THIRD EDITION

Photoshop

RESTORATION

& RETOUCHING

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Foreword by John McIntosh

New Riders

VOICES THAT MATTER™

DAMAGE CONTROL AND REPAIR

6

The torture we put our old photographs through—storing them in damp basements or hot attics, carrying them in wallets, folding, tearing, cutting, scribbling on them, and pasting them into albums—all leave telltale marks, cracks, rips, tears, and misshapen corners. So if this is so bad for photographs, why do we put them through the gauntlet of abuse? Because we value, treasure, and cherish them. We like carrying pictures of loved ones in our wallets or purses; we take pleasure in making the family photo album or collage; and sadly, we often don't realize that the basement or attic isn't the best place to store a valuable print.

So rather than relegating the damaged photos to a dark, forgotten basement corner or a hot, dusty attic, let's get them out, scan them in, and learn to:

- Eliminate cracks, tears, and rips

- Make stains, scribbles, and discoloration disappear

- Repair antique documents

- Remove distractions and correct the perspective

Continuing with the techniques addressed in Chapter 5, "Dust, Mold, and Texture Removal," the tools used to tackle these challenges include:

- The Clone Stamp and all the Healing Brush tools

- Layers and Quick Mask

- Warp option of the Transform tool

- The Lens Correction filter

ELIMINATING CRACKS, RIPS, AND TEARS

Prints that have been mishandled or improperly stored often suffer the indignities of cracks, tears, rips, and missing information. Although some of the damaged originals you face may seem daunting, with enough time, care, and realistic expectations you can turn a very poor original into a treasured family heirloom. My restoration strategy is to improve tone and color and then fix the easier problems as I work my way up to the problems that require more care and attention. Working from simpler to more complex repairs allows me to develop a feel for the image and build up confidence before tackling the more challenging aspects.

Patching Good over Bad

We all have that one drawer that is collects all those things we don't know where to put—from rubber bands to single batteries to, as seen in **figure 6.1**, old color prints that somehow end up in the back of the drawer to be cracked and creased as time goes by. When this photo was taken it was a nice snapshot, but now that the young boy is in college and the girl a senior in high school its sentimental value has increased and it's time to pull it out of the drawer and repair it, as seen in **figure 6.2**.

🌐▷✂ **ch6_cracked_print.jpg**

1. Add a Curves adjustment layer and use the Options button to select Enhance per Channel Contrast in the Auto Color Corrections dialog box to quickly and easily color balance the file, as seen in **figure 6.3**.

2. To create a new layer to use the Patch tool on, press Cmd-Option-Shift-E/Ctrl-Alt-Shift-E to merge up the color correction and Background layer. Select the Patch tool (nested with the Healing Brush and Spot Healing Brush tools) and make sure the Source button is selected in the options bar. Use the Patch tool to select a 1- to 2-inch piece of the crack. Drag the selection to good image information and release to repair the crack (**figure 6.4**).

figure 6.1

BEFORE

© Wayne Palmer

figure 6.2

AFTER
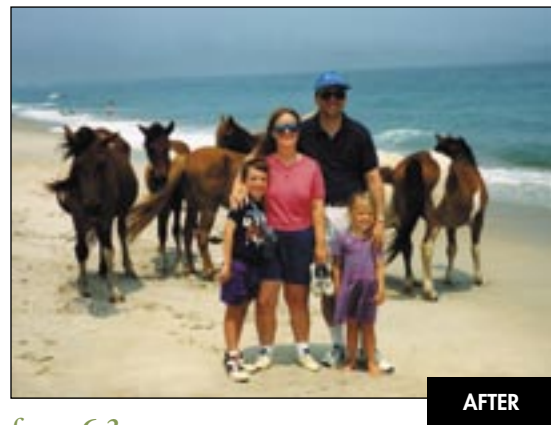
figure 6.3

Take advantage of the Auto Color Corrections to quickly and easily improve color and contrast.

figure 6.4

Select the damaged area with the Patch tool, then drag the selection over good information and release to heal the crack.

3. When you get closer to areas with tonal differences, such as where the sky meets the horizon on the right side of the image, make a more careful selection that does not include any water and drag up into good sky information.

4. Move on to the sand and use the same technique of selecting small sections and dragging the selection to matching areas of sand. Use the Patch tool to select and cover up the time stamp, as seen in **figure 6.5**. (If the time stamp falls on more complex areas in your own photos, use the Healing Brush and Clone Stamp to conceal it.)

After the sand and sky are repaired, the areas across the people's legs require more careful attention. Due to the high contrast and important detail of these areas, the Patch tool is not the best choice to use to fix them. To maintain the detail, use the Clone Stamp and Healing Brush on a separate layer as described here.

figure 6.5

The Patch tool effectively removes the time stamp.

5. Add a new layer and call it *Fine Repair*. Zoom in on the legs, and use the Clone Stamp tool with a small 50% hardness brush with Sample All Layers selected to create the initial repair, as seen in **figure 6.6**. Admittedly, the first repair may not be perfect, but it is important to lay down initial information that will then be refined with careful use of the healing tools.

figure 6.6

Use the Clone Stamp tool to build up the initial repair.

6. Use a smaller, hard-edged Healing Brush to refine the cloning. Stay away from areas with strong tonal or color differences to avoid smudging the repair. Follow the Healing Brush with a few dabs of the Spot Healing Brush, also set to Sample All Layers, to clean up any telltale repair artifacts or specks of dust (**figure 6.7**).

figure 6.7

Refine the cleanup on a separate layer with the Healing and Spot Healing brushes.

7. Finally, cropping the image a bit tighter (**figure 6.8**) focuses the photograph on the family and creates an image that can be printed and sent to the son's college dorm address as a very nice reminder of a summer vacation on Assateague Island.

figure 6.8

A tighter crop removes distractions.

Tip

When cleaning up dust, if a certain speck does not go away no matter how often you clone, heal, or spot it, make sure that (a) you're on the right layer, (b) you have selected Sample All Layers, (c) the tool's blending mode is set to Normal, and, as silly as it may sound, (d) the dust isn't on the monitor… which has happened to me more often than I care to admit.

Combining the Healing Tools and the Clone Stamp

Improper handling and storage can also create cracks on photos or scratches on negatives. **Figure 6.9** shows an original print that was accidentally damaged when the family moved. There are several superficial cracks in the background, as well as more severe cracks on the child's face that go through her eye. Repairing the background can be easily undertaken with the Patch tool. The cracks that fall on important image information such as her arms and dress can be repaired with the Healing Brush and Clone Stamp tools, while repairing the crack over her eye requires more sophisticated skills involving layers, layer masking, and detailed cloning to create the image in **figure 6.10**.

ch6_cracked_baby.jpg

Before we dive into fixing this image, imagining what the final print will look like can help you to save time and effort. In this example, the client wanted the print to be vignetted with a soft oval falling off to white. This is a common request, and it can be very useful to cover up damage—damage that you do not need to repair. To see how much damage the final vignette will conceal, I add it as the first step and use it as a template to reveal what will be visible in the final image. This keeps me focused on repairing only the areas that will be seen in the final image.

1. Use the Elliptical Marquee tool to draw an oval around the baby as seen in **figure 6.11** and inverse the selection via Select > Inverse.
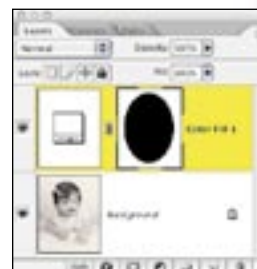
figure 6.9

BEFORE

figure 6.11

Select the subject with the Elliptical Marquee.

2. Add a Solid Color fill layer and choose white from the Color Picker to create a harsh white oval around the infant. To soften the vignette, use Filter > Blur > Gaussian Blur as seen in **figure 6.12**. On a high-resolution file like this one, a filter setting of 75 is not uncommon. Of course your settings will vary depending on file size.

figure 6.10

AFTER

figure 6.12

Blurring the layer mask softens the vignette edge.

3. As the close-up views in **figure 6.13** shows, a lot of damage is covered and so does not need to be repaired. Keep this vignetted layer at the top of your layer stack and turn it on and off to check how much to repair. For safety's sake, I do work past the transparent areas to insure that all required repairs are done.

figure 6.13

Creating the vignette first shows how far you'll have to go with your repairs.

4. To offset the slight fading, add a Levels adjustment layer and move the shadow point to the right to where the tonal information starts and move the highlight slider to the left, as seen in **figure 6.14**.

5. With vignette layer turned off, press Cmd-Option-Shift-E/Ctrl-Alt-Shift-E to merge up the Background and Levels adjustment layer and create a new working surface. Name this new layer *Crack Repair* and activate the Patch tool, making sure that the Patch option is set to Source.

6. Starting with the smaller cracks, circle one section with the Patch tool and move it to good information (**figure 6.15**).

figure 6.14

Improving overall density with Levels.

figure 6.15

Repairing smaller areas creates information needed to fix larger problems.

7. Continue fixing the small cracks, as this will create repaired information you can use with the Patch tool to repair the lower, larger crack (**figure 6.16**).

8. Continue patching the monotone areas with no detail on the blanket and her hands, as seen in **figure 6.17**.

figure 6.16

*The Patch tool offers the fastest way to repair cracks and damage on even surfaces.*

figure 6.17

Avoid high-contrast and highly detailed areas when working quickly with the Patch tool.

After fixing the cracks on the background, it's time to tackle the more delicate areas, such as the damage on her arms and dress, with a combination of healing and cloning. Use the Healing Brush on areas that have only one tonality and the Clone Stamp tool on areas where tones or colors contrast and where there is fine detail.

9. Add a new layer and name it *Fine Repair*. Activate the Healing Brush and make sure its options are Blend Mode: Normal; Source: Sampled; and that both Aligned and Sample All Layers are selected. When Option/Alt-clicking to set the healing source, stay approximately ½ to 1 brush width away from contrasting areas, such as where the little girl's arm meets her dress or on the shadow, to avoid smudging the repair. I like to repair the center of the damage with the Healing Brush and the areas that overlap tonal differences with the Clone Stamp tool (**figure 6.18**).
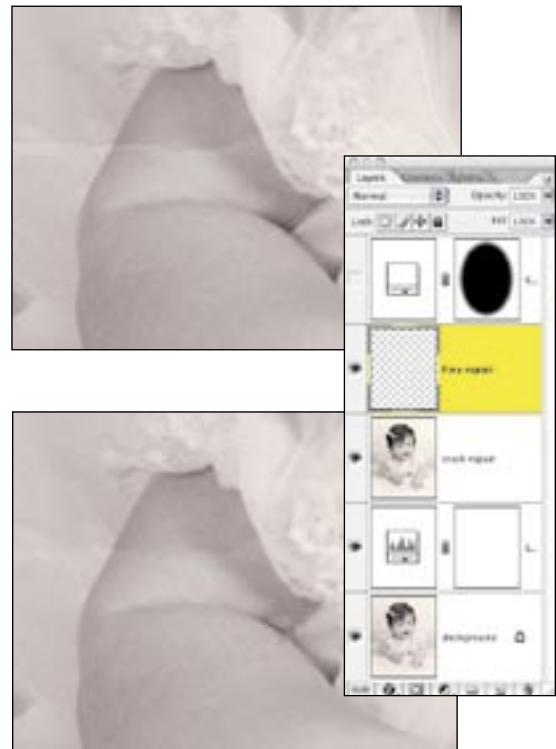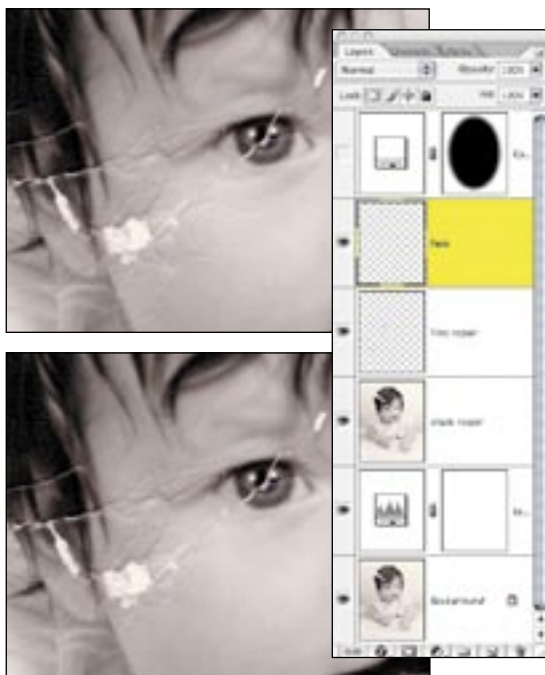

figure 6.18

Combine the Clone Stamp and the Healing Brush to fix contrasting areas.

10. The severe damage on her face requires special care. Repairing areas where entire pieces of print emulsion are missing requires some creative borrowing. Rather than cloning or healing over the large empty surface, use the following technique to rebuild the paper texture quickly. Add a new layer and name it *Face*.

11. Starting from the outside, where the smaller, simpler cracks are, work your way in with the Healing Brush set to Normal and Sample All Layers. By working from outside to inside, as shown in **figure 6.19**, you are building up more and more area to sample from to repair the larger areas.

figure 6.19

Working from the easier to the harder areas builds up useful image information.

12. Use a 1- to 2-pixel feathered Lasso tool to generously select good cheek area, as seen in **figure 6.20**.

13. Choose Edit > Copy Merged (Cmd-Shift-C/Ctrl-Shift-C) to copy all the visible layers. Choose Select > Deselect to insure that the copied piece will be pasted without a layer mask. Now choose Edit > Paste.

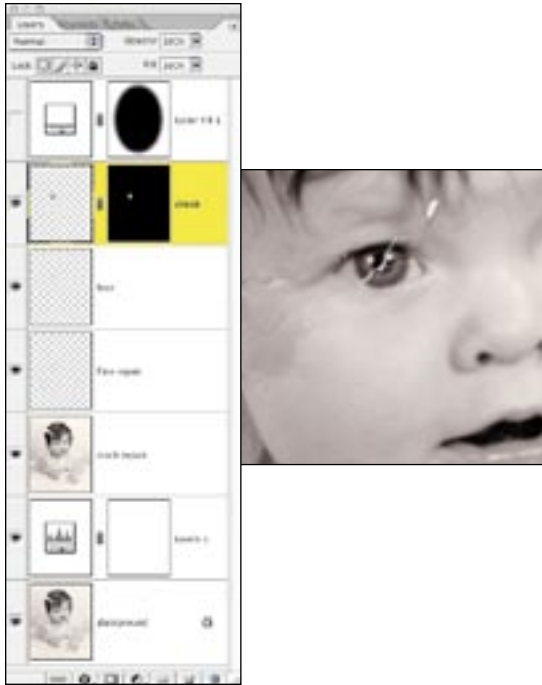**figure 6.20**

Select good image information.

14. Move and rotate the pasted piece into position (**figure 6.21**) and press Return/Enter. Then Option/Alt-click the Layer Mask button to add a black layer mask that conceals the new area.

figure 6.21

Rotate the piece into place to cover up as much damage as possible.

15. Use a soft, white Paintbrush on the layer mask to paint back the cheek texture (**figure 6.22**) and to blend in the new area use the Gaussian Blur filter on the layer mask with a setting between 5 and 10 pixels. If necessary, use the Healing Brush to clean up any details on the layer.
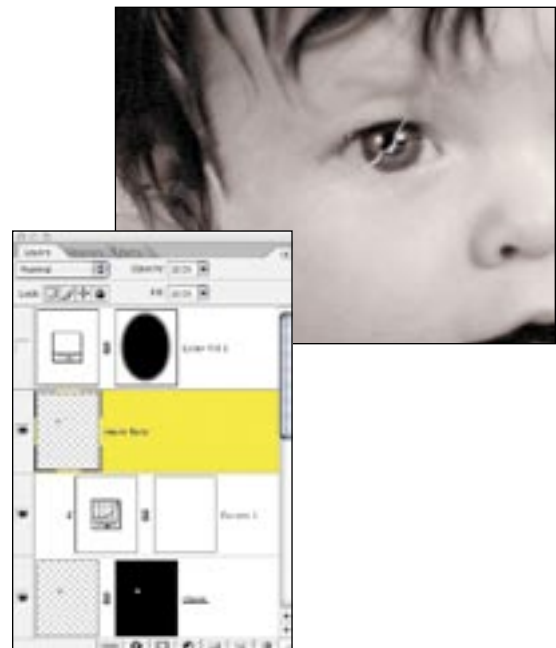
figure 6.22

Paint on the layer mask to conceal the damage.

16. The patched area is a bit darker than the surrounding area. Option/Alt-click the Create new fill or adjustment layer button, select Curves, and select Group with Previous Layer to Create Clipping Mask to make sure the following tonal adjustment affects only the cheek and not the entire image.

17. Pull the curve up ever so gently to lighten the area and match the rest of the face (**figure 6.23**). I often find it easier to make the clipped area a touch lighter or darker than needed and use the layer opacity to fine-tune the match.

18. Add a new layer and take advantage of the repaired crack to continue healing and cloning her face (**figure 6.24**).
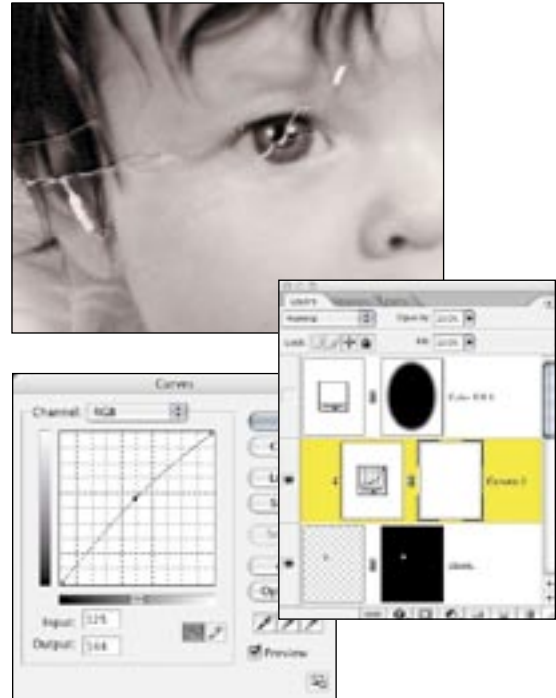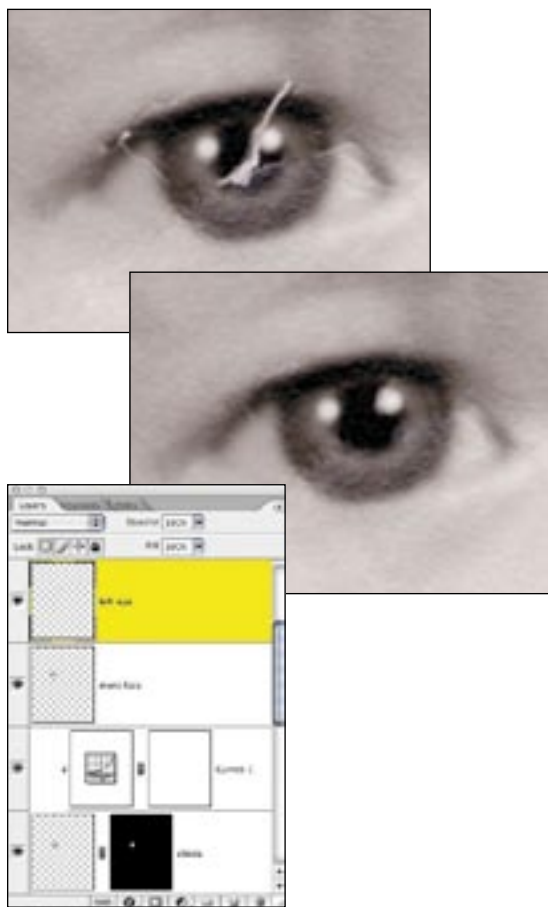

figure 6.23

Use a clipped Curves layer to match tonality.

figure 6.24

Working layer by layer and piece by piece rebuilds the face.

19. To repair the delicate eye layer, you could try to use the other eye as a source, similar to repairing the cheek, but we are so sensitive to eyes and how they look that copying, pasting, and flipping eyes seems to make eyes look odd or uncomfortable. I prefer to add a new layer and use a small, hard-edged Clone Stamp tool to build up information, as seen in **figure 6.25**. Most important: If I make a bad stroke, it's easy to immediately undo it and start again. Avoid the temptation to clone over the bad spot—that never works at all.

figure 6.25

Use a small, hard-edged Clone Stamp tool to repair the eye.

20. Use a softer-edged brush when repairing the edges of the iris and catchlight. As you can see in the undamaged eye, these areas are naturally softer and it is best to mimic the natural contours and transitions.

21. Refine the cloned eye repair with a few dabs of the Spot Healing Brush and then continue to fix the remaining cracks. After repairing the cheek and eye, the remaining work will feel very easy.

Putting It All Together

Over the years, the photographs we cherish tend to get folded, cracked, torn, and damaged. If you're lucky, you'll at least have all the pieces to reconstruct the image. If you're not so lucky, you'll have to make up image information to reconstruct missing pieces.

As you can see in **figure 6.26**, the original print had been torn into five pieces. At first this looked like a daunting job, but after scanning the pieces on a flatbed scanner, using a piece of foam core to hold the pieces in place, the challenge morphed into a digital jigsaw puzzle that required piecing the parts together and removing the ragged edges. The image came to life, as you can see in **figure 6.27**.

Tip

When scanning large print pieces or prints that are larger than your flatbed scanner platen, do not overlap pieces or change the print orientation by rotating pieces. That will vary the reflectance of the paper texture, making the pieces difficult to merge.

Many scanners try to auto correct the exposure when you select the area to scan. When working with oversized pieces that you plan to reassemble, either turn off the auto exposure feature or scan the entire bed for each section without doing a new preview to keep the exposures the same.

ch6_sailor.jpg

1. Using the Lasso tool without feather, roughly select the first piece, as shown in **figure 6.28**.

2. Select the Magic Wand and Option/Alt-click the white areas within the selection to subtract the large white areas of the scanner lid (**figure 6.29**). Don't remove the ripped paper edges from the selection; they may contain valuable image details.

figure 6.26
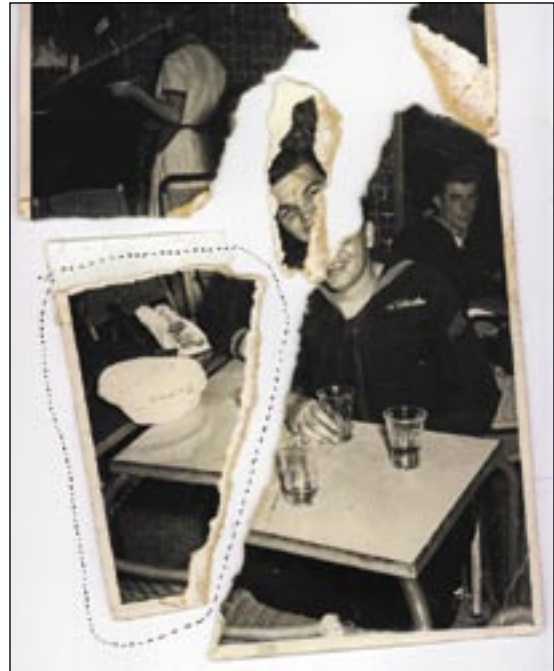
BEFORE

figure 6.27

AFTER

figure 6.28

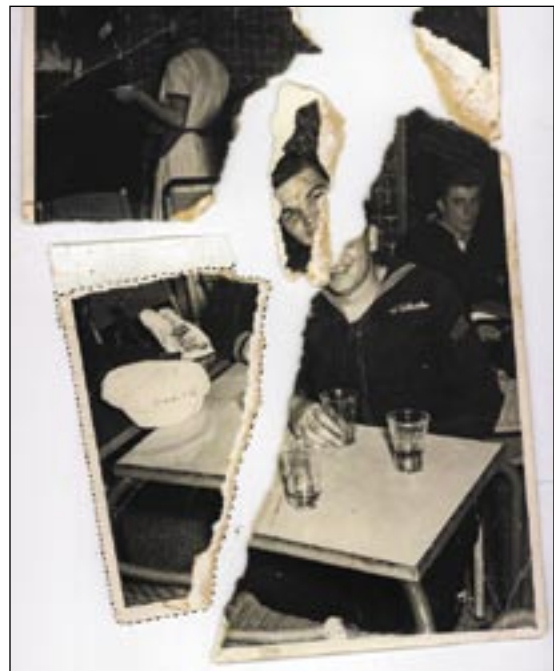*Roughly select a piece of the image with the Lasso tool.*

figure 6.29

Use the Magic Wand to quickly subtract the white areas of the scanner bed.

3. Choose Cmd-J/Ctrl-J or Layer > New > Layer via Copy to place the selected print piece onto its own layer. I highly recommend naming the layers, as shown in **figure 6.30**.

figure 6.30

After copying a section to its own layer, it is best to name it.

4. You can make new layers only out of selections with pixel image information. Select the Background layer and repeat steps 1 through 3 for each piece of the image.

5. Because the Background layer is still intact, it could be confusing to see it while you are moving the individual pieces around. To block it from view but maintain the image data, click the Background layer and add a new layer. Fill this with white to conceal the original Background layer.

6. When you have all the pieces on their own layers, the next step is to straighten them out. Select View > Show > Grid to use the grid and guides as a visual aid for alignment. (If the grid doesn't appear, make sure that View > Extras is checked.) Use Edit > Free Transform to position and rotate each piece roughly into place, as shown in **figure 6.31**.

7. With the Move tool set to Auto Select Layer and Show Transform Controls, grab the lower-left corner piece and move it toward the large lower-right corner (**figure 6.32**). These two pieces come together well, but the ripped edge of the right corner print is covering up good image information of the left corner.
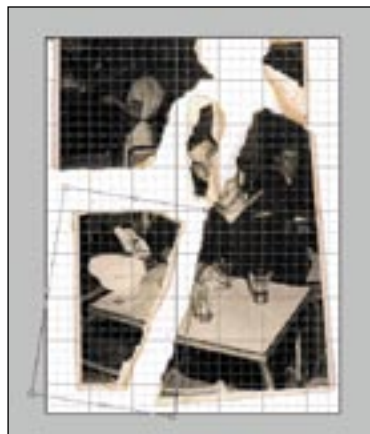
figure 6.31

Use Edit > Free Transform to position and rotate each piece roughly into place.

figure 6.32

Setting Auto Select Layer and Show Transform Controls will allow you to easily grab and move pieces with the Move tool.

8. To control how the pieces come together, you could erase the ripped paper edge, but that approach is risky because it can be difficult to control, and erasing deletes pixels—something that always makes me very nervous. To control what is visible without actually removing it, use a layer mask on the piece of the image that is blocking good image information. In this case, the ripped edge of the large right piece is covering image information of the left piece.

9. Add a layer mask to the lower right corner layer and use a small, hard-edged black brush to paint over the ripped edge. It will look as though you are erasing, but you're not, as you can see in **figure 6.33**. The black brush on the layer mask is concealing the image information, not deleting it.

figure 6.33

Adding a layer mask and painting on it with a black brush hides the ripped edges without actually deleting them.

10. Continue moving pieces together and adding layer masks wherever the torn paper is blocking good image information, as seen in **figure 6.34**.

11. Once the pieces are together, create a Work in Progress (WIP) layer at the top of the layer stack, as you see in **figure 6.35**. Do this by choosing Select > All, Edit > Copy Merged, and Edit > Paste or use the new CS2 keyboard shortcut Cmd-Option-Shift-E/Ctrl-Alt-Shift-E.

12. Use a combination of cloning and healing as described previously to repair the remaining cracks and to build up image data.

When the pieces first tumbled out of the envelope, the job looked like a hopeless cause. By thinking of them as a puzzle, they can be pieced together seamlessly to create the final image.

figure 6.34

Continuing to match pieces together while hiding torn areas with layer masks.

figure 6.35

Refine the restoration on a merged WIP layer with the Clone Stamp and Healing Brush tools.

HIDING CLUTTER AND DISTRACTIONS

In the excitement of taking a picture, we often forget to look at the entire scene. We might not notice distracting clutter, bits of garbage on the sidewalk, or as seen in **figure 6.36**, the tree perfectly placed behind the bridesmaid, giving her the appearance of a peacock with its feathers open. A second distraction is the tree coming out of one of the groomsmen's shoulders. By removing the clutter and distractions, you focus the viewer's attention on the important aspects of the picture, as in **figure 6.37.**

figure 6.36

figure 6.37

ch6_wedding_party.jpg

You can't physically take something out of a digital image without leaving a white hole, but you can cover up distractions. You also could take the background out of the image and put in a new one (addressed in Chapter 7, "Rebuilding and Recreating Images"). In the following example, with just a few minutes of borrowing some shrubbery from within the existing picture, you can produce a much better image.

1. When I face a new type of restoration challenge, I prefer to start with the easier parts of the image. In this case, that means removing the tree behind bridesmaid. The tree doesn't need to be completely hidden, just broken up so that its limbs aren't so obvious. Use the Lasso tool with a 5-pixel feather to carefully outline her head and shoulders and then make a generous selection around the lower section of the tree, as shown in **figure 6.38**.

figure 6.38

Selecting the distracting an area.

2. Choose Select > Feather and use a relatively low setting of 5 pixels.

3. With any selection tool, move the active selection to an area that has uncluttered information to serve as a suitable replacement, as shown in **figure 6.39**.
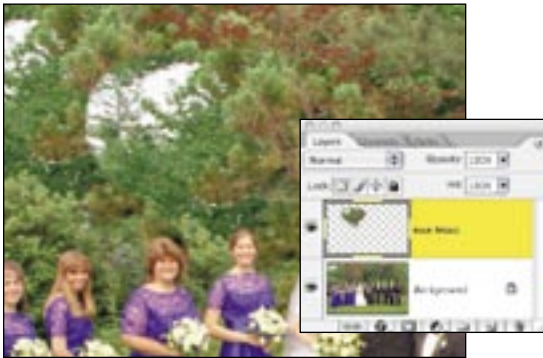

figure 6.39

Move the selection marquee to an area with good information.

4. Press Cmd-J/Ctrl-J to create a new layer with the uncluttered shrubbery. Use the Move tool to drag the good information over the bad. Use the arrow keys to nudge the background into place, as in **figure 6.40**.

figure 6.40

Move the new layer with the good information into place.

5. Add a layer mask by clicking on the Layer Mask button at the bottom of the Layers palette. Use a large, soft-edged black brush to paint in the transition between the new information and the original image, as seen in **figure 6.41**.

6. Select the Background layer and repeat the process to cover the tree coming out of the groomsman's shoulder.
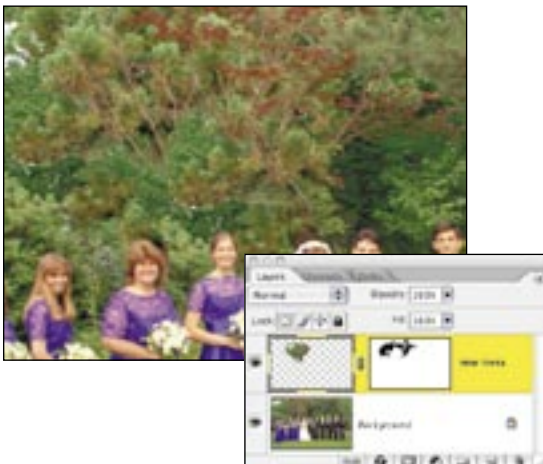
figure 6.41

Paint with black on the layer mask to blend the bushes into the trees.

7. To refine the effect, add a new blank layer and go over the entire image at high magnification with the Clone Stamp and Healing Brush tools set to Sample All Layers to fix any edges or distractions, as shown in **figure 6.42**.
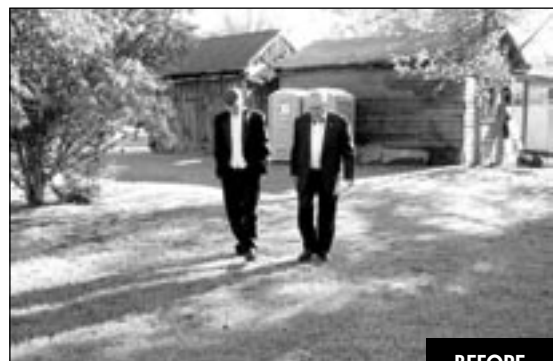

figure 6.42

Refine the details on a separate layer.

What Constitutes a Distraction?

Alan Jones shared this example of his work with me. Many family members liked this candid shot (**figure 6.43**) taken prior to a family wedding. Knowing of his Photoshop skills, he was asked to remove the "two distracting elements." His first attempt was met with a little dismay, as shown in **figure 6.44**. With a clarification of what the "distracting elements" were, Alan revisited the image to produce the glorious image seen in **figure 6.45**.

BEFORE

© Alan Jones

figure 6.43

figure 6.44

figure 6.45

REMOVING STAINS AND DISCOLORATION

The only dirt you should remove from the physical print original is the type that you can brush or blow off easily. A professionally trained conservator should be the only one to treat stains that are embedded in the film or print emulsion. There are many types of stains and discoloration that can befall an image, ranging from overall yellowing to density changes caused by sun, fire, or water damage to child-inflicted scribbling with pens, markers, or crayons. To hide these indignities, take advantage of channel information to rebuild the image with layers, cloning, and healing; and sometimes you even borrow image information from parts of the image that aren't stained.

Removing the Stain of Age

Photographs change over time. Especially older photographs, which may not have been processed to archival standards, have a tendency to yellow as the paper oxidizes and reacts with the cardboard it is mounted on or the box it is stored in. We can't stop time, but we can stop the staining. In **figure 6.46**, you see a scan of an original print that has discolored with age. **Figure 6.47** shows the image with the staining removed and a slight sepia tone added.

figure 6.46

figure 6.47

The first thing you need to recognize when working with old images from the 19th and early 20th century is that they were not in color and did not have a heavy yellow or sepia tone. They were originally black-and-white images, meaning that the color you see in the yellowed print is not normal and not important. It makes sense to pull the best black-and-white image from the file before doing any restoration work. The easiest (but least effective) method to change a color image to black

and white is to use the Image > Mode > Grayscale feature. I highly recommend that you do not use this; I explain why in Chapter 8, "Refining and Polishing the Image." In the meantime, trust me and work along.

🌐▷⑀ **ch6_country_car.jpg**

1. Before converting a file to grayscale, always inspect the individual image channels either by clicking the words *Red*, *Green*, and *Blue* in the Channels palette or by using the keyboard shortcuts Cmd/Ctrl-1, 2, and 3 to see the quality of each of the three channels (**figure 6.48**). By inspecting the channels, you can see which ones have image information that you either want to preserve or ignore. Notice how the red channel has the most damage while the green and blue channels look fairly similar.

Red

Green

Blue

figure 6.48

Inspecting the individual color channels reveals many differences in detail and apparent damage.

2. Add a Channel Mixer adjustment layer and select Monochrome in the lower-left corner. By adjusting the sliders to mix the green and blue channels and ignore the red (**figure 6.49**), you can create a black-and-white image that has good tonality and detail without including all of the damage that the red channel is carrying.

figure 6.49

Adjust the Channel Mixer sliders to use only the best information from each channel.

3. Make a Work in Progress layer by pressing Cmd-Option-Shift-E/Ctrl-Alt-Shift-E and then label the layer *Dust & Scratches*.

4. To rid the image of the numerous tiny specks, select Filter > Noise > Dust & Scratches. Using the Dust & Scratches filter is always a balancing act of concealing dust and dirt while maintaining image detail and texture. Use a Radius of 1 with the Threshold set at 0, as seen in **figure 6.50**.

5. To emphasize the men and the car, we will sharpen just them and let the less important image background remain soft. Duplicate the *Dust & Scratches* layer and rename it *Overlay Sharpen*.

figure 6.50

Using the Dust & Scratches filter to remove the numerous small specks.

6. Select Filter > Other > High Pass. The image will turn gray and take on an embossed appearance. To better define the edges, use a Radius between 2 and 5; in this example I used 4, as seen in **figure 6.51**.

7. Change the Layer blending mode to Overlay, which makes the gray invisible while revealing the sharpening effect. If you feel that the sharpening effect is too strong, as I do, reduce the layer opacity to 70%.
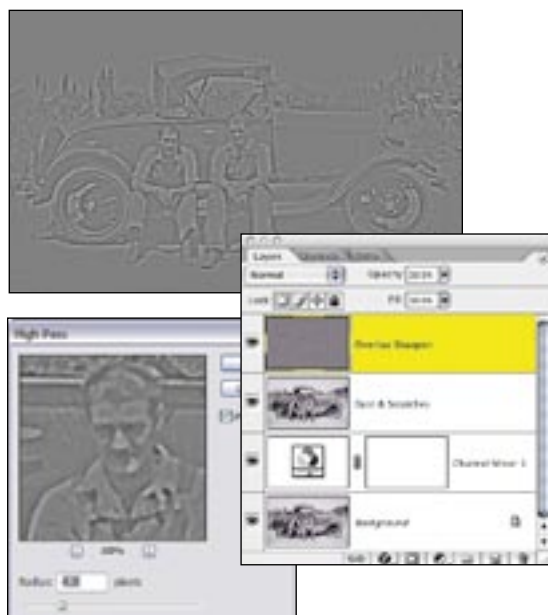
figure 6.51

Use the High Pass Filter to accentuate the edges in the picture.

8. To sharpen only the men and the car, Option/Alt-click the Layer Mask icon in the Layers palette to add a black layer mask that conceals the entire layer. Use a soft, white Paintbrush and paint over the men and the car, as seen in **figure 6.52**.

8. To clean up any remaining specks or damage, add a New Layer and use the Spot Healing Brush set to Sample All Layers and clean up the spots in the sky (**figure 6.53**) and the edge along the bottom.
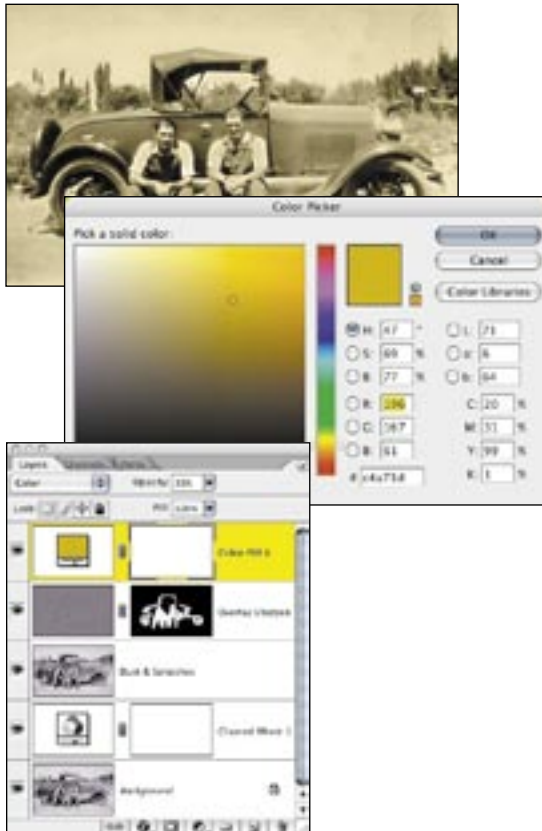

figure 6.52

Paint the sharpening back over the men and car.

figure 6.53

The Spot Healing Brush makes quick work of the damage in the sky.

9. Giving the image a slight sepia tone adds a reminiscent feeling. Add a new Solid Color fill layer, choose a brown color, and click OK. Change the layer's blending mode to Color, which will allow the image to show through the color, and reduce the layer opacity to create a subtle wash rather than overpowering the image, as seen in **figure 6.54**.

figure 6.54

A Color Fill adjustment layer set to the Color blending mode creates a sepia effect.

Removing Partial Staining

Staining can occur in part of an image as seen in **figure 6.55**, in which the prized photo was not completely washed in the printing process. The remaining fixer continued to react and created an unpleasant yellow stain. By subtracting the stain, removing the spots, and lightening the shadows, the image is ready for proud display, as seen in **figure 6.56**.

BEFORE

figure 6.55

AFTER

figure 6.56

1. Start by inspecting the individual channels with Cmd/Ctrl-1, 2, and 3 to see if one is more damaged or useful than the others. As you can see in **figure 6.57**, all channels have noticeable damage.
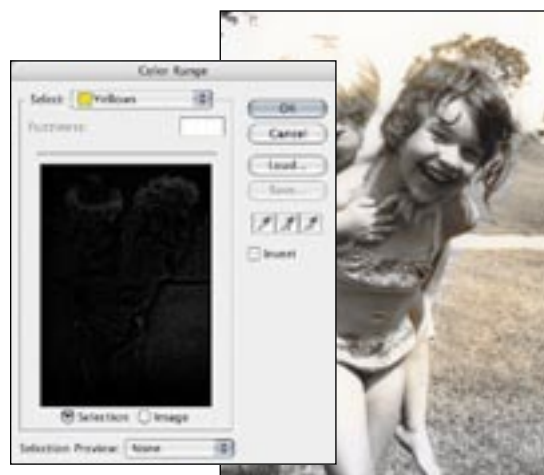
Red

Green

Blue

figure 6.57

Inspecting the channels is often useful to identify problems.

2. Return to the composite channel by pressing Cmd-~/Ctrl-~. Choose Select > Color Range and use the Select pop-up menu to select Yellows, as seen in **figure 6.58**. Click OK and click OK to the warning that the selection edges will not be visible.

figure 6.58

Use Color Range to select the Yellows

3. Add a Hue/Saturation adjustment layer, which automatically transfers the active selection to the layer mask and reduce the saturation by –100 (**figure 6.59**). Since the effect is applied through such a dense layer mask you may not see a lot of change.

figure 6.59

The dark areas of the mask protect the good parts of the image and the lighter areas allow the change to take place.

4. Select the Hue/Saturation layer. From the Layers palette menu, choose New Group from Layers. Name the group *Yellow Removal*.

5. Click on the Hue/Saturation layer and duplicate the Hue/Saturation layer with Cmd-J/Ctrl-J until the yellow disappears. In this example, it took 12 layers to create the final effect seen in **figure 6.60**.

figure 6.60

Duplicate the Hue/Saturation layer until the staining disappears.

6. Close the Group to save space in the Layers palette and use Cmd-Option-Shift-E/Ctrl-Alt-Shift-E to merge all layers up to create a new working surface.

7. Choose Filter > Noise > Dust & Scratches and use a Radius of 1 to cover up the remaining specks, as seen in **figure 6.61**.
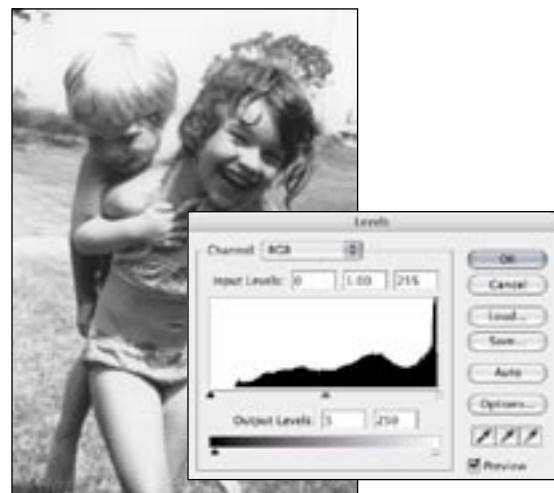

figure 6.61

Use a low radius to remove noise and dust.

8. To reduce the contrast of the image, add a Levels adjustment layer and increase the shadow output to 5 and decrease the highlight output to 250 (**figure 6.62**).

Using multiple adjustment layers is an easy method to increase the correction effect, which although very subtle at first is made more and more effective by stacking the layers up.

figure 6.62

Adjusting the Levels output settings reduces overall image contrast.

Erasing Pen Scribbles

Old photos and blue ballpoint pens are an irresistible combination for young children. An unattended child created his own artwork on the old family photo in **figure 6.63**. It would seem like a daunting task to go through and heal or clone all the scribbled lines. However, inspection of the three separate channels reveals that the pen damage is barely visible in the blue channel. Using the blue channel as the basis for repair reduces the amount of effort to restore this image, as seen in **figure 6.64**.

> 🔍 **T i p**
>
> Should you find yourself with a similarly damaged color or black-and white-image, scan it in color to give yourself the flexibility of taking advantage of the individual channels to help with the repair.

🌐✄ **ch6_inkscribbles.jpg**

1. Inspect the three color channels (see **figure 6.65**) and note that the blue ink is not as noticeable in the blue channel.

2. Create a Channel Mixer adjustment layer, select the Monochrome box, and slide the red and green channel sliders to 0 and the blue channel slider to +100%, as shown in **figure 6.66**.

3. Minimizing the pen scribbles left the image very flat, without a pure black or a bright white. Add a Levels adjustment layer and brighten the image by moving the highlight slider to the left to where the tonal information begins, as seen in **figure 6.67**.

4. To remove the remnants of the pen scribbles add a new layer and name it *Scratch Fix*. Use a small, 50% hardness Clone Stamp tool set to Sample All Layers and remove the last traces of the scribble over the faces.
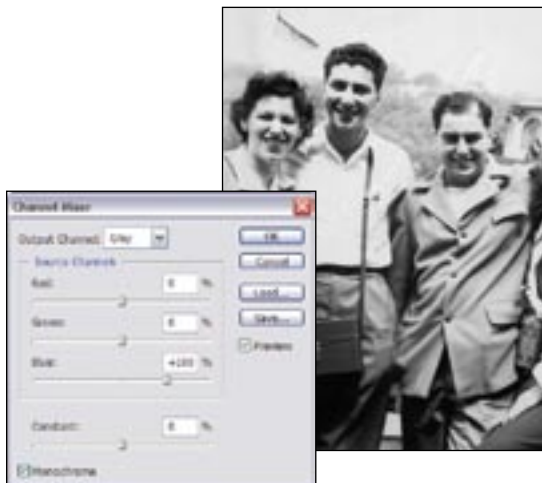

BEFORE

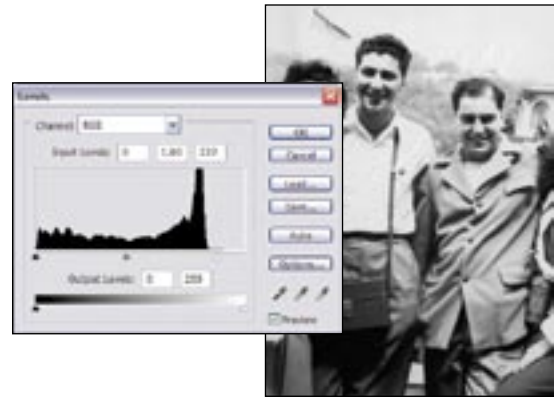*figure 6.63*

AFTER

figure 6.64

Red   Green
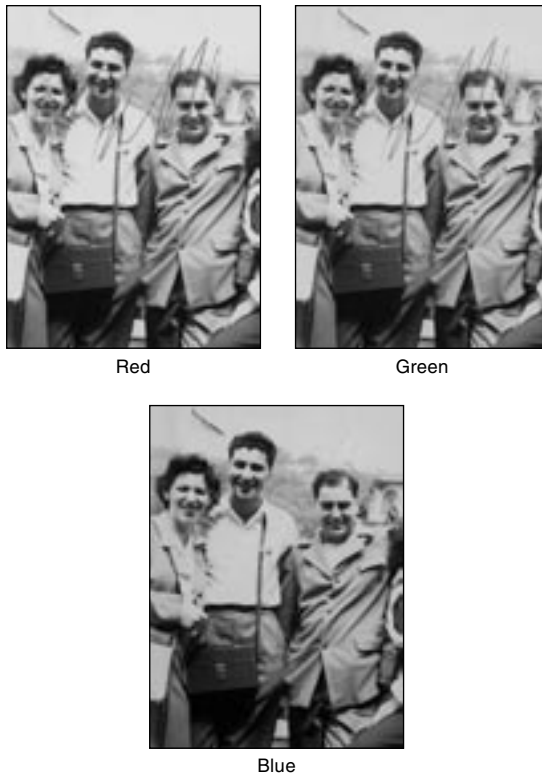
Blue

figure 6.65

*Inspect the channels individually to find the best one.*

figure 6.66

Using only the blue channel minimizes the blue ink.

figure 6.67

A Levels adjustment layer brings back the contrast missing in the blue channel.

5. Use the Healing Brush tool set to Sample All Layers and unselect Aligned to repair the less important image areas. One clear advantage to placing your fixes on their own layer is that they are editable. If you don't like the result, erase it and try it again (**figure 6.68**).
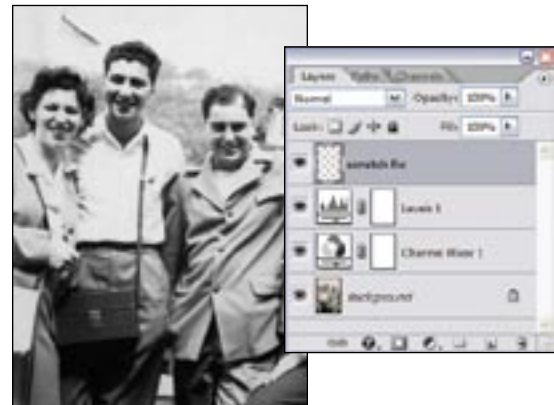
figure 6.68

Use both the Clone Stamp and Healing Brush tools to cover up the vestiges of damage.

T i p

Sometimes the solution is not to fix every scratch but simply to break up the scratch so that the eye does not readily detect it. This has to be balanced against the size of print to be made, with smaller prints being more forgiving than larger ones. If your image is sized for print and the damage is not noticeable at 100% view, then it probably will not be noticeable in the print.

Document Repair

Documents, certificates, and letters are also an important part of family history. And just like photographs, they too can suffer the ravages of time. The techniques to repair them are not all that different from repairing photographs. Repairing a document can be tedious and may require you to work around each and every letter.

George Brinkerhoff shared the family Civil War document seen in **figure 6.69**. It is a handwritten page out of the diary his great-grandfather kept during the conflict. This type of document is particularly difficult to restore because it is handwritten on thin paper and the writing from the other side shows through. Although the strategy for repair is simple, it is anything but quick. To bring this old document back to life, the text needs to be enhanced, the paper needs to be replaced, and any text that shows through needs to be concealed. With a lot of time, patience, and a steady hand, the entire document can look like **figure 6.70.**

⊕⧐ **ch6_diary_closeup.jpg**

1. Inspect the three channels and notice how the text is darkest and clearest in the blue channel. Add a Channel Mixer adjustment layer, select the Monochrome option and increase the red and blue components and decrease the green component to make text stand out, as shown in **figure 6.71**.

2. To increase the contrast ever further, create a Levels adjustment layer and slide the midtone slider towards white, which helps separate the text on the back of the page from the text on the front, as shown in **figure 6.72**.

3. To create the new paper-texture background, turn off the visibility of the Channel Mixer and Levels layers. On the Background layer, use the Rectangular Marquee tool to select a good section of the paper. Copy the selected area by pressing Cmd-C/Ctrl-C followed by Cmd-D/Ctrl-D to deselect the rectangle.
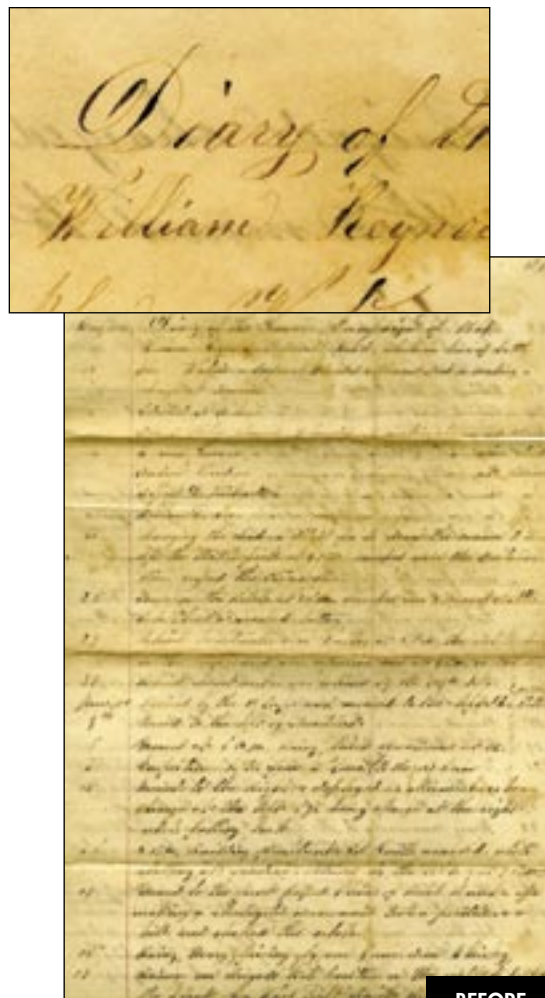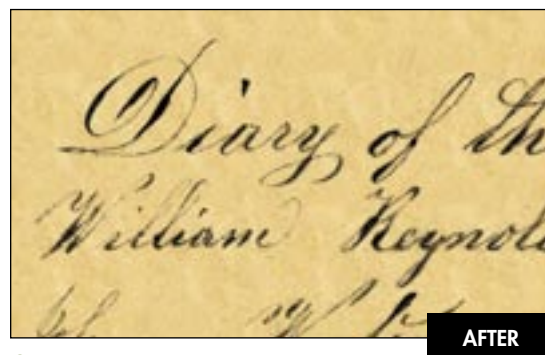

BEFORE

figure 6.69

AFTER

figure 6.70

4. Make the Channel Mixer and Levels layers visible again and click the Levels layer. Create a Work in Progress layer by pressing Cmd-Option-Shift-E/Ctrl-Alt-Shift-E. Name it *WIP*.

5. Add a new layer and select Filter > Pattern Maker and check the Use Clipboard as Sample option and click the Generate button (**figure 6.73**).

figure 6.71

A Channel Mixer adjustment layer enhances the text.

figure 6.72

A Levels adjustment layer further accentuates the contrast and helps to separate the bleed-through of the text from the other side of the page.

figure 6.73

The Pattern Maker filter can create a faux paper from a sample of the original document.

5. Repeat clicking the Generate Again button until you get a pattern that looks like paper (**figure 6.74**). As this pattern will be a background for the text, don't be too concerned about pattern repetition. Click OK to exit the filter when satisfied. Name the layer *Paper.*

6. Change the paper layer's blending mode to Multiply to allow the WIP layer text to show through, as shown in **figure 6.75**.
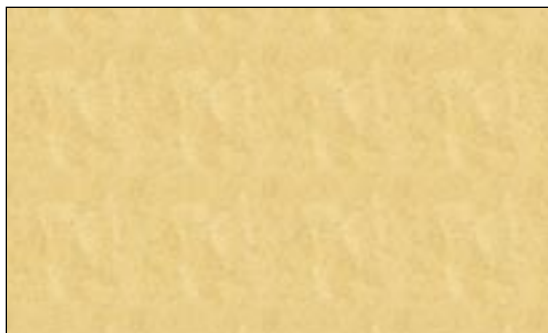

figure 6.74

The faux paper layer.

figure 6.75

Changing the blending mode to Multiply allows the enhanced text to show through the paper layer.

7. The last and most tedious step is removing the bleed-through text. Turn off all layers except the paper and WIP layers. Target the WIP layer and add a layer mask by clicking on the layer mask button. Use small, hard-edged black brush to paint away the bleed-through

text, as seen in **figure 6.76**. You could experiment with different selection techniques to try to isolate the text for easier cleanup. But I have found that, due to the uneven pressures in handwriting, selection tools are not very effective.

figure 6.76

After careful cleaning up to conceal the bleed through.

Here are a few other tips to keep in mind when working on documents:

- Recycle and reuse. Often letters you need for replacement may already be in the document.

- Your font library may contain similar fonts to help fill in missing characters.

- For documents printed on both sides, place a black or blue paper (depending on the color of ink) behind the original to help minimize bleed-through.

- Reflective materials like seals do not reproduce well. Treating the reflective material as a separate image and adding it later to the document might yield better results but printing inks generally do not have reflective properties.

REMOVING CURVATURE, DISTORTION, AND KEYSTONING

The very nature of photography is the flattening of three-dimensional space onto a two-dimensional plane—something that is harder to do well than many people realize. During the flattening process, straight or parallel lines can easily bow, bend, pinch, or become just plain crooked. To control lines and perspective, professional photographers use large-format view cameras that swing, tilt, and pivot to align the film plane, lens board, and subject. This allows architectural and product photographs to be straight—so buildings don't fall backwards and products aren't distorted. No matter how subtle the distortion in your photos may be, correcting it will make your images look professional and polished.

Straightening Pictures with Warp

Photographing an existing image (also called "doing copywork" or "reproduction") is a lot harder to do perfectly than you would think. Even when using a dedicated copystand, a slight misalignment between the camera plane and the original can be quite apparent in the reproduction. To straighten images, use Edit > Transform, which with Photoshop CS2 includes the Warp feature to bend an image into place. This is a tremendous asset when working with images that are either bent, warped, distorted, or simply will not lie flat.

In **figure 6.77** you see a daguerreotype whose hinge would not allow the picture to fully open, which caused the image to become distorted. **Figure 6.78** shows the same image after a careful dose of Warping to straighten it out.

🌐▷⋉ **ch6_warp_daguerreotype.jpg**

1. Choose Layer > Smart Objects > Group into New Smart Object.

BEFORE

figure **6.77**

AFTER

figure **6.78**

2. Turn on the rulers by pressing Cmd-R/Ctrl-R or choose View > Show Rulers. Drag guides from the left and top rulers to frame the four sides of the image and to establish which sides need to be squared. Notice in **figure 6.79** that the image bends slightly inward along the bottom and also along the upper-right corner.

figure **6.79**

Guides help determine which edges need to be corrected.

3. Select Edit > Transform > Warp. You can move any of the anchor points or click the image itself and drag in any direction. In this example, gently adjust the bottom center of the image to bend it into shape as seen in **figure 6.80**.

figure 6.80

Pull the bottom edge of the image to align with the guide.

4. Grab the upper-right corner and drag it until it fills in the corner of the upper-right guides, as seen in **figure 6.81**.

5. Once you are satisfied with the warp correction, press Return/Enter to accept the Warp.

The advantage of using the Smart Object feature is that even after accepting the Warp, if you need to refine the image with additional transformation or Warp you choose Edit > Transform > Warp the original transform bounding box reappears allowing you to continue transforming without degrading the file.

figure 6.81

Pull the upper corner of the image to match the guides.

Working with Lens Correction

Introduced in Photoshop CS2, the Lens Correction filter is an excellent feature to straighten, rotate, remove distortion, and correct vertical or horizontal perspective. Granted, some of these corrections can be accomplished with perspective cropping or Transform, but the ability to apply a variety of corrections while seeing how each one improves the image is the strength of the Lens Correction filter. Although it was developed with architectural images in mind, I use it on a wide variety of images as addressed in the following section.

Working Efficiently with the Lens Correction Filter

- Imagine the feature to be corrected (for example, the building) imposed on a cube—a single face of the cube when the image is in one-point perspective or an angled cube when photographed in two-point perspective. Imagining the subject on a cube makes it easier to see which lines need to be straightened or where distortion needs to be removed.

- Set the grid to a useful size and color. The Default of 16 and gray are usually too small and too subtle to be very helpful.

- During the correction session, use the Move Grid tool to reposition the grid along important lines.

- Start the correction session by straightening the subject with the Straighten tool by dragging along a vertical or horizontal line. If the subject isn't straight, it will be more difficult to use the other correction features.

On the right side of the interface, work from top to bottom:

- Remove Distortion: Corrects bowing or pinching (officially called *barrel distortion*) when the image bows outward and *pincushioning* when the image edges pinch in.

- Chromatic Aberration: Removes color fringing most often found near the edges of images on high-contrast areas. If you work with a digital camera that can capture in the raw format, it is better to remove chromatic aberration with Camera Raw.

- Vignette: Lightens dark corners that were created by large lens shades or zoom lenses. Also use vignette to darken corners for a creative effect.

- Set Lens Default: Useful when using prime lenses (not zoom lenses). After correcting an image, click Set Lens Default to save the corrections for the next time an image is opened that was photographed with that same lens.

- Transform: Corrects perspective to straighten up buildings and boxes and to correct keystoning.

- Edge: As the image is scaled and corrected, transparent areas are created. The options to conceal this are Transparency, Edge Extension (not recommended), and Background Color. I recommend either scaling to increase the image to hide the transparent edges or to ignoring this feature and using the Crop tool afterwards.

Straightening Antique Images

The Kodak Brownie camera popularized photography, which is quite astounding when you consider that the camera was a bulky cardboard box with a viewfinder smaller than half a postage stamp that showed a blurry scene that was very difficult to see in bright sunlight. That difficulty caused a lot of crooked images, such as the one seen in **figure 6.82**. Thankfully, many decades later, the Photoshop Lens Correction filter can correct the perspective of the image, which was then restored to create the final image as seen in **figure 6.83**.

🌐▷፦ **ch6_crooked_house.jpg**

1. Duplicate the Background layer. Select Filter > Distort > Lens Correction and unselect Show Grid.

2. Use the Straighten tool (second from the top) to trace a line in the image that should be straight, or (in this sense) aligned vertically or horizontally. In this example, I used the lower edge of the house. The adjusted image is shown in **figure 6.84**.
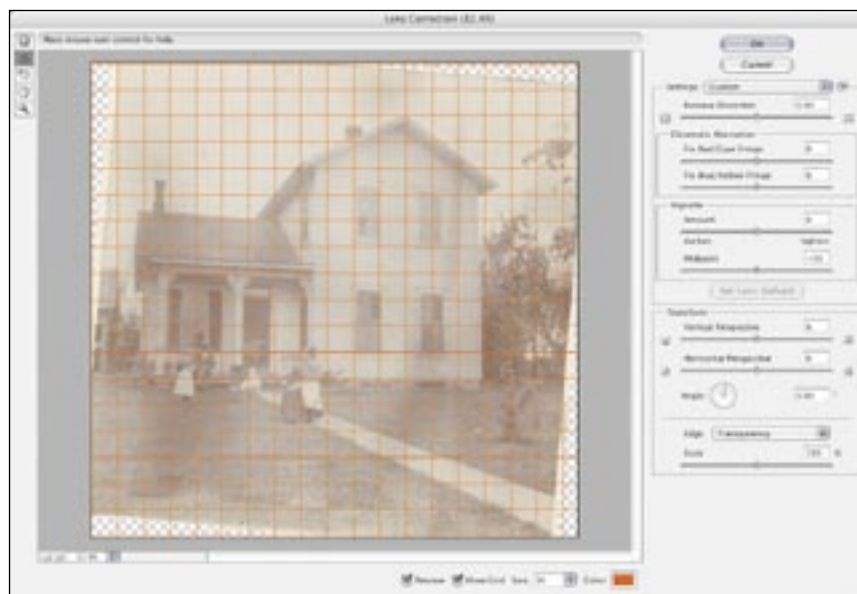

BEFORE

© Berger Family Archive

figure 6.82

AFTER

figure 6.83

3. Click Show Grid. The default settings (Size: 16 and Color: gray) are not very useful. Increase the grid size to 36 and click on the color picker to select a bright red, as seen in **figure 6.85**. This grid will serve as a reference to fine-tune the image.

figure 6.84

*Start the correction by straightening the image.*

figure 6.85

*Use a grid size and color that creates an essential reference.*

4. Concentrate on either the vertical or horizontal lines. In this example, straightening the right side of the building by correcting the vertical perspective (**figure 6.86**) straightens the building out very nicely.

5. If you look carefully, you'll see that the front of the house bulges out towards you ever so

slightly. Increase Remove Distortion by +2.00 to push the center of the building back a bit (**figure 6.87**). The Lens Correction filter doesn't allow you to pull individual corners of the image—something Transform does very well. Click OK to accept the correction and continue with the next step.
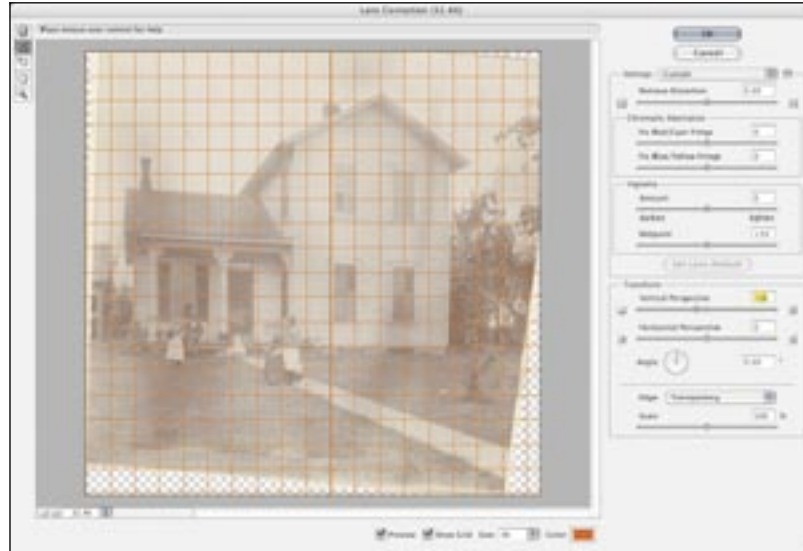
figure 6.86

Tackle one dimension at a time.
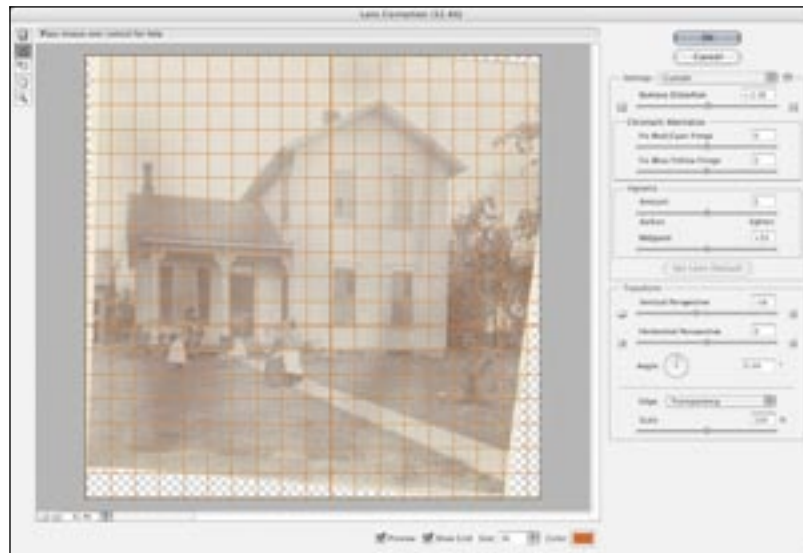
figure 6.87

Correct the bowing with the remove distortion feature.

6. I find it easier to concentrate if I turn off the Background. To pull down the left side of the house, choose Edit > Transform > Skew and pull the center left handle down and the center top handle slightly to the left, as **figure 6.88** shows.

figure 6.88

*Continue the correction with the Transform > Skew command*

7. To continue the restoration, use the skills presented in Chapter 2, "Improving Tone and Contrast," and Chapter 3, "Exposure Correction," to enhance the tonality with Levels (**figure 6.89**) and Channel Mixer (**figure 6.90**) and clean the image up with techniques presented in Chapter 5.

Although the Lens Correction filter was designed for contemporary digital camera files, it is a wonderful tool to correct images that were photographed in an age when color photography—let alone digital photography—was unimaginable.

figure 6.89

Improve tonality with Levels.
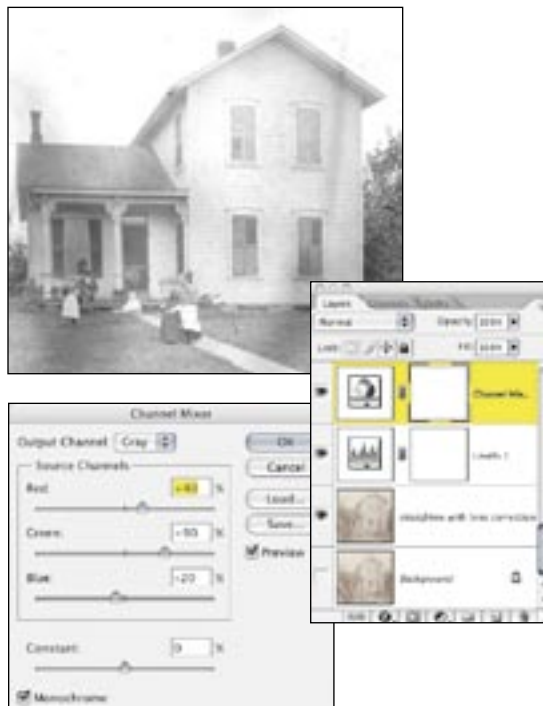
figure 6.90

Converting the image to black and white with a Channel Mixer layer.

Correcting Lens Distortion

When we use different focal length lenses, we often trade off an optical distortion for the ability to get the whole image within our viewfinder. This is very noticeable when a wide-angle lens is used. As the lens takes in a wider view, a noticeable bend is created in straight lines. Lens Correction is the ideal tool to correct distortion problems created by using wide-angle lenses.

This image of a Southwestern service station, taken with a 20mm lens, has visible distortion in **figure 6.91.** With just a few adjustments inside the Lens Correction filter, the sides are straightened and the bowing is removed, as seen in **figure 6.92**.

**ch6_service_station.jpg**

1. Duplicate the Background layer and turn the original Background layer off.

2. Select Filter > Distort > Lens Correction. Check the Show Grid box for assistance in determining perpendicular lines. Set Remove Distortion to +2.00 to reduce the bowing.

3. Next, use the Transform sliders to correct Vertical and Horizontal Perspective. Slide the Vertical Perspective to –11 to make the building stand up straight. Adjust the Horizontal Perspective to –4 to bring the left side of the building to the foreground ever so slightly, as seen in **figure 6.93**.
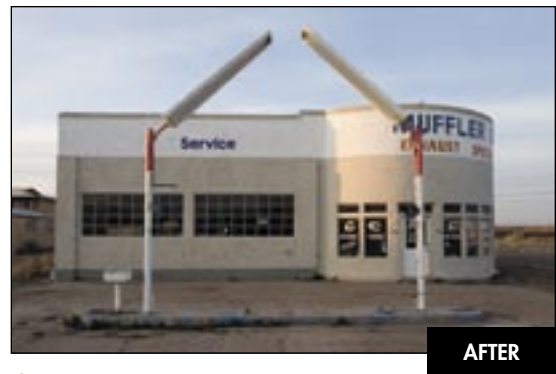
figure 6.91
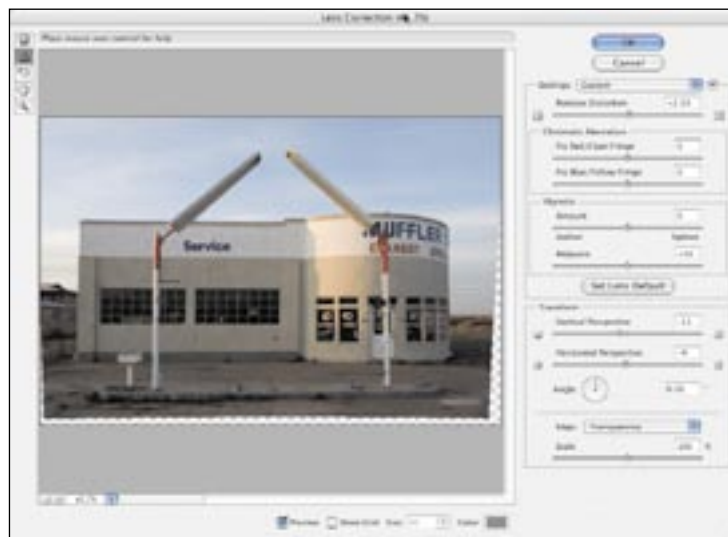
figure 6.92

figure 6.93

The Lens Correction settings used to bend the image into perfect flatness.

Correcting Architectural Perspective

If you use a 35 mm film or digital SLR camera to photograph a building, you'll notice that the building looks as if it's falling backwards (**figure 6.94**). But when you look at the actual scene, the building isn't tilting at all. Our visual system corrects the perspective just as a photographer who uses the swings and tilts of a large format view camera aligns vertical and horizontal lines to make the building look as straight as it really is (as in **figure 6.95**).

Although it's always better to create the best image in front of the lens and not rely on Photoshop to fix mistakes, I do not use a view camera, which means I rely on the Transform and Lens Correction features to correct images that curve, bend, fall backwards, and generally are out of alignment. You can see in the Lens Correction filter interface shown in **figure 6.96** how I straightened the top of the building, removed distortion, and brought the building up via the Vertical Perspective slider.
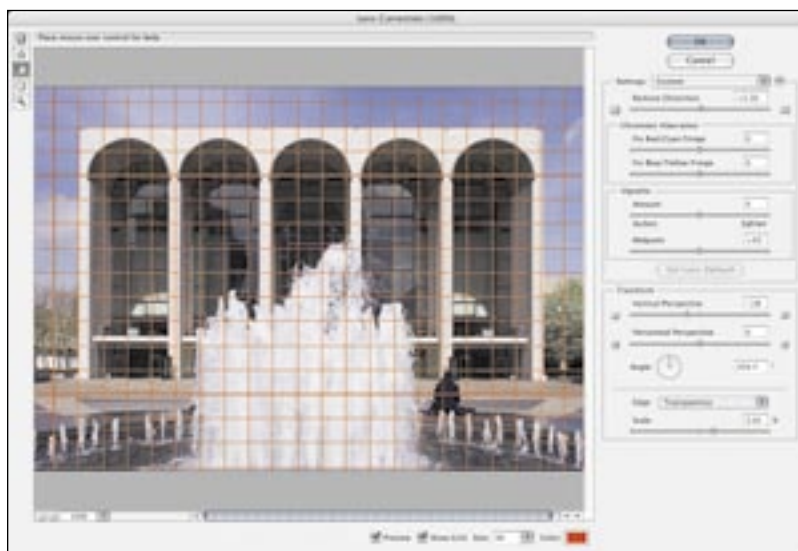
ch6_lincoln_center.jpg

figure 6.94

figure 6.95

figure 6.96

Removing distortion and improving the vertical perspective makes the building stand straight and tall.

Tip

When photographing a scene with the intent of correcting it with the Lens Correction filter, frame the scene in the viewfinder, and then take a few steps back to allow for space needed to correct and scale the image.

CLOSING THOUGHTS

Although repairing tears or removing clutter sound like mundane endeavors, I hope the techniques shown in this chapter have given you some creative approaches to ridding the world of scratches, distractions, and distortion. Most importantly, always keep in mind the value of the photo that you're working on—the people, the memories, the captured moment might be the only reminder you or your client has of something or someone near and dear to them. By removing those scratches and damage, you're giving them back their memories as clear as the day the picture was taken.