regularly update) information from retailers, distributors, and manufacturers about the stability characteristics of available photographic materials and of the materials that will come in contact with them.
28. Share and discuss such information with those in the field and other interested people.

Summary

Every effort must be made to protect valued photographs from physical and chemical harm. Careful handling and conservation matting can contribute significantly to preserving the original quality of a print.

Before any mounting procedures are decided upon, the intentions of the photographer should be learned. It is the responsibility of curators, caretakers, collectors, and dealers, to preserve and present photographs according to the photographer's wishes. This task always requires the dedication and cooperation of all people involved, including the photographer.

Few definitive statements can be made about the long-term effects of high-quality mount boards and adhesives on contemporary color and black-and-white photographs. Mounting and enclosure materials should be at least as stable as the photograph to be mounted and should not have any adverse effect on the photographic image, its emulsion, or its support. Mount boards for prints should be sulfur-free, lignin-free, have a high alpha-cellulose content, and, until research shows otherwise, have a neutral pH value without the presence of alkaline-buffering chemicals. If the recommended boards cannot be used, a neutral barrier should prevent contact between unsuitable mounting materials and the photographs. Much more research needs to be done — and the results published with brand names identified — on the interactions between mounting materials and the wide variety of photographic materials.

In the United States, at the time this book went to press in 1992, there were twelve major manufacturers and distributors marketing high-quality boards made specifically for mounting photographs: ANW-Crestwood Paper Company; Archivart Division of Heller & Usdan, Inc.; Conservation Resources International, Inc.; Crescent Cardboard Company; Hurlock Company, Inc.; Light Impressions Corporation; Paper Technologies, Inc.; Miller Cardboard Company; Parsons Paper Company; Rising Paper Company; Talas, Inc.; and University Products, Inc. Regular inquiries should be made to these and other companies about the manufacture, composition, testing, stability characteristics, and appropriate uses of their products.

Manufacturers and distributors should provide with every package or container of paper, board, or other mounting material, a complete list of each product's contents and the manufacturing specifications. Knowing the specific composition of a product and who has manufactured it is essential knowledge for conservators and those doing conservation research if they are to properly understand the mechanisms by which the product affects photographs. In addition, when complete information is provided, and a spirit of openness and cooperation is shared by everyone involved, photographers will be better able to set lasting standards for the materials they use and to produce work that will last.

Where quality in objects — as in life — is to be preserved, thoughtful care is necessary to prevent damage for which there is usually no cure. The photographs properly taken care of now are the ones which will have a chance to survive. In this author's experience, careful handling and conservation matting are two important ways to provide protection and care for valuable and valued photographic prints.

Acknowledgments

This author expresses her appreciation and gratitude to Sharp Lannom IV, John Wolf, and Henry Wilhelm for their long-standing support in this work.

Notes and References

Introduction and Section One

1. Background: Pratt Institute, School of Art and Design, Department of Fine Arts, Brooklyn, New York, 1969–1974 (BFA 1974); first employed to prepare conservation mats by the H. Shickman Gallery in New York City (June to September 1971), and by LIGHT Gallery in New York City (October 1971 to June 1982); associate member of the Photographic Materials Group of the American Institution for Conservation of Historic and Artistic Works (since 1982), and guild member of the Professional Picture Framers Association (since 1985).
2. Bonnie Barrett Stretch, "State of the Art: Big Deals on 57th Street," *American Photographer*, Vol. 16, No. 6, June 1986, p. 22.
3. Peter MacGill, telephone conversation with this author, July 14, 1986.
4. Henry Wilhelm originally outlined his views on the subject in this author's survey in 1982; further comments were added during subsequent discussions between 1983 and 1986.
5. Thomas Barrow is a photographer, curator, historian, and Professor of Art at the University of New Mexico in Albuquerque, and a former Assistant Director of the International Museum of Photography at George Eastman House in Rochester, New York.
6. Roy L. Perkinson, telephone conversation with this author, December 13, 1982.
7. Henry Wilhelm, "Preservation of Black and White Photographs," presentation given at **Preserving Your Historical Records: A Symposium**, The Olmstead Center of Drake University, Des Moines, Iowa, October 20–21, 1978.
8. Harold Jones is a photographer, dealer, former Associate Curator at George Eastman House, first Director of LIGHT Gallery, first Director of the Center for Creative Photography, and Associate Professor and Director of the Photography Program at the University of Arizona in Tucson.
9. Marvin Heiferman is a curator, dealer, author, and the former Director of Photography at Castelli Graphics (1976–1982).
10. Caldecot Chubb is a motion picture producer and publisher of limited-edition photographic books and portfolios.
11. Andy Grundberg, letter to this author, August 30, 1983, and telephone conversation with this author, September 3, 1985.
12. When asked, "Do you recall a situation in which the matting or mounting prevented damage to a photographic print?" 84% of the respondents said yes, 11% said no. Photographer Thomas Barrow, print dealer Monah Gettner, writer Andy Grundberg, framer Keith Knight, and gallery directors Peter MacGill and Laurence Miller all independently commented that they had seen overmats absorb the shock of falls, leaving the prints inside unharmed. "I've witnessed photographs, framed, and unframed but matted, fall off walls with the mats assuming most of the physical damage," wrote Alan B. Newman, who is Executive Director of Photographic Services at the Art Institute of Chicago, Illinois (formerly chief photographer at the Museum of Fine Arts in Boston, Massachusetts, and formerly Assistant Professor of Photography at Pratt Institute and at the New School for Social Research in New York City).
13. Exhibition and auction guide, June 6–10, 1983, Milwaukee Center for Photography, 207 East Buffalo Street, Milwaukee, Wisconsin 53202.

Notes and References — Section Two

14. Beaumont Newhall, letter to this author, August 29, 1982. In a follow-up letter to this author (January 31, 1985), Newhall also wrote: ". . . regarding Stieglitz's disappointment with the framing/matting of his photographs by the Museum of Fine Arts in Boston. . . . Unfortunately I have no documentation to support my recollection of a conversation with Stieglitz held probably some 45 years ago! I do know definitely that he insisted that his personal presentation of his photographs should be preserved. When I was Curator of Photography at the Museum of Modern Art I acquired a dozen or so prints

from Stieglitz which we had him frame, and we had velvet-lined boxes made for them. . . he was very pleased!"

15. The edition consists of 30 portfolios (plus seven artist's proofs) with 82 different images in each. The negatives were printed on 16x20-inch Agfa Portriga-Rapid Paper. Issue of this portfolio of original prints coincided with the publication of the Aperture book **Social Graces** (1983).
Other examples of collaboration between photographers and publishers in creating portfolios are:
 - **In China** by Eve Arnold, with Castelli Graphics (1980).
 - **Desnudo** by Manuel Alvarez Bravo, with Acorn Editions (1980).
 - **The Seven Deadly Sins and The Seven Cardinal Virtues** by Don Rodan, with Castelli Graphics (1981).
 - **Twelve Photographs** by Stephen Shore, with the Metropolitan Museum of Art (1976).
 - **Portraits** by Andy Warhol, with Bruno Bischofberger (1981).
 - **Surrounded Islands** by Christo and photographer Wolfgang Volz, with Hugh Lauter Levin (1984).
16. Philip Katcher, "How to Date an Image from Its Mat," **Photographic Society of America Journal**, Vol. 44, No. 8, August 1978, p. 26.
17. William Adair, **The Frame in America, 1700-1900: A Survey of Fabrication Techniques and Styles**, The American Institute of Architects Foundation, Washington, D.C., 1983.
18. David Vestal, **The Art of Black-and-White Enlarging**, Harper & Row, New York, New York, 1984, p. 186.
19. Beaumont Newhall, letter to this author, July 21, 1983.
20. Beaumont Newhall, **Frederick H. Evans**, Aperture, Inc., Millerton, New York, 1973, p. 18.
21. Beaumont Newhall, see Note No. 19.
22. Beaumont Newhall, see Note No. 19.
23. Raymond Sokolov, **The Wall Street Journal**, December 3, 1982, p. 31.
24. Andre Kertesz, telephone conversation with this author, August 24, 1983.
25. This quote, in Kertesz's words for what Newhall said, was also printed in Janis Bultman's article, "The Up and Down Life of Andre Kertesz," which appeared in the September/October 1983 issue of **Darkroom**, Vol. 5, No. 6, pp. 32-50.
26. John Szarkowski, letter to this author, July 26, 1983.
27. Beaumont Newhall, see Note No. 19.
28. Beaumont Newhall, see Note No. 19.
29. Andre Kertesz, **Distortions**, Alfred A. Knopf, Inc., New York, New York, 1976.
30. Peter MacGill, telephone conversation with this author, September 1, 1983.
31. At the time of this writing in 1983, France, Germany, Italy, California, and Massachusetts also recognized the legal rights of artists to protect the integrity of their works.
32. New York State Assembly Bill No. 5052-C, "Artists' Authorship Rights Act," was signed into law by Governor Mario Cuomo on August 13, 1983.
33. Josh Barbanel, "New York Law Gives Artists Right to Sue to Protect Work," **The New York Times**, August 14, 1983, p. 1.
34. Beaumont Newhall, see Note No. 20, p. 10.
35. Beaumont Newhall, see Note No. 20, p. 17. Ward Muir's quote first appeared in **The Amateur American Photographer**, London, October 2, 1902, p. 273.

Newhall continued the discussion of Evans's concern with presentation: "Evans perfected the type of multiple mounting which was called, inaccurately, the American style because of its popularity with the members of the New American School. The trimmed print was first fastened with dabs of paste at its upper corners to a colored card, usually a subdued gray or tan, hardly more than an eighth of an inch larger in size than the picture. This in turn was mounted on a somewhat larger card of contrasting or harmonizing tint. The process was repeated, sometimes as many as eight times. The result was a series of borders around the photograph. Evans said the technique was 'really an easier way of arriving at the French method of surrounding a drawing by ruling ink lines and filling up some of the spaces between them with faint washes of colour.' Still it was exacting work, for each mount had to be of precisely the proper tint and cut exactly to the right size; it might take from five minutes to half an hour to get a satisfactory combination. [This section was footnoted: **The Photographic Journal**, February 1908, pp. 99-114.] Evans gave a practical course of instruction in mounting in a series of twelve monthly lessons in **The Photogram** magazine for 1904. In each issue there was a reproduction of a photograph, printed on one side only of a supplementary page. This the reader was invited to cut out, and to mount, according to Evans's explicit directions, on the cover paper – which was left unprinted on one side for this purpose. Not all of the cover paper was needed, and the reader was told to save the unused pieces for future les-

- sons. Each month's cover was a different tint, so that by December the reader-student had a stock of mounting material, and was able to make an elaborate presentation. In 1908 Evans organized an exhibition of good and bad examples of multiple mounting at the Royal Photographic Society and gave a demonstration." (Beaumont Newhall, **Frederick H. Evans**, Aperture, Inc., Millerton, New York, 1973, p. 17.)
36. Andy Grundberg, "A Pioneer Whose Images Range from the Grim to the Glittery," **The New York Times**, March 1, 1987, Arts and Leisure, Sec. 2, pp. 35 and 37. The Gordon Parks retrospective exhibition was shown at The New York Public Library and the Schomburg Center for Research in Black Culture, both in New York City.
37. Among the 63 respondents who noticed surface texture of mount boards, 76% preferred smooth-textured board for matting and mounting photographs. Only 5% preferred rough-textured boards. Approximately 17% said it depended on the photograph or photographer.
38. Roy L. Perkinson, see Note No. 6.
39. Andre Kertesz, discussion with this author, May 29, 1983.
40. Ansel Adams, "Finishing, Mounting, Storage, Display," **The Print**, New York Graphic Society, Little, Brown and Company, Boston, Massachusetts, 1983, pp. 145-147.
41. Ralph Baum, "Light in the Darkroom: Arranging Exhibits," **Industrial Photography**, Vol. 14, No. 8, August 1965, p. 6.

Notes and References — Section Three

42. The terms paper and board are sometimes used interchangeably in this text. Because board is usually made with sheets of paper that have been laminated together to create greater strength and thickness, board is sometimes referred to as "paper."
43. American National Standards Institute, Inc., **ANSI IT9.2-1991, American National Standard for Imaging Media – Photographic Processed Films, Plates, and Papers – Filing Enclosures and Containers for Storage**. (This Standard, which replaced **ANSI PH1.53-1986**, includes a new version of the Photographic Activity Test which is based on work done by James M. Reilly and Douglas W. Nishimura at the Image Permanence Institute at the Rochester Institute of Technology in Rochester, New York.) American National Standards Institute, Inc., 11 West 42nd Street, New York, New York 10036; telephone: 212-642-4900.
44. There is a third type of high-quality board, which is a composite board made of de-acidified wood pulp or cotton fiber. Faced with colored papers that have textured or smooth finishes, it is better suited to matting than mounting. This "decorative" board is approximately 4-ply thick and has a bright white core. Bainbridge Alphamat, Crescent Rag Mat (**not** Crescent "Rag Mat 100"), and Miller Ultimat are examples.
45. Alden W. Hamilton, Manager of Commercial Development for James River Corporation, pointed out that longer cotton fibers and cotton rags are essential in the manufacture of durable papers for such products as bank notes, documents, and paper currency. These papers must be thin, yet have great folding and tearing endurance. In this author's experience, papers used to make mounting corners and hinges also require this kind of physical strength, although to a lesser degree.
46. Alden W. Hamilton, telephone conversation with this author, May 12, 1983. According to Hamilton, James River Ragmount was made from cotton rags until about 1974.
47. This statement by Charles T. Bainbridge's Sons, Inc. (currently Nielsen & Bainbridge) appears in literature published by the company and on folders containing samples of its mount board. Code:1-82-65m.
48. Kate McCarthy, telephone conversation with this author, July 18, 1986.
49. Chi C. Chen, telephone conversation with this author (regarding letters of June 21 and August 4, 1982), March 11, 1983.
50. Kurt R. Schaefer, follow-up letter to this author, July 14, 1982, after July 2, 1982, telephone conversation.
51. David Pottenger, telephone conversations with this author, May 11, 1983 and July 17, 1986. Mr. Pottenger was Marketing Manager in 1983.
52. Strathmore Paper Company, "Strathmore Artists' Paper, 500 Series," Westfield, Massachusetts, no date, p. 3.
53. This information was confirmed by Emily Vinick of the American Paper Institute in a telephone conversation with this author, May 12, 1983. American Paper Institute, 260 Madison Avenue, New York, New York 10016; telephone: 212-340-0600.
54. "Cotton Fiber Content Paper. Paper that contains 25% or more cellulose fibers derived from lint cotton, cotton linters and cotton or linen cuttings. The term is used interchangeably with rag content and cotton content papers."
"Rag Content. A term used interchangeably with cotton fiber content which indicates that a paper contains a percentage of cotton fiber pulp. The cotton fiber content normally used may vary from 25

- to 100%." **Dictionary of Paper**, fourth edition, American Paper Institute, Inc., New York, New York, 1980, pp. 116 and 334.
55. Roberts and Etherington gave the following definition for "cotton fiber content papers": "Papers which are made from cellulose fibers derived from COTTON LINTERS, cotton or linen cuttings, and lint cotton. Flax is also sometimes included in this definition. Also called 'rag content paper' and 'cotton content paper.'" Matt T. Roberts and Don Etherington, **Bookbinding and the Conservation of Books**, Library of Congress, Washington, D.C., 1982, p. 67.
 56. Glossary, **Paper – Art & Technology**, The World Print Council, San Francisco, California, 1979, p. 117.
 57. Dennis O'Connor, undated letter to this author, received September 8, 1983.
 58. Dennis Inch, telephone conversation with this author, September 9, 1983.
 59. Ron Emerson, telephone conversation with this author, September 23, 1985.
 60. Vera G. Freeman, Manager of the Art Paper Department, and Karen L. Crisalli, Assistant Manager of the Art Paper Department (A/N/W), telephone conversations with this author, May and August, 1983.
 61. Michael S. Ginsburg, telephone conversation with this author, January 2, 1985.
 62. Arno Roessler, telephone conversation with this author, August 20, 1985, and letter to this author, August 28, 1985 in response to author's letter dated August 21, 1985.

Notes and References — Section Four

63. The terms mount and mat are often used interchangeably in this text. In this author's context, a matted print is always mounted whereas a mounted print is not always matted. When referring to the "mounted print," the print may or may not be matted. When referring to the "matted print," the print is always mounted onto the backing board, which is attached to the overmat. (The print may have been pre-mounted, such as dry mounted, in which case the mount is then mounted into the mat. If the print is loose, it is attached to the mat with either corners, hinges, etc.)

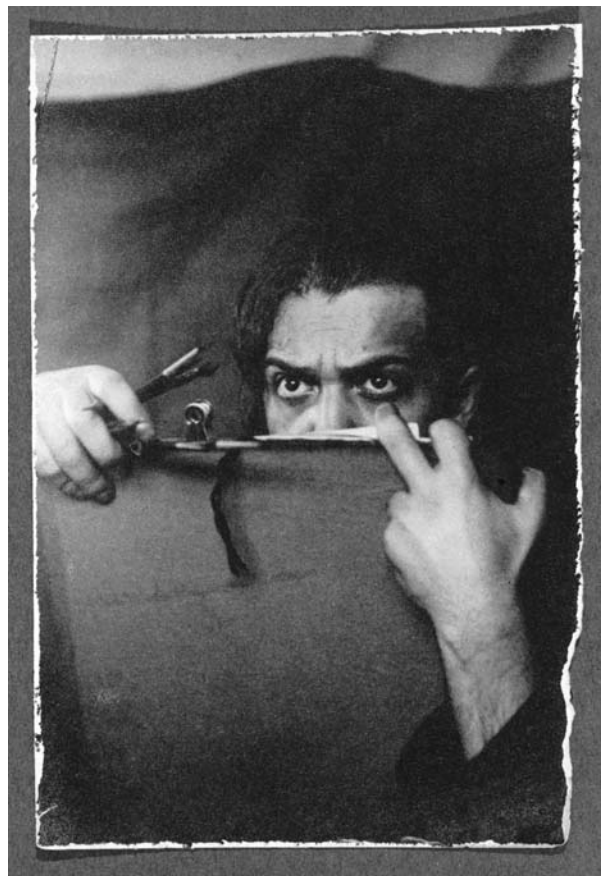
For the sake of brevity, prints are more often referred to as being "mounted" than either "mounted and matted" or "matted" because "mounted prints" refers to both "mounted and matted prints" and to "mounted and unmounted prints." When prints are referred to as "matted," it is to distinguish them from prints that are mounted without overmats.

Most board in the chapter is called mount board, because this author's overmats and mounts are nearly always made from the same board. The term "mat board" is used only when a board is specifically intended for making an overmat and is generally unsuitable for mounting.

64. A "point" is a unit used to measure the thickness of paper and paperboard and is equivalent to $\frac{1}{1000}$ inch; for example, a board which is 55 points thick is $\frac{55}{1000}$ inch thick.
65. Contact: Department of Cultural Affairs, Materials for the Arts, 410 West 16th Street, New York, New York 10001; telephone: 212-841-4100, and 212-555-5924.
66. Pieces of 16x20-inch board are more rigid when the 20-inch sides are taken from the 40-inch sides of the full sheet, provided the board is grain long. Four 16x20-inch pieces, all grain long, can be extracted from a sheet of 32x40-inch board which is grain long.
67. Claude Minotto, "Photograph Bibliography," *Archivaria*, No. 5, 1977-78, p. 138.
68. This author's survey question, "In your experience, what are the most common sizes you have found available for matting and framing photographic prints?" (no sizes were given with the question), received 49 responses and showed that the most common board sizes for mounting photographic prints are:

1. 16x20 inches (43)
2. 20x24 inches (30)
3. 11x14 inches (27)
4. 14x18 inches (25)
5. 14x17 inches (23)
6. 22x28 inches (18)
7. 8x10 inches (10)
8. 18x22 inches (8)
8. 24x30 inches (8)
9. 30x40 inches (7)
10. 12x14½ inches (6)
11. 20x26 inches (3)
11. 40x60 inches (3)

Numbers in parentheses represent the number of respondents who listed that size as standard in their experience.



This striking 1920's portrait is unfortunately all the more dramatic with its torn edges and lost emulsion. Its photographer and history are a mystery. From a private collection.

69. Chi C. Chen, see Note No. 49.
70. See: Jared Bark, "Notes on Framing" (1982) and "More Notes on Framing" (1985) published by Bark Frameworks, Inc., 85 Grand Street, New York, New York 10013; telephone: 212-431-9080.
A.P.F., Inc. has relocated to 320 Washington Street, Mt. Vernon, New York 10053; telephone: 914-665-5400.
71. Gaebel Enterprises, Inc., P.O. Box 6849, East Syracuse, New York 13217; telephone: 315-463-9261; toll-free: 800-722-0342.
72. See: E. J. Pearlstein, D. Cabelli, A. King, and N. Indictor, "Effects of Eraser Treatment on Paper," *Journal of the American Institute for Conservation*, Fall 1982, Vol. 22, No. 1, pp. 1-12. This author prefers kneadable erasers for cleaning mount board because they create fewer particles, or "crumbs."
73. Archivart sells alkaline-buffered wrapping paper: Product Number CP-101-CP, Archivart Acid-Free Wrapping Paper.
74. Arnon Ben-David, telephone conversation with the author, July 30, 1982.
75. The window was made large enough to show the $\frac{1}{4}$ inch border impression that surrounds the images to create a "double-border." However, impressions or lines in the border area that surrounds a photographic image may also be covered because the mat window also creates a "frame" around the picture.
76. This author was introduced to conservation matting in 1971 by Charles S. Moffett and Norman Leitman at the H. Shickman Gallery in New York City, a private establishment dealing in old master prints, drawings, and paintings. The fragility and difficulty of handling the artworks on paper depended a great deal on whether they had ever been trimmed and whether they were previously matted. Comparison of numerous prints – some trimmed long ago, some never trimmed shortly before they reached the gallery, and some never trimmed – helped demonstrate both the reasoning behind and the danger of trimming artwork. It also clearly showed the importance of conservation matting. The torn edges, fingerprints, stains, adhesive residue, and other evidence of improper handling and/or mounting which had occurred during past decades and centuries to some rare and

- valuable old master prints and drawings before they arrived in the gallery often detracted from the artwork. Some individuals had responded by trimming off damaged areas. Trimming of artwork is not allowed in the Shickman Gallery because, as I was told, trimming a finished print is itself a further mutilation of the work. A freshly cut edge may appear beautiful, but such beauty is usually short lived, and subsequent handling, new stains, and fresh tears may encourage further trimming. Repeated trimming of artwork brings image areas increasingly closer to areas that are handled directly and therefore makes them more susceptible to damage. In the case of some rare and valuable prints and drawings that had arrived unmounted, it was impossible not to touch the actual art. Conservation matting for such prints was done immediately.
77. Four-bladed easels are sold by The Saunders Group, Inc., 21 Jet View Drive, Rochester, New York 14624; telephone: 716-328-7800 (Master and Heavy Duty Professional Easels), and by the Kostiner Division of Omega/Arkey, 191 Shaeffer Avenue, P.O. Box 2078, Westminster, Maryland 21158; telephone: 410-857-6353; toll-free: 800-777-6634 (Kostiner Adjustable Universal Easels).
 78. An exception to this illustrates the importance of considering composition of the image before deciding the mat's design. Some of Val Telberg's photographs such as "City Hanging in the Sky – Le Acrobat" (1951) which pictures five free-floating figures – three dancing women and two sleeping men, all in different positions – are full of movement and "without gravity." This photograph may be hung in any direction, always appearing upside down and right-side up. Therefore, the picture is most effectively presented with mat borders that are paired and equal in order to maintain the free-floating feeling.
 79. This writer is not experienced in using mat cutting machines, such as the Esterly Speed-Mat Cutter, that do not require marking measurements on board. When this author observed the Esterly Speed-Mat Cutter demonstrated at the Frame-o-rama Convention in New York City in April 1982 and April 1985 by H. F. Esterly, it was accurate in its measurements when adjusted properly. It is essential to take into account any possible inconsistency of outside board dimensions when using such machines and instruments.
 80. "Cutting mats" made of rubber-like "self-healing" materials are not recommended for cutting mount board upon. These translucent, green, or blue semi-hard "cutting mats," such as those made by Arttec, Dahle, and Uchida are excellent for cutting individual sheets of thin paper (e.g., mounting corners), but mount boards tend to shift position on them during cutting. If not fastened down, the "cutting mats" themselves will move on a smooth tabletop.
 81. This approach is usually successful only when opening any of the eight "sides" where they meet at the four corners. The open incision in the middle of the appropriate side serves as a starting point and a guide for inserting the razor blade and setting the angle before directing its movement to the corner.
 82. If the right hand is pushing the cutting instrument, the left hand is holding the straightedge. For right-handed individuals, the elbow and forearm of the right arm, which is moving the hand-held cutter forward, should rest on the straightedge to assist the left hand, which is holding the straightedge in place. (Right and left would be reversed in the case of left-handed individuals.)
 83. Two photographers, Rivera Da Cueva and Guta de Carvalho, discovered when purchasing a Dexter Mat Cutter in New York City in November 1982 that the instrument weighed less than previously available models. Experienced in cutting mats with an earlier version, Da Cueva said that the "new" Dexter Mat Cutter was more difficult to control than the earlier model. According to the manufacturer, the metal was replaced with a slightly lighter metal, and the plastic knob on the blade holder was replaced with an aluminum knob, in the late 1970's. In 1984, Dexter returned to using plastic knobs because the aluminum ones were difficult to adjust.
 84. Ansel Adams, see Note No. 40, p. 147.
 85. Process Materials Corporation, Technical Bulletin No. CP-197-PH: Atlantis Silversafe Photostore Paper 100% Cotton Fiber, May 1983. This paper was available in 27-lb., 54-lb., and 81-lb. weights. The 54-lb. or 81-lb. papers are suitable for most medium-weight prints.
 86. Process Materials Corporation, Technical Bulletin No. CP-195-PH: Archivat Photographic Storage Paper, 75 lbs. (111 g/m²), May 1983; this paper is also available in 80-lb. weight. Light Impressions Renaissance Paper is an 80-lb. text-weight paper with a smooth finish.
 87. Howard Paper Mills, the manufacturer of Permalife papers, also makes nonbuffered papers, including Renaissance Paper distributed by Light Impressions Corporation. Howard Paper Mills, Inc., 354 South Edwin C. Moses Boulevard, P.O. Box 982, Dayton, Ohio 45401; telephone: 513-224-1211; toll-free: 800-543-5010.
 88. One of the first recommendations about the need for wide borders on photographic prints was made in 1968, when the Creative Photography Laboratory at the Massachusetts Institute of Technology announced that it would collect only "archival processed" prints: "Archival prints must be made with a 1 or 2 inch border on all four sides cropped on the easel, then stored and displayed untrimmed beneath overmats." Jacob Deschin, "M.I.T. Starts Archival Photographic Collection," *The New York Times*, April 7, 1968, section 2, p. 31.
 89. Eastman Kodak Company has also recommended ample print borders: "Examination of old photographs indicates that those mounted with wide borders often suffer less from atmospheric deterioration due to chemical penetrations at the print edges than those with narrow borders. For this reason, it is desirable to mount prints with borders about 8 cm (3 inches) wide at the top and sides and about 9 cm (3½ inches) wide at the bottom." Eastman Kodak Company, *Storage and Care of Kodak Color Materials* (major revision), Kodak Pamphlet No. E-30, May 1982, p. 6.
 90. Michael Wilder, a top-quality commercial color printer, specializes in making Ilfochrome (called Cibachrome until 1990) prints, and has had extensive experience mounting them. Michael Wilder, 3716 Surfwood Road, Malibu, California 90265; telephone: 213-459-0305.
 91. See: Merrily A. Smith, Norvell M. M. Jones, II, Susan L. Page, and Marian Peck Dirda, "Pressure-Sensitive Tape and Techniques for Its Removal from Paper," *Journal of the American Institute for Conservation*, Vol. 23, No. 2, Spring 1984, pp. 101-113.
 92. T. J. Collings, *Archival Care of Still Photographs*, Society of Archivists Information Leaflet No. 2, Society of Archivists, 56 Ellin Street, Sheffield S1 4PL, England, 1986.
 93. James M. Reilly, Director of the Image Permanence Institute at the Rochester Institute of Technology (established by RIT and the Society of Photographic Scientists and Engineers in January 1986), has been conducting research into the effects of enclosure materials on albumen prints. His findings suggest that uncoated polyester sheet is preferable to paper enclosures. See: James M. Reilly, *Evaluation of Storage Enclosure Materials for Photographs Using the ANSI Photographic Activity Test*, (National Museum Act Grant No. FC-309557), March 1984. See also: James M. Reilly, *Care and Identification of 19th-Century Photographic Prints*, Kodak Publication No. G-2S, Eastman Kodak Company, Rochester, New York, 1986, pp. 92-97.
 94. Carol Joan Pedzich, Chief Archivist of the Photographic Archives of the International Museum of Photography at George Eastman House in Rochester, New York, addressing the visiting Photographic Materials Group of the American Institute for Conservation, February 1, 1982.
 95. For example, fifteen 11x14-inch double-weight black-and-white prints matted to the size of 16x20 inches will weigh approximately the following:
 - 4-ply overmat and backing: 12¾ pounds
 - 2-ply overmat and backing: 6¾ pounds
 - 2-ply overmat and 4-ply backing: 10 pounds
- The same 15 prints, when matted with 2-ply overmats and 4-ply backings, will be approximately 1¾ inches thick on the binding side and approximately 17/16 inches thick on the opposite side (see **Appendix 12.2: Mount Board Thickness**). The model for these dimensions is the portfolio **Robert Doisneau – 15 Photographs**, published by Hyperion Press Limited in New York City (1979), matted with 2-ply overmats and mounted on 4-ply backings. The weight of the entire portfolio in its case is 15¾ pounds.
96. The portfolio **Larry Burrows: Vietnam, The American Intervention 1962-1968** consists of 18 Dye Transfer prints on 16x20-inch paper, conservation matted with Rising Photomount Museum Board (4-ply, white) – thirteen to the size of 20x24 inches, five to the size of 16x20-inches – and presented in a sturdy, hand-made case, elaborately designed to contain the two sizes. The portfolio was published in 1985 by the Laurence Miller Gallery in New York City, in collaboration with the photographer's son, Russell Burrows.
 97. This author's survey included several questions regarding the use of interleaving papers. Of those responding to the survey question: "In general, do you feel that interleaving interferes with the viewing of pictures in galleries or private collections?" 44% said yes and 51% said no. Individuals on both sides commented that interleaving is necessary to protect the surfaces of prints when they are matted and when they are not protected by sleeves or in other ways. Peter MacGill's response to the question was, "No, not at all; it helps viewing [because] people learn proper care." Laurence Miller said, "On the contrary – it can increase the viewer's appreciation for a print because it requires people to pause before they look." Unframed prints in the Laurence Miller Gallery and the Pace/MacGill Gallery are protected with interleaving papers.
- Most people interested in photography are aware of the need to protect print surfaces. In practice, however, only 53% of those

responding used interleaving paper between loose prints, 35% used it sometimes, and 11% did not interleave loose prints. Regarding the use of interleaving paper over prints inside mats, 54% did, 28% did sometimes, and 18% did not.

98. #40 Manning 600 Tissue Paper may be ordered from Manning Paper Company, P.O. Box 328, Troy, New York 12181; telephone: 518-273-6320. Unfortunately, the minimum order is 5000 pounds. It is hoped that a distributor can be found for this product. As with most of the enclosure papers mentioned in this book, #40 Manning 600 (Troya #40) has not undergone testing with the Photographic Activity Test in ANSI IT9.2-1991, **American National Standard for Imaging Media – Photographic Processed Films, Plates, and Papers – Filing Enclosures and Containers for Storage**.
99. In 1984, Andrews/Nelson/Whitehead began to sell an interleaving paper called Troya #0122, which bears but a slight resemblance to Troya #40. Troya #0122 is a heavier weight and stiffer paper.
100. Frank R. Hart, letter to this author, August 12, 1983.
101. "L" Tissue and "M" Tissue are manufactured by Barcham Green & Company, Ltd. at the Hayle Mill in Kent, England. ANW-Crestwood in New York is the distributor in the United States.
102. Process Materials Corporation, see Note No. 85.
103. Process Materials Corporation, see Note No. 86.
104. Light Impressions Archival Supplies Catalogs, Fall 1992 and earlier.

Additional References

- Miles Barth, "Notes on Conservation and Restoration of Photographs," **Print Collector's Newsletter**, May/June 1983, pp. 48–50.
- Paul N. Banks, "Matting and Framing Documents and Art Objects on Paper," *The Newberry Library*, Chicago, Illinois, first published 1968, revised May 1973 and November 1978.
- Doris Bry, "An Approach to the Care of Photographs," Sotheby Parke Bernet, New York, New York, 1976.
- Anne F. Clapp, **Curatorial Care of Works of Art on Paper**, third revised edition, Intermuseum Conservation Association, The Intermuseum Laboratory, Oberlin, Ohio, March 1978.
- Anne F. Clapp, **Curatorial Care of Works of Art on Paper**, fourth revised edition, Nick Lyons Books, New York, 1988.
- Francis W. Dolloff and Roy L. Perkinson, **How to Care for Works of Art on Paper**, third edition, Museum of Fine Arts, Boston, Massachusetts, 1979, p. 29.
- Eastman Kodak Company, "Finishing and Mounting," in **Quality Enlarging with Kodak B/W Papers – Art, Technique and Science**, Kodak Publication No. G-1, Eastman Kodak Company, Rochester, New York, May 1982.
- Eastman Kodak Company, **Preservation of Photographs**, Kodak Publication No. F-30, Eastman Kodak Company, Rochester, New York, 1979.
- Eastman Kodak Company, **Conservation of Photographs** (George T. Eaton, editor), Kodak Publication No. F-40, Eastman Kodak Company, Rochester, New York, 1985.
- Margaret Holben Ellis, "Matting Drawings for Storage and Exhibition," **Drawing**, Vol. 2, No. 1, May/June 1980, pp. 7–10.
- Margaret Holben Ellis, **The Care of Prints and Drawings**, American Association for State and Local History, Nashville, Tennessee, 1987.
- Ann Ferguson, **Conservation Framing for the Professional Picture Framer**, Windsor Graphics, Galveston, Texas, 1985.
- Grace Glueck, "What's in a Frame? Less and Less at the Modern," **The New York Times**, July 15, 1984, Section 2, pp. 1 and 6.
- Per E. Guldbek, **The Care of Historical Collections**, American Association for State and Local History, third printing, Nashville, Tennessee, 1979.
- Judith Harlan, "Hockney Redefines Role of Framer," **Art Business News**, May 1986, pp. 1 and 70.
- Robert Heller, "Photography in American Art Museums: A History," **Pictoscope**, Vol. 29, No. 3, Fall 1981, pp. 84–90.
- Klaus B. Hendriks, **The Preservation and Restoration of Photographic Materials in Archives and Libraries: A RAMP Study with Guidelines**, United Nations Educational, Scientific and Cultural Organization (UNESCO), Paris, 1984.
- Klaus B. Hendriks, together with Brian Thurgood, Joe Iraci, Brian Lesser, and Greg Hill of the National Archives of Canada staff, **Fundamentals of Photographic Conservation: A Study Guide**, published by Lugus Publications in cooperation with the National Archives of Canada and the Canada Communication Group, 1991. Available from Lugus Productions Ltd., 48 Falcon Street, Toronto, Ontario, Canada M4S 2P5; telephone: 416-322-5113; Fax: 416-484-9512.
- Craig W. Jensen (compiled by), **The Book & Paper Group Annual – Volume 2**, The American Institute for Conservation of Historic and Artistic Works, Washington, D. C., 1983.
- Klaus B. Kasper and Rudolf Wanka, "Chemical Formulations and Requirements of Photographic Paper," **Journal of Applied Photographic Engineering**, Vol. 7, No. 3, June 1981, p. 67.
- Laurence E. Keefe, Jr. and Dennis Inch, **The Life of a Photograph**, Focal Press (Butterworth Publishers), Boston, Massachusetts and London, England, 1990. The book's first edition was published in 1984.
- Stuart A. Kohler, "Archival Photo Corners of Japanese Tissue," **The Abbey Newsletter**, Vol. 6, No. 5, October 1982, pp. 63–64.
- Stuart A. Kohler, "How to Make and Use Wheat Starch Paste," **History News**, Vol. 36, No. 7, July 1981, pp. 38–39.
- Sue Beauman Murphy and Siegfried Rempel, "A Study of the Quality of Japanese Papers Used in Conservation," **The Book and Paper Group Annual**, Vol 4, The American Institute for Conservation of Historic and Artistic Works, Washington, D.C., 1985, pp.63–72.
- Library of Congress, Preservation Office – Research Services, **Matting and Hinging of Works of Art on Paper**, Library of Congress, Washington, D.C., 1981, p. 30.
- National Gallery of Canada, Restoration and Conservation Laboratory, **The Care of Prints and Drawings with Notes on Matting, Framing and Storage**, revised edition, National Gallery of Canada, Ottawa, Ontario, April 1981.
- Laraine Wright O'Malley, ed., **Mounting Art Work**, Basics & Beyond Series, Commerce Publishing Company, St. Louis, Missouri, 1979.
- Joan Pedzich, "Balancing Preservation and Research: Some Principles that Help," **PhotographiConservation**, Vol. 4, No. 2, June 1982, pp. 6–7.
- Roy L. Perkinson, **Conserving Works of Art on Paper**, American Association of Museums, Washington, D.C., 1977, p. 4.
- Polaroid Corporation, **Storing, Handling and Preserving Polaroid Photographs: A Guide**, Polaroid Corporation, Cambridge, Massachusetts, 1983.
- Sandra Powers, "Why Exhibit? The Risks Versus the Benefits," **The American Archivist**, Vol. 41, No. 3, July 1978, p. 297.
- Professional Picture Framers Association, **PPFA Guild Guidelines for Framing Works of Art on Paper**, Professional Picture Framers Association, Richmond, Virginia, 1985.
- Professional Picture Framers Association, **PPFA Guild Guidelines for Framing Works of Art on Paper** (revised edition), Professional Picture Framers Association, Richmond, Virginia, 1987.
- Professional Picture Framers Association, **Survey on Mat/Mount Boards**, Richmond, Virginia, March 1986.
- Jeanne Schonberg, "Questions to ask your framer and answers you should get," Tamarind Institute, The University of New Mexico, Albuquerque. Revised by Judith Booth, July 1973.
- Bob Schwalberg, with Henry Wilhelm and Carol Brower, "Going! Going! Gone!!! – Which Color Films and Papers Last Longest?," **Popular Photography**, June 1990, Vol. 97, No. 6, pp. 37–49, 60.
- Merrily A. Smith and Margaret R. Brown, **Matting and Hinging of Works of Art on Paper**, A National Preservation Program Publication, National Preservation Program Office, Library of Congress, Washington, D.C., 1981; and, The Consultant Press, A Division of the Photographic Arts Center, New York, New York, 1986.
- Otha C. Spencer, **A Guide to the Enhancement & Presentation of Photographs**, Prentice-Hall, Inc. Englewood Cliffs, New Jersey, 1983.
- Nathan Stolow, **Conservation Standards for Works of Art in Transit and on Exhibition**, United Nations Educational, Scientific and Cultural Organization, Paris, France, 1979.
- Marla Strasburg and Vivian Kistler, **Floorplans for Galleries and Frame Shops**, Columbia Publishing, Akron, Ohio, 1989.
- Susan Garretson Swartzburg, ed., **Conservation in the Library – A Handbook of Use and Care of Traditional and Nontraditional Materials**, Greenwood Press, Westport, Connecticut, 1983.
- Time-Life Books, **Caring for Photographs – Display, Storage, Restoration** (revised edition), Time-Life Books, Alexandria, Virginia, 1982.
- David Vestal, "How David Vestal Mounts and Mats Prints," **Popular Photography**, Vol. 90, No. 9, September 1983, pp. 87–94.
- David Vestal, **The Craft of Photography** (updated edition), Harper & Row Publishers, Inc., New York, New York, 1975.
- Lee D. Witkin and Barbara London, **The Photograph Collector's Guide**, New York Graphic Society, Little, Brown and Company, Boston, Massachusetts, 1979.
- Carl Zigrosser and Christa M. Gaehde, **A Guide to the Collecting and Care of Original Prints**, sponsored by the Print Council of America, Crown Publishers, New York, New York, 1965.

(See Chapter 12 Appendices and Suppliers List on following pages. . .)

Appendix 12.1: Survey

In August 1982, this author sent out survey forms to 86 individuals actively involved with photography. The survey, titled "The Care and Presentation of Photographic Prints," consisted of 131 questions and was conducted to review changing attitudes and practices related to the preservation and presentation of photographic prints. Among those queried were 18 photographers, 14 curators and historians, 13 conservators, 10 print dealers, 6 print collectors, 4 writers, 11 miscellaneous professionals, and 10 "multiple role" people. Although many individuals were involved in more than one area, only 10 were classified as having active multiple roles. For example, Harold Jones, who currently teaches at the University of Arizona, is also well known as a photographer, educator, curator, print dealer, and gallery director.

Of the 72 returned forms, 65 were usable and 7 were unusable (apologies, incomplete). In addition, one person wrote an informative letter to substitute for the incomplete form, 6 people participated in telephone interviews (2 of these had returned unusable forms), and 10 people did not respond. Answers to the questions and all additional comments written in the usable forms were tabulated and yielded an enormous amount of information. Some of the data was used by citing statistics to illustrate various concerns and some of the written comments have been woven into the chapter. Only those individuals who completed the survey forms were included in the statistical tabulations. Those who wrote letters and participated in telephone interviews have been quoted in the text and are referenced at the end of the chapter.

It is hoped that this is only the first of a series of surveys that will be conducted periodically in the coming years. This author would like to thank the following people who participated in this survey:

Ansel Adams
 Gary E. Albright, Northeast Document
 Conservation Center
 Jared Bark, Bark Frameworks, Inc.
 Thomas Barrow, University of New Mexico
 Miles Barth, International Center for Photography
 Arnon Ben-David
 Jane and Larry Booth, San Diego Historical Society
 Irene Borger
 Harry Callahan
 Eleanor Caponigro
 Pat Marie Caporaso, Castelli Graphics
 William Christenberry
 Caldecot Chubb
 Mitch Epstein
 Louis Faurer
 David Fahey, G. Ray Hawkins Gallery
 Roy Flukinger, Humanities Resource Center,
 University of Texas
 Frances Fralin, Corcoran Gallery of Art
 Helen Gee
 Monah and Alan Gettner, Hyperion Press Ltd.
 Ralph Gibson
 Emmet Gowin
 Andy Grundberg
 Susan Harder
 Marvin Heiferman
 Marvin Hoshino
 Harold Jones, University of Arizona
 Peter C. Jones
 Pepe Karmel
 Andre Kertesz
 Susan Kismaric, Museum of Modern Art
 Keith Knight, Knightworks
 Patti and Frank Kolodny
 David Kolody
 Helen Levitt
 Robert Littman, Grey Art Gallery (presently
 Director of Museo Rufino Tamayo)
 Robert Lyons

Peter MacGill, Pace/MacGill Gallery
 Jerald Maddox, Library of Congress
 Joyce and Robert Menschel
 Ronay and Richard Menschel
 Laurence G. Miller, Laurence Miller Gallery
 National Film Board of Canada
 Weston J. Naef, Metropolitan Museum of Art
 (presently Curator of Photography at the
 J. Paul Getty Museum)
 Hans Namuth
 Beaumont Newhall
 Alan B. Newman, Museum of Fine Arts, Boston
 (presently Executive Director of Photographic
 Services at The Art Institute of Chicago)
 Arnold Newman
 Debbie Hess Norris
 Eugene Ostroff, Smithsonian Institution
 Merrily Page, Page Imageworks, Inc.
 Roy L. Perkinson, Museum of Fine Arts, Boston
 Mary Kay Porter
 Ani Rivera
 Don Rodan
 John Rohrback, Aperture, Inc.
 Grant Romer, International Museum of Photography
 at George Eastman House
 Leo Rubinfien
 Gerd Sander, Sander Gallery, Inc.
 Allen Schill
 Victor A. Schrager
 Douglas G. Severson, The Art Institute of Chicago
 Frederick Sommer
 Eve Sonneman
 Joel Sternfeld
 Alice Swan
 Susan Unterberg
 Samuel Wagstaff, Jr.
 Thomas Walther
 Rick Wester
 Henry Wilhelm
 Peter Wilsey

Appendix 12.2: Mount Board Thickness

Museum mount board is available in 1-, 2-, 4-, 6-, and 8-ply thicknesses of which 2- and 4-ply are the most common. One-ply is usually about 12.5 points thick. A “point” is a unit for measuring the thickness of paper and paperboard and is equivalent to $\frac{1}{1000}$ inch. A point measurement is more accurate than a ply measurement because the term “ply” merely means “layer” and not actual thickness. For example, a piece of 4-ply museum board is usually about $\frac{1}{16}$ -inch thick, while a different 4-ply paper product, such as a bristol board, may be less than $\frac{1}{32}$ -inch thick. Thickness is not an accurate guide to weight since some manufacturers’ boards are denser (and consequently heavier) than others of the same thickness.

Following are the approximate thicknesses of single sheets or pieces of museum mount board:

2-ply = $\frac{1}{32}$ inch = 25–30 points

4-ply = $\frac{1}{16}$ inch = 50–60 points

The following examples indicate how the thicknesses of 1-, 2-, and 4-ply mount boards vary among different companies and show some other available thicknesses of mount board (measurements were supplied by the companies in 1985):

Andrews/Nelson/Whitehead:

1-ply: 13–14 points

2-ply: 27 points

4-ply: 54 points

6-ply: 81 points

James River Corporation:

1-ply: 13 points

2-ply: 26 points

4-ply: 56 points

Process Materials Corporation:

2-ply: 25–27 points

4-ply: 50–55 points

60x104-inch museum board: 60 points

6-ply: 85 points

Rising Paper Company:

1-ply: 15 points

2-ply: 30 points

Conservamat: 55 points

4-ply: 60 points

In March 1986, the Professional Picture Framers Association in Richmond, Virginia, published its first *Survey on Mat/Mount Boards*. This comprehensive report provides information about numerous boards, and includes a more extensive list of board thickness (see above: **Additional References**).

Suppliers

High-Quality Boards and Papers

A. Manufacturers (museum board)

Barcham Green & Company, Ltd.

Hayle Mill
Maidstone, Kent ME15 6XQ
England

Beckett Paper Company

400 Dayton Street
Hamilton, Ohio 45011
Telephone: 513-863-5641

Custom Papers Group

(formerly James River-Fitchburg, Inc.)
Old Princeton Road
Fitchburg, Massachusetts 01420
Telephone: 617-345-2161

James River Corporation

(see Custom Papers Group)

Lydall-Manning Paper Company

Division of Hammermill Paper Company
P.O. Box 328
Troy, New York 12181
Telephone: 518-273-6320

Monadnock Paper Mills, Inc.

Antrim Road
Bennington, New Hampshire 03442
Telephone: 603-588-3311

Papeteries Canson & Montgolfier

P.O. Box 139
F-07104 Annonay
Cedex, France

Parsons Paper Company

Division of NVF Company
Holyoke, Massachusetts 01040
Telephone: 413-532-3222

Rising Paper Company

Division of Fox River Paper Company
295 Park Street
Housatonic, Massachusetts 01236
Telephone: 413-274-3345

St. Cuthbert's Paper Mill

Wells, Somerset BA5 1A6
England
Telephone: 0749-72015

Strathmore Paper Company

South Broad Street
Westfield, Massachusetts 01085
Telephone: 413-568-9111

B. Convertors and Distributors

ANW-Crestwood Paper Co.

Division of Willmann Paper Co.
315 Hudson Street
New York, New York 10013
Telephone: 212-989-2700
Toll-free: 800-525-3196

Atlantis Paper Company Limited

No. 2 St. Andrews Way
London, E3 3PA
England
Telephone: 01-481-3784

High-Quality Boards and Papers**B. Convertors and Distributors****Archivart**

Division of Heller & Usdan, Inc.
7 Caesar Place
Moonachie, New Jersey 07074
Telephone: 201-933-8100
Toll-free: 800-333-4466

The Columbia Corporation

Artists Supplies Division
Route 295
Chatham, New York 12037
Telephone: 518-392-4000
Toll-free: 800-833-1804

Crescent Cardboard Company

100 West Willow Road
Wheeling, Illinois 60090
Telephone: 312-537-3400
Toll-free: 800-323-1055

Hurlock Company, Inc.

1446-48 W. Hunting Park Avenue
Philadelphia, Pennsylvania 19140
Telephone: 215-324-8094
Toll-free: 800-341-0142

Light Impressions Corporation

439 Monroe Avenue
Rochester, New York 14603
Telephone: 716-271-8960
Toll-free: 800-828-6216

Miller Cardboard Corporation

75 Wooster Street
New York, New York 10012
Telephone: 212-226-0833
Toll-free: 800-888-1662

Morilla Inc.

211 Bowers Street
Holyoke, Massachusetts 01040
Telephone: 413-538-9250
Toll-free: 800-628-9283

Nielsen & Bainbridge

Esselte Business Systems, Inc.
40 Eisenhower Drive
Paramus, New Jersey 07652
Telephone: 201-368-9191
Toll-free: 800-631-5414

Paper Technologies, Inc.

929 Calle Negocio
San Clemente, CA 92673
Telephone: 714-366-8799

Process Materials Corporation
(see Archivart)**Rupaco Paper Corporation**

110 Newfield Avenue
Edison New Jersey 08818
Telephone: 908-417-9266
Toll-free: 800-336-4736

Talas, Inc.

213 West 35th Street
New York, New York 10001-1996
Telephone: 212-736-7744

University Products, Inc.

517 Main Street
Holyoke, Massachusetts 01041
Telephone: 413-532-9431
Toll-free: 800-628-1912

C. Retailers**Charrette Corporation**

31 Olympic Avenue
Woburn, Massachusetts 01888
Telephone: 617-935-6000
Toll-free: 800-367-3729

Conservation Materials, Ltd.

1165 Marrietta Way
Sparks, Nevada 89431
Telephone: 702-331-0582

Conservation Resources International, Inc.

8000-H Forbes Place
Springfield, Virginia 22151
Telephone: 703-321-7730
Toll-free: 800-634-6923

Light Impressions Corporation

439 Monroe Avenue
Rochester, New York 14603
Telephone: 716-271-8960
Toll-free: 800-828-6216

New York Central Art Supply

62 Third Avenue
New York, New York 10003
Telephone: 212-473-7705
Toll-free: 800-242-2408

Sam Flax, Inc.

39 West 19th Street
New York, New York 10011
Telephone: 212-620-3000
Toll-free: 800-628-9512

Talas, Inc.

213 West 35th Street
New York, New York 10001-1996
Telephone: 212-736-7744

University Products, Inc.

517 Main Street
Holyoke, Massachusetts 01041
Telephone: 413-532-9431
Toll-free: 800-628-1912

Conservation Materials**A. Distributors****Archivart**

Division of Heller & Usdan, Inc.
7 Caesar Place
Moonachie, New Jersey 07074
Telephone: 201-933-8100
Toll-free: 800-333-4466

Filmolux (U.S.A.), Inc.

(tapes, adhesives)
4600 Witmer Industrial Estate
Niagra Falls, New York 14305
Telephone: 716-298-1189
Toll-free: 800-873-4839

Paper Technologies, Inc.

929 Calle Negocio
San Clemente, CA 92673
Telephone: 714-366-8799

Seal Products, Inc.

550 Spring Street
Naugatuck, Connecticut 06770
Telephone: 203-729-5201
(Contact Seal for information on Ademco products and Archival Aids tapes.)

B. Retailers**Conservation Materials, Ltd.**

1165 Marrietta Way
Sparks, Nevada 89431
Telephone: 702-331-0582

Conservation Resources International, Inc.

8000-H Forbes Place
Springfield, Virginia 22151
Telephone: 703-321-7730
Toll-free: 800-634-6923

Light Impressions Corporation

439 Monroe Avenue
Rochester, New York 14603
Telephone: 716-271-8960
Toll-free: 800-828-6216

Lineco Inc.

P.O. Box 2604
Holyoke, MA 01041
Telephone: 413-534-7815
Toll-free: 800-322-7775

Talas, Inc.

213 West 35th Street
New York, New York 10001-1996
Telephone: 212-736-7744

University Products, Inc.

517 Main Street
Holyoke, Massachusetts 01041
Telephone: 413-532-9431
Toll-free: 800-628-1912

Matting / Framing Supplies

(See also Chapter 15.)

A. Manufacturers**A.P.F., Inc.** (frames)

320 Washington Street
Mt. Vernon, New York 10553
Telephone: 914-665-5400
Toll-free: 800-221-9515

The C-Thru Ruler Company

6 Britton Drive
Bloomfield, Connecticut 06002
Telephone: 203-243-0303
Toll-free: 800-243-8419

Dahle U.S.A., Inc.

6 Benson Road
Oxford, Connecticut 06483
Telephone: 203-264-0505
Toll-free: 800-243-8145

Faber-Castell Corporation

(drafting supplies)
41 Dickerson Street
Newark, New Jersey 07107
Telephone: 201-483-4646
Toll-free: 800-835-8382

Frame Tek (frame fillets)

5120-5 Franklin Boulevard
Eugene, Oregon 97403
Telephone: 503-726-5779
Toll-free: 800-227-9933

Frame Strips, Inc.

(polyester strips for mounting prints)
P. O. Box 1788
Cathedral City, California 92234
Telephone: 619-328-2358
Toll-free: 800-448-1163

Gaebel Enterprises, Inc. (rulers)

P.O. Box 6849
100 Ball Street
East Syracuse, New York 13217
Telephone: 315-463-9261
Toll-free: 800-722-0342

Innerspace (frame fillets)

43 E. Lancaster Avenue
Paoli, Pennsylvania 19301
Telephone: 215-644-9293
Toll-free: 800-327-9348

Koh-I-Noor, Inc.

(pens, drafting supplies)
100 North Street
Bloomsbury, New Jersey 08804
Telephone: 908-479-4124
Toll-free: 800-631-7646

B. Distributors**Larsen-Juhl**

3900 Steve Reynolds Blvd.
Norcross, GA 30093
Telephone: 404-279-5319
Toll-free: 800-221-4123

Morilla Inc.

211 Bowers Street
Holyoke, Massachusetts 01040
Telephone: 413-538-9250
Toll-free: 800-628-9283

S&W Framing Supplies, Inc.

120 Broadway
P.O. Box 340
Garden City Park, New York 11040
Telephone: 516-746-1000
Toll-free: 800-645-3399

United Manufacturers Supplies, Inc.

80 Gordon Drive
Syosset, New York 11791
Telephone: 516-496-4430
Toll-free: 800-645-7260

C. Retailers**Charrette Corporation**

31 Olympic Avenue
Woburn, Massachusetts 01888
Telephone: 617-935-6000
Toll-free: 800-367-3729

New York Central Art Supply

62 Third Avenue
New York, New York 10003
Telephone: 212-473-7705
Toll-free: 800-242-2408

Sam Flax, Inc.

39 West 19th Street
New York, New York 10011
Telephone: 212-620-3000
Toll-free: 800-628-9512

Light Impressions Corporation

439 Monroe Avenue
Rochester, New York 14607
Telephone: 716-271-8960
Toll-free: 800-828-6216

Talas, Inc.

213 West 35th Street
New York, New York 10001-1996
Telephone: 212-736-7744

University Products, Inc.

517 Main Street
Holyoke, Massachusetts 01041
Telephone: 413-532-9431
Toll-free: 800-628-1912

Westfall Framing, Inc.

P.O. Box 13524
Tallahassee, Florida 32317
Telephone: 904-878-3546
Toll-free: 800-874-3164

Paper and Mat Cutting Instruments and Machines

(Contact the following companies for the names of distributors and retailers.)

Alto's EZ/Mat, Inc.

607 West Third Avenue
Ellensburg, Washington 98926
Telephone: 509-962-9212

Carithers International Associates, Inc.

P.O. Box 16997
Jackson, Mississippi 39236
Telephone: 601-956-8378

C & H/Bainbridge

Nielsen & Bainbridge
50 Northfield Avenue
Edison, New Jersey 08818
Telephone: 201-225-9100
Toll-free: 800-631-5414

Dahle U.S.A., Inc.

6 Benson Road
Oxford, Connecticut 06483
Telephone: 203-264-0505
Toll-free: 800-243-8145

Dexter Mat Cutters

Russell Harrington Cutlery, Inc.
44 Green River Street
Southbridge, Massachusetts 01550
Telephone: 617-765-0201

H. F. Esterly Company

Box 890, R.R. 3, U.S. Rt. 1
Wiscasset, Maine 04578
Telephone: 207-882-7017
Toll-free: 800-882-7017

The Fletcher-Terry Company

65 Spring Lane
Farmington, Connecticut 06032
Telephone: 203-677-7331
Toll-free: 800-843-3826

General Tools, Inc.

80 White Street
New York, New York 10013
Telephone: 212-431-6100

Grifhold (available from Charrette Corporation and Sam Flax, Inc.)**Holdfast Mat Cutting Systems Concept Design**

Box 84, RR 5
Cape Elizabeth, Maine 04107
(Distributed by Morilla Inc.)

KeenCut North America

The Saunders Group
21 Jet View Drive
Rochester, New York 14624
Telephone: 716-328-7800
Toll-free: 800-828-6124

Kutrimmer Cutters

(see Triumph Paper Cutters)

Logan Graphic Products, Inc.

1100 Brown Street
Wauconda, Illinois 60084
Telephone: 708-526-5515
Toll-free: 800-331-6232

Maped S.A.

B.P. 190
4, avenue des Vieux Moulins
74005 Nancy, France
(Maped matcutters are distributed in North America by Talens C.A.C., Inc. and sold through fine art material stores in Canada)

Morilla Inc.

211 Bowers Street
Holyoke, Massachusetts 01040
Telephone: 413-538-9250
Toll-free: 800-628-9283

Olfa Corporation

Higashi-Nakamoto 2-11-8
Higashinari-ku, Osaka 537
Japan
Telephone: 06-972-8101/5
(Olfa cutters are sold in the United States by Charrette Corporation and Sam Flax, Inc.)

Picture Framing Equipment Company

5836 North Commerce Plaza
Jackson, Mississippi 39206
Telephone: 601-956-9894
Toll-free: 800-221-8592

Stanley Works

Tool Division
600 Myrtle Street
New Britain, Connecticut 06050
Telephone: 203-225-5111

Starr-Springfield, Inc.

2610 Prancer Street
New Orleans, Louisiana 70114
Telephone: 504-392-7905

Talens C.A.C., Inc.

2 Waterman Street
Department AT3
St. Lambert, Quebec J4P 1R8
Canada
Telephone: 514-672-9931

Triumph Paper Cutters

Michael Business Machines Corporation
3290 Ashley Phosphate Road
North Charleston, South Carolina 29418
Telephone: 803-552-2700
Toll-free: 800-552-2974

X-Acto

Subsidiary of Hunt
Manufacturing Corporation
2020 West Front Street
Statesville, North Carolina 28677
Telephone: 704-872-9511
Toll-free: 800-438-0977