Restoring History
Retouching an old or damaged photo yourself in the digital age.

by Christopher J. Switzer

As a professional in the field of digital imaging I constantly alter photos for printing in ads and magazines. These same tools can be applied to your photos at home. By using some simple techniques, you can spruce up your old photos and make them new. In this tutorial, I will walk you through the restoration of an old, damaged photo and then print it on Strathmore's Digital Photo Paper for a beautiful finished product.

Choosing your tools

Many photo editing utilities are available on the market today. They range from free utilities that come bundled with many digital cameras and scanners to high-end photo editing programs such as Adobe's Photoshop®. Most software developers offer a free trial version available for download from their website. For this tutorial I will be using Photoshop.

Tools used in the tutorial

The tools used are useful in every type of digital photo manipulation. These are some of the basic tools you can use as a beginner to achieve amazing results:

Layers – We will use these to work on different versions of the photo and to test different techniques. Layers allow you to work on several exact duplicates of your photo layered on top of one another.

Dust/Scratches Filter – With this filter you can clear up the dust and spots on your image. It is used to take care of the tiny imperfections that would be impractical to fix one at a time.

Clone Stamp Tool – This tool is the mainstay of photo manipulation. With this tool you copy or "clone" pixels from one part of the image and paint them onto another part.

Blur Tool - This tool is used for medium sized blemishes and to soften lines.

Sharpening Filter – This filter is used to sharpen the clarity of the image. When used properly it can bring out detail that may otherwise be lost in your image.

> **"** By using some simple techniques, you can spruce up some of your old photos and make them new.**"**
> **– Christopher J. Switzer**

Preserving your work

The most important step in restoring your photo is to make sure that no further damage occurs to it.

Digitize your photo - Scanning your photo is the best way to preserve it for future generations. Once scanned the image can be archived and reproduced whenever you need it.

Make copies of your files - As you begin work on the restoration, open your file and then select File > "Save As." As you work, make sure that you save frequently (make your life easier by learning the keyboard shortcut for the "Save" command, usually Control+S).

Use layers - Do this to leave your original image untouched.

Duplicate your layers - For operations like cloning or sharpening, you can modify sections of your image and then flatten them onto your photo.

Back up your work - Save a copy of your work as often as possible to a different device. You can save your image to a floppy or rewritable CD. Make a back-up to be sure your work isn't lost due to computer complications.

Scanning the image

1. Begin by cleaning the glass of your scanner with a static-free cloth designed for cleaning eyeglasses, cameras or monitors (You can buy these at optical shops and photo shops). DO NOT use household chemical cleaners such as Windex®. Examine your original photo for anything that might harm the scanner, such as staples, tape, or glue. Check your computer's available disk space for sufficient space to scan and edit the image or images.

2. Position the photo on the scanner and make sure that it is not so close to the edges that part of the original will be cut off. Although you can straighten the image later, the process is smoother if you position it correctly at this point.

3. Select the resolution. How many dots per inch are appropriate? Consider the final use of the scan – is it for an archive, or is it to make an image you can email? Balance the value of the image with your purpose in scanning it.

4. Specify the type of scan. Is it line art? A color photograph? Black-and-white photograph? Magazine or newspaper photo? Color slide or transparency? Select the appropriate scan type and test it. Then scan your image.

5. Select File > "Save As." Make a copy of your image to an alternate location on your computer or on your backup media. This will prevent you from saving over your original image accidentally.


I scanned the original image as grayscale. However, these same techniques may be used in full-color photos as well.

Clean it up

Before you fix other aspects of the photo, repair imperfections in the image resulting from dust, hair, scratches, water damage, etc. It is helpful to make these corrections at this stage, because later they may become magnified through other changes you make, and thus may be more difficult to fix. You will probably want to zoom in on the photo to a pixel level to make many of these corrections.

Dust and Scratches – Select the Dust and Scratches filter and set the Radius at the minimum level (1 pixel), then increase to find the minimum levels at which the flaws disappear. For a photo with many speckles, some programs have a global dust/speckle replacement filter. This may decrease image sharpness, so use judiciously.
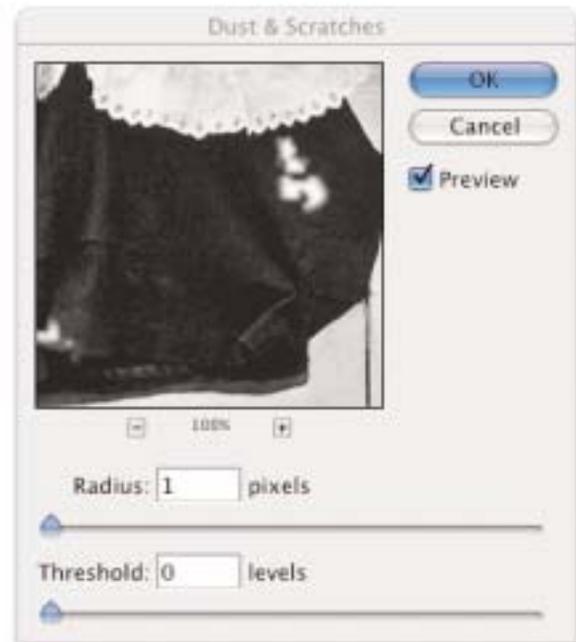
Before Dust and Scratches   *After Filter*

Clone Stamp Tool – Use this tool to fix larger speckles, hairs, tears and creases. The Clone Stamp tool takes a sample of an image, which you can then apply over another image or part of the same image. You can also clone part of one layer over another layer. Each stroke of the tool paints on more of the sample.

When you use the Clone Stamp tool, you set a sampling point on the area you want to apply over another area. You can also use opacity and flow settings in the options bar to finesse the way you apply the cloned area. You can also sample from one image and apply the clone in another image, as long as both images are in the same color mode.

Before Clone Stamp Tool   *After Clone Stamp Tool*

1. Select the Clone Stamp tool.

2. Choose a brush tip and set brush options for the blending mode, opacity, and flow in the options bar.

3. Next, determine how you want to align the sampled pixels. Select Aligned in the options bar to sample pixels continuously, without losing the current sampling point, even if you release the mouse button. Deselect Aligned to continue to use the sampled pixels from the initial sampling point each time you stop and resume painting.

4. Select Use All Layers in the options bar to sample data from all visible layers; deselect Use All Layers to sample only from the active layer.

5. Set the sampling point by positioning the pointer in any open image and Alt-clicking (Windows) or Option-clicking (Mac OS).

6. Drag over the area of the image you want to correct.

Blur Tool – Often times after using the Clone Stamp tool you are left with a hard edge to the repaired area. The Blur tool softens edges or areas in an image to reduce detail.


Before Blur Tool   *After Blur Tool*

1. Select the Blur tool.

2. Choose a brush tip and set options for the blending mode and strength in the options bar.

3. Select Use All Layers in the options bar to blur using data from all visible layers. If this is deselected, the tool uses data from only the active layer.

4. Drag over the part of the image you want to blur.

Sharpening Filter – I recommend using the Unsharp Mask filter to sharpen your images. The controls provided by this filter make it the best choice for sharpening. Although Photoshop also has the Sharpen, Sharpen Edges, and Sharpen More filter options, these filters are automatic and do not provide controls and options. You might use these filters for producing creative effects in your image.

The Unsharp Mask does not detect edges in an image. Instead, it locates pixels that differ in value from surrounding pixels by the threshold you specify and increases the pixels' contrast by the amount you specify. So, for neighboring pixels specified by the threshold, the lighter pixels get even lighter and the darker pixels get even darker based on the specified amount.

In addition, you specify the radius of the region to which each pixel is compared. The greater the radius, the larger the edge effects.

The degree of sharpening applied to an image is often a matter of personal choice. However, over-sharpening an image produces an unattractive halo effect around the edges. The Unsharp Mask can only be applied to one layer at a time, even if layers are linked or grouped. You can merge the layers before applying the Unsharp Mask filter.
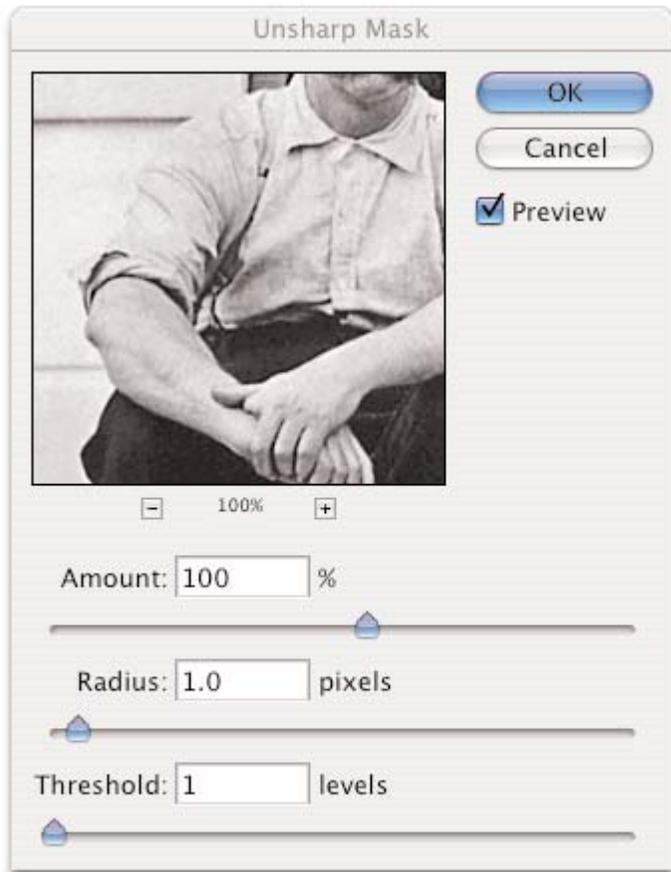
Before Sharpening   *After Sharpening*

With a few easy steps and a little practice you can take an old photo and go from this...

...to this.

Finally, I recommend printing it on Glossy Digital Photo Paper available from Strathmore Artist Papers. For a unique presentation, instead of framing the photo print it on Matte Digital Photo Paper and mount it on a piece of pre-stained wood using spray adhesive. Another great presentation is Strathmore's new Digital Photo Papers Easel Kit.

The World of Papermaking

Paper manufacturing hasn't changed much from its invention over 2000 years ago. The major changes have been in the advancement and size of the machinery, materials and amount of paper manufactured.

The fibers used to make paper come from vegetable matter that gets broken down into the basis material of papermaking, pulp. The vegetable matter (today mostly trees) are harvested, chopped up, soaked, cooked, beaten, shaken on a screen, then dried into sheets.

When the process first began, papermaking was all done by hand. The process would take over 100 days from harvest to pulping. A papermaker would create sheets of paper in a mold with a screen and yield about 192 sheets a day.

The process today is still basically the same. Trees (or other vegetable materials such as cotton or hemp) are harvested, chopped and cooked; only the process is mechanical instead of by hand. The other difference is in the volume. Cords of wood are processed at a time to produce large batches of pulp. The trees are debarked, chipped into small pieces, cooked, beaten, bleached, and processed into thick sheets stacked to make bales. These bales are used in paper machines that do not have the facilities to process whole trees (Some paper mills are "integrated" and pulp is fed directly to the paper machine.).

The bales of pulp are processed much like the trees. It is thrown into a large vat called a pulper, mixed with water and chemicals for paper working properties, then it is beaten again to break up the fibers. The more the pulp is beaten, the more "refined" the sheet of paper gets. If you hold a sheet of watercolor paper and a sheet of copy paper up to the light you will see a difference in the way the fiber looks. Copy paper looks smoother because the pulp is beaten so that the fibers separate evenly. Watercolor paper is more course because the fibers stay together.

Once the fibers are refined, it is fed into the holding tank where it is combined with a lot more water and dye if the sheet is colored. The ratio of 99% water to 1% fiber is dispersed onto the wire section of the paper machine. The wire is a huge screen on the paper machine that shakes back and forth to interlock the fibers together and remove water. Handmade paper works similarly only the papermaker uses screens mounted to a wooden frame.

Bales of pulp that will be mixed with water and chemicals in the pulper.

Pictured above is a "beater" where pulp is refined.

The web of paper moves down the paper machine where it goes through a "press section" that squeezes out more of the water. The press section is where the texture of the paper is formed. In this part of the machine, felts are used to impress a mark into the surface of the paper.

The web of paper then travels through a "dryer section" which consists of large rollers heated by steam that dry out more of the water. When papermaking started, the papermaker would stick the sheets of paper onto heated masonry walls to dry the sheets. The dryer section of the paper machine works similarly to the heated masonry walls. Surface sizing is applied to the paper in this part of the papermaking process. Finally, the paper, which is about 95% fiber, is wound into large rolls which are later sheeted, packaged and shipped.

Paper is widely used these days and paper machines run much faster and produce tons of paper a day. In 2003 the world wide consumption of paper and tissue was approximately 151 million tons. In order to keep up with this demand, some machines can run at a capacity of 4000 feet per minute and produce 360,000 tons of paper a year. That equals about 72 billion sheets of copy paper a year at 197 million sheets a day. So, keep that in mind when you think about the amount of art paper that you may use in a year; it is probably a very small part of the overall consumption of paper.

Pulp is fed into a holding tank where it will get mixed with more water and sent to the paper machine.

How much wood does it take to make paper?

There aren't exact measures to answer this question but the Tappi Paper University website had estimates of what a cord of wood may produce. A cord of wood measures 8' wide x 4' deep x 4' high and weighs approximately 2 tons and the Tappi website gives the list below as an estimated amount that can be produced from one cord of wood.

1,000 – 2,000 Pounds of Paper

942 Hard-Cover Books (100 pages each)

61,370 Standard Business Envelopes

4,384,000 Commemorative Postage Stamps

460,000 Personal Checks

1,200 copies of National Geographic

2,700 copies of an average daily newspaper

A Fourdrinier paper machine at Strathmore Paper's Woronoco mill in Massachusetts circa 1950: To the left, pulp is dispersed into the wire where water is shaken out of the pulp to form the sheet or web of paper. The web continues through the press section and into the dryer. Then it is wound into large rolls which are later sheeted.

For more information about paper and forestry visit the Tappi Paper University website and the American Forest & Paper Association website: Tappi Paper University (www.tappi.org/paperu/welcome.htm) American Forest & Paper Association (www.afandpa.org)

Testing Your Own Color

By David Pyle, Director of Technical Education for Liquitex
From What Every Artist Needs to Know About Paints and
Color, Krause Publication ©2000

Testing your own colors for lightfastness is a worthy exercise. On a canvas board (for oils or acrylics) or strip of watercolor paper (for watercolors or gouache), lay down swatches of colors you use regularly. Apply the swatches in a vertical row, and try to apply the color with a thicker film (mass tone) on the top portion of the stroke, pulled down to a thin, more transparent film below (undertone). The reason for trying to get two distinctly different thicknesses of film is because some colors are considered permanent in a thick film and less so in a tint, or thin film. Be sure to label the colors by name.

Now, cut a strip of thick paper or board longer than the total length of all of your swatches. The paper or board needs to be heavy enough to prevent light from passing through. Tape the strip over one half, or one side, of the length of the swatches, and place the board in a window that gets plenty of sun. Then let it sit. And sit. And sit some more, over the course of weeks and months.

Periodically (every few weeks), take the board from the window and lift the strip to compare the side that's been covered to the side that's been exposed to sun. You'll see that colors which rate an ASTM I or II will have changed little or not at all. And, if you're using colors that are prone to fading, you'll see the difference. If you're using fluorescent colors, or liquid dyes like those made by Luma or Dr. Martin's, you'll notice fading in a matter of days.

It's easy to test your own colors for lightfastness. While this homemade procedure won't give you quite the accuracy or control of a standardized procedure, it will give you some clear indications about the colors you use regularly.
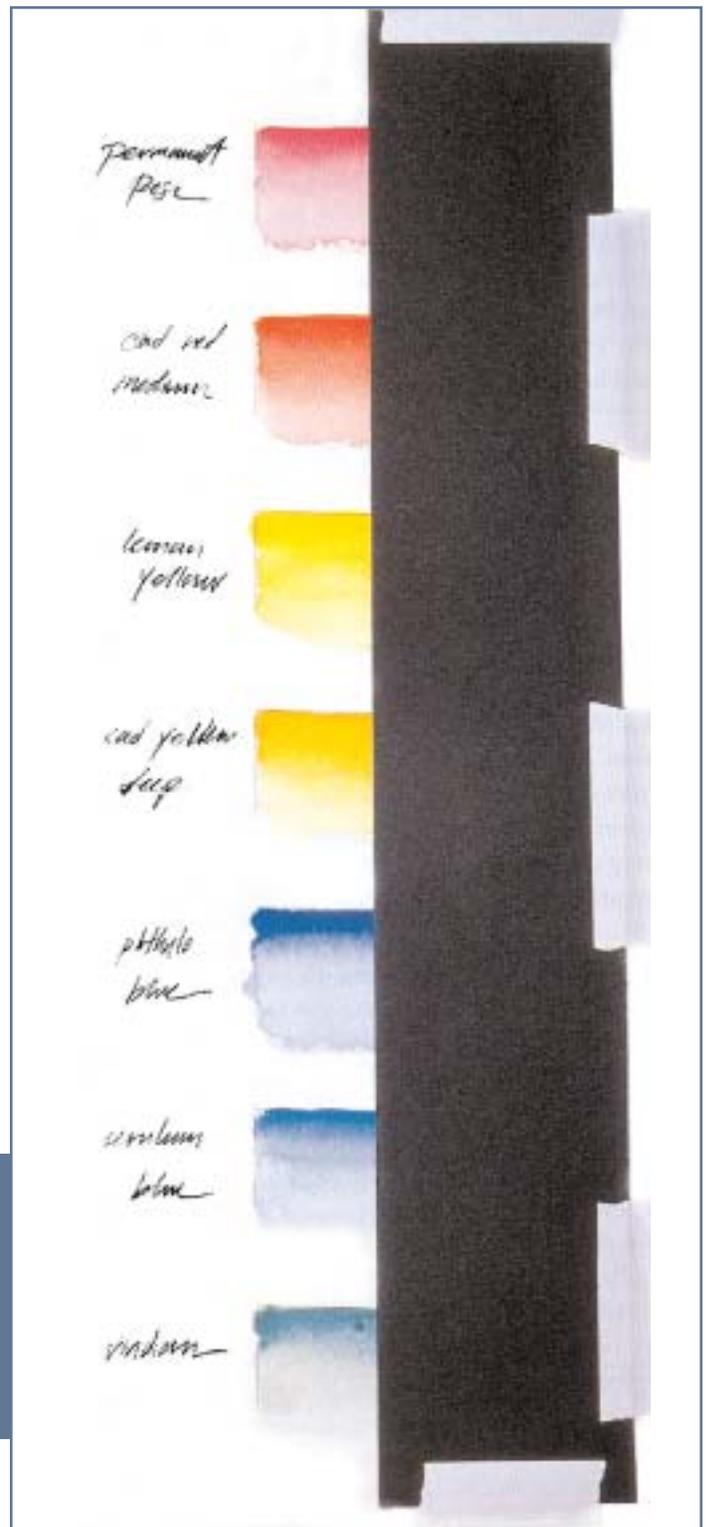
"**Now that I have a digital camera, what do I do with the pictures?**"
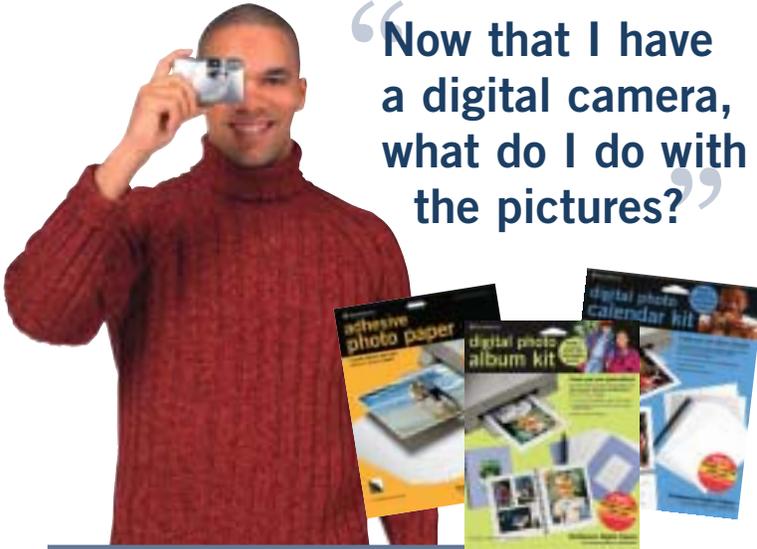
Strathmore is offering the solution to this question with their new line of Digital Photo Papers. The line not only includes photo papers, but also offers great product kits to take a project from start to finish.

The **Digital Adhesive Photo Paper** is glossy photo paper with an adhesive backing. This is a great paper for printing out your digital photographs and easily mounting them in standard photo albums or on memory book pages.

Greeting cards have been offered for many years now and Strathmore has recognized the need to take these cards one step further. The **Digital Photo Cards** come in six great finishes in a standard 5"x7" greeting card size. These cards produce a professional look with photo quality printing.

Strathmore offers photo frame cards in their standard greeting card line and they have expanded on these highly demanded cards by creating the **Digital Photo Frame Cards** in four great colors. These cards are combined with the Adhesive Photo Paper. Print your digital photographs on the photo paper, adhere to the inside flap of the card and write your message on the inside. Create beautiful, handmade cards with your digital photographs.

Memory books have become a big activity these days. Strathmore has taken this concept and created the **Digital Photo Album Kit** for the digital photographer. This kit comes with pre-punched paper, cover and a binding mechanism for you to create a beautiful album using your digital photographs and printer.

The **Digital Photo Calendar Kit** is similar to the Album Kit by offering paper and a binding mechanism for you to create personalized calendars. Print your photograph on the gloss side and the calendar month on the matte side. The finished product makes a great gift.

Finally, the **Digital Easel Kit** is a great way to display 4"x6" digital photographs. The kit includes the Adhesive Photo Paper for you to print out your photograph, peel off the backing and adhere to the easel. Display on your desk or give as a gift to friends and family.

Strathmore has made printing on these products easy with their on-line print center. The print center allows you to import your digital photo into the template and print directly from the web. No special formatting or training is needed. Take as many pictures as you want, now you have some exciting ways to use those photographs. Check out the full line of products on the Digital Photo Papers page.

Watercolor Gift Bag Project

Do you have unfinished watercolor paintings you've been wondering what to do with or watercolor paintings that you won't be framing? Our watercolor gift bag project is the ideal use for these paintings. It creates a wonderful wrapping for that special gift. It is easy to make and can be made in any size by adjusting the dimensions of the template. Visit our projects page to print out our watercolor gift bag project.