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Beginning Photo Retouching and Restoration Using GIMP

LEARN TO RETOUCH AND RESTORE YOUR PHOTOS LIKE A PRO!

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Introduction

The Joy of Restoring Photos

When you look through your family photo album, chances are you'll notice that some of those pictures are showing their age. They might have faded, lost a great deal of color, have stains, tears, or other forms of damage. There may be only one picture of a favorite aunt or uncle in existence, possibly in poor condition. If you have photos that are precious to you, you know how important it is to rescue and preserve them for posterity (Figure 1).

Figure 1. *A faded image rescued for future generations*

With the advent of digital imaging software, it's now possible to perform minor miracles and revive damaged photographs that might have been considered beyond repair. In my profession, there's nothing more gratifying than the look of surprise and joy on a client's face when he or she sees a fresh, new copy of a restored family photo for the first time. Sometimes, the client is moved to tears, which reiterates how important family photographs are. Most of us in the photo retouching and restoration profession love what we do. I personally find it very therapeutic—even when wrestling with some of the more challenging jobs that come my way. Learning these skills is a plus for photographers who want to add an extra revenue stream to their business. Genealogists can greatly benefit from knowing how to digitally resurrect images from generations past. The family archivist will have fun preserving the history of Mom and Dad, as well as an assortment of cousins, aunts, and uncles.

Why Photographs Are Important

Our old family photographs go largely unnoticed in our day-to-day lives. They are tucked away in aging photo albums (Figure 2), displayed in frames (often exposed to damaging light), or stored in drawers and boxes. Improper storage and exposure to UV light cause the majority of damage to photographs.

Figure 2. *Photographs kept in an aging album*

Our photographs are linked to our history. The fact is, we often don't give them much thought until a milestone anniversary or birthday, a loved one passes on, or other such event. Throughout my career, I've had many desperate clients hire me to restore their treasured images for all of these occasions. Preventing damage is always preferable to repairing it. Keeping photos in acid-free albums, displaying them in frames with UV resistant glass, and keeping them out of junk drawers and boxes will go a long way toward preserving your images. It's also important to digitize them, so copies can be given to family members. Those images of our parents, grandparents, kids—even distant relatives—are part of our heritage and well worth preserving. It would be a shame if our visual family history couldn't be passed on to future generations. Fortunately, with the aid of this book, and the image-editing power of GIMP 2.8, you'll be able to rescue all of the damaged images in your family's collection, as well as those of your clients, if you choose to make a profession out of this fun and challenging activity.

GIMP: The Powerful Free Image-Editing Alternative

Years ago, there weren't many options available for full-featured photo-editing programs. Adobe Photoshop was by far the most powerful—and the most expensive. While it is still considered the leading photo-editing software, there are other options that have narrowed the gap over the years.

One of the most powerful free photo editors is the open source GIMP, currently in version 2.8. GIMP stands for *GNU Image Manipulation Program*. The best part about it (other than being free) is that you can share it with friends and install it on multiple computers—all without fear of committing piracy or violating licensing agreements. It is issued under the terms of the GPL, which stands for *General Public License.* Photoshop is probably *the* most pirated software on Earth. With GIMP, that isn't possible. The developers *encourage* you to distribute copies (and, yes, it says so on their web site).

Open source software such as GIMP means that the source code is openly available. Anyone with programming skills can make improvements and enhancements. There is a large community of GIMP users that develops fixes: *plug-ins* (software add-ons that improve functionality). Over the years, GIMP has matured into a powerful tool used by many independent photographers, graphic designers, and artists who require a full-featured image editor.

In May 2013, Adobe Systems, Inc., changed to a subscription-only business model. It no longer sells physical boxed software packages or downloads with perpetual licenses. Adobe customers must pay a monthly fee to use the company's current products on a continual basis. This apparently angered many of Adobe's customers, many of whom began seeking alternatives to Adobe products, especially Photoshop. There was a dramatic increase in the download frequency of GIMP in the months that followed Adobe's decision. It would be reasonable to assume that GIMP will become more popular over time, as it keeps improving.

Although GIMP lacks some of Photoshop's features, such as the CMYK color model, adjustment layers, or 16-bit-per-channel mode (that is due to arrive in version 2.10), it is still an extremely capable editor for photo retouching and restoration tasks. There are plug-ins available that can restore some of the missing features, so GIMP will become more on par with Photoshop.

To download the software and access the documentation and license, visit the official web site at www.gimp.org. GIMP can be installed on Windows, Macintosh, Linux, and Unix derivatives. The web site will help direct you to the correct installer (or source code) for your system. Even though this book is a beginner's guide to photo retouching and restoration, it's not a beginner's guide to GIMP. For the benefit of those new to GIMP, Chapter 1 is an overview of this software's important features. It should provide beginners with enough information to follow the tutorials, but the GIMP User Manual will provide much more specific information about the software itself. I recommend *GIMP for Absolute Beginners* by Jan Smith, with Roman Joost (Apress, 2012), as an excellent companion book.

The retouching and restoration techniques in this book can be replicated by other programs, such as Adobe Photoshop, Corel Paint Shop Pro, among others. However, some of the tool names and command names will differ.

If you've been eager to learn photo retouching and restoration without the high price tag that accompanies Photoshop, I encourage you to get started with GIMP 2.8. You can download the practice photos with which to follow along in each lesson from the companion web site: *www.gimprestoration.com*.

This book will teach you how to do the following:

- Acquire the best scans and digitize oversized photos
- Improve contrast to make faded photos look their best
- Correct exposure problems
- Make color corrections in photos that have color shifts or color casts
- Colorize black-and-white photos
- Digitally clean up dust on photos (great for scanned images acquired from old 35mm slides or negatives)
- Repair images with tears, cracks, and stains
- Remove unwanted objects from photos
- Recompose portraits (add or remove people, change backgrounds, or make other changes)
- Digitally remove skin blemishes, whiten teeth, etc.
- Protect and preserve your restored images

Visualizing the Editing Steps

It will be beneficial to evaluate each photo and visualize your steps from start to finish. This may be a little challenging in the beginning, but it gets easier with practice. Outlined below is the progression of an image restoration that should serve as a general guide.

1. **Straighten the image**. Sometimes, the image you are working with will be tilted slightly. GIMP can easily correct this. You can see in the example (Figure 3, right-hand example) that the porch has been straightened. Now the edges are at an angle and will have to be cropped.

Figure 3. *The image straightened*

2. **Crop the photo.** In the next example (Figure 4), I cropped the image to the client's specifications. Photos from the 1950s were often square, and cropping eliminates the excess foreground.

Figure 4. *Image cropped (left) and contrast improved (right)*

3. **Make the necessary exposure and contrast adjustments.** By using a combination of layers set with the *Multiply* and *Overlay* blending modes, the photo has much better contrast and brightness (Figure 4, right-hand example). When editing color images, make the needed color adjustments after exposure corrections.
4. **Do your digital cleanup/editing.** Remove scratches, spots, blemishes, and any distracting elements. After editing, recheck the exposure and contrast. In color photos, recheck the color correction.

5. **Recheck the photo for overlooked dust, blemishes, etc.** Give the photo a final overview, to make sure you removed all of the imperfections that might have been overlooked the first time. Once you're satisfied with the outcome, it is finished. Be sure to save a layered version of your work. (I'll explain this in greater detail in "Working with Layers," in Chapter 1).
6. **Resize the image.** Resize the photo to its final output size.
7. **Sharpen the photo.** Last, sharpen the image slightly. The end result looks much better (Figure 5).

Figure 5. *Before and after comparison*

■ **Note** This process will vary somewhat, depending on the image and the editing requirements. For example, it's better to repair images with heavy damage (large cracks, tears, or missing areas, in which large patches of underlying white from missing image emulsion are visible) before making tonal and/or color corrections.

Improving with Practice

The tutorials in this book will help you learn a great deal about photo retouching and restoration. Mastering the lessons in this book will help you along the way to becoming an expert retouch or restoration artist, and with *dedicated* practice, you will become one. This is especially important if you plan to become a professional retoucher and restorer. Top-notch work that exceeds your clients' expectations will make them very happy, which can promote glowing word-of-mouth testimony leading to potential clients.

You'll discover that some restoration work requires experimentation with different approaches, before you achieve the results you want. You won't achieve perfect results with every image; some will be too far damaged, and making the best attempt you can make will have to suffice. You can still end up with pleasing results!

As mentioned earlier, if you are going to professionally restore and retouch photographs, skillful work will thrill your customers. That's why improving and maintaining your skill level is vital. There will be the occasional hard-to-please client, and there will be times when revising work will be necessary. While it's important to keep revisions to a minimum, they can also serve as learning experiences. Many times, I've learned a new and better way of restoring a photo because my first attempt wasn't satisfactory. After the revision, I'd end up with a very happy client—often leading to repeat business.

After you've spent a great deal of time editing a particularly difficult photo, it helps to leave it alone for a day or so and then reexamine it with a fresh set of eyes. (It also helps to have someone else look at it.) It can be frustrating to print your finished work, only to discover it wasn't *quite* finished, because you overlooked something. After mastering the tutorials in this book, you might consider asking family and friends for practice photos. It's a great way to build a portfolio to show prospective clients. Just be sure to ask for permission to use them first—especially if you plan to put them online.

Equipment Purchases to Consider

These days, most people own a computer, scanner, and printer. All-in-one printer/copier/scanners have become popular in recent years. These are the minimum requirements for scanning, editing, and printing photographs up to 8" × 10". For many people, this will probably be sufficient. For those editing images at the serious amateur level or offering a professional service, there are a few purchases you might want to consider. They will make your workflow smoother and more efficient and will also enable you to handle a wider range of editing tasks. If you're a professional, you probably already have this equipment. If not, the following are some items you might require at some point:

- ***A multi-format flatbed scanner*** (Figure 6). Using a multi-format photo-quality scanner will capture images with a wide dynamic range (greater detail in shadow areas), as well as transparencies, such as 35mm slides and negatives. They typically range in price from about $99.00, for basic models, to $700.00, for models that can scan 12–16 slides at one time.

Figure 6. *A multi-format flatbed scanner*

- ***A good quality tripod***. You may encounter large images, such as 16" × 20" portraits. With a tripod and a good camera, you can digitize large images for editing. A decent consumer-quality camera will work, but a camera that captures in the RAW format is best. The tripod should have a head that tilts 90 degrees, so that the camera can be aimed straight down.
- ***Lighting***. Digitizing large images outside on an overcast day works very well but may not always be possible. You can purchase from your local camera shop lighting equipment to illuminate large images. Photo-flood bulbs emit light at 3200 or 3400 degrees Kelvin to work with your camera's indoor setting.
- ***Graphics tablet*** (Figure 7). A graphics tablet can make your work much easier and faster. It mimics the feel of using a brush, pencil, or pen. This is especially useful when applying colors to an image, such as colorizing a black and white photograph.

Figure 7. *A graphics tablet can make your work easier. (Image © iStock by Getty Images)*

Copy with Caution

If you are learning the art of digital photo restoration for professional purposes, you'll have to be careful when duplicating and editing some images, to avoid committing copyright infringement. Because I'm not an attorney, I can't really offer this as specific legal advice, but more as a general cautionary guide for you to keep in mind. *You should always consult an attorney who specializes in intellectual property law for legal specifics.*

On occasion, a customer will request retouching or modifying a professionally shot portrait. Legally, the photographer who took the picture owns the copyright to the image (unless other arrangements were agreed upon beforehand). When possible, have the customer obtain written permission from the photographer or studio that owns the copyright, before proceeding with any work. Naturally, some portraits will be decades old, and the photographer will have passed on or closed his/her business, or there simply may not be any way of knowing who the photographer is. In those cases, it's probably a moot issue.

It's good practice to have the customer sign a waiver (your attorney can help you draft one) releasing you from any copyright infringement liability. However, if the picture is obviously the work of a professional (especially a local photographer), obtaining permission to edit the image is very important. Photographers can be very protective of their work (trust me, I know), and you can't really blame them. If it happened to get back to him or her that you were editing his/her work, a lawsuit might follow. (I personally know of a photo lab owner who was almost sued over just such an incident.)

Many people believe that because they paid for the photography service and prints, they own the copyright to those images. It can sometimes be difficult to convey the concept that the photographer (or studio that employs him/her) owns the copyright. However, it's important that you do. Customers won't always understand why they need to obtain permission or sign a waiver, but you must legally protect yourself. It's also just professional courtesy to ask for permission to edit someone else's work.

So, be sure to remember these important points.

- When possible, have the customer sign a waiver releasing you from any potential copyright infringement. Most of the images you work with will be family snapshots or an old portrait that was the work of a professional. It may be impossible to identify the photographer.
- When it's obvious that a photo is the work of a professional, obtain permission from the copyright owner to edit the image, if at all possible. There is usually an embossed signature at the bottom-right corner of a photo and a "Do Not Copy" warning on the back.
- *Consult an attorney when you need more specific legal advice*. It pays to be careful.

Macintosh Users

The tutorials in this book use the Windows/Linux keyboard shortcuts, but if you are a Macintosh user unfamiliar with the aforementioned keyboard shortcuts, the Mac equivalents are shown in Table 1.

Table 1. *Mac/Windows Keyboard Shortcuts Equivalents*

Editing		
Function	**Mac OS**	**Windows**
Cut to clipboard	Command + X	Control + X
Copy to clipboard	Command + C	Control + C
Paste from clipboard	Command + V	Control + V
Undo	Command + Z	Control + Z
Contextual Menus	Control + Click	Right click

Plug-ins

Plug-ins are software components that add functionality to GIMP. There are a few tutorials in this book that will require that certain plug-ins be installed. These plug-ins, like GIMP, are free of charge. The easiest way to acquire most of the plug-ins you'll use in the upcoming tutorials is to install the GIMP Extensions Pack (for Windows) and the Repository of optional extensions for GIMP (for popular Linux distributions such as Ubuntu). These extension packs include Resynthesizer, G'MIC, and Wavelet Decompose.

- The extensions pack for Windows allows you to choose which plug-ins you want to install (Figure 8).

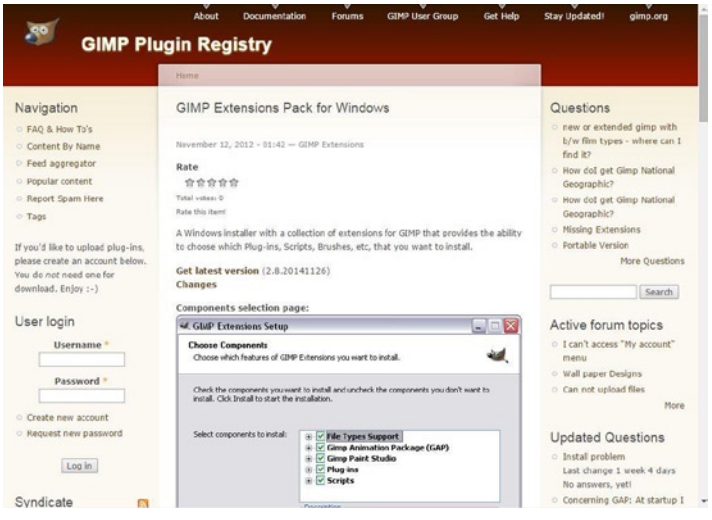

Figure 8. *The set-up for installing the GIMP Extensions Pack on Windows*

- Log on to `http://registry.gimp.org/node/27656` to see the complete list of available plug-ins in the extensions pack and to get the latest version.
- The GIMP extensions for Linux distributions such such as Ubuntu are available from the Software Center (Figure 9). Just type *repository of optional plug-ins* in the search field to pull it up, and click on it to open the Install option.

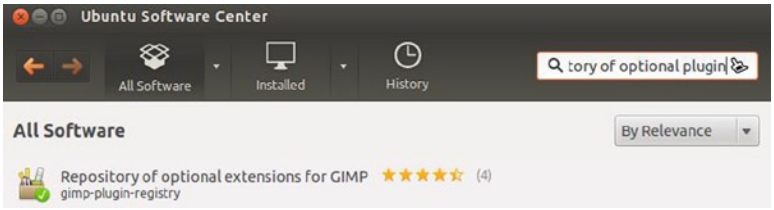

Figure 9. *The GIMP extensions in the Ubuntu Software Center*

For Mac OS, Partha's Place (Figure 10) provides GIMP builds that already include these plug-ins, in which case Mac users can download GIMP from Partha's Place instead of the GIMP website as described in Chapter One. Log on to `www.partha.com` to access the web site.

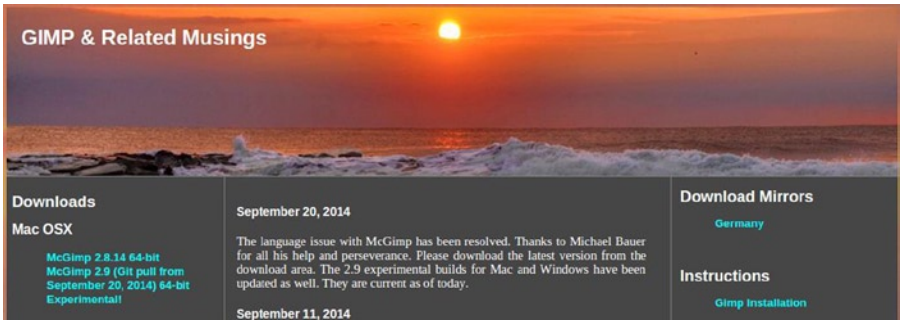

Figure 10. *GIMP builds for Mac OS with preinstalled plug-ins are available from Partha's Place*

Here are the plug-ins that will be used throughout this book:

- ***Resynthesizer.*** This is actually a suite of scripts, but the one that you'll be using is called *Heal Selection.* This function is very useful for removing unwanted objects from images and is also useful for repairing large, damaged areas.
- ***G'MIC.*** The G'MIC (which stands for *Greyc's Magic for Image Computing*) plug-in adds a wealth of filters and effects. One could easily spend hours exploring all it has to offer. There are many artistic filters that can turn your photographic images into digital works of art.
- ***Wavelets Decompose.*** This plug-in is very useful for portrait retouching. It allows retouching without the result looking artificial. It essentially separates the image into layers called wavelets containing varying degrees of detail for precise editing.
- ***GimpLensfun.*** This plug-in can be used to correct lens distortions. When digitizing large images with a tripod and camera (as you'll see in Chapter 2), there is usually some distortion that results. GimpLensFun is available from `http://seebk.github.io/GIMP-Lensfun` (Figure 11).

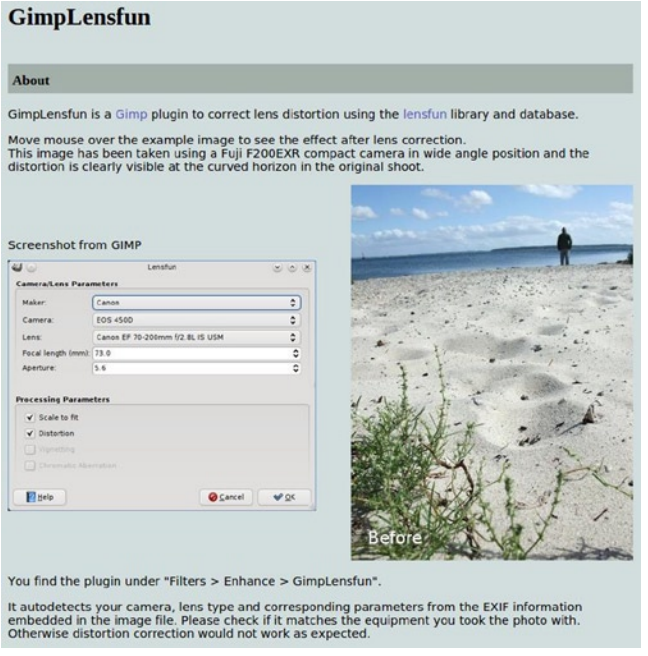

Figure 11. *GimpLensFun is a useful plug-in for correcting lens distortion*

Practice Images

You can download the Practice Images folder that contains the images that accompany each tutorial in this book. The images are contained in each corresponding sub-folder. To download the Practice Images folder, download the source code package here: http://www.apress.com/9781484204047.

If you're ready now, you can start on your path to becoming an image retoucher and restoration artist!

PART I

Starting with the Essentials

CHAPTER 1

An Overview of GIMP 2.8

In This Chapter

- Downloading and Installing GIMP 2.8
- The GIMP Interface
- The Image Menu
- The Image Navigation Bar
- The Toolbox and Important Tool Functions
- Working with Layers
- Plug-ins to Enhance GIMP

■ **Note** If you are an absolute beginner, I hope that this chapter will provide you with enough information about GIMP to follow along with the exercises in this book. The GIMP *User Manual* will provide much more detailed information and can be accessed from the official GIMP web site at www.gimp.org.

Downloading and Installing GIMP 2.8

If you don't already have GIMP installed on your computer, then the first thing to do is go to the official GIMP web site at www.gimp.org. Next, just follow the steps below that apply to the operating system of your computer. Remember: GIMP is free—no need to have a credit card ready!

Once you are on the GIMP web site, you'll see the Download button at the top of the home page (Figure 1-1). The GIMP web site will automatically detect your computer's operating system. Click the Download button, and you'll be taken to the appropriate download link(s).

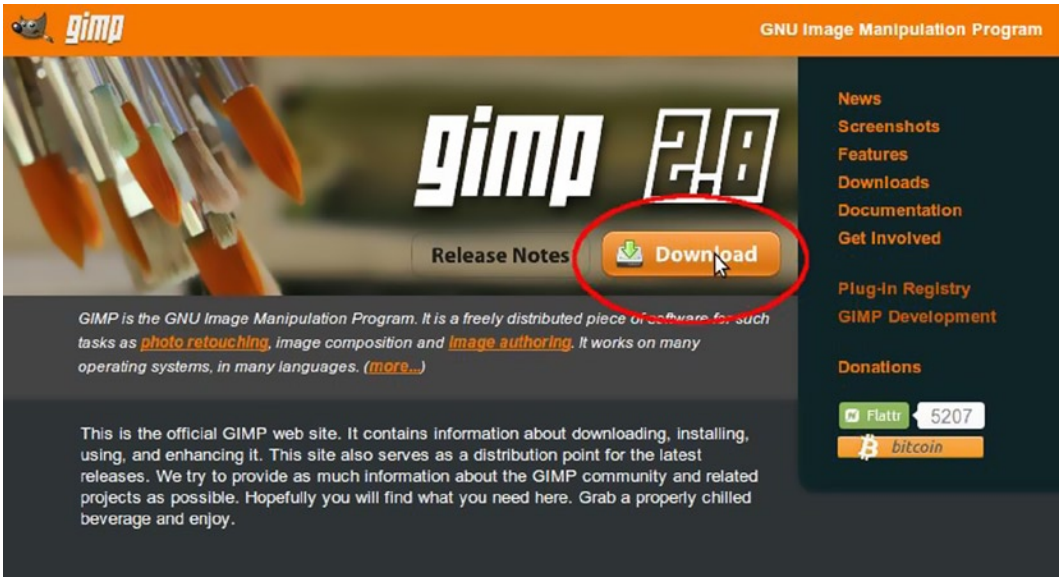

Figure 1-1. *The Download button on the GIMP home page*

GIMP for Windows

The following steps will help assist you in installing GIMP 2.8 on Windows. These steps were performed on Windows 7 (the same steps will apply for Windows 8).

1. Once you are on the download page for Windows, click the Download GIMP 2.8.10 link (Figure 1-2).

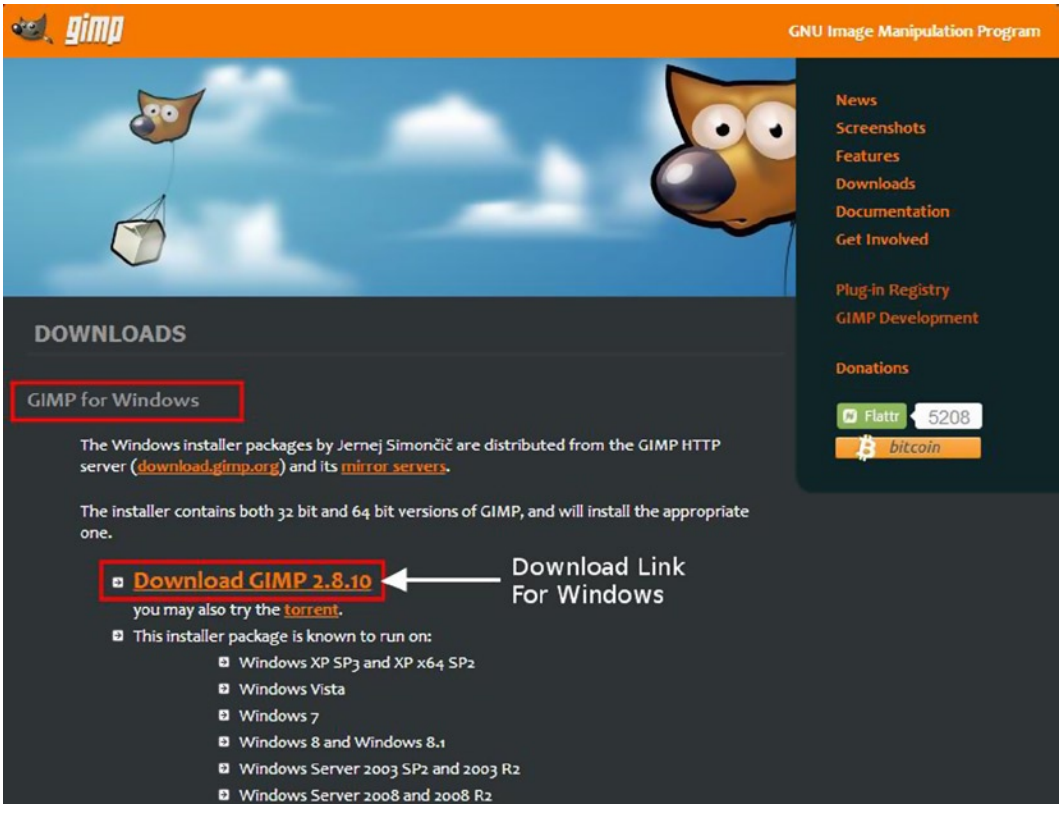

Figure 1-2. *The download page for Windows*

2. After the download completes, the GIMP installer will be in the Downloads folder or the place you normally designate for downloads. Click the GIMP installer, and the Open File - Security Warning dialog box will open. Click the Run button, and GIMP will be installed on your system. The installation process might take several minutes (Figure 1-3).

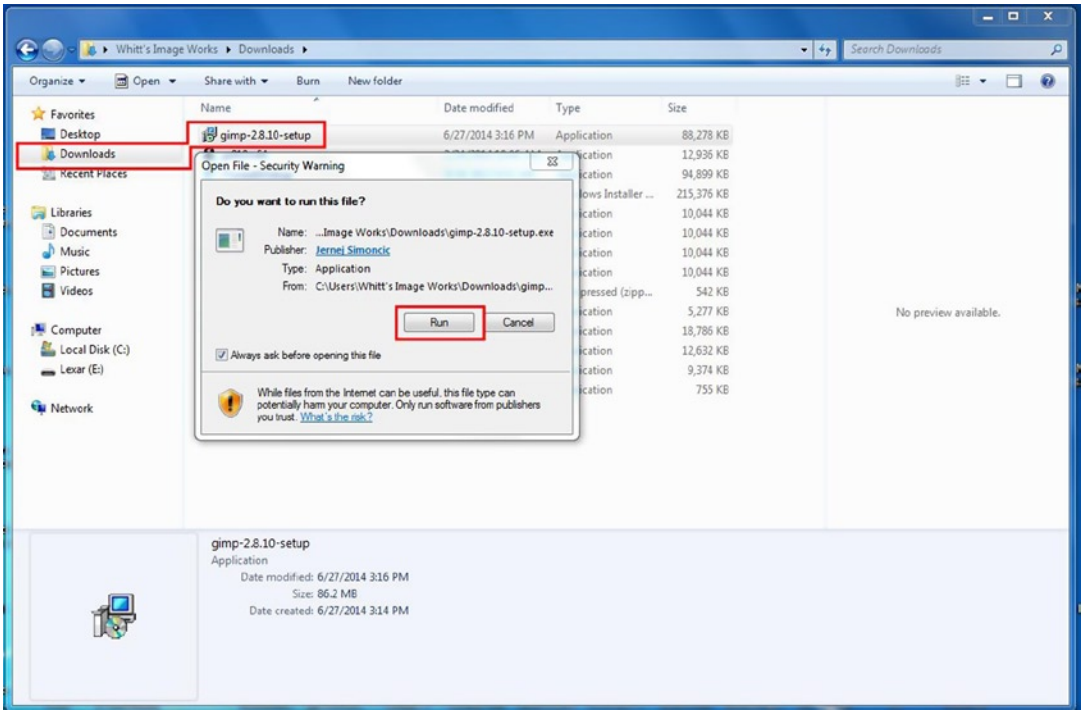

Figure 1-3. *Installing GIMP on Windows 7*

GIMP for Linux and Unix-Like Systems

If your computer's operating system is a Linux distribution such as Ubuntu or Debian, then GIMP is probably already installed. If for some reason it isn't, the GIMP for Unix-Like Systems section of the GIMP download page will guide you to the appropriate installation instructions for your particular operating system (Figure 1-4). If you use Ubuntu, you can download GIMP from the Software Center (Figure 1-5).

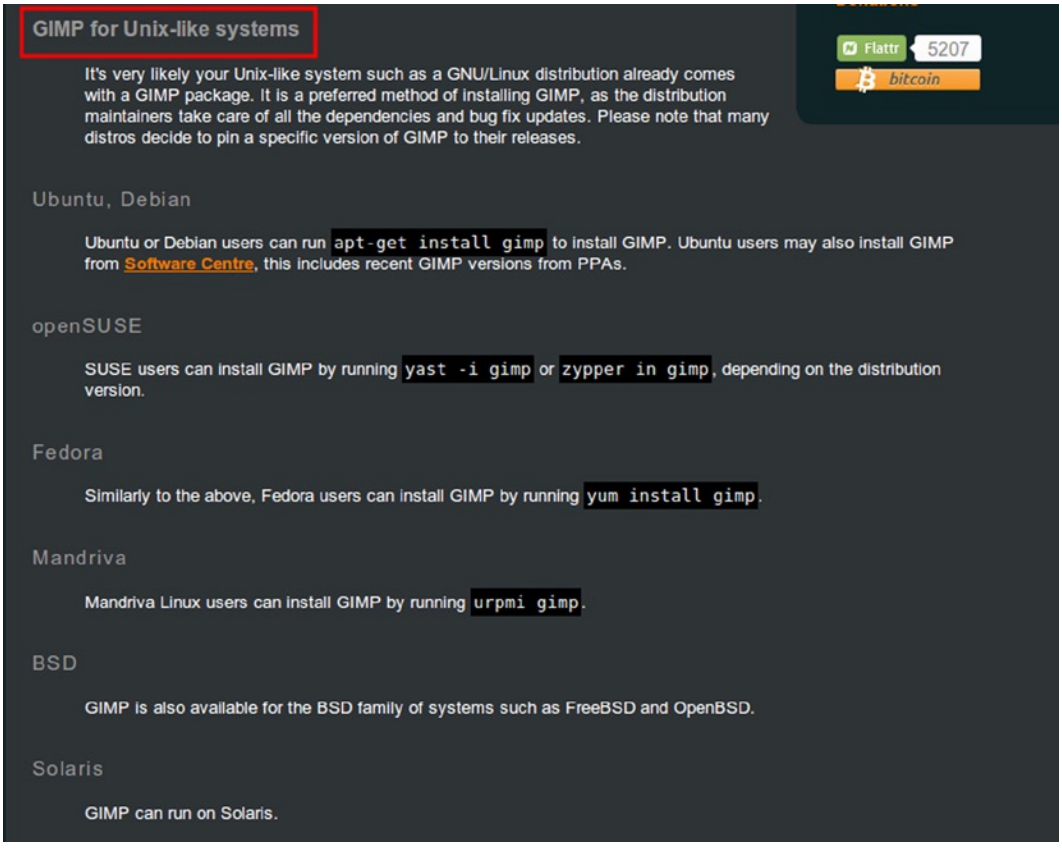

Figure 1-4. *GIMP for Linux and various Unix-like systems*

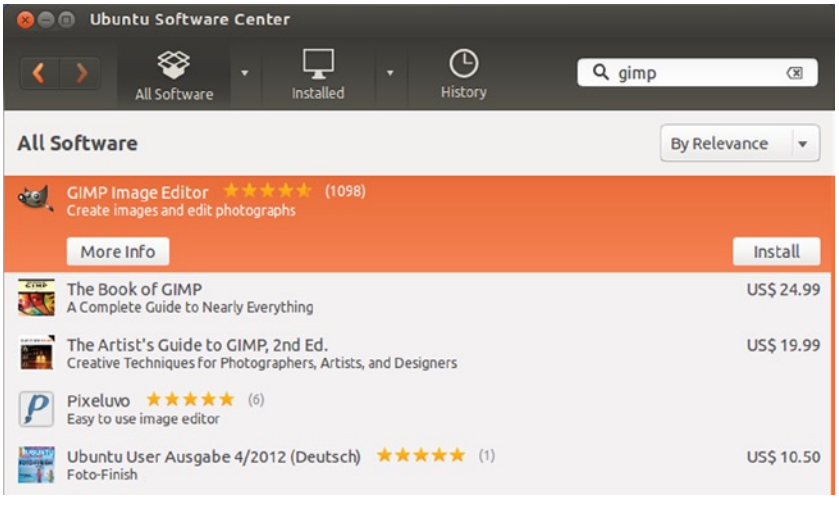

Figure 1-5. *Acquiring GIMP from the Ubuntu Software Center*

GIMP for Mac OS X

This page (Figure 1-6) is where you'll find the download links for your Macintosh. You can now download the GIMP 2.8 installer and then open the downloaded DMG file and drag the GIMP.app to the Applications folder (older versions of GIMP required X11 to be installed).

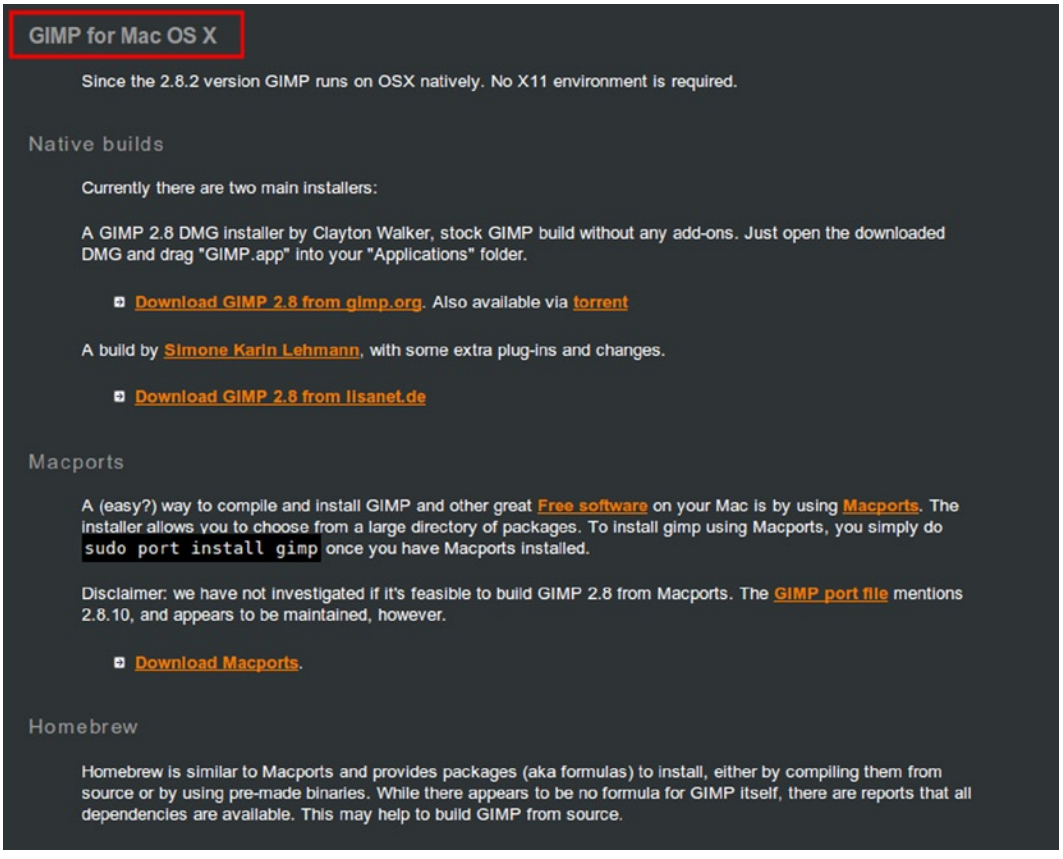

Figure 1-6. *GIMP for Mac OS X*

The GIMP Interface

This is where it all happens—the digital darkroom where you'll learn how to retouch and restore your treasured images (or those of your clients). The interface will differ slightly in appearance from one platform to another, but the operations are pretty much the same across the board. I do most of my work on a Linux desktop computer, so the majority of the screen shots throughout this book are taken from the Linux version of GIMP. However, I do also use Windows 7 sometimes, so there will be a few screen shots I generated that show that version as well. Figure 1-7 is the interface on Linux (Ubuntu 14.04).

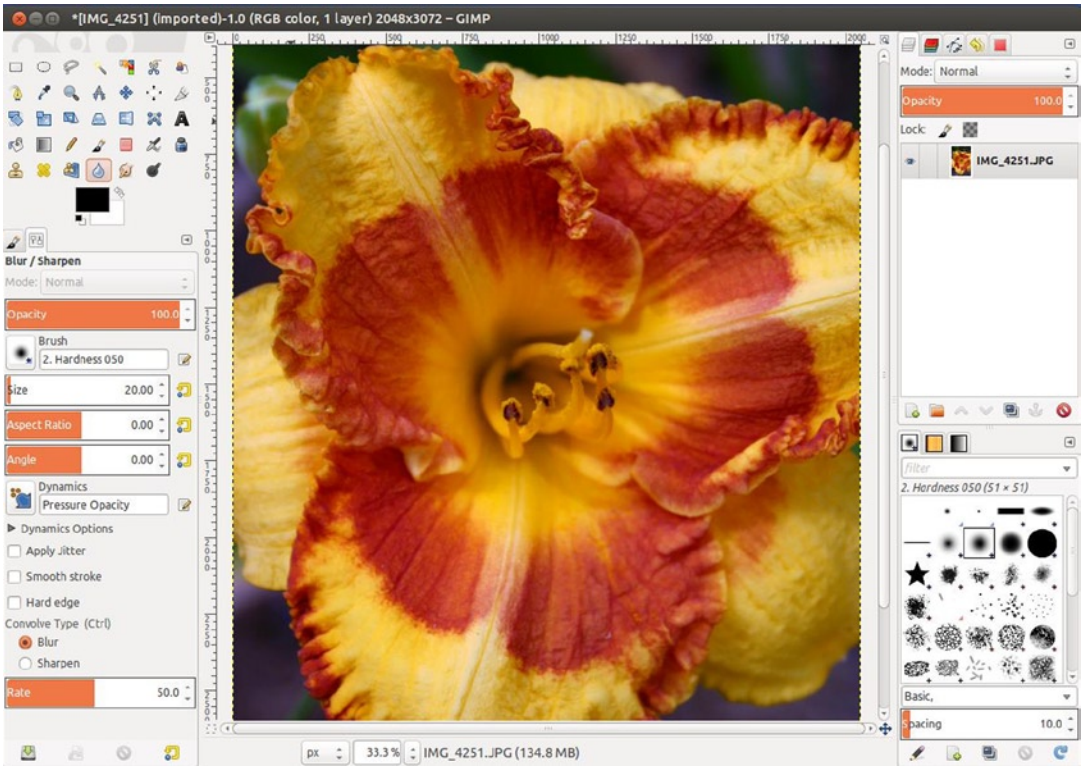

Figure 1-7. *The GIMP interface on Linux*

One of the best features of GIMP 2.8 is that it now has a Single Window Mode. When you launch GIMP 2.8 for the first time, it will likely be in the Multi-Window Mode by default. To change the interface from multiple floating panels to the single window, go to the Image menu (above the image window) and select Window ➤ Single-Window Mode (Figure 1-8).

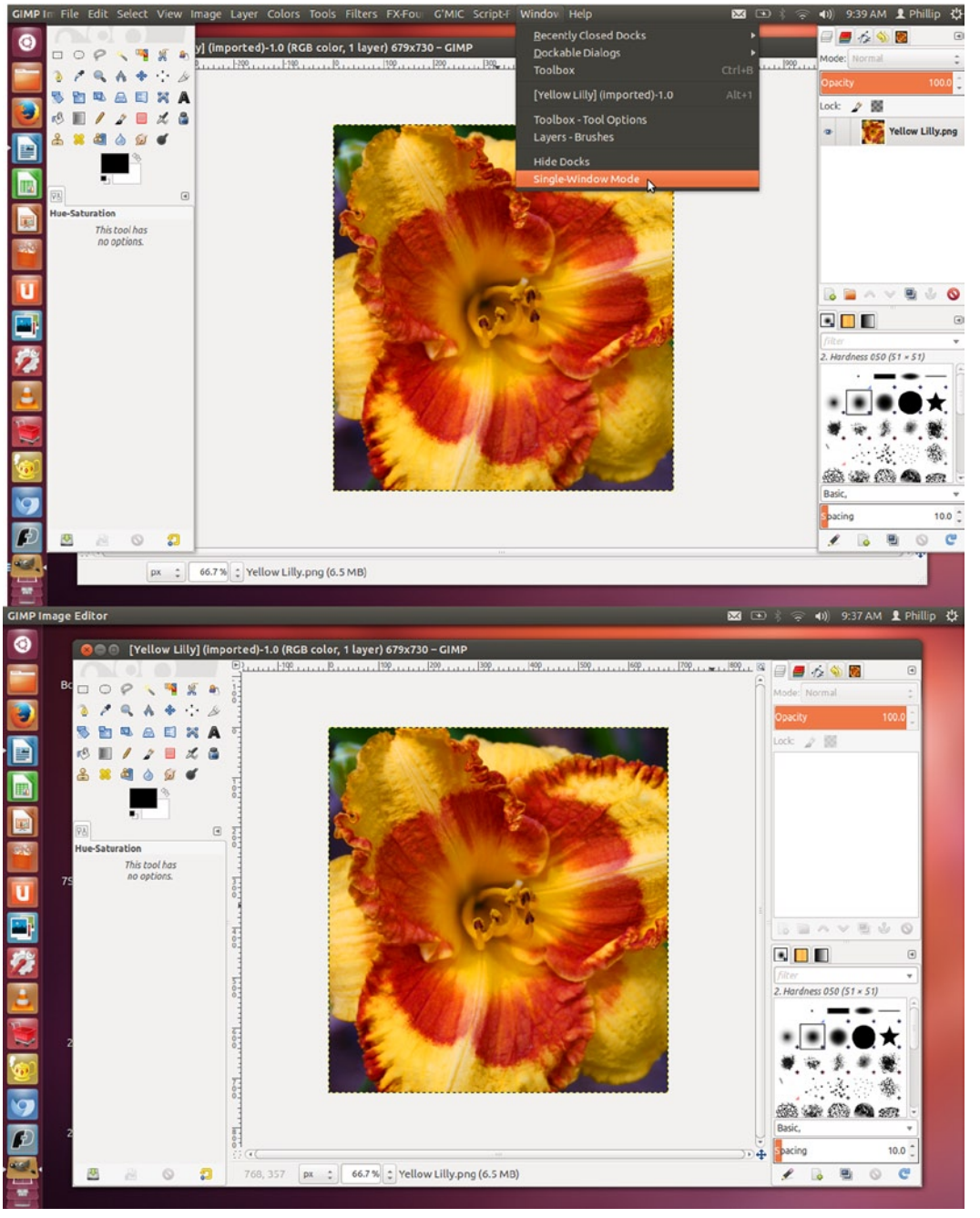

Figure 1-8. *The Multi-Window Mode and the Single-Window Mode*

The Image Menu

The Image Menu Bar is set atop the GIMP image window (Figure 1-9). It can be thought of as "Command Headquarters"; you can access almost every function from here. Following is a quick run-through of some (but not all) of the functions within each option:

File: Opens existing files, creates new files, saves, and exports

Edit: Undoes and redoes, copies, pastes, accesses preferences

Select: Provides various options for choosing and modifying selections

View: Provides viewing options for images, layers, navigation, guides

Image: Provides options for adjusting image orientation, size, printing images, and canvas settings

Layer: Creates new layers, duplicates existing layers, works with layer properties

Colors: Accesses the color adjustment dialogs, such as Color Balance, Levels, Curves, and Hue/Saturation

Tools: Accesses the image editing and color tools

Filters: Accesses the filters, such as Blur or Sharpen, as well as artistic and specialty filters

Windows: Accesses the recently closed docks, hiding docks, etc.

Help: Accesses the GIMP *User Manual* (if installed on your computer) and also links to the online GIMP *User Manual*

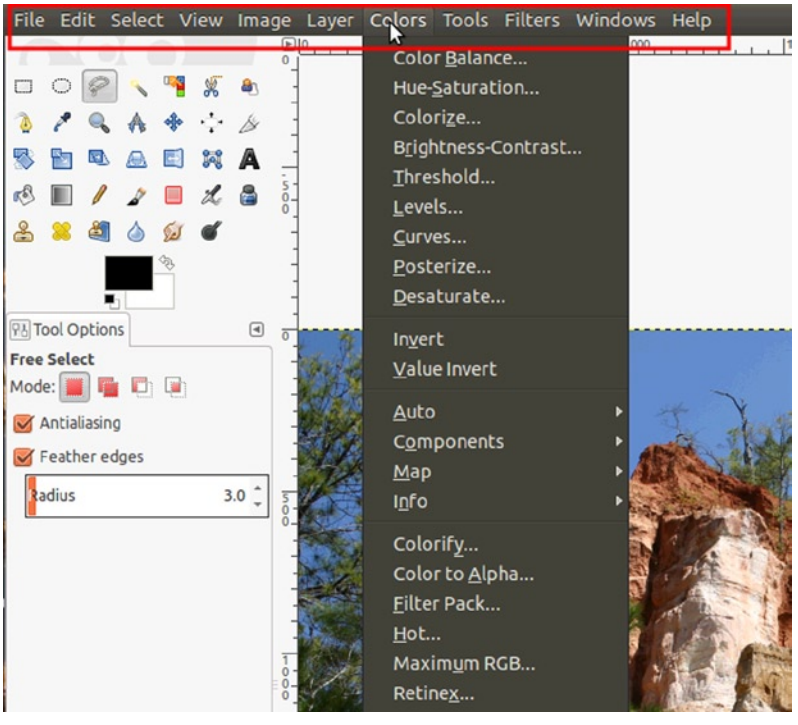

Figure 1-9. *Image Menu Bar*

Many of the functions used routinely have keyboard shortcuts. It's a good idea to familiarize yourself with them and make a habit of using them on a regular basis.

The Image Navigation Bar

This is a useful new feature for GIMP 2.8. The Image Navigation Bar allows you to easily browse through all of the images that are open in GIMP, by viewing the thumbnails just above the image workspace (Figure 1-10).

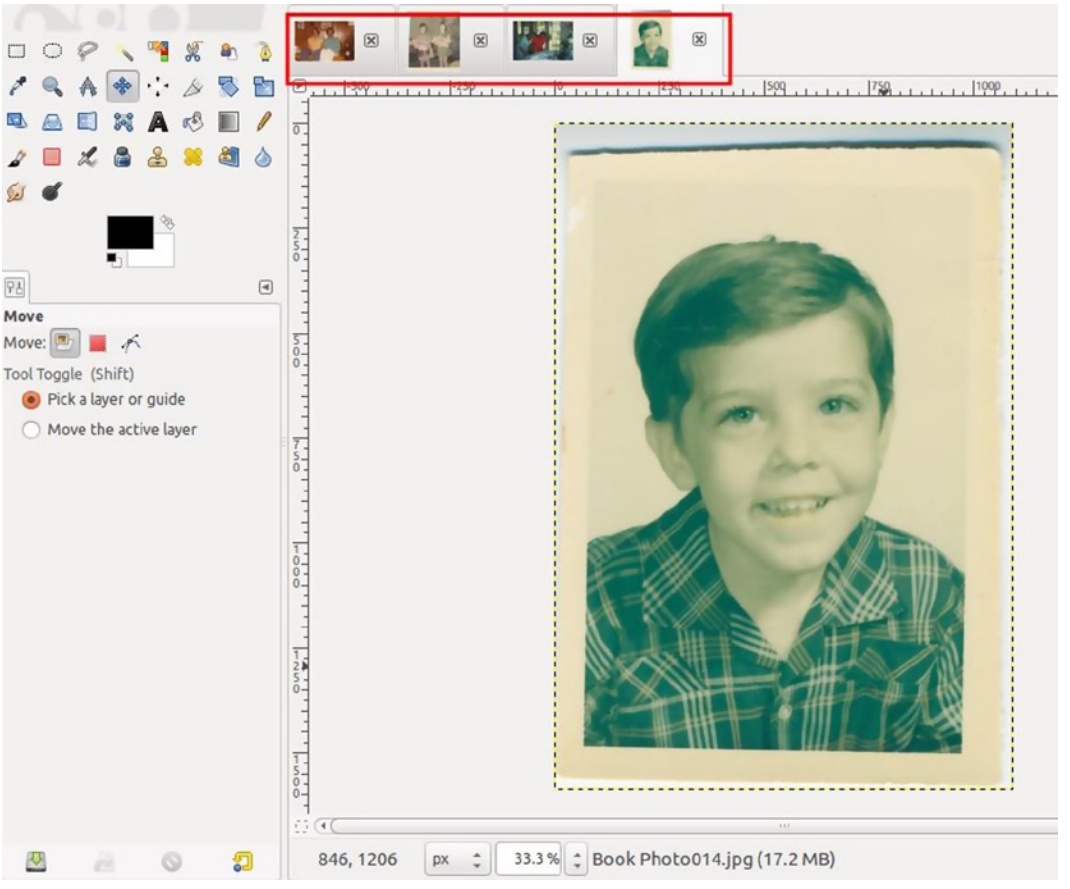

Figure 1-10. *Image Navigation Bar*

Simply click the thumbnail of the image you want to display in the workspace. The thumbnail of the active image will be in the forefront. The Image Navigation Bar only displays if two or more images are open.

The Toolbox and Important Tool Functions

The Toolbox groups many of the functions you'll use on a routine basis. To identify each tool, hold the cursor over the icon and the tool name. A brief description of its function and the keyboard shortcut pop up in a small call-out (the Perspective Clone tool doesn't use a keyboard shortcut). Below the Toolbox is the Tool Options dialog. In Figure 1-11, the Healing tool is active, so such options as brush size, hardness, dynamics, etc., can be changed to suit the specific task at hand.

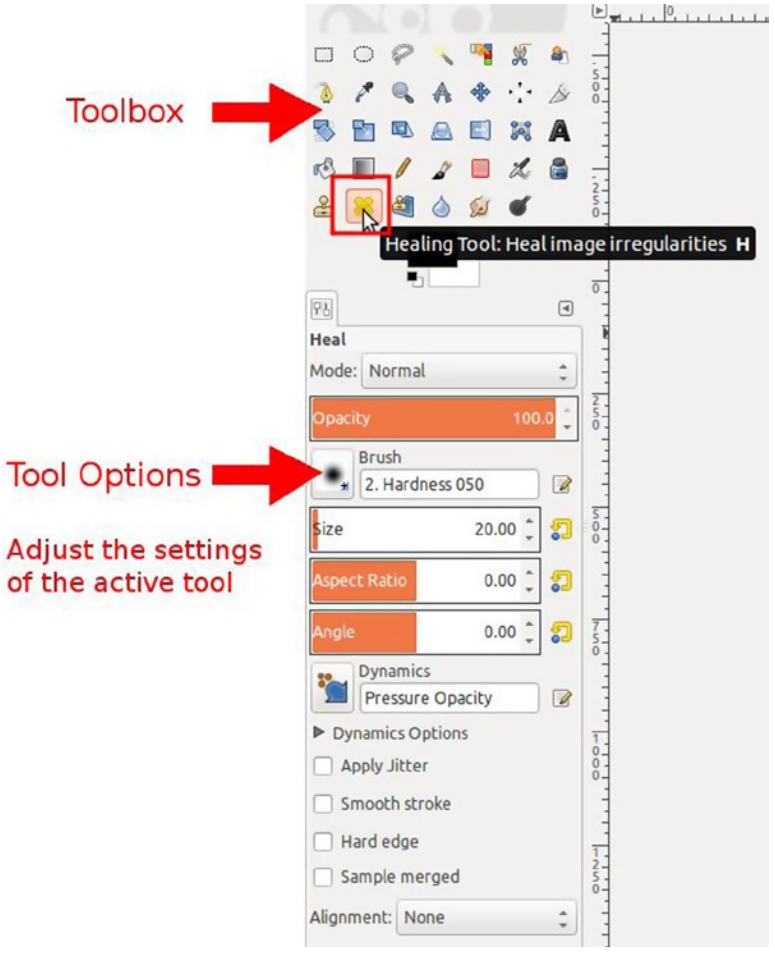

Figure 1-11. *The call-out describing the Healing tool and the Tool Options dialog*

The Selection Tools

GIMP offers a variety of selection tools that will enable you to isolate certain areas of the image you're editing. This confines the changes you want to make to the pixels within the selection boundary, leaving the rest of the image unaltered. The Free Select tool is one of the most commonly used selection tools, allowing you to draw an outline around the area you want to isolate. The Fuzzy Select tool is useful for isolating regions by color range (Figure 1-12).

Figure 1-12. *An example of a freehand selection and a selection by color range*

Selections can be further refined with the Quick Mask function, which will be explored further later on. You'll be able to edit selections with great precision, which is useful for isolating people to put on different backgrounds or to recompose images. Refer to Table 1-1 below to become familiar with the name, shortcut, and function of each tool.

Table 1-1. *Tool Shortcuts and Functions*

Icon	Name	Shortcut	Tool Function
	Rectangle	R	Selects rectangular or square areas
	Ellipse	E	Selects elliptical or circular areas
	Free Select	F	Draws free-form and polygonal selections
	Fuzzy Select	U	Selects continuous areas of color
	Select By Color	Shift + O	Selects areas of similar color
	Intelligent Scissors	I	Selects shapes, using intelligent edge fitting
	Foreground Select	*(none)*	Selects an area with foreground objects

The Brush Tools

The brush tools (brushes) in GIMP allow you to paint, repair flaws, and apply local exposure corrections, among other things. Out of all of the brushes (for the purposes of retouching and restoration), the "dynamic duo" of the set would be the Clone tool and the Healing tool. These are the two you'll most often use to correct imperfections and repair damage on the images you edit (Figure 1-13).

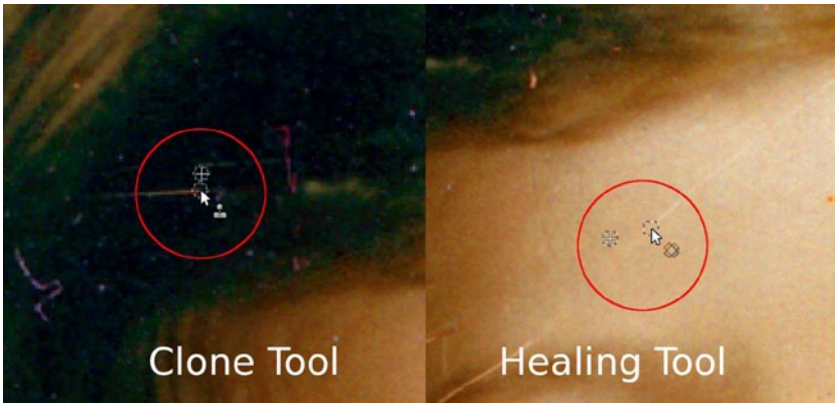

Figure 1-13. *Repairing damage with the Clone tool and the Healing tool*

The Clone tool works by sampling the pixels from one part of an image and pasting them on a target area on another part. The Healing tool is a type of "smart clone" that takes the surrounding texture and tone of the sampled area into account and seamlessly blends the pixels in for a flawless repair. Generally, the Clone tool is better suited to repairing larger cracks and creases, and the Healing tool, although it can be good at repairing smaller cracks and creases, is usually best at removing facial blemishes in portrait retouching.

There are plenty of other tools you'll be using in your retouching and restoration exercises. The following table (Table 1-2) briefly describes each tool, the keyboard shortcut, and a description of the tool's function.

Table 1-2. *Tool Shortcuts and Functions*

Icon	Name	Shortcut	Tool Function
	Bucket Fill	Shift + B	Fills an area with a color or a pattern
	Blend	L	Fills an area with a gradient
	Pencil	N	Draws hard-edged lines
	Paintbrush	P	Paints smooth strokes using a brush nib
	Eraser	Shift + E	Removes pixels from a layer
	Airbrush	A	Paints using variable pressure, similar to a paint spray gun
	Ink	K	Calligraphy-style painting
	Clone	C	Copies pixels from one part of an image to another
	Healing	H	Heals image irregularities by blending-in surrounding texture and tone
	Perspective Clone	*(none)*	Clone from an image source, after applying perspective transformation
	Blur/Sharpen	Shift + U	Selective blurring or sharpening, using a brush
	Smudge	S	Selective smudging, using a brush
	Dodge/Burn	Shift + D	Selective lightening or darkening, using a brush

The Transform Tools

The Transform tools allow you to alter the size, position, orientation, and perspective of the image and individual layers or selected areas. These features are extremely useful for re-composting images, straightening crooked images, correcting lens distortion, etc.

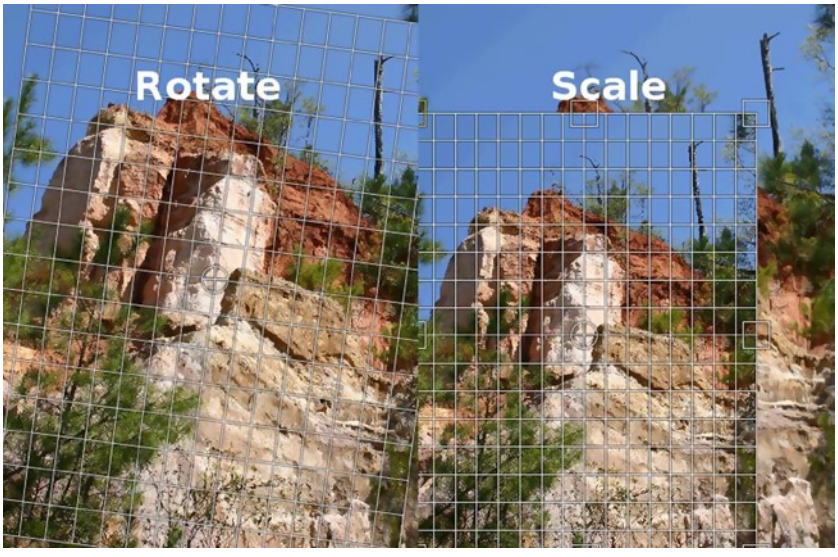

Figure 1-14. *Two examples of Transform tools*

One example would be using the Perspective tool to correct the distortion that often results when photographing a building—an exercise we'll undertake later in this book. Refer to Table 1-3 below to become familiar with the name, shortcut, and function of each tool.

Table 1-3. *Tool Shortcuts and Functions*

Icon	Name	Shortcut	Tool Function
	Move	M	Moves layers and selections
	Align	Q	Aligns or arranges layers and other objects
	Crop	Shift + C	Removes edge areas from the image or layer
	Rotate	Shift + R	Rotates the active layer, selection, or path
	Scale	Shift + T	Scales the active layer, selection, or path
	Shear	Shift + S	Shears the active layer, selection, or path
	Perspective	Shift + P	Changes the perspective of the active layer, selection, or path
	Flip	Shift + F	Reverses layers, selections, or paths vertically or horizontally
	Cage Transform	Shift + G	Deforms a selection with a cage

Other Tools

The remaining tools are the Path tool, Color Picker, Zoom tool, Measure tool, and the Text tool. Power GIMP users employ all the tools in the Toolbox at one time or another, and the exercises in this book will use most of them at least once.

If you are accustomed to using Photoshop, the tools should seem somewhat familiar, but the names and icons might differ slightly. Refer to Table 1-4 below to become familiar with the name, shortcut, and function of each tool.

Table 1-4. *Tool Shortcuts and Functions*

Icon	Name	Shortcut	Tool Function
	Path	B	Creates and modifies paths
	Color Picker	O	Selects colors from image pixels
	Zoom	Z	Adjusts the magnification level of the image you are viewing
	Measure	Shift + M	Shows distances and angles
	Text	T	Creates or edits text layers

Working with Layers

Layers can be likened to sheets of clear acetate, each one with a graphical element stacked on top of another. The sample illustration shown in Figure 1-15 demonstrates how the elements on each layer combine to make a complete composite.

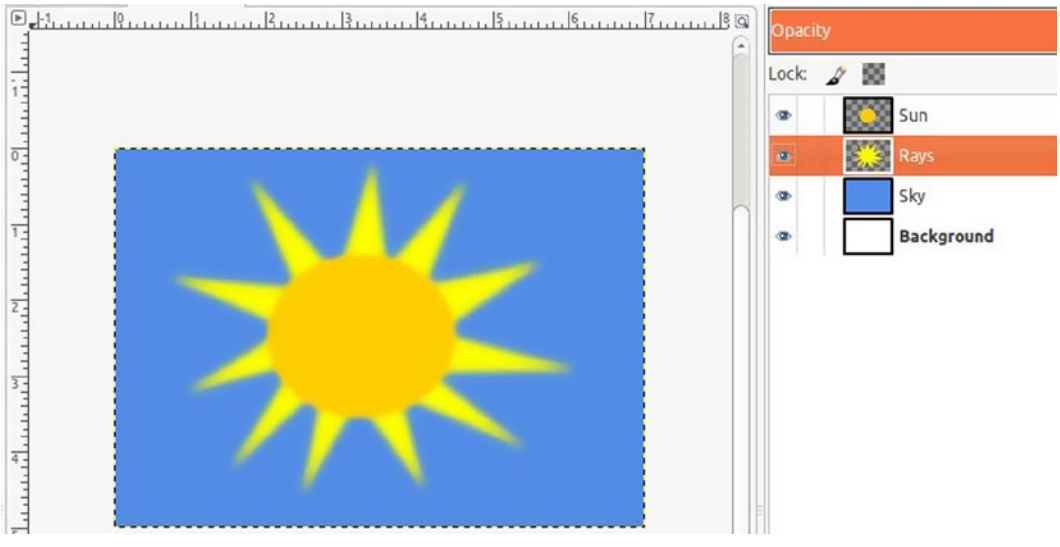

Figure 1-15. *Separate layers form a complete picture*

Layers are one of the most important aspects of photo editing. Sometimes it will be necessary to make revisions to your work, and having a layered version will make this much easier. If I wanted to redo the sun's rays, I could hide the original layer (titled "Rays"), by clicking the eye-shaped icon, and redraw them on a new layer (Figure 1-15).

You should *never edit directly on the background layer!* Make a copy of the original image layer to edit. In the following example (Figure 1-16), I duplicated the original layer and named it Edit Layer (you can name it however it best suits you), then desaturated it, to remove the color. The original background layer is still intact. By adding a *layer mask,* I was able to paint some of the color back in for a selective colorized effect. Layer masks allow you to add or remove data on a layer in a nondestructive way.

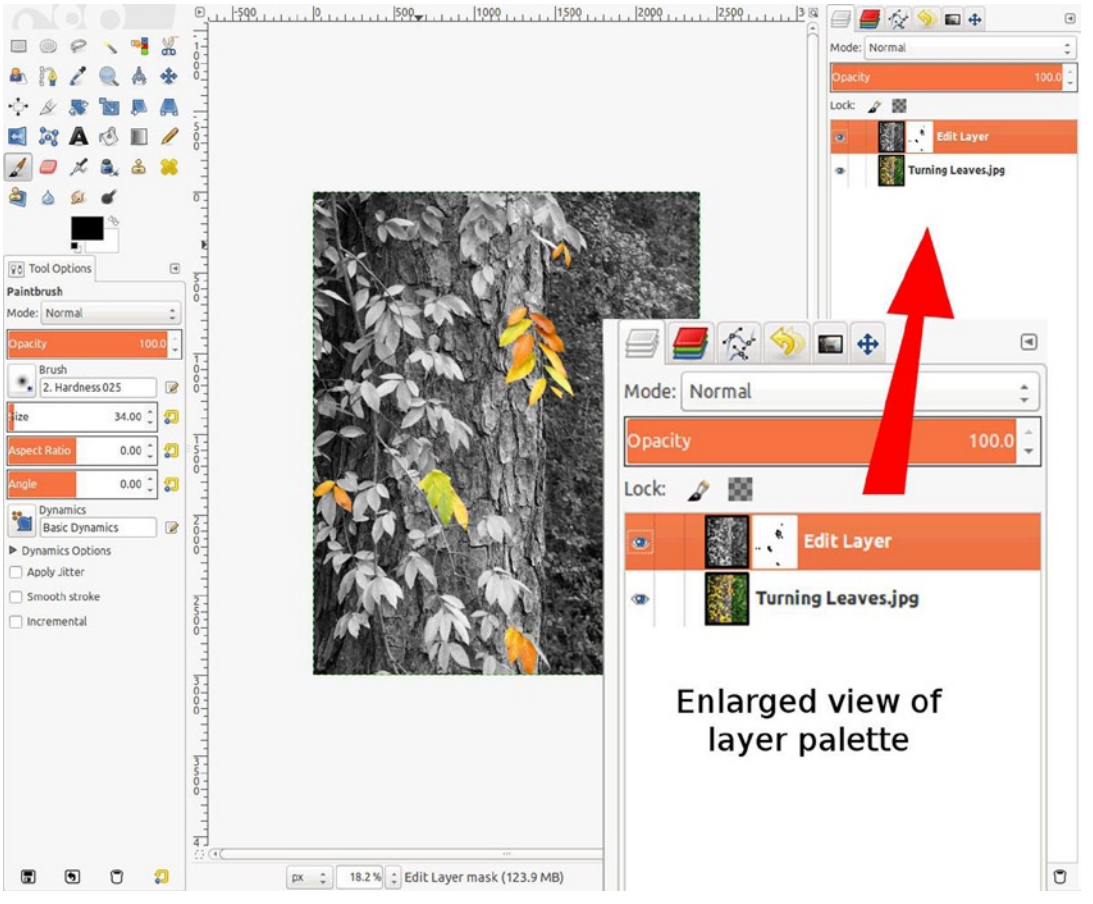

Figure 1-16. *The work is done on a copy of the background layer*

You might end up having 10, 15, or more layers in your restoration projects, depending on the degree of work involved. It's a good practice to name the layers as you create them. If you have a project with many layers, it will make it much easier to find a particular layer, should you need to edit it.

Layer Groups

Layer groups are new to GIMP 2.8 and are very helpful for organizing large numbers of layers. Layers within a layer group can be toggled on when you have to locate a particular one and then toggled off to hide the layers within that group. This will help make your work go smoother when you work with complex images composed of a large number of layers (Figure 1-17). I named the layer group Tonal Adjustment Layer Group. Some images might have more than one layer group, depending on the complexity of the work being done.

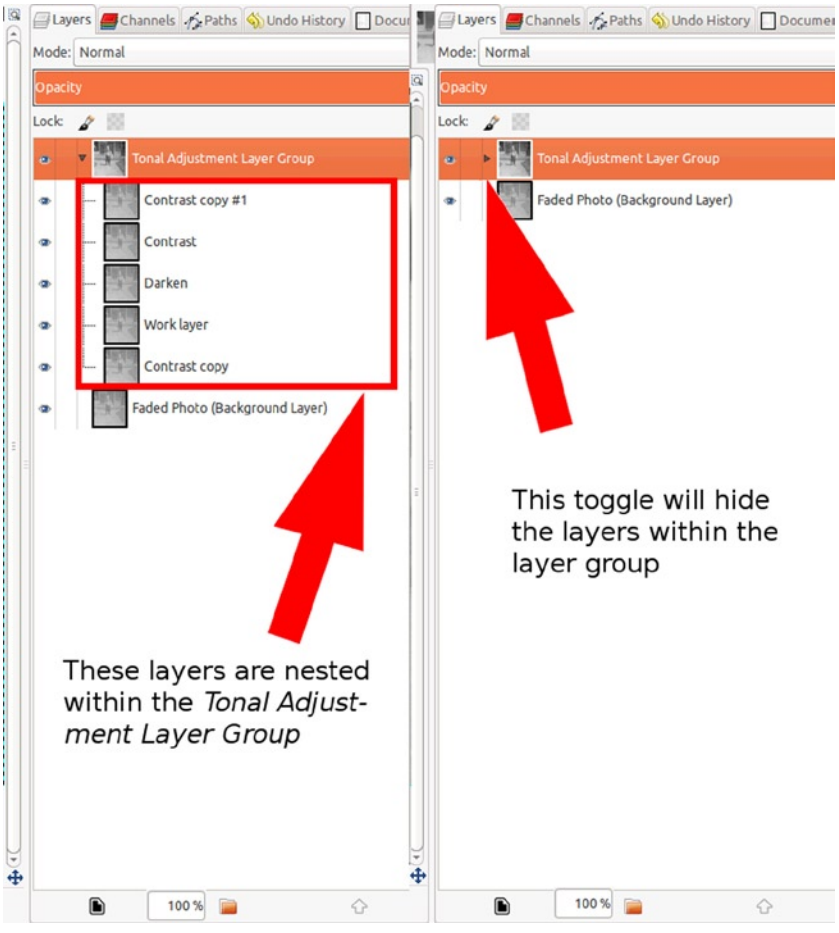

Figure 1-17. *Keeping layers organized in a layer group*

Layer Blending Modes

Layers have a variety of *blending modes,* which interact with the underlying layer in specific ways. Blending modes can be very useful when restoring photos. For example, an underexposed photo, such as the one in Figure 1-18, can be quickly enhanced by simply duplicating the background layer and changing the blending mode to Screen. The result is a brighter picture.

Figure 1-18. *An overlay layer blend mode brightens up this image*

It's often possible to correct images with serious tonal problems with a combination of blending modes. It will require some experimentation but can often workvery well.

Plug-ins to Enhance GIMP

There are a number of plug-ins for GIMP that expand its capabilities. Some plug-ins are useful, some not so much, at least for photo restoration work. You can peruse the available plug-ins at the GIMP Plugin Registry at `http://registry.gimp.org/`—there are plenty to see.

Summary

We looked at how to download and install GIMP 2.8 on your computer and had a cursory overview of the software. As mentioned earlier, the overview will help you to get acquainted with GIMP, but you also have access to the GIMP *User Manual*, which covers everything about this program in depth. The plug-ins available for GIMP can expand its capabilities, especially Resynthesizer. It can save you a lot of time.

For the absolute beginner using GIMP, the best way to learn this program is by jumping in and spending time playing with it. Open an image (make a copy of it first) and use the tools, to see what they do and how they behave. Experiment with the functions in the Image menu, to see how they work. When you feel somewhat comfortable with the features of GIMP, then you can move on to Chapter 2.

CHAPTER 2

Digitizing Your Photos, Slides, and Negatives

In This Chapter

- Acquiring Your Digital Images
- Starting with a Clean Scan
- Scanning Photographs
- Digitizing Large Images
- Scanning Slides and Negatives
- Straightening and Cropping Your Images

Acquiring Your Digital Images

As you're mastering the exercises in this book, you might be eager to try your newly acquired skills on your own images. Getting your images into a digital format is the first step toward the image editing process. You can either hire the task out or do it yourself—which, I presume, will be the choice of the majority of those reading this book.

If you are going to work only with relatively small photographic prints (8" × 10" or less), a basic model scanner will be adequate. If you plan to digitize transparencies such as slides and negatives, you'll need a *multi-format* flatbed scanner. These models will digitize transparencies as well as photos. Some models will handle medium- and large-format negatives, such as 4" × 5". There are also dedicated scanners for digitizing mounted slides (in a 2" × 2" mount) and 35mm negatives.

A tripod and good digital camera are useful tools for digitizing large images, as you'll see shortly. You'll be able to comfortably digitize portraits up to 16" × 20".

Starting with a Clean Scan

Because it's likely that the image you are scanning requires some type of digital repair, it's logical to assume that you don't want to add even more dreck to remove. I make it a habit to keep a can of compressed air (or a bulb brush), a can of foam-type glass cleaner, and a clean cloth near my scanner (Figure 2-1). There's no need to digitally edit out a small hair or stray ball of dust from your image, when you can avoid scanning it

in the first place. It's also a good idea to use a soft bristle brush or bulb brush on the material to be scanned, to remove any loose dust. This is especially true with transparencies—even the smallest dust particles will stand out. Use caution when brushing off original materials. If the emulsion is flaking or loose, you could make the damage even worse.

Figure 2-1. *Keeping cleaning articles near your scanner is a good idea*

■ **Note** When cleaning your scanner, spray the cleaning fluid on the cloth and not on the glass platen. This will prevent the cleaning fluid from running into the seams of your scanner, which could possibly damage it.

Scanning Photographs

It's important to scan the original image at the correct resolution, to have sufficient data to work with, especially when the edited image will be printed as an enlargement. If the input data is too low, the result will be an image with a jagged appearance. The following illustration (Figure 2-2) shows two enlarged sections scanned from a 3" × 5" photograph of the lettering on a boat. The image on the left is a scan at 300 DPI (for print), and that on the right is a scan at 75 DPI (the resolution generally used for viewing images on the Web). Ninety-six DPI is also used for web-based images.

Figure 2-2. *A comparison of 300 DPI and 75 DPI scans*

Generally, scanning a photograph at 300 DPI is sufficient, if the final print output size doesn't exceed the original image size—at least, by very much. When you upscale an image, the software must *interpolate*, or estimate, when it adds pixels to re-create the image data. Without sufficient captured image data, an enlarged photo will look horrible when printed.

My clients often request enlargements made from small prints. These can be achieved (within reason) by scanning the original at a higher resolution. I find that scanning a small print (such as one that is wallet size) at 600–800 DPI will usually suffice, depending on the image quality you are starting with and how much you want to enlarge the image (8" × 10" is about the maximum I will attempt to coax from a wallet-size original).

After performing the necessary edits, the file can be scaled up to the desired output size. For printing, the image can be down-sampled to 300 DPI.

Many scanners are capable of capturing 48-bit (16 bits per channel) color. Because GIMP 2.8 currently handles 24 bits (8 bits per channel), a 48-bit image will be converted to 24 bits when imported into the program (a prompt window opens first). Forty-eight-bit color support will be available in GIMP 2.10. If you have plenty of data storage space, it's a good idea to scan your images in the 48-bit mode and save the files in a loss-less format, such as TIFF. These will serve as your *digital negatives*, preserving the maximum degree of image integrity.

Digitizing Large Images

Most of the images you scan will be small enough to fit comfortably on a scanning bed that accommodates a sheet 8.5" × 11". But what if you are confronted with an old 16" × 20" portrait? If you have large photographs to contend with, there are options available to enable you to digitize them, in order to transfer them to your computer, so that you can edit them.

Find a Service Provider

When you have to digitize a large photograph, check with the local photo labs or with photographers who offer copy services. They can photograph your image and either provide you with a copy negative or a digital file (which is preferable). Printing companies often use oversized scanners for large documents, photographs, or artwork—usually up to 11" × 17".

Use Your Camera and Tripod

With a sturdy tripod and a decent digital camera, you can fashion your own copy stand to digitize large pictures (you can also purchase a purpose-built copy stand from a photographic supplier). The tripod should have a head that can tilt at 90 degrees and be tall enough to allow adequate room to place the image between the feet. I set up the following example (Figure 2-3) outside, on an overcast day, with my camera's white balance set to Daylight, and the ISO set to 100. Although I prefer shooting outside like this, it's not always practical—the weather doesn't always cooperate.

Figure 2-3. *A tripod set up as a copy stand and a 16" × 20" portrait digitized with a camera*

For working indoors, good results can be achieved by using three or four 250-watt photo flood lamps and the Tungsten setting on your camera. Photo flood bulbs have a color temperature of 3200 degrees Kelvin to help capture your image with the correct color balance. B&H Photo is a great online supplier from which to purchase studio lighting equipment. Visit their site at `www.bhphotovideo.com`. You can also shop on eBay for good used equipment.

Following are the steps to capture a large image with a digital camera and tripod setup:

1. Position the tripod over the image.
2. Tilt the tripod's head at a 90-degree angle (the camera should point straight down at the image) and move the tripod, as required, to frame the image within the camera's viewfinder and minimize distortion of the image.

3. If you're working inside, make sure the image is evenly illuminated.
4. Adjust the camera's white balance, if your camera has manual settings; otherwise, use the auto white balance.
5. Make sure the image is in focus, and capture it with your camera. Experiment with the ISO and exposure settings and capture several variations of the image, so that you can then choose the best one.
6. Capture the image with the highest quality setting possible. The more image data you capture the better.
7. The image might have some slight keystone distortion. After you import the file to your computer, use GIMP's Perspective transform tool to correct the distortion (Figure 2-4). A plug-in worth trying to help correct lens distortions is GimpLensfun, available from http://seebk.github.io/GIMP-Lensfun/.

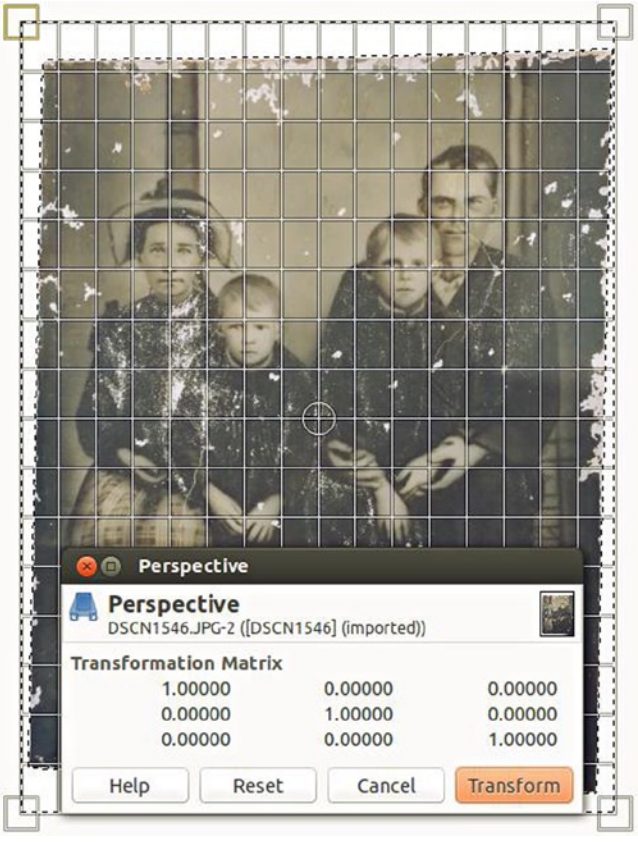

Figure 2-4. *Using the Perspective tool to correct distortion*

■ **Tip** Images with a glossy or reflective surface might need to be propped up on one side, so they're not lying perfectly flat. This will angle the surface of an image, to eliminate any glare that might show up in the captured copy.

Scanning Photos in Sections

An alternative to using a camera and tripod setup is to scan larger photos in sections. This method is better suited for photos that can be scanned in two sections, such as a 10" × 13" or an 11" × 14" print. It also works well for panoramas that have been rolled up for many years and are too curled to lay flat for using the camera-tripod capture method.

The following sample 11" × 14" image is included (`ch2_babygirl.jpg`, parts 1 and 2) in the Practice Images available for download from the Apress companion web page (mentioned in the Introduction). If you don't have a photograph that large to scan, at least you can follow along the reassembly portion of this tutorial, using the practice images.

Following are the steps to capture an 11" x 14" image by scanning it in two sections:

1. Lay one end of the photograph horizontally across the scanning bed.
2. Scan the image at 300 DPI into GIMP (Image Menu ➤ *File Create* ➤ *Scanner/Camera*). Select your scanner when prompted. Expand the canvas (Image Menu ➤ *Image* ➤ *Canvas Size*) to about 4500 pixels (15") wide. This will give you some extra wiggle room to negotiate the second part of the image into place (Figure 2-5).

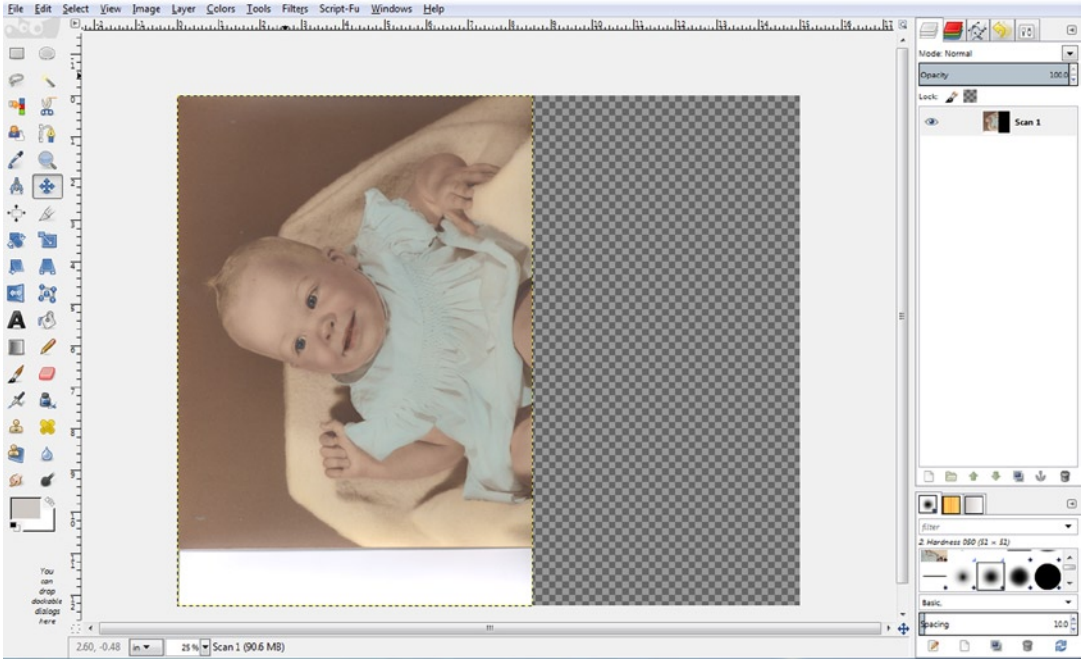

Figure 2-5. *The background expanded on the first part of the scanned image*

3. Rename the background layer Scan 1 (Activate the Background Layer ➤ Right Click ➤ Edit Layer Attributes).

4. Lay the other end of the photograph horizontally across the scanning bed, keeping the orientation the same as the first scan. Scan it into GIMP (Figure 2-6).

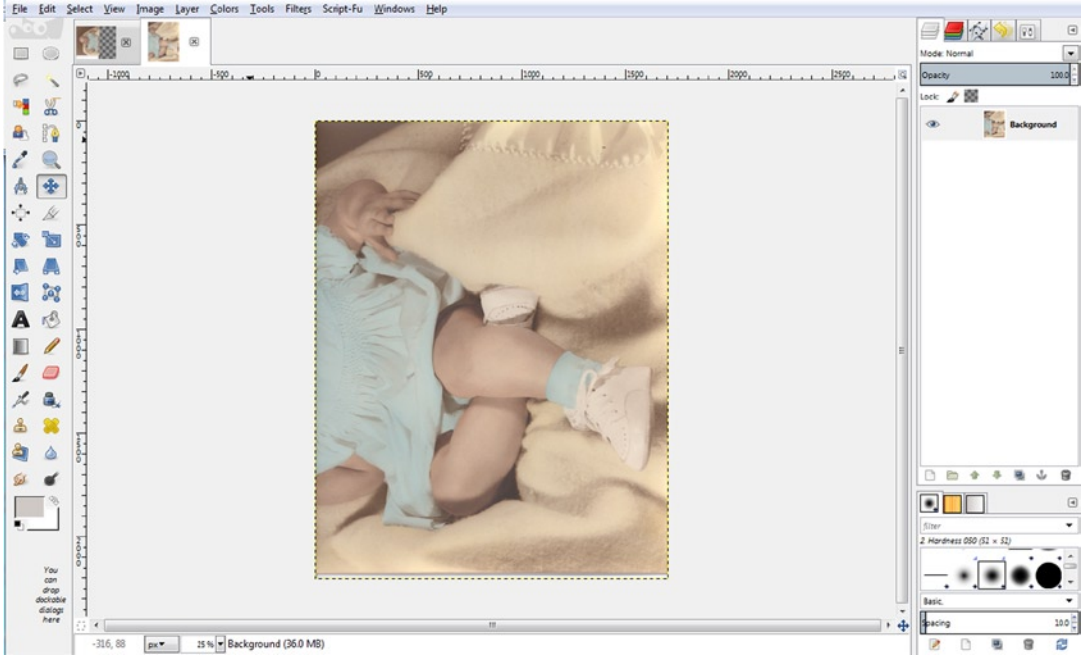

Figure 2-6. *The second part of the image scanned into GIMP*

5. Copy the image to the clipboard (Image Menu ➤ Edit ➤ *Copy*).

6. Activate the first scanned image by clicking the tab on the *Image Navigation Bar*.

7. Paste the second part of the image (Image Menu ➤ Edit ➤ Paste As New Layer).

8. Change the layer's boundary size to match the image size (Layer ➤ Right Click ➤ Layer to Image Size).

9. Rename the layer Scan 2.

10. Lower the layer's opacity enough to see the first scan underneath. This will help make alignment easier (Figure 2-7). Using the Move tool, position the layer into place and use the Arrow keys to nudge it in small increments, for precise alignment.

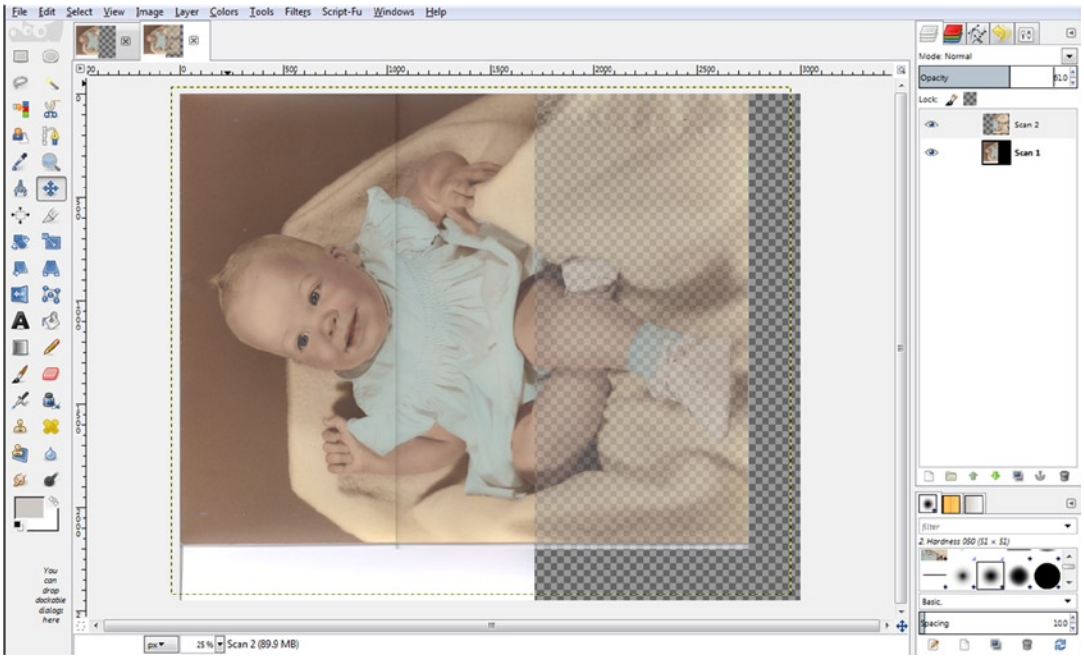

Figure 2-7. *Position the second part of the image into place*

11. After the second part is in position, increase the layer's opacity back up to 100%.

12. There is usually a visible line and some tonal difference running along the image, similar to the example being used in this guide. To remove this, add a Layer Mask to the layer named Scan 2 (Right Click ➤ Add Layer Mask). Use the default White (Full Opacity) setting.

13. Activate the Paintbrush tool. Using a large, soft brush and black as the active color, paint away the line (Figure 2-8). Depending on the results you achieve with your image, it might be necessary to vary the brush opacity.

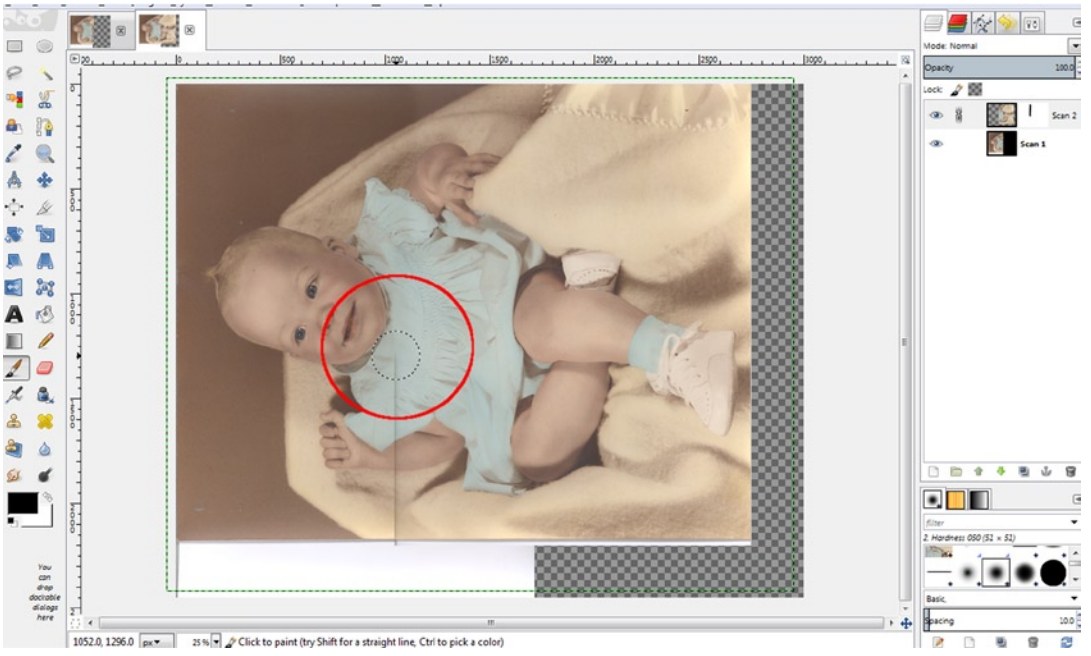

Figure 2-8. *Removing the line and tonal differences with a large, soft brush*

14. After the two sections match to your satisfaction, use the *`Crop tool`* to trim away the excess area. Rotate the image to its proper vertical position (*Image Menu* ➤ *Image* ➤ *Transform* ➤ *Rotate 90 Degrees Clockwise*).

15. Save a layered copy as an XCF file, which is GIMP's native file format. *It's always a good practice to save layered copies, in case you have to make revisions.*

16. Flatten the image. If it requires restoration work, this will become the background layer. Save this version with a new name. You now have the image digitized and can move forward with its restoration (Figure 2-9).

Figure 2-9. *The two parts unified into a complete image*

Scanning Slides and Negatives

The vast majority of your retouching and restoration tasks will involve working from photographic prints. Of course, transparencies can incur damage over time—mold and mildew, embedded dirt, and color shifts are fairly common. It might be a good idea to hire this task out, if you rarely come into contact with transparencies and don't want to invest in a dedicated or multi-format scanner. On the other hand, if photo editing work will be part of your professional activities, then investing in a capable scanner would be a wise choice. Digitizing slides and negatives can add a boost to your income stream. A multi-format flatbed scanner offers added versatility. You'll be able to obtain good scans from a variety of original photographic materials. These scanners use *adapters* to hold the transparencies in place on the scanner's bed (Figure 2-10). A high-quality, dedicated slide/negative scanner can offer the ultimate in quality scans, with the best *dynamic range* (detail in shadow areas). It pays to do some research to best determine your needs, before making your purchase.

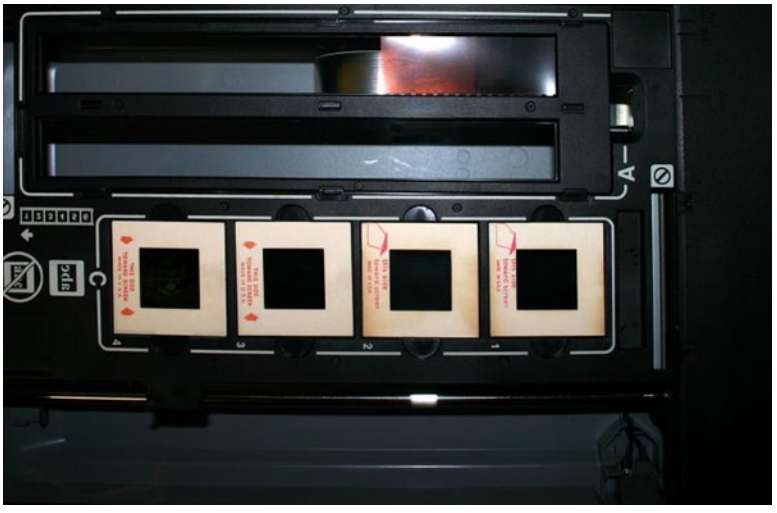

Figure 2-10. *The adapter used for scanning 2" × 2" mounted slides and 35mm negatives*

Before You Start

Remember the rule about starting with a clean scan? This is *especially* important when transparencies are involved. Every speck of dust and dirt shows up in a scan. A blower brush and a clean, lint-free cloth should be used to remove as much loose dust from transparencies as possible. It's amazing how much you can reduce your workload simply by cleaning the transparency first, as well as making sure the scanner is clean. Figure 2-11 illustrates this point well. Notice the difference between the two scans of a 35mm color negative. Using a clean, lint-free cloth makes a huge improvement. Now it requires only minimal digital cleanup work. Of course, the results will vary: some transparencies will have more embedded dirt and dust than others. Film cleaning fluids are available but should be used with great care and *lots* of ventilation, as the fumes these fluids give off can be flammable, as well as dangerous, if breathed for prolonged periods.

Figure 2-11. *Cleaning this negative with a lint-free cloth makes a huge difference*

Using the Auto-Settings

Normally, I don't use the scanner's automated features. I prefer to capture the image as close to original as possible.

However, some of the auto-settings can be expedient when scanning large quantities of slides or negatives and time is limited. I find the most useful are the color-correction and exposure-correction features. The dyes in slides often fade and change over time, and the images have often been shot at the wrong exposure. Figure 2-12 illustrates the improvement made in a 126 color slide taken in the 1960s. The image isn't perfect, but it is a far cry from what it was.

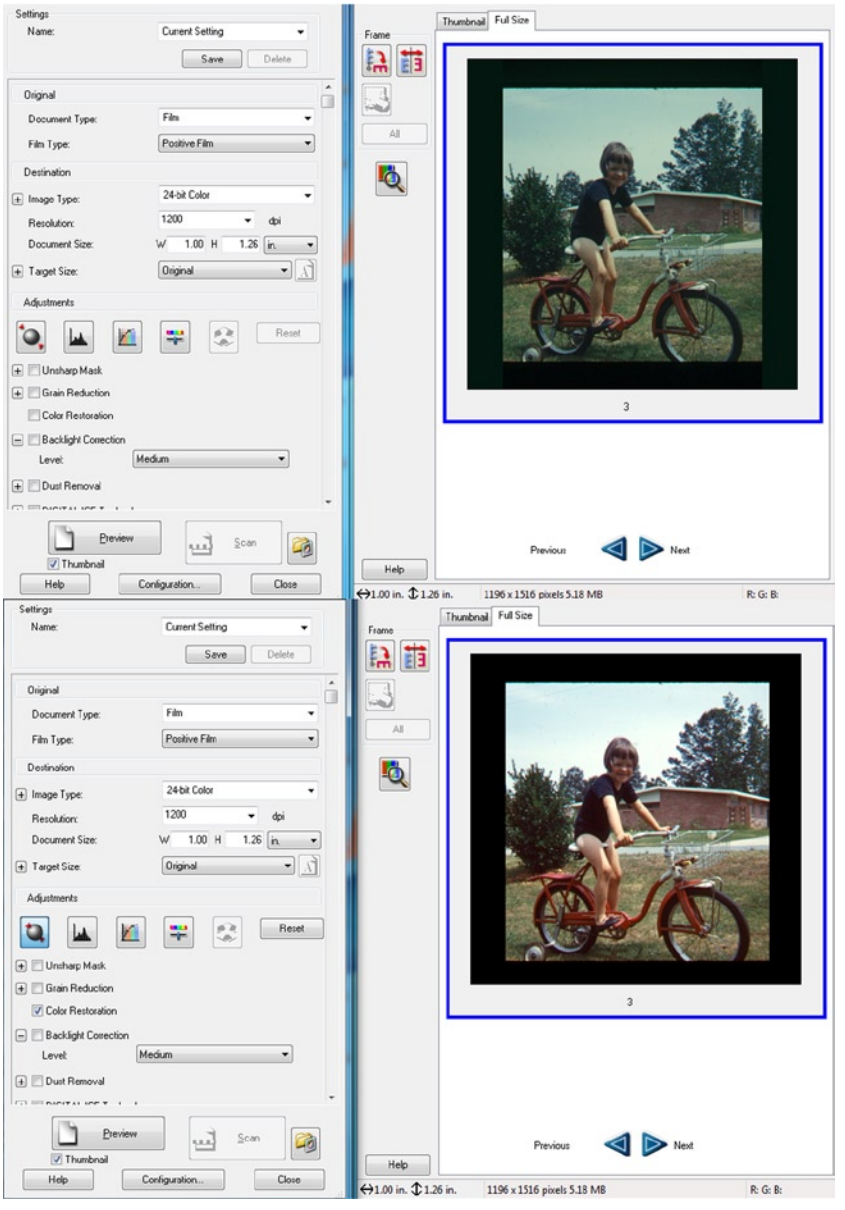

Figure 2-12. *The auto color feature improves this 126 color slide*

■ **Note** While the aforementioned auto-settings can be time savers and work well, beware of ones such as Digital ICE or other dust-removal features. They can soften the image, resulting in diminished quality. The best action is to remove as much physical dust as possible before scanning. If you must use a dust-removal feature, try using minimal settings.

Scanning Resolution for Transparencies

What resolution should you scan your slides and negatives? The answer is, it depends. Many of my clients no longer have a working slide projector but would like to be able to see their slides again. Usually, they want to view them as a slide show on their television or computer monitor. For that purpose, scanning them at an ultra-high resolution isn't required. I find that scanning them at 400-600 DPI works well for viewing on a monitor or television screen, particularly in high definition.

However, the best option is scanning at a resolution to provide the highest quality image data. I normally scan them at a *minimum* of 1200 DPI, while scaling up to 4" × 6" for 35mm slides and negatives and 6" × 6" for 126 slides. Scanning at 2400 DPI or more is a better option, if the image will be printed at 8" × 10" or larger. Most modern scanners are capable of resolutions well beyond 2400 DPI.

The reality is that scanning at such a high resolution creates a large file size, but you are capturing sufficient image data to provide adequate image quality. Trying to get a decent 8" × 10" print from a slide scanned at 300 DPI will only disappoint. Looking at the enlarged example, it's easy to see how much more jagged the leaf on the left is from a 300 DPI scan, compared to the same leaf from a 1200 DPI scan, both taken from the same 35mm color negative (Figure 2-13).

Figure 2-13. *An enlarged section of a 300 DPI scan, compared to one at 1200 DPI, from a 35mm color negative*

Straightening and Cropping Your Images

The images you work with will sometimes require straightening out by leveling the horizon line. Sometimes the original photograph has an irregular shape, and squaring it perfectly on the scanner's bed is difficult, at best. Other times, the photographer may just have held the camera at an odd angle, resulting in a crooked image. Following are the steps to straighten an image in GIMP:

1. Scan the image into GIMP (*Image Menu* ➤ *File* ➤ *Create* ➤ *Scanner/Camera*). Select your scanner when prompted. The following sample image (`ch2_tilted ocean.jpg`) is also included in the Practice Images available for download from the Apress companion web page (mentioned in the Introduction), if you'd like to use it to follow along.

2. Select the *Rotate tool (Shift + R).* In Tool Options, make sure that the Corrective (Backward) button is active and that Crop to result is active. Set the number of lines to 25. Move the slider until the closest guide is parallel to the horizon line (Figure 2-14).

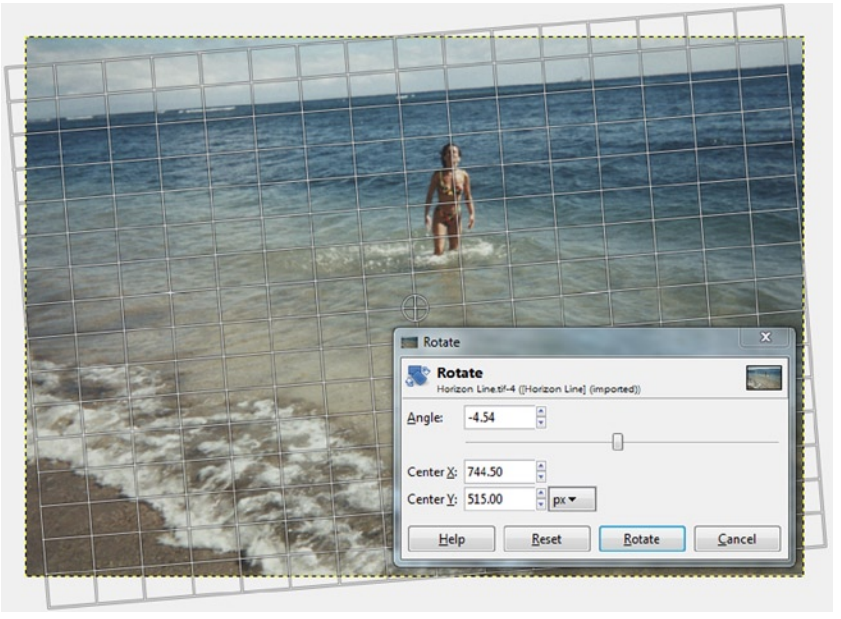

Figure 2-14. *Using guides to aid in leveling the horizon line*

3. Now the image is straightened—and looks much better (Figure 2-15).

Figure 2-15. *The image is now straightened*

4. Next, select the *Crop tool* (Shift + C) and trim away the excess area around the image. Compared to the before example, it now looks much better (Figure 2-16).

Figure 2-16. *A before-and-after comparison*

Summary

In this chapter, you learned that acquiring your photographic materials as digital images is the first step in the editing process, so it should be done as well as possible. There are choices as to whether to hire this task out or do it yourself, depending on what best suits you. When scanning your own photographic prints, dust removal is important, as is acquiring sufficient image data by scanning at the right resolution.

With a good tripod (or copy stand) and camera, you can digitize large images. It's also possible to scan some larger photos in sections and to reassemble them as complete images.

Transparencies require an especially high degree of dust and dirt removal, because everything is captured by the scanner. Auto-settings, while not always ideal, can speed up the process of handling large quantities of transparencies. You also discovered that transparencies requiring high-resolution scanning capture the maximum image data.

Images will sometimes have to be straightened out after scanning, because of having an irregular shape or being shot at odd angles in the first place.

GIMP can easily fix tilted images and much, much more, as you'll see as we proceed into Part II of this book.

PART II

Tone, Exposure, and Color

CHAPTER 3

Correcting Tone and Exposure

In This Chapter

- Common Tonal Problems
- The Brightness-Contrast Dialog
- Tonal Corrections Using Levels
- Tonal Correction Using Curves
- Tonal Corrections Using Layer Blend Modes

Common Tonal Problems

Many old photographs have various tonal problems—low contrast, loss of detail from fading, darkening with age, etc. Even many of the pictures you currently shoot with your digital camera could probably benefit from tonal corrections. Sometimes, one or two adjustments are all that is needed to revive a dull photograph. Other problems will require a greater degree of correction.

Many, if not most, of the images you work with will require some degree of tonal adjustment. Tonal problems generally fall under one of the following descriptions:

- The image is overexposed/too bright.
- The image is underexposed/too dark.
- The image has low contrast/dull and flat.

Some images have local or mixed tonal issues. For example, an image might be properly exposed in one area and underexposed in another.

Using the Histogram to Assess Tonality

A *histogram* (Figure 3-1) is a graphical representation of the pixel brightness values in an image, ranging from 0 (pure black) to 255 (pure white). Factors such as image tonality and exposure determine the shape of the histogram. Tonal correction tools such as Levels and Curves display a histogram in the window. You can also access the histogram window by itself (Image Menu ➤ Colors ➤ Info ➤ Histogram).

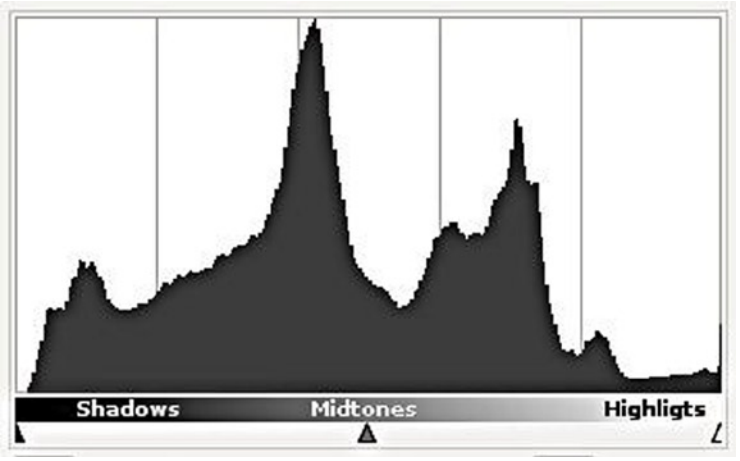

Figure 3-1. *A histogram represents pixel brightness in image data*

You can look at an image and tell whether it's too bright, too dark, etc. Viewing the histogram will show you how the image data is distributed within the image. This information is important for making the proper tonal correction, as you'll see in more depth in the upcoming "Tonal Corrections Using Levels" section of the chapter.

The following examples demonstrate how the image tone distributes the data in a histogram.

> ***Overexposed (too bright)***: Most of the image data is in the mid-range to the bright pixels in the histogram (Figure 3-2).

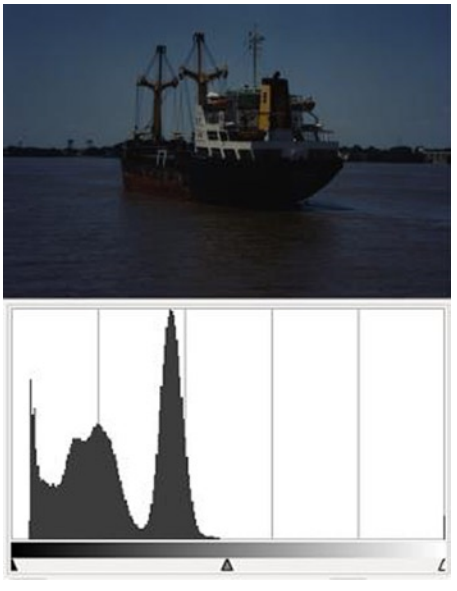

Figure 3-2. *Most of the data is in the brightest range*

Underexposed (too dark): Most of the image data is in the mid-range to the dark pixels in the histogram (Figure 3-3).

Figure 3-3. *Most of the data is in the darkest range*

Low contrast (dull tone): More of the image data is in the mid-range, with none in the darkest or lightest ranges (Figure 3-4).

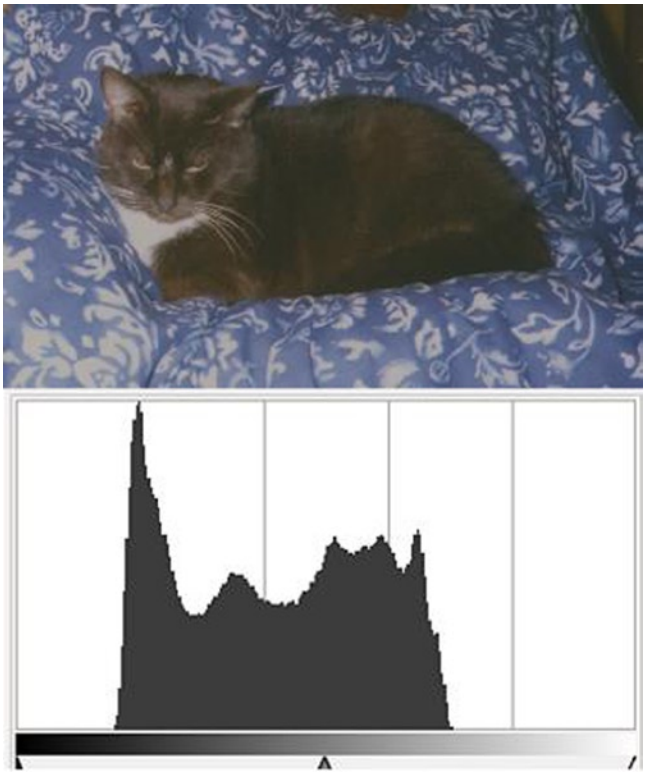

Figure 3-4. *Most of the data is in the middle range*

Balanced Tonality: The image data is spread across the full length of the histogram (Figure 3-5).

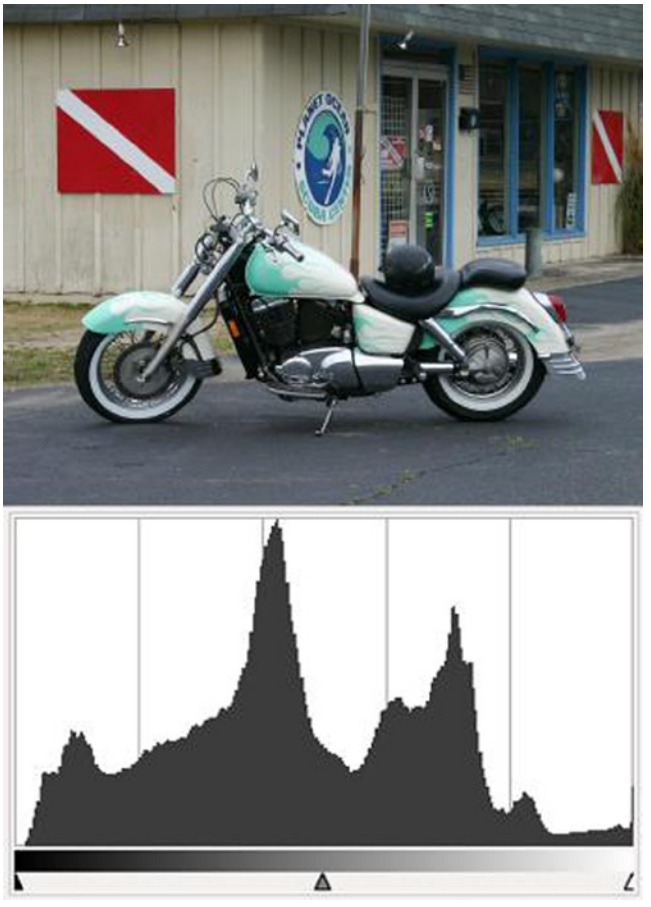

Figure 3-5. *Most of the data is spread throughout the histogram*

Tonal problems could be due to improper lighting or exposure settings, or in the case of old photographs, chemical changes in the print itself over time. Old photographs will often have mixed tonal issues, such as uneven fading, which can make correction more complex and challenging.

Using the Color Picker Tool to Track Tonality

As mentioned in the Introduction, software to calibrate your monitor can be very helpful to display an image as accurately as possible. However, it's a good idea to take measurements for an accurate readout of what pixel values you are seeing. What you see on your monitor may differ some from reality.

The Color Picker tool is used to sample areas to determine color values and tonal values. In the grayscale image in Figure 3-6, several areas have been sampled to determine the gray value (percentages) in various areas. A grayscale image (as displayed on a monitor) is made up of equal amounts of red, green, and blue light (you'll learn more about color models in Chapter 4). Using the eyedropper to sample pixels will display the brightness value from 0 to 255, and also the RGB values. You can sample a single pixel, or an average of a radius of pixels you set the parameters for.

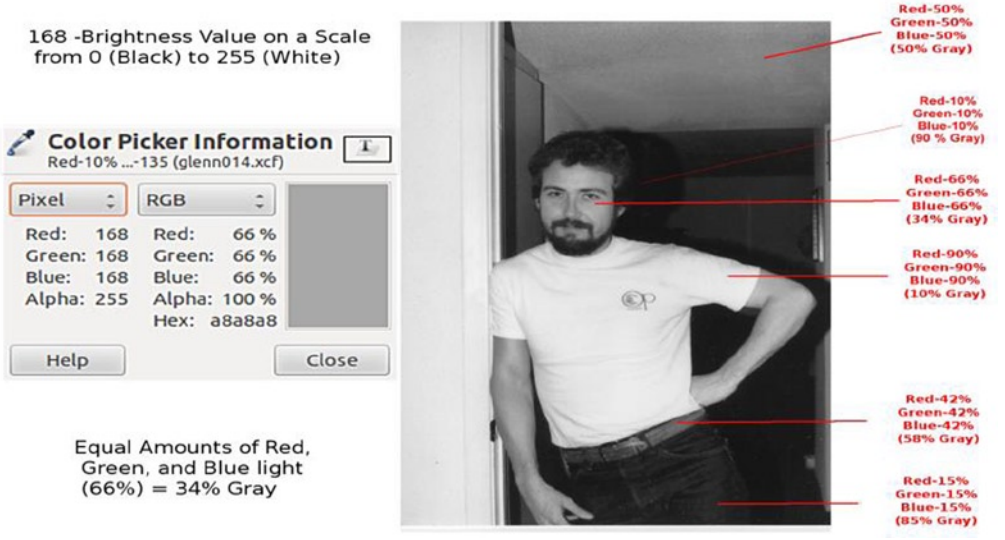

Figure 3-6. *Using the Color Picker tool to track tonality*

Using Sample Points

Sample Points are markers that can be placed on four parts of an image, to help monitor specific areas as you edit. The data displayed will change in real time as you work. They can be used to keep track of highlights, mid-tones, and shadows throughout the image (Figure 3-7). They are useful when making tonal changes and show you certain areas that may be adversely affected, allowing you to selectively fine-tune those areas.

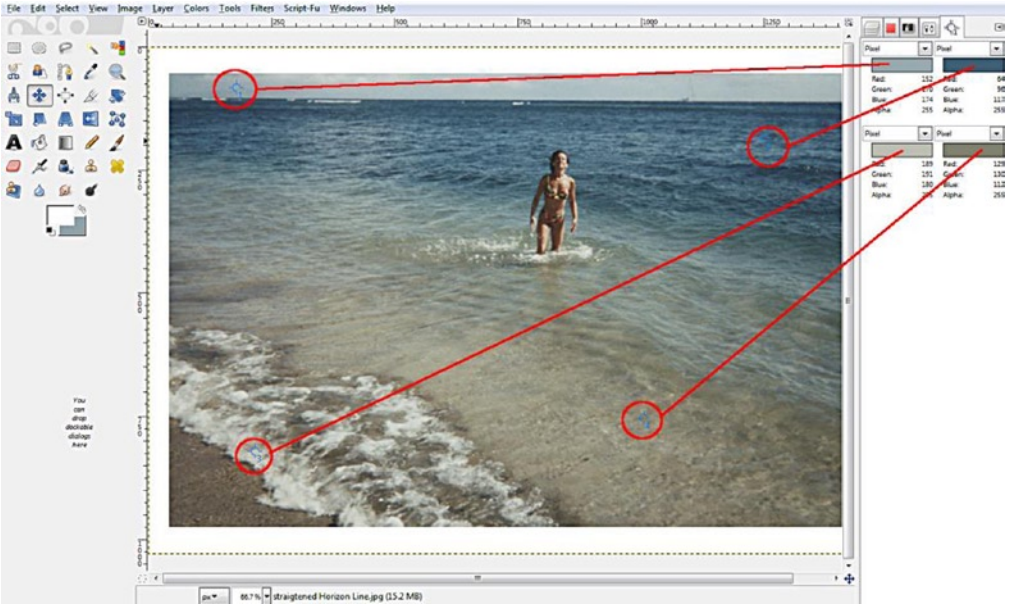

Figure 3-7. *Tracking image data using Sample Points*

You can access the Sample Points dialog from the Image menu (Windows ➤ Dockable Dialogs ➤ Sample Points). To create a Sample Point, Control + Click on one of the rulers in the image window, and drag with the mouse. Two perpendicular guides will appear. When you release the mouse button, the Sample Point will be placed where the two guides intersect (Figure 3-8).

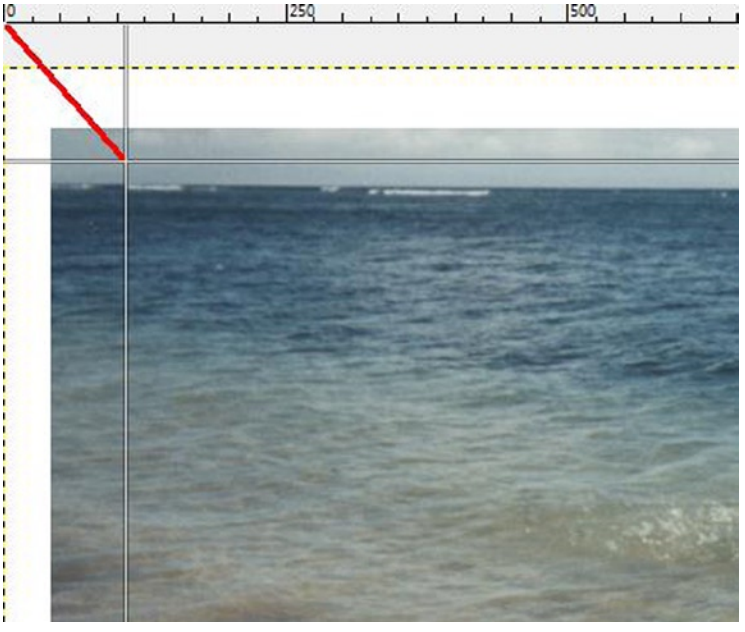

Figure 3-8. *Creating a Sample Point*

The Brightness-Contrast Dialog

This is the first tonal correction method that many beginners use. The Brightness-Contrast dialog (Figure 3-9) has two sliders: one for brightness and one for contrast. The adjustments are broad, with little ability to fine-tune, so this method of contrast adjustment has limits. When overused, it obliterates image detail.

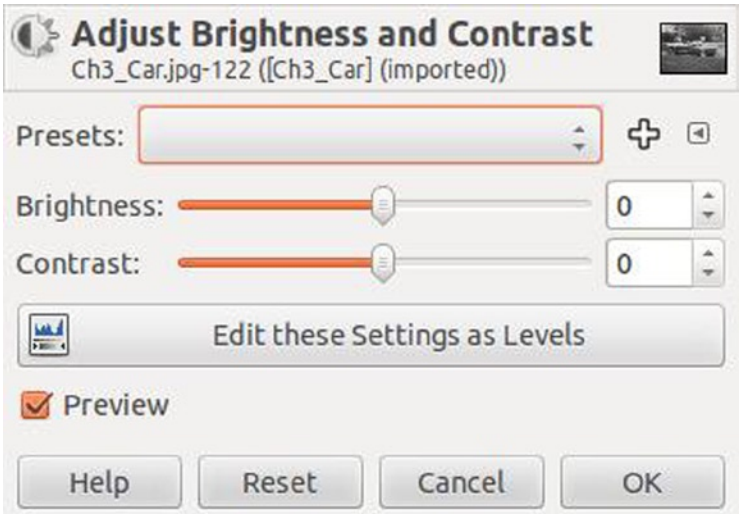

Figure 3-9. *The Brightness and Contrast feature is a basic tonal correction tool*

Although it can be useful in some instances where a light adjustment is all that's required, the results can be destructive if you don't use it carefully. There are some images that just won't yield good results using this feature. Levels, Curves, and layer blend modes are much better options.

Tutorial 1: Brightness-Contrast Adjustment

In this exercise, we're going to look at the basic Brightness-Contrast dialog. This image (Figure 3-10) is noticeably flat and dull. Although the Brightness-Contrast dialog is not the best tool to use, we'll improve the image by using it.

Figure 3-10. *A low-contrast image*

To correct this image, follow these steps:

1. Open the image (*Ch3_car*) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Contrast Adjustment (Figure 3-11).

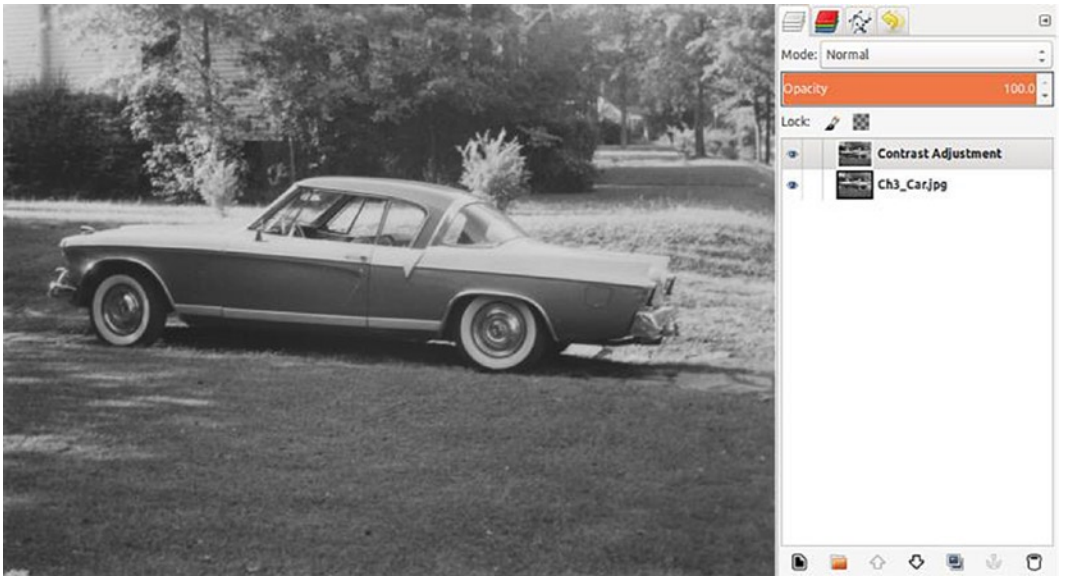

Figure 3-11. *The background layer duplicated and renamed Contrast Adjustment*

3. Open the Brightness-Contrast dialog (Image Menu ➤ Colors ➤ Brightness-Contrast).
4. I found increasing the brightness to 24 and the contrast to 35 improved the look overall (Figure 3-12).

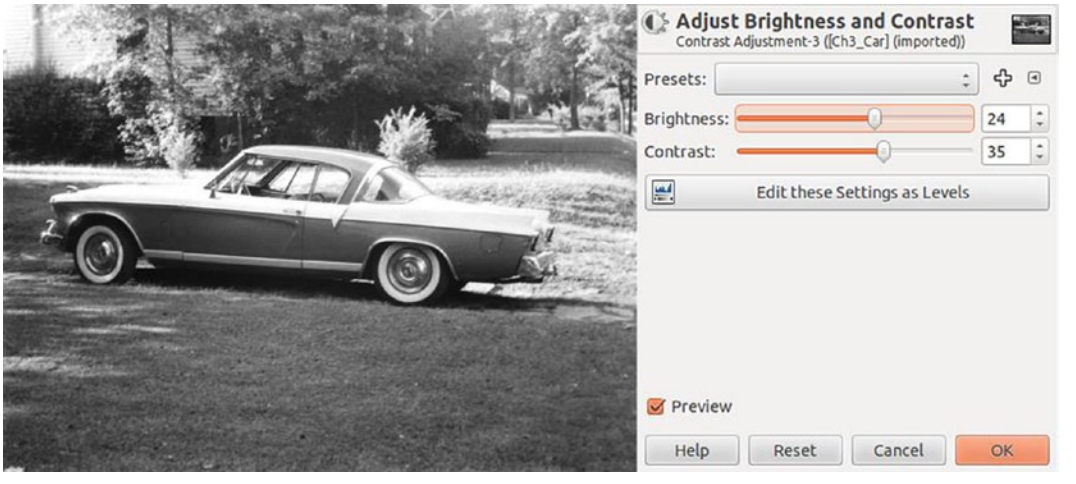

Figure 3-12. *The image is improved, but with some washed-out highlights*

Although the contrast is improved, the outlined areas in the edited example are highlights blown to pure white, which illustrates this tool's limitations (Figure 3-13).

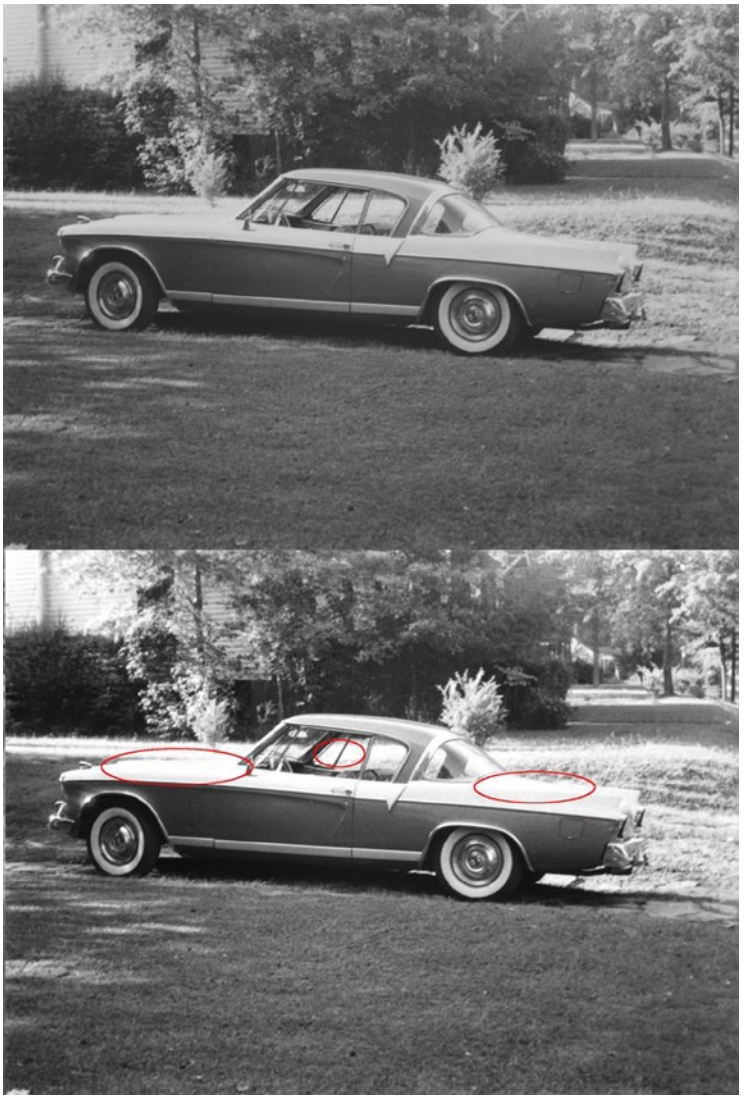

Figure 3-13. *Before and after comparison*

Tonal Correction Using Levels

The Levels dialog box (Figure 3-14) allows you to shift the brightest, mid-tone, and darkest pixels in the image you are working with. Essentially, this allows you to make an image lighter or darker or to change the contrast. It also lets you make color adjustments, which we'll look at in Chapter 4.

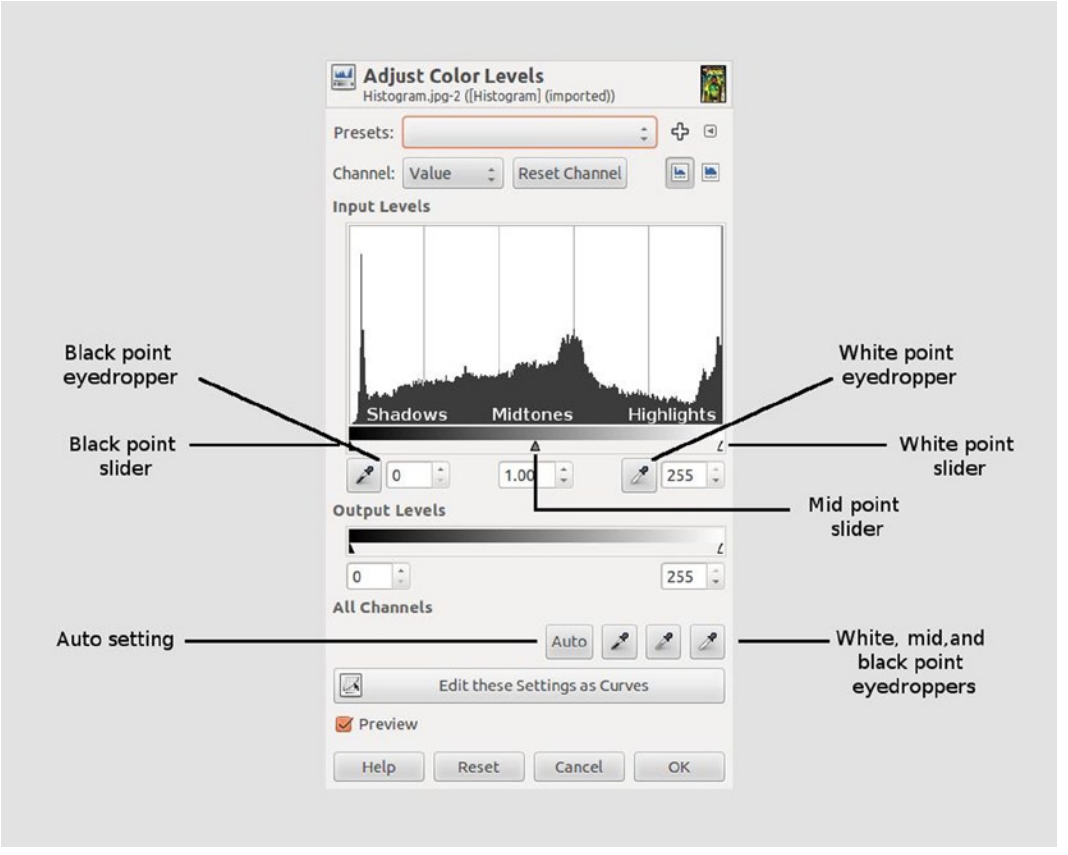

Figure 3-14. *The Levels dialog*

The Levels dialog displays a histogram, which is a graphical representation of the pixel values across the image, ranging from 0 (pure black) to 255 (pure white). Factors such as image tonality and exposure determine the shape of the histogram.

Levels allows you make changes on a composite of the red, green, and blue channels (Value) by default. Changes can be made on each color channel individually, which we'll look at in Chapter 4.

Tutorial 2: Correcting Contrast with Levels

In this exercise, we're going to improve the contrast in this image. As you can see in Figure 3-15, it has a rather flat tone. The highlight areas are dingy; the shadow areas are gray and muddy. A simple levels adjustment will make this photo pop out a lot more.

Figure 3-15. *A flat, dull image*

To correct this image, follow these steps:

1. Open the image (*Ch3_lady by tree*) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Contrast Adjustment (Figure 3-16).

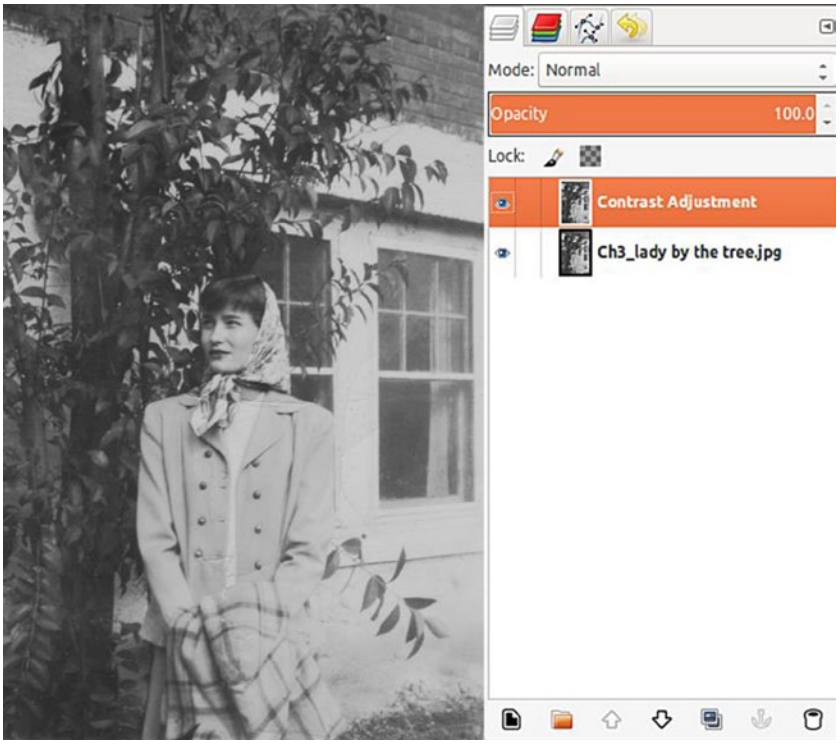

Figure 3-16. *.The background layer duplicated and renamed Contrast Adjustment*

3. Open the Levels dialog box (Image Menu ➤ Colors ➤ Levels). Looking at the histogram, we can see that the image pixels are mainly in the middle range; it lacks shadow and highlight areas (Figure 3-17).

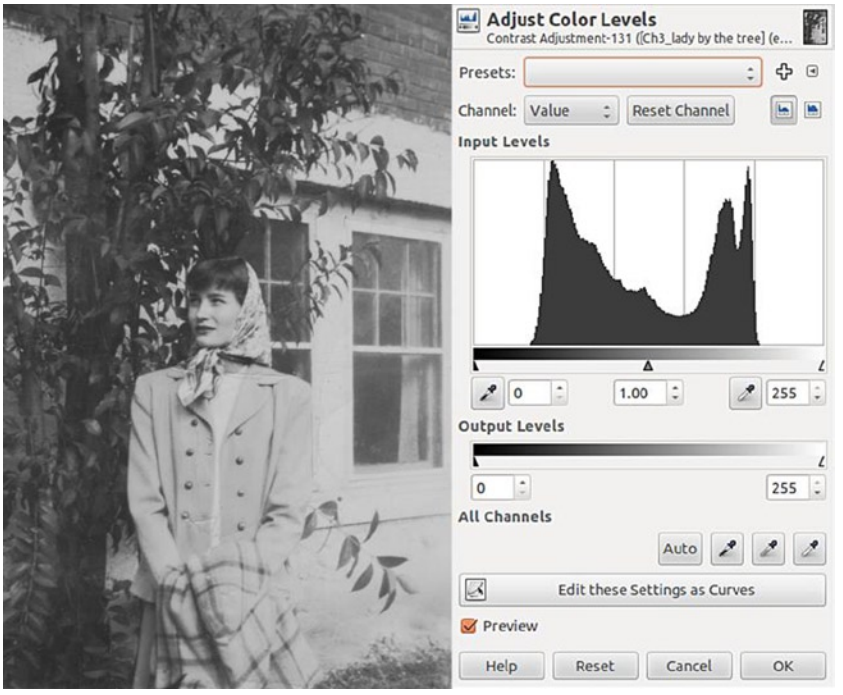

Figure 3-17. *The histogram shows the lack of the darkest and lightest pixels*

4. Move the black slider on the left toward the center and stop where the image data begins. Repeat the same step with the white slider. Move toward the center and stop where the image data begins (Figure 3-18).

Figure 3-18. *Moving the black and white point sliders inward improves the contrast*

The image looks much better; the added contrast gives it more snap. The highlights are brighter, and the shadow areas are darker (Figure 3-19).

Figure 3-19. *Before and after comparison*

Tutorial 3: Using the Eyedroppers in Levels

Another method of improving contrast with Levels is using the Black and White Point eyedroppers These tools are used to sample the darkest and lightest areas of the image, to remap tonality and improve contrast.

This image (Figure 3-20) has very low contrast and is extremely flat. It's difficult to know by visual evaluation alone where the darkest and lightest range of pixels exists in this image. We will use the Threshold feature to find the black and white points of this image. Threshold reduces the pixels to pure black and white. It can be used to find where the darkest and lightest pixels exist in an image.

Figure 3-20. *A very low-contrast image*

To correct this image, follow these steps:

1. Open the image (*Ch3_lady with baby*) found in the Practice Images folder.
2. Duplicate the background layer **three times** (Shift + Control + D). Rename the first duplicate layer Contrast Adjustment. Rename the other two layers Black Point and White Point, respectively (Figure 3-21).

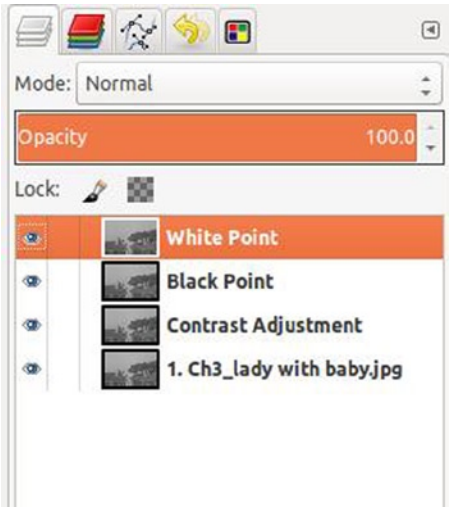

Figure 3-21. *Creating layers for use in finding black and white points*

3. Activate the *White Point* layer, then open the *Threshold* dialog box (Image Menu ➤ Colors ➤ Threshold). Move the black slider to the far right, and then proceed to slowly move it toward the left, until the brightest cluster of pixels begins to emerge (Figure 3-22).

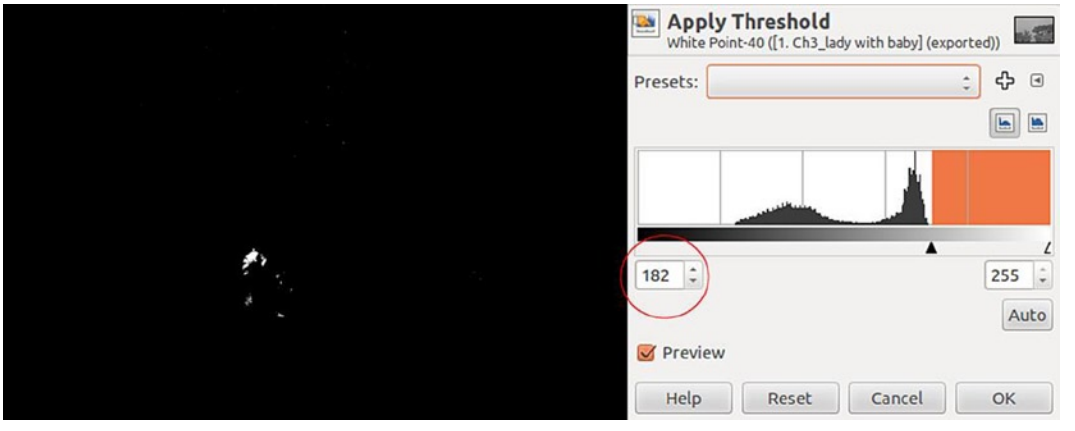

Figure 3-22. *Finding the white point of the image*

4. Now activate the Black Point layer, and open the Threshold dialog again. Move the black slider to the far left, then slowly toward the right, until the darkest cluster of pixels begins to emerge (Figure 3-23).

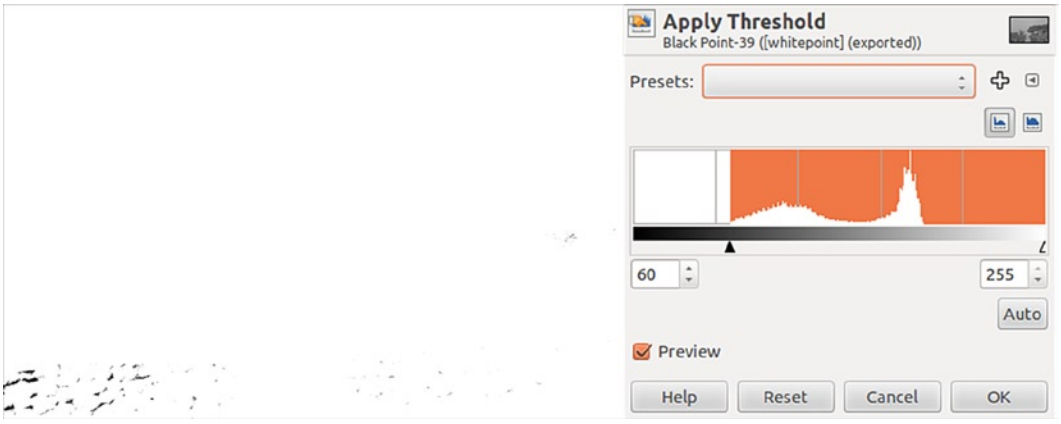

Figure 3-23. *Finding the black point of an image*

5. Lower the opacity of both the White Point and Black Point layers to about 50%, so that the image is partially visible and both the black and white reference areas are visible (Figure 3-24).

Figure 3-24. *Lower the opacity of the layers, to see where to place the eyedroppers*

6. Click the Contrast Adjustment layer, to make it active, and open the Levels dialog box (Image Menu ➤ Colors ➤ Levels). Use the black eyedropper to click the black point indicated by the Black Point layer. Repeat the same step with the white eyedropper on the white point. *Do not click OK yet; keep the Levels dialog box open!* Hide the Black and White Point layers at this point.

7. Now, adjust the midpoint slider slightly to the left, until the value is about 128, then click OK (Figure 3-25).

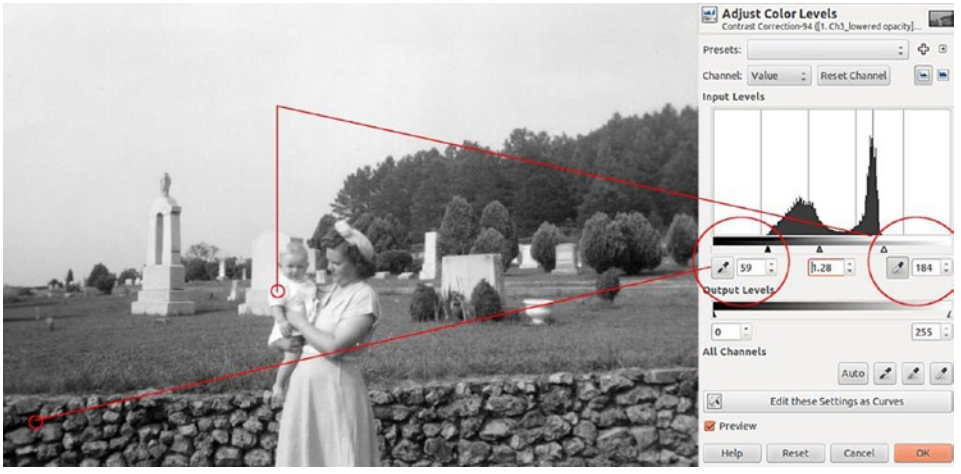

Figure 3-25. *Sampling the darkest and lightest pixels to remap tonality*

If the effect is too strong, it can be toned down just a little. You can fine-tune the results by reducing the Contrast Adjustment layer by 5–10%. The end result is an image that, although not perfect, is much better than before (Figure 3-26).

Figure 3-26. *Before and after comparison*

Tutorial 4: Enhancing Detail with Levels

This image has a different issue: slight underexposure. Although it's subtle, the image is a bit too dark (Figure 3-27).

Figure 3-27. *This image is slightly too dark, hiding some of the detail*

The detail in this image is slightly lacking in the darker areas. The middle slider in the Levels dialog box can correct this, by improving the overall brightness and pulling more detail from the darker areas. This is called a *gamma* correction.

To correct this image, follow these steps:

1. Open the image (*Ch3_canyon wall*) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Gamma Adjustment (Figure 3-28).

Figure 3-28. *Creating a layer on which to make a gamma adjustment*

3. Open the Levels dialog box (Image Menu ➤ Colors ➤ Levels). The histogram shows the two valleys in the middle area (on either side of the data spike). The highlighted end of the histogram is a bit shy of data as well (Figure 3-29).

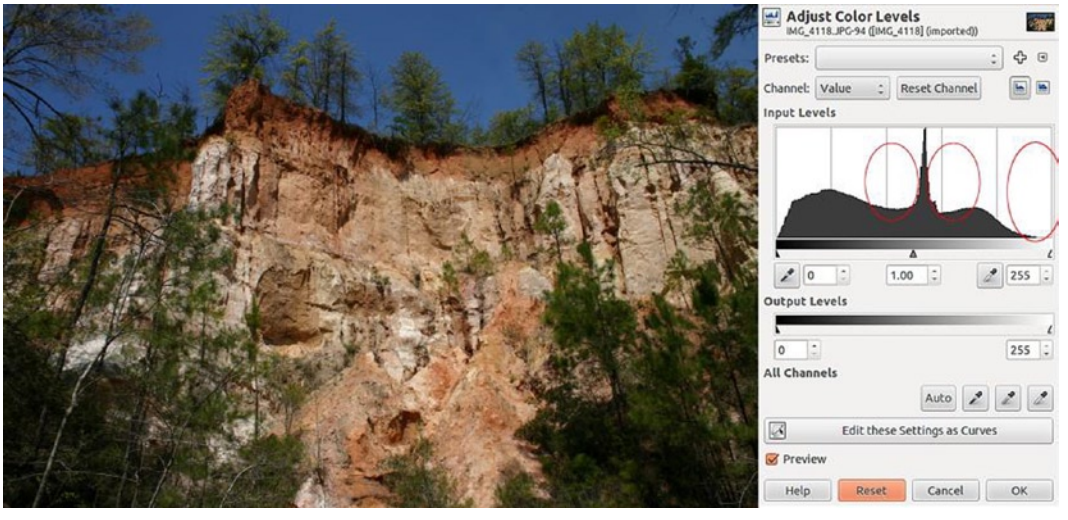

Figure 3-29. *The two valleys in the mid-range area indicate a lack of some image data*

4. Move the middle (gamma) slider slightly toward the left, to bring out the detail (the value should be about 1.50). Move the white slider to the left, to the point where the image data begins (Figure 3-30).

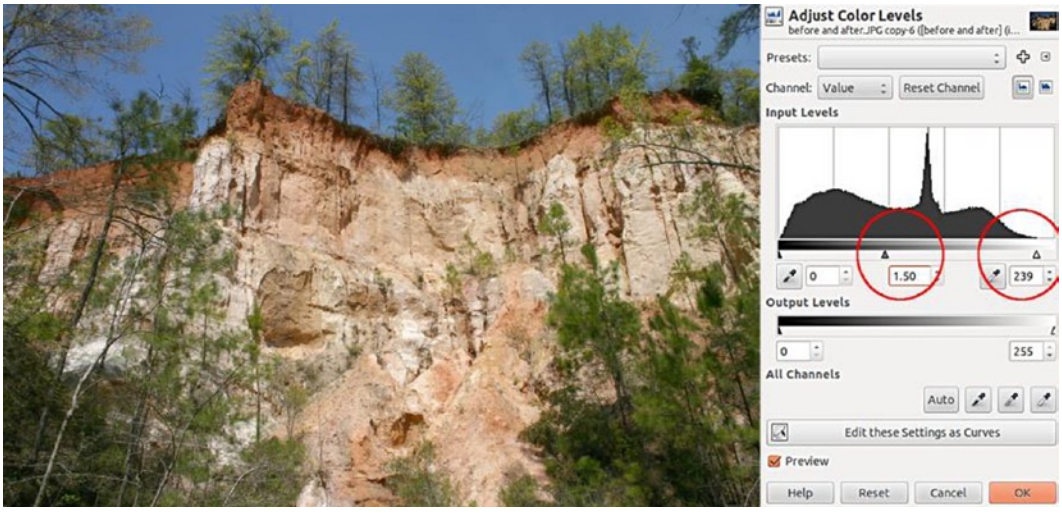

Figure 3-30. *Revealing detail by adjusting the midpoint slider*

The result is an image that is brighter, more detailed, and less harsh than before—a more accurate portrayal of this scene on a bright, sunny mid-afternoon (Figure 3-31).

Figure 3-31. *Before and after comparison*

Tonal Corrections Using Curves

The Curves dialog box (Figure 3-32) allows you to shift the brightest, mid-tone, and darkest pixels in the image you are working with. As with Levels, this allows you to make an image lighter or darker or to change the contrast and color.

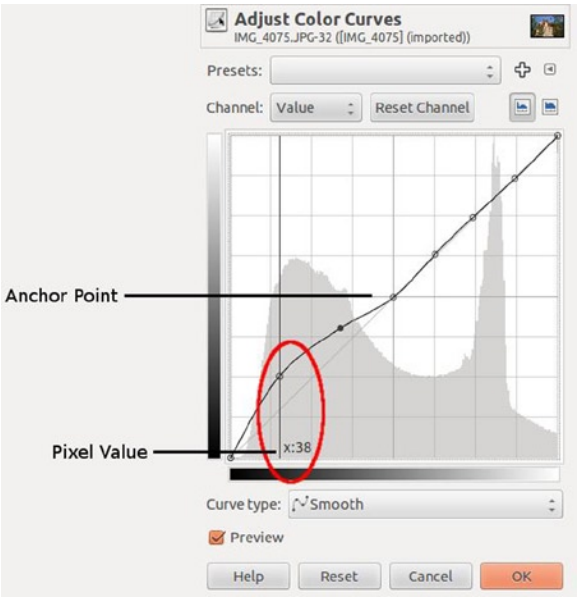

Figure 3-32. *The Curves dialog box*

It also displays a histogram, as Levels does. A key difference in how curves work is the ability to isolate and adjust narrow ranges of tonality. You can attach anchor points to the adjustment curve, to prevent changes to a particular range of pixels, and apply changes to the range you want. As with Levels, Curves allows you to make changes on a composite of the red, green, and blue channels (Value) by default. Changes can be made on each color channel individually, as well as the Alpha channel, which we'll look at in Chapter 4.

Tutorial 5: Correcting Contrast with Curves

This image is a little lackluster (Figure 3-33), so we'll look at a simple way to snap it up. In this exercise, we're going to bump the contrast up slightly, using the Curves dialog box. As previously mentioned, Curves offers a great degree of fine-tuning. For this image, we're going to apply an S curve—a common technique used for improving contrast. As you might have guessed, an S curve bears a slight resemblance to the letter *S*.

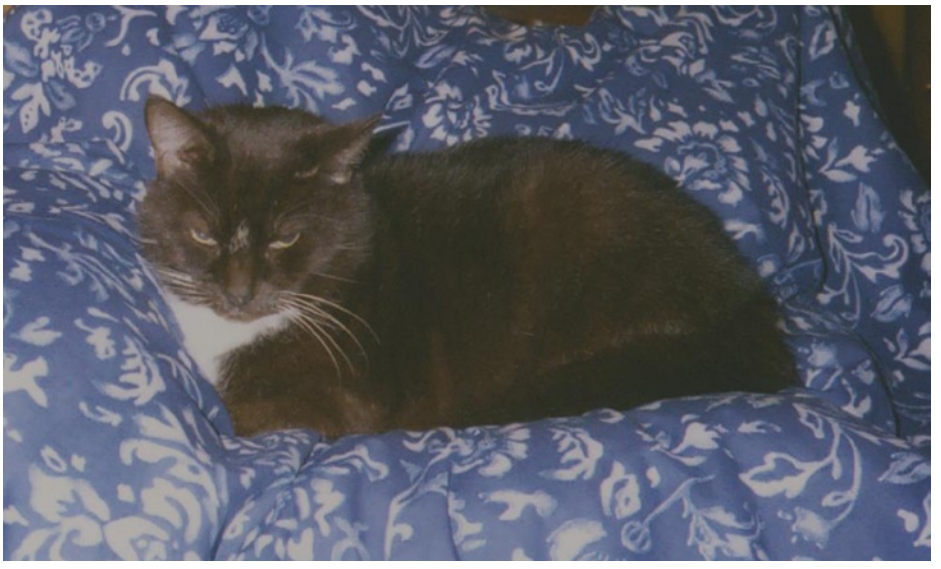

Figure 3-33. *A good picture but a little low on contrast*

To correct this image, follow these steps:

1. Open the image (`Ch3_cat`) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Contrast Correction (Figure 3-34).

Figure 3-34. *Creating a layer to make a Curves adjustment on*

3. Open the Curves dialog box (Image Menu ➤ Colors ➤ Curves). Make sure the *Preview* box is checked. Click the diagonal line toward the top and right (highlights). Pull up and slightly to the left. The anchor point should line up with the image data in the histogram. On the lower left (shadows), pull the line down and slightly to the right. Note the slight *S* shape in the curve adjustment (Figure 3-35)

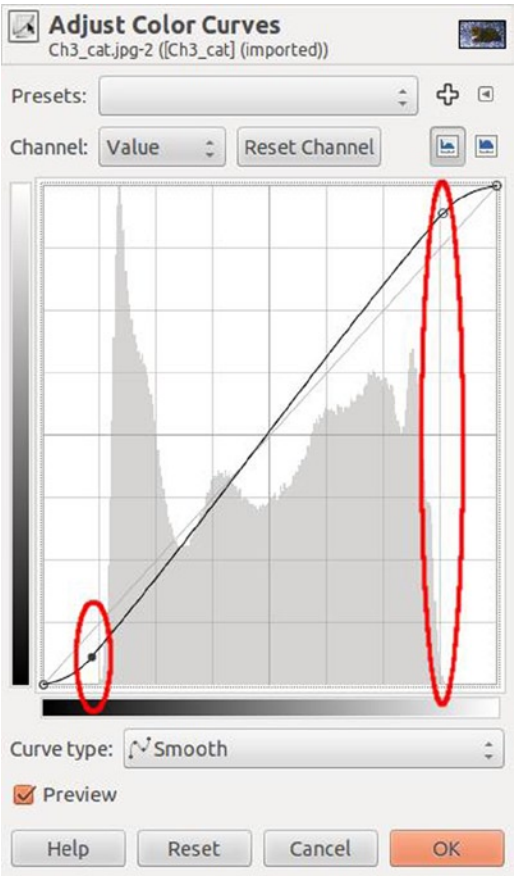

Figure 3-35. *Making a slight S curve*

The result is an image with better contrast (Figure 3-36). This action brightens the highlights and darkens the shadows in the image. The Curves dialog is a powerful correction tool well worth your time and practice. It works very well in tonal adjustments and is an excellent color-correction tool as well, as we'll see in the next chapter.

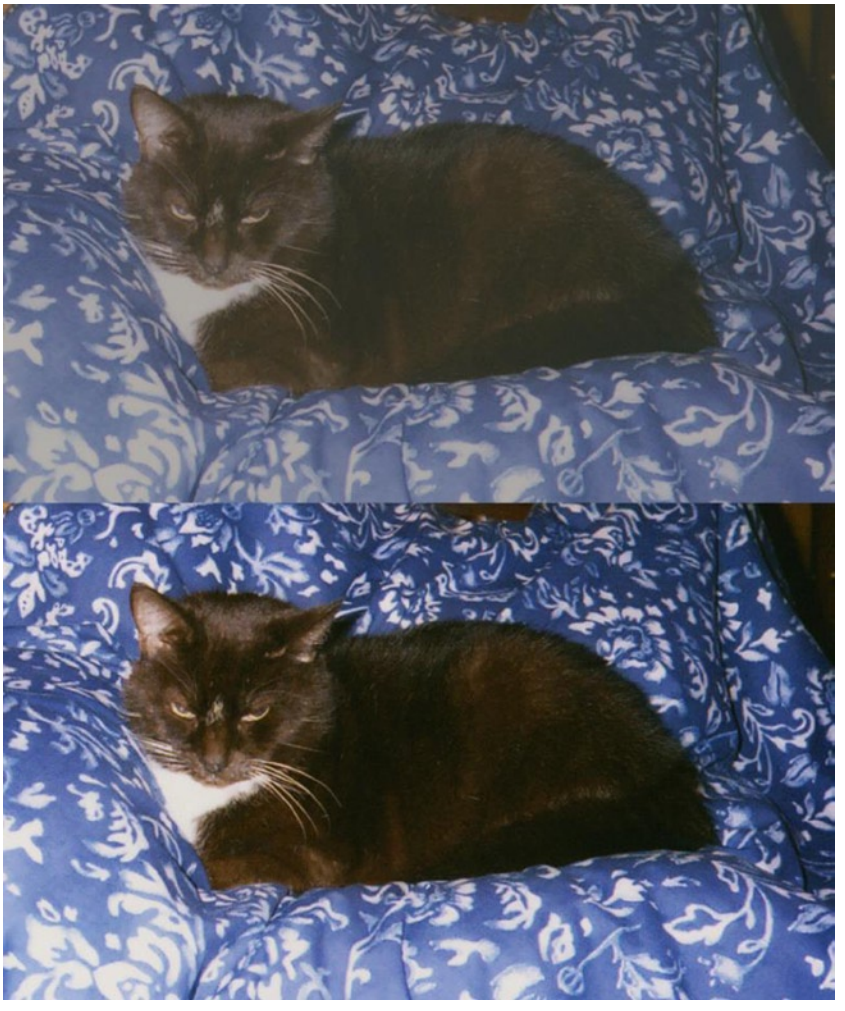

Figure 3-36. *Before and after comparison*

■ **Note** Apply the S curve with a light touch. There is usually some loss of fine detail in the shadows and highlight areas, so make your adjustments gradually, while monitoring the detail.

Tutorial 6: Tonal Adjustment Using Curves (with Local Adjustments)

This exercise is similar to the previous one using levels to enhance the detail in the image of the canyon wall. In this image (Figure 3-37), we'll make a minor Curves adjustment that will brighten the darker areas that should be lighter (essentially a digital fill flash).

Figure 3-37. *An image requiring selective tonal correction*

To correct this image, follow these steps:

1. Open the image (*Ch3_myra*) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Lighten (Figure 3-38).

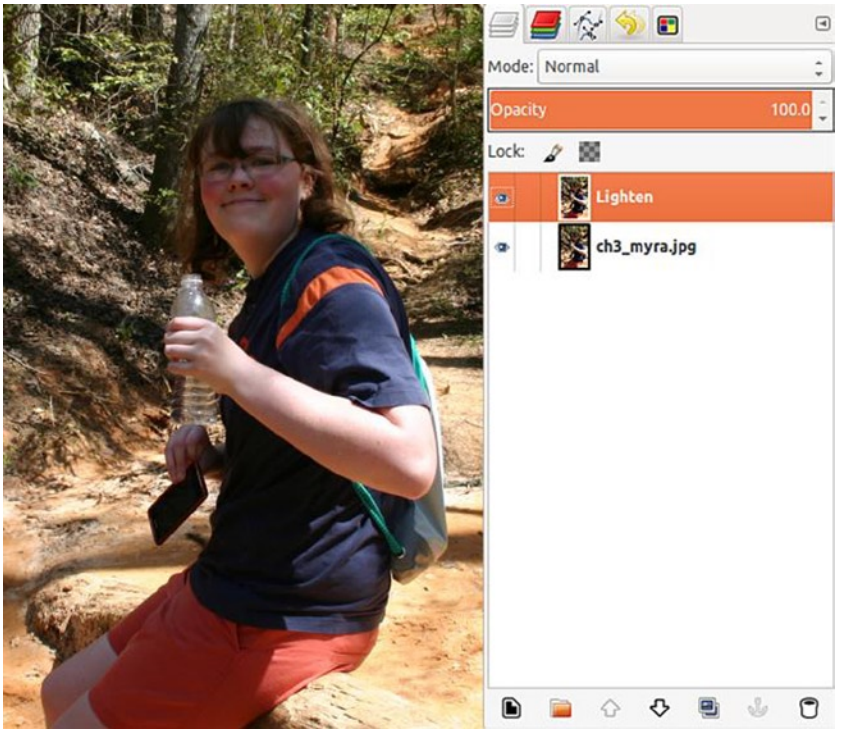

Figure 3-38. *Creating a layer to make a Curves adjustment on*

3. Open the Curves dialog box (Image Menu ➤ Colors ➤ Curves). Make a bow curve by clicking the center and pulling up and left, as shown in Figure 3-39. This will work like a fill flash and lighten the darker areas in the cast shadow.

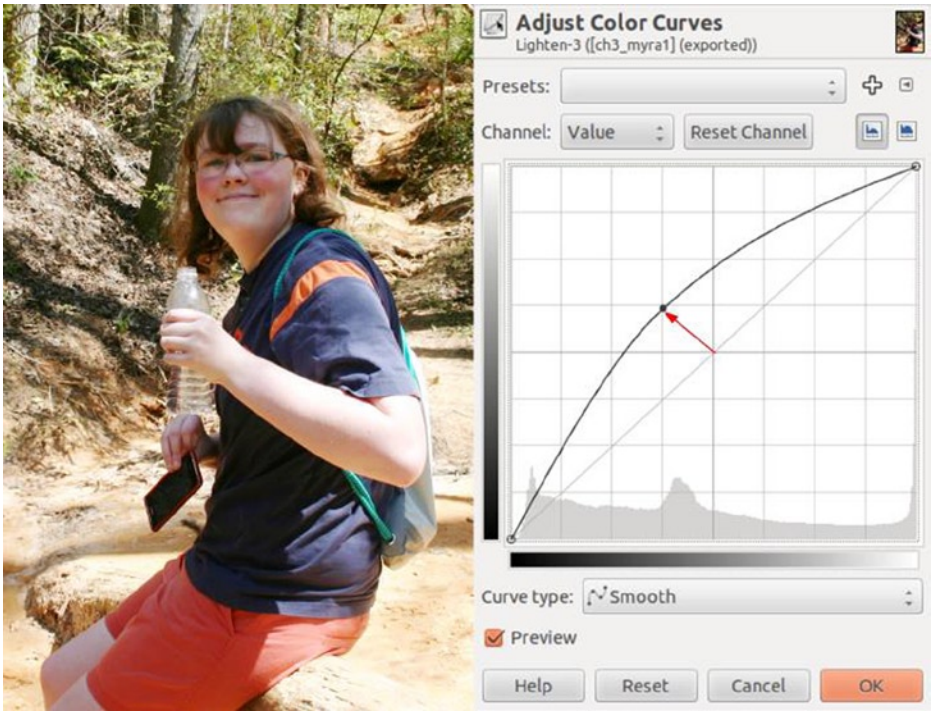

Figure 3-39. *Making a bow curve to lighten the shadowy areas*

4. The face is much better now, but the effect lightened the foreground, arm, and sunlit areas in the background a bit too much. We'll now reduce this effect a bit. Add a layer mask to the *Lighter* layer (Right Click + Add Layer Mask), as shown in Figure 3-40.

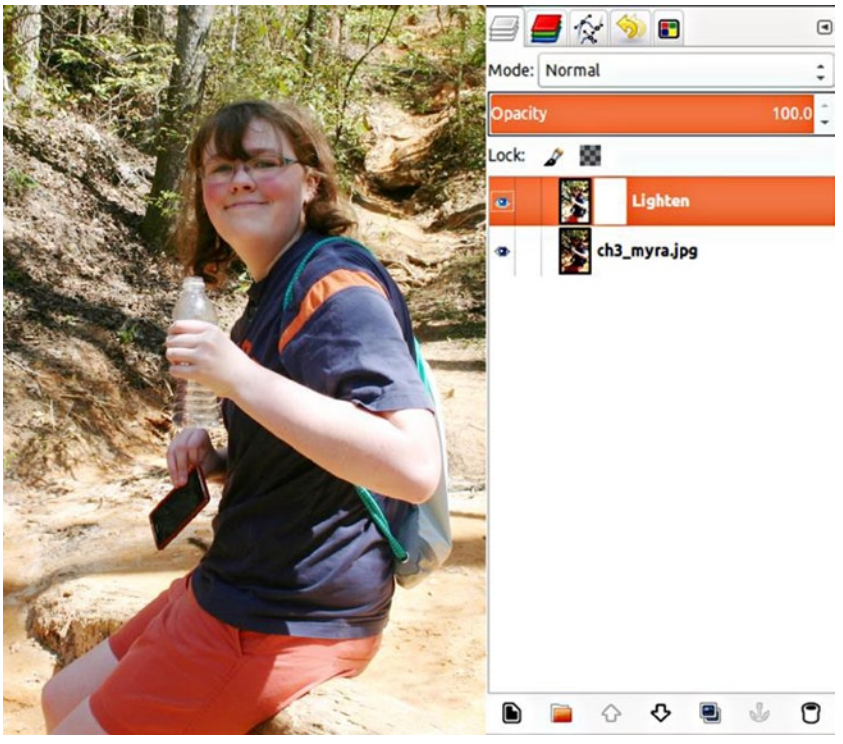

Figure 3-40. *Adding a layer mask to restore some of the over-affected areas*

5. Activate the layer mask by clicking it (it will have a white border around it). Using a large, soft brush at 50% opacity and black as the active color, paint back some of the washed out detail in these areas (Figure 3-41).

Figure 3-41. *Painting on the layer mask restores some of the original tone*

The result is much better (Figure 3-42). Using the layer mask is a way to perform selective tonal corrections with precision, by varying the brush opacity or using shades of gray as the paint color to control the pixel transparency.

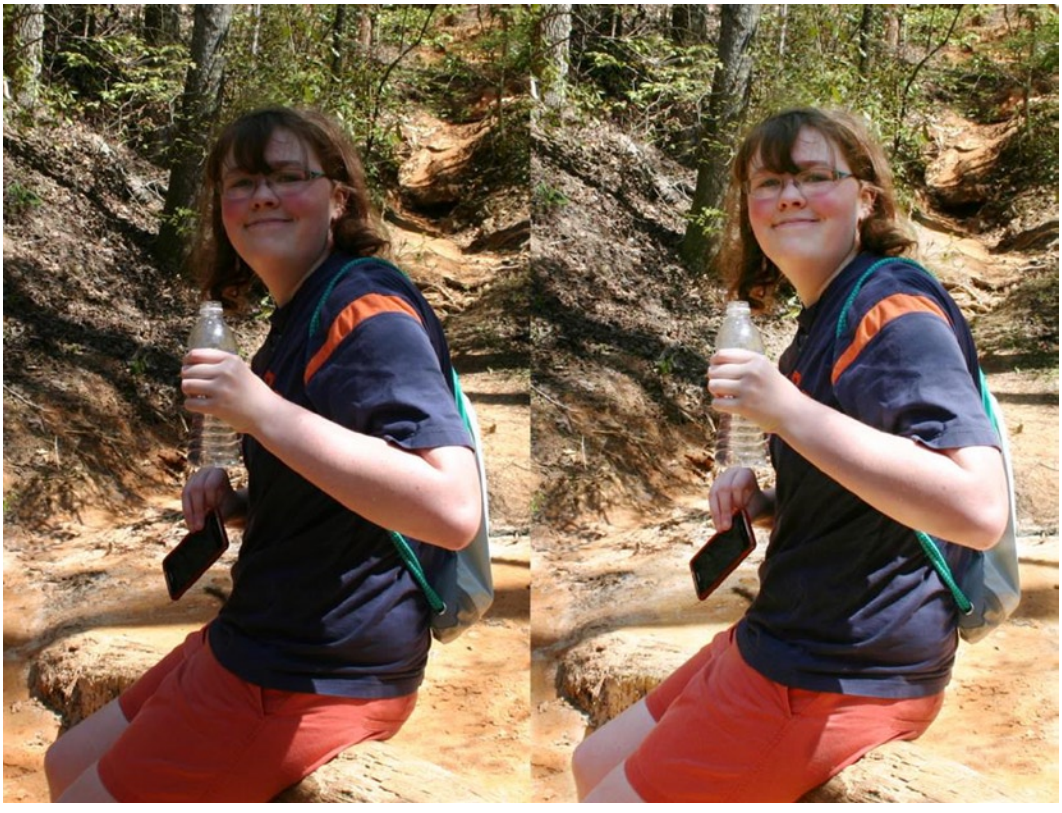

Figure 3-42. *Before and after comparison*

Tonal Corrections Using Layer Blend Modes

Layers have 21 different blend modes in GIMP. Blend modes control how layers interact with one another. They can produce a wide array of different effects. It's worth spending time experimenting with them. You can come up with some interesting results. For the purposes of this chapter, we'll only be concerned with two layer blend modes that are useful for correcting exposure—Multiply and Screen.

- *Multiply*: Multiplies the value of each pixel of the top layer with the corresponding pixel for the layer underneath, resulting in a darker image
- *Screen*: The opposite of Multiply, resulting in a brighter image

Layer blend modes are very useful for correcting overexposed and underexposed images. They often require duplication, adjusting opacity, and more than one blend mode. Using layer blend modes requires some experimentation, but they can work very well.

Tutorial 7: Correcting an Underexposed Image

An underexposed image this dark might seem beyond saving, but using the Screen blend mode can bring it back. It works amazingly well, in many cases.

To correct this image, follow these steps:

1. Open the image (*Ch3_dark boat*) found in the Practice Images folder (Figure 3-43).

Figure 3-43. *Very underexposed and dark image*

2. Duplicate the background layer (Shift + Control + D). Rename the duplicate layer Lighten, and change the blend mode to Screen (Figure 3-44). We can see that this has made quite a difference, but the image is still too dark.

Figure 3-44. *A noticeable difference from using one Screen layer*

3. Duplicate the Lighten layer twice. Lower the opacity to about 50% on the topmost layer, and the overall result turns out well (Figure 3-45).

Figure 3-45. *The image looking much better*

4. The result is much better. For a final touch, duplicate the background layer. We are going to use the Dodge tool to brighten up slightly the lettering on the ship's stern (Figure 3-46). In the Tool options, choose the following settings:

   - Dodge option checked
   - Highlights option checked
   - Opacity 100%
   - Exposure 80%
   - Brush diameter set at 3 pixels

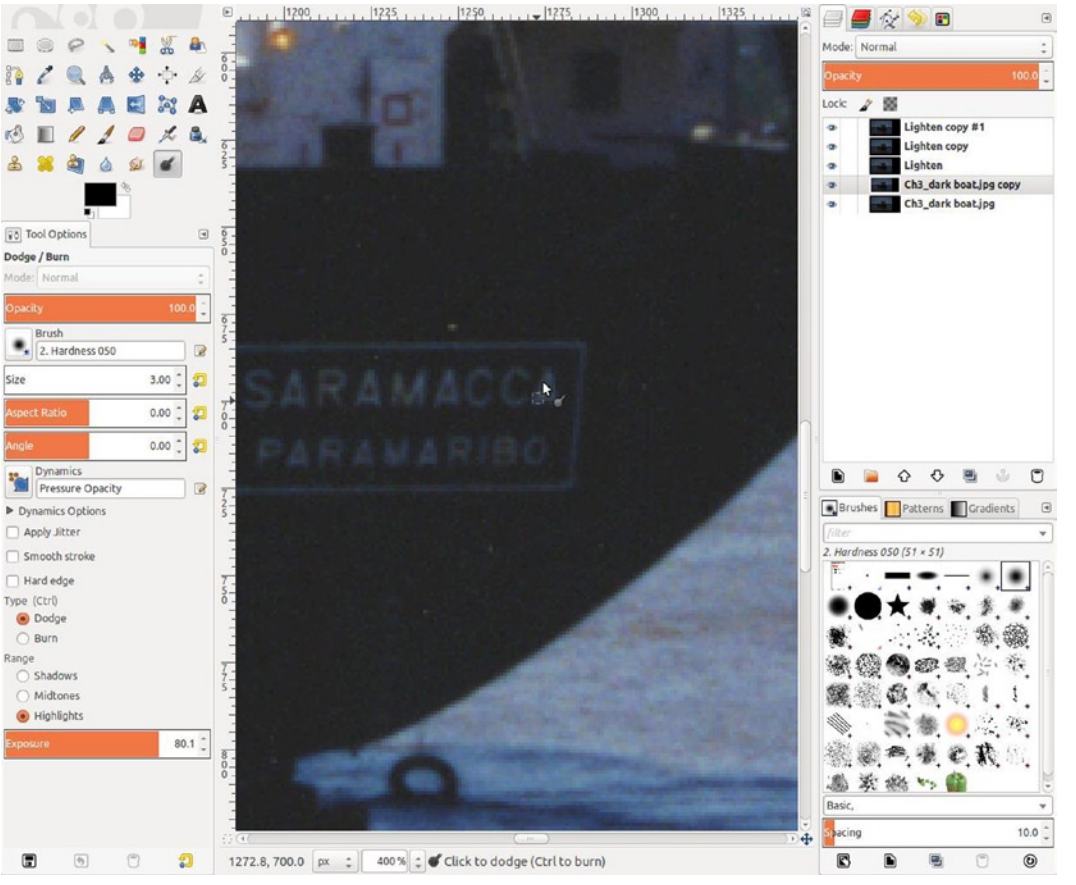

Figure 3-46. *Using the Dodge tool to brighten the lettering*

8. Use the Dodge tool on the lettering and the outline, as shown, to slightly brighten them up (Figure 3-47). (Go lightly; you don't want the effect too intense.)

Figure 3-47. *Before and after comparison*

The final image is much better. Notice how the lettering stands out more, without being too intense.

Tutorial 8: Correcting an Overexposed Image

This image is a slide taken in the late 1960s that was overexposed at the time it was shot (along with numerous others in the family archives). Slide film's exposure latitude is less forgiving than print film, so improperly exposed slides are fairly common.

To correct this image, follow these steps:

1. Open the image (*Ch3_overexposed beach*) found in the Practice Images folder (Figure 3-48).

Figure 3-48. *Overexposed, with loss of detail*

2. Duplicate the background layer (Shift + Control + D) and rename it Detail. Change the blend mode to Multiply (Figure 3-49). We can see it's beginning to work.

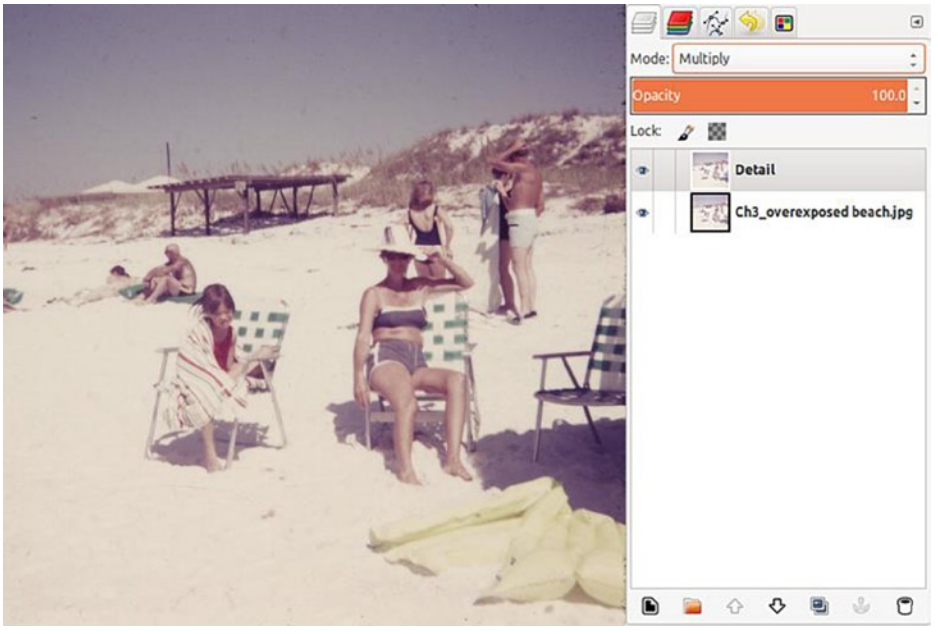

Figure 3-49. *The Multiply mode adds detail and darkens the image*

3. Duplicate the Detail layer. It will make the image a good deal darker, so lower the opacity to about 75% (Figure 3-50). It's looking better—and will do for the time being.

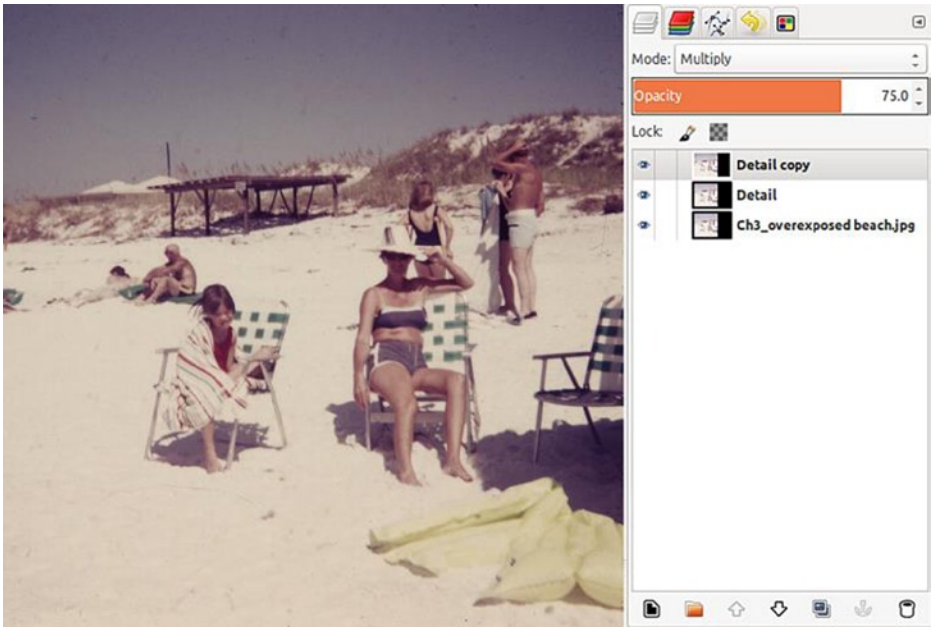

Figure 3-50. *Duplicating the Detail layer*

It's much improved but could benefit from some color-correction work (Figure 3-51), which we'll explore in Chapter 4.

Figure 3-51. *Before and after comparison*

Summary

In this chapter, you learned about the most common tonal problems and how to assess them, using the histogram. The Color Picker tool is a useful tool for sampling pixels, to determine brightness and RGB values. The assortment of tutorials demonstrated some powerful methods for making a variety tonal corrections in images, using GIMP. In the next chapter, you'll learn about working with color.

CHAPTER 4

Color Correction and Restoration

In This Chapter

- Common Color Problems
- Color Essentials
- Correcting Color CastsCorrecting and Restoring Color

Common Color Problems

When color became mainstream, our family photographs took on a new dimension. While monochrome photographs possess an aura of mystery, color photographs have an element of added realism. When we look at an old color family photo in pristine condition, memories rush back (I believe) more completely. We can instantly see the colors in a birthday cake or Halloween costume and relive those moments. Of course, it's distracting to view a cherished photograph that has faded or shifted colors.

There are several factors that can result in color problems: bad processing, the wrong film type or camera settings, chemical changes over time, etc. The following are the color problems that often plague images:

- Color casts and color shifts
- Faded colorExtreme color loss

For me, one of the most challenging aspects I encounter as a professional retoucher is restoring images that have suffered extreme color loss, owing to fading over time. Many of these images were displayed in frames and exposed to damaging UV light that caused fading and color shifts. Many of the photographic papers and chemicals used during the late 1960s through the 1980s resulted in unstable prints that degraded at an accelerated rate.

■ **Tip** I recommend downloading the free PDF version of the book *The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures* by Henry Wilhelm (Preservation Pub. Co., 1993). It's available from `www.wilhelm-research.com` and contains a wealth of information about the stability and longevity of various makes and types of photographic materials.

Color Essentials

Before moving on to the tutorials, there are a few essentials that must be covered. In this section, you'll learn about *additive* and s*ubtractiv*e color models and using the Color Picker tool to sample and determine color values. We'll also look briefly at the RGB *color channels*.

Additive Color

The color we see on a computer monitor is composed of light, which is *additive color*. The most common color model is the RGB (which stands for red, green, and blue light), and is GIMP's default mode for working with images. The RGB color mode can produce a little over 16.7 million colors. Full intensity of red, green, and blue light results in white (Figure 4-1), while zero intensity of each results in black. When the percentages of each are equal, it produces a shade of gray between black and white (as we saw in Chapter 3), but when the percentages differ, the result is a colorized hue.

Figure 4-1. *The RGB (additive) color model*

Subtractive Color

Subtractive color is based on the absorption and reflection of light from printed pigments, dyes, and inks. Colors that are absorbed by a particular ink, pigment, or dye are being subtracted. For example, red ink reflects a red wavelength of light, but all other color wavelengths are absorbed. Black ink absorbs all color wavelengths, resulting in an absence of any color.

The CMYK color model is widely used in the offset printing industry. *CMYK* refers to the ink colors cyan, magenta, yellow, and black (the *K* is assigned to black, because it means "key" in the printing industry). Theoretically, equal combinations of cyan, magenta, and yellow ink produce black (Figure 4-2), but in actual practice, the result is a dark brown. This necessitates black as a fourth color, for accurate reproduction of grays and black in print.

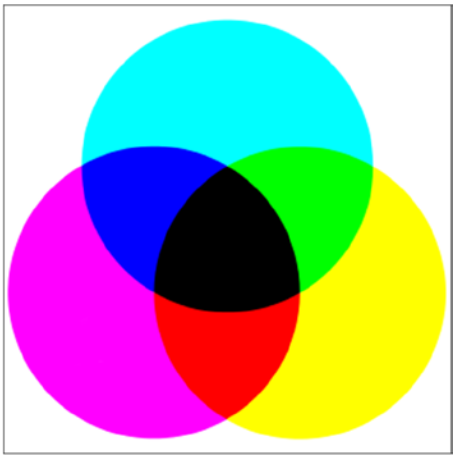

Figure 4-2. *The CMYK (subtractive) color model*

The RGB color model displays a much wider color range, or *gamut,* than the CMYK model. That's why an image displayed on your monitor often appears to be more vivid than the printed version.

■ **Tip** For creating a color-managed work environment, you might want to invest in color-measurement devices known as colorimeters and spectrophotometers. These devices come with their own configuration software.

The Color Picker Tool

In the previous chapter, we used this tool to evaluate tone in a grayscale image. It's a good idea to develop the habit of using this tool for sampling and evaluating color values in the images you edit. Even if you have a well-calibrated monitor, the Color Picker tool will show you the actual color values you are working with.

In Figure 4-3, we can see the shoes are reddish in color, but sampling the area indicated shows the exact percentages of red, green, and blue under the RGB setting (make sure the Use Info Window option is checked). This tool will sample single pixels or an average of surrounding pixels, depending on the Radius setting used. In addition to the default RGB setting, it also displays readouts in the HSV (hue, saturation, value) and the CMYK modes.

Figure 4-3. *Sampling an area using the Color Picker tool*

■ **Note** The Color Picker tool in GIMP isn't currently color-managed, so the CMYK value should be viewed as an approximation of the color when printed.

The Color Picker tool is useful for identifying color casts in images, as we'll see a little later in this chapter.

Color Channels

An RGB color image is a composite of three "storage bins," or channels of color data, one of each for red, green, and blue. Note where each color is represented, by the brighter areas in each color channel (Figure 4-4).

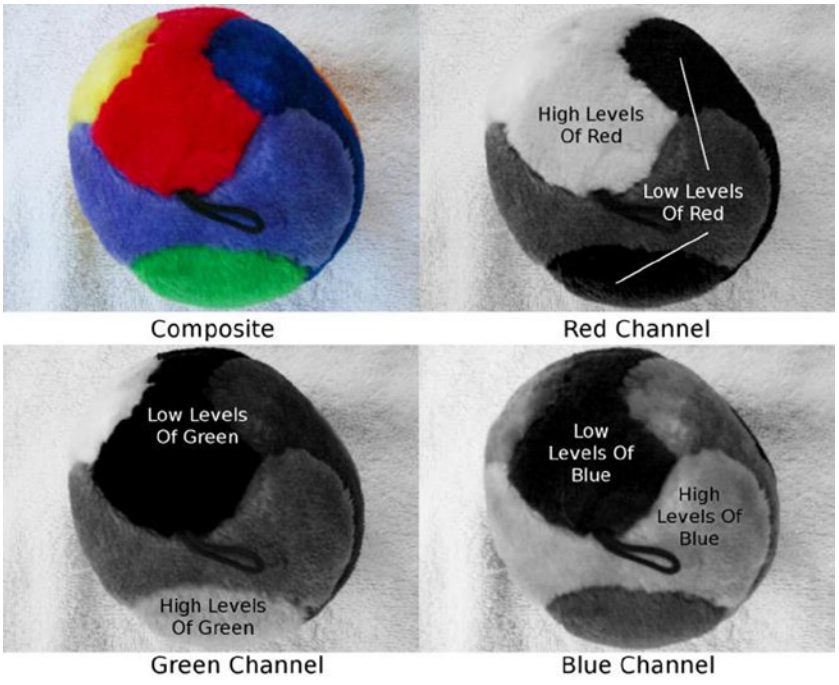

Figure 4-4. *Color channels store color data for an RGB image*

In GIMP, the channels are accessed in the Channels Palette. The tab to access the palette is right next to the Layers Palette tab (Figure 4-5). In some types of restoration work, it will be necessary to make adjustments to a specific color channel. The last tutorial in this chapter involves making an edit to a specific channel in a fairly complex color-correction exercise. Later in this book, we'll also look at how some restorations can be done by merely keeping one channel and discarding the others.

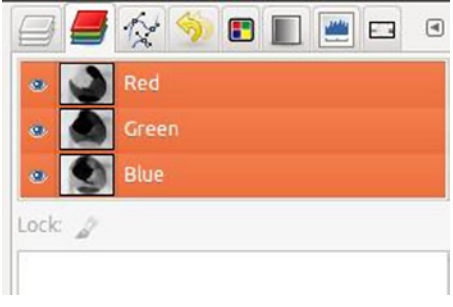

Figure 4-5. *The Channels Palette*

Correcting Color Casts

A color cast is a predominance of a certain color throughout the entire image. Color casts are usually unwanted, but sometimes, a photographer might be attempting a certain artistic effect for which the color cast is desirable. Most of the time, however, they are just representative of pictures that have gone wrong. Color casts can be the result of a number of factors: the wrong film type used for the light source, incorrect white balance setting in digital cameras, etc.

The Color Balance feature (Image Menu ➤ Colors ➤ Color Balance) in GIMP essentially offsets a color cast by increasing its opposite color (Figure 4-6). This tool works fairly well on images with very light color casts, but for most images GIMP offers better methods of correction, as you'll see shortly.

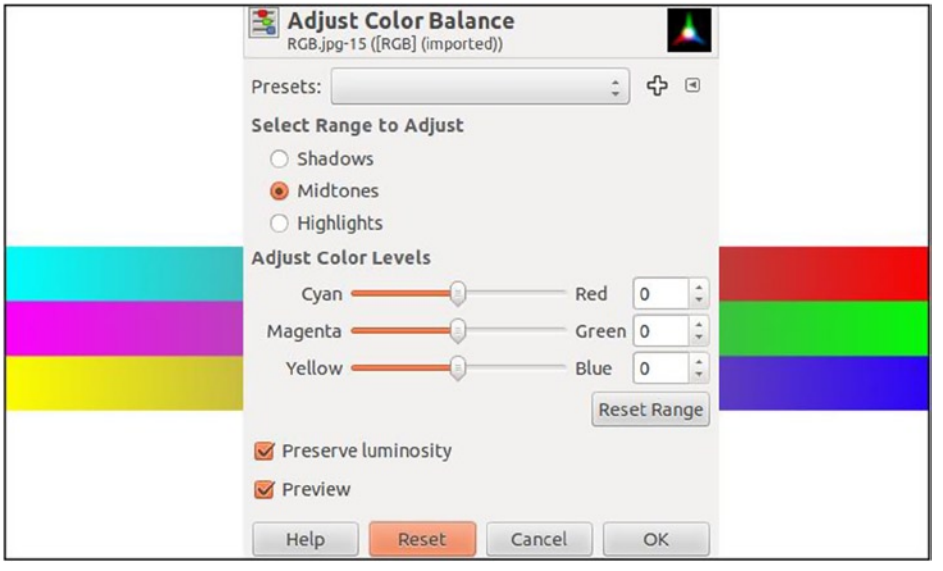

Figure 4-6. *Color Balance involves increasing the offending color's opposite*

Tutorial 9: Correcting a Color Cast (No. 1)

This photo (Figure 4-7) was just one of about a dozen that displayed the same color imbalance, and all wound up with the same blue tinge. In this tutorial, we'll correct this color cast, using the Filter Pack/Hue Variations function on this image.

Figure 4-7. *An image with a color cast*

To correct this image, follow these steps:

1. Open the image (*Ch4_mister cash*) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Color Correction (Figure 4-8).

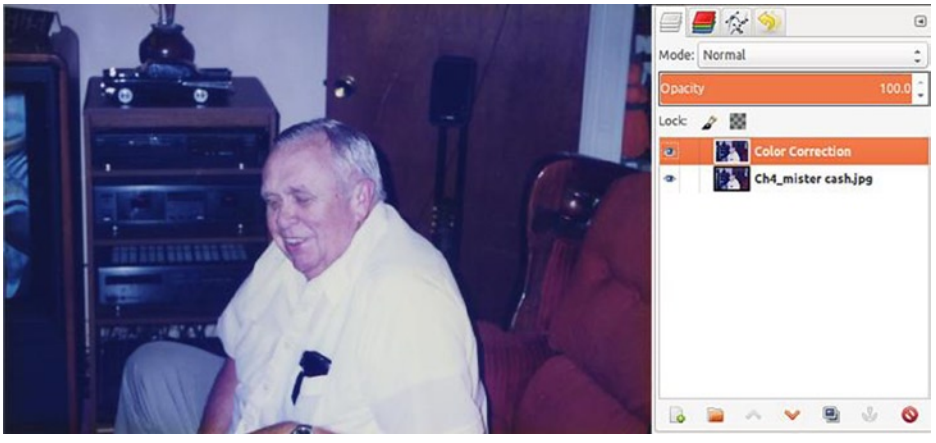

Figure 4-8. *Color correction edits*

3. We can see by merely looking at the image that it has a blue color cast, but because I'd like to encourage you to get in the habit of using the Color Picker tool, go ahead and open it (keyboard shortcut O). Sample from a neutral color area, such as the wall (the pants would work as well). The readout shows a higher percentage of blue than red or green (Figure 4-9).

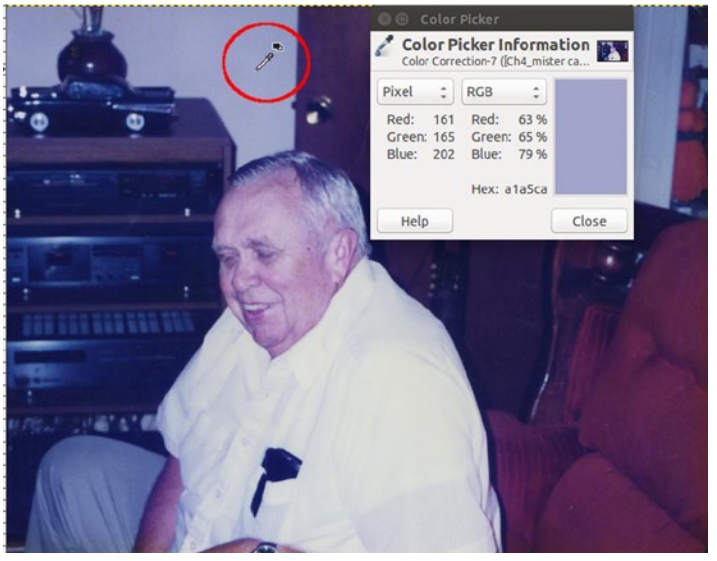

Figure 4-9. *Taking a color sample from the wall*

4. Open the Filter Pack Simulation option (Image Menu ➤ Colors ➤ Filter Pack). This function simulates the use of colored filter gels. Click the Hue option, and the Hue Variations window will open (Figure 4-10).

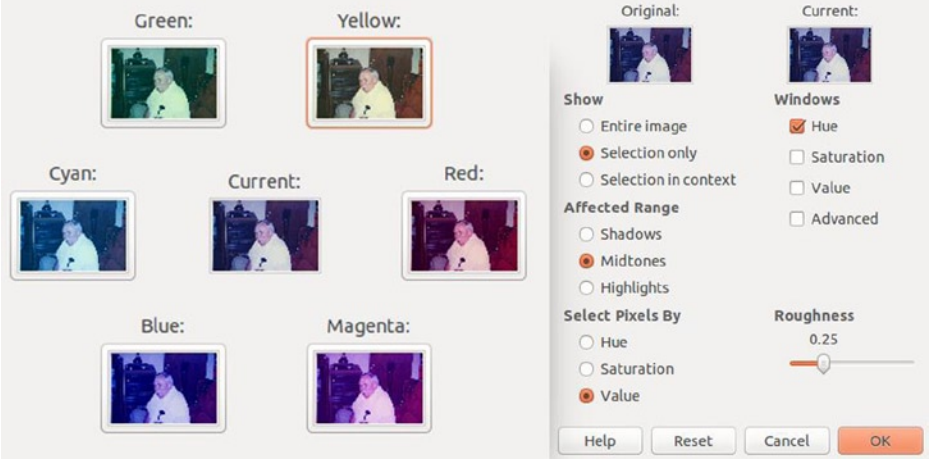

Figure 4-10. *Hue Variations is a good way to correct color casts*

5. As does a color ring, Hue Variations show the opposite of a particular color directly across from it. Because this photo has a blue color cast, we have to click on the opposite color, which would be yellow, to counteract the excess blue.

6. The effect makes the image look much better, but I found the initial result a little too strong, so lowering the layer's opacity to 90% did the trick. The contrast could be bumped up a bit, so at this point, duplicate the background layer and merge the Color Correction layer down (Figure 4-11).

Figure 4-11. *Lowering the layer's opacity a bit, to reduce the effect*

7. Open the Curves dialog box (Image Menu ➤ Colors ➤ Curves). Make a slight S curve, as shown in Figure 4-12 (we just want to bump the contrast up slightly).

Figure 4-12. *A slight S curve will bump up the contrast*

The end result looks much better (Figure 4-13). Slightly increasing the contrast makes the man's undershirt less conspicuous under the thin fabric of the pale yellow shirt. Use the Color Picker tool to sample the wall again. You'll see the percentage of red is now closer to that of the green and blue, resulting in an almost perfectly neutral gray. The Hue Variations function is often all that's needed to correct a color cast—perhaps not in every case, but it's a good place to start.

Figure 4-13. *Before and after comparison*

Tutorial 10: Correcting a Color Cast (No. 2)

This image, taken in the 1980s (Figure 4-14), has a mild color cast. We'll use a "quick fix" method here, which is the Levels auto-setting. I'm generally not a fan of "auto" methods, but they do sometimes have their place and are worth trying before moving on to more complex manual correction methods.

Figure 4-14. *An image with a red color cast*

To correct this image, follow these steps:

1. Open the image (*Ch4_mom and daughter*) found in the Practice Images folder.
2. Duplicate the background layer and rename it Color Correction (Figure 4-15).

Figure 4-15. *Color correction edits will be made on a duplicate layer*

3. We'll now identify the color cast (it might be obvious, but let's double-check anyway). Open the Color Picker tool (O). Sample the darker areas of the mom's pants, which are the most neutral areas in the image (Figure 4-16). The readout indicates an excess amount of red for what should be close to a light gray.

Figure 4-16. *Taking a color sample from the most color neutral part of the image*

4. Open the Levels dialog box (Image Menu ➤ Colors ➤ Levels). Click the Auto button, and in one shot, you get the result below (Figure 4-17). Use the Color Picker tool to sample from the same area of the pants as previously, and you'll see the color percentages match more closely.

Figure 4-17. *The auto feature produced good results*

In this case, the Levels auto-setting did a decent job; it doesn't always. In this case, it looks much better, compared to the original image (Figure 4-18). If you find the effect too intense, lower the opacity of the Color Correction layer.

Figure 4-18. *Before and after comparison*

Correcting and Restoring Color

Restoring faded color is fairly routine in the retouching/restoration profession. As mentioned earlier, color photographs often suffer to varying degrees from the ravages of time and destructive UV light. The following tutorials will demonstrate various methods of restoring lost or shifted colors, in increasing levels of difficulty.

Tutorial 11: Color Correction with Levels (No. 1)

If you recall, we worked on this image in Chapter 3. It was originally overexposed, and the density was restored by using the Multiply layer blend mode (Figure 4-19). The image was improved, but the color still requires some adjustment. Because each color channel has a different tonal value, we're going to make adjustments on each one, to revive both contrast and color.

Figure 4-19. *The colors need some improvement*

To correct this image, follow these steps:

1. Open the image (*Ch4_beach*) found in the Practice Images folder.
2. Duplicate the background layer and rename it Color Correction (Figure 4-20).

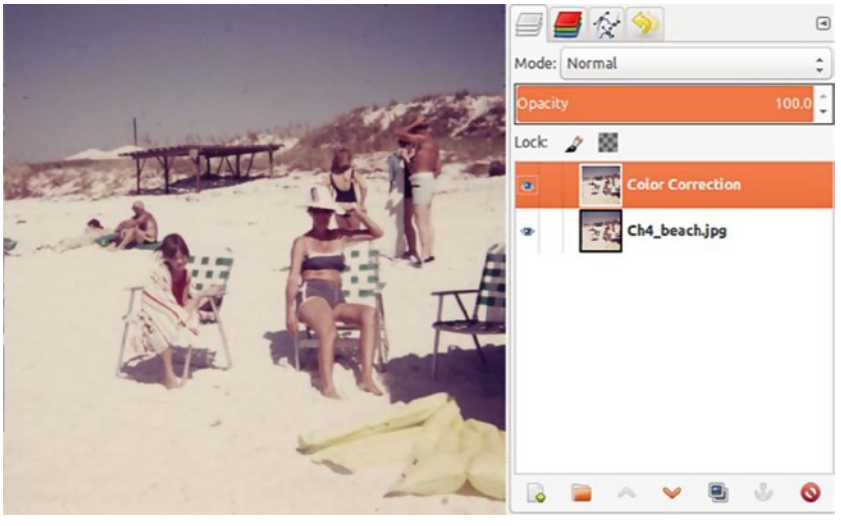

Figure 4-20. *Color correction edits will be made on a duplicate layer*

3. Open the Levels dialog box (Image Menu ➤ Colors ➤ Levels). Because each color channel has a different tonal value, we're going to make adjustments on each one, to revive both contrast and color. In the Channels option, select the Red color channel (Figure 4-21). Move the black point slider to the right, stopping where the image data begins. Move the white point slider to the left, stopping where the image data starts. (Wait until you adjust all three color channels before clicking OK.)

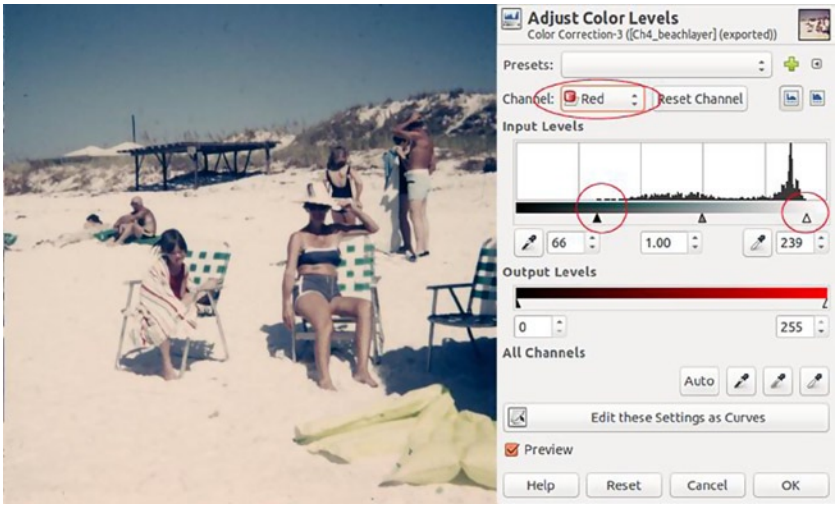

Figure 4-21. *Adjusting the levels in the Red channel*

4. Select the Green color channel and repeat the same steps with the black and white point sliders (Figure 4-22) as previously.

Figure 4-22. *Adjusting the levels in the Green channel*

5. Finally, select the Blue color channel and repeat the same steps with the black and white point sliders (Figure 4-23) and click OK.

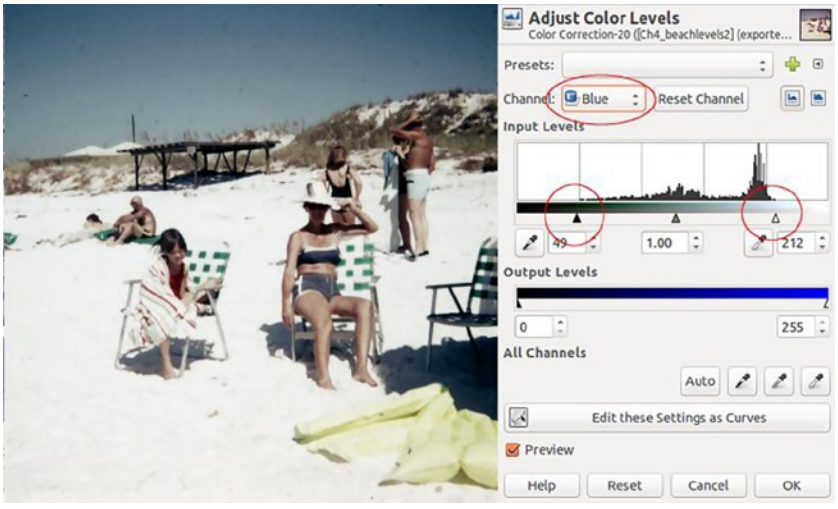

Figure 4-23. *Adjusting the levels in the Blue channel*

After rebalancing each color channel, the final result has improved contrast, and the colors are much better (Figure 4-24).

Figure 4-24. *Before and after comparison*

■ **Note** In Chapter 3, the tonal adjustments made on the grayscale images with Levels used the default Value setting in the dialog box. Grayscale images only have one gray channel. In RGB color images, the Value setting is a composite of the tonal information in the red, green, and blue color channels. Adjusting Levels using the Value setting makes broad color changes in the image, whereas adjusting each color channel is more precise.

Tutorial 12: Color Correction with Levels (No. 2)

In this exercise, we'll be restoring faded color and improving tonality in the following image (Figure 4-25), with Levels. Because each color channel has a different tonal value, we're going to make adjustments on each one, to revive both contrast and color.

Figure 4-25. *This image lost color over the years*

To correct this image, follow these steps:

1. Open the image (*Ch4_girl fishing*) found in the Practice Images folder.
2. Open the Crop tool (Shift + C) and trim the borders away from the image (Figure 4-26), so they don't "contaminate" the adjustment (as discussed in the Introduction).

Figure 4-26. *Cropping the borders, to achieve accurate Levels adjustments*

3. Duplicate the background layer and rename it Color Correction (Figure 4-27).

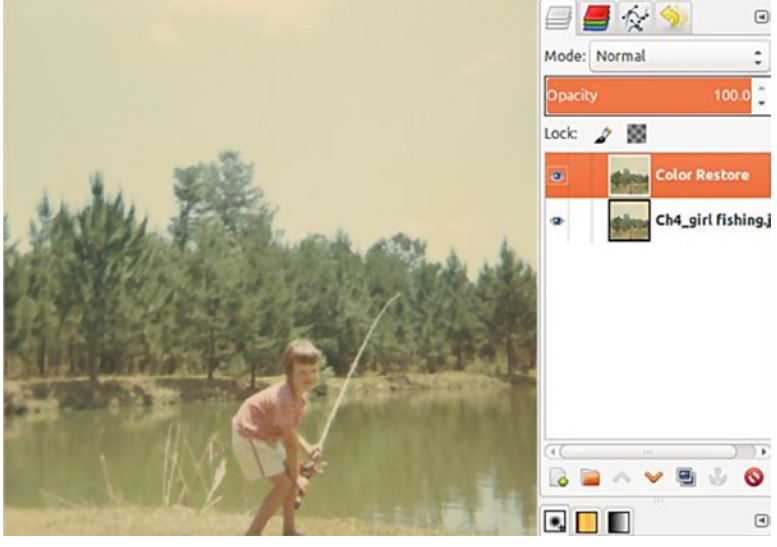

Figure 4-27. *Color correction edits will be made on a duplicate layer*

4. Open the Levels dialog box (Image Menu ➤ Colors ➤ Levels). Because each color channel has a different tonal value, we're going to make adjustments on each one, to revive both contrast and color (Figure 4-28). In the Channels option, select the Red color channel. Move the black point slider to the right, stopping where the image data begins. Move the white point slider to the left, stopping where the image data starts. (Wait until you adjust all three color channels before clicking OK.)

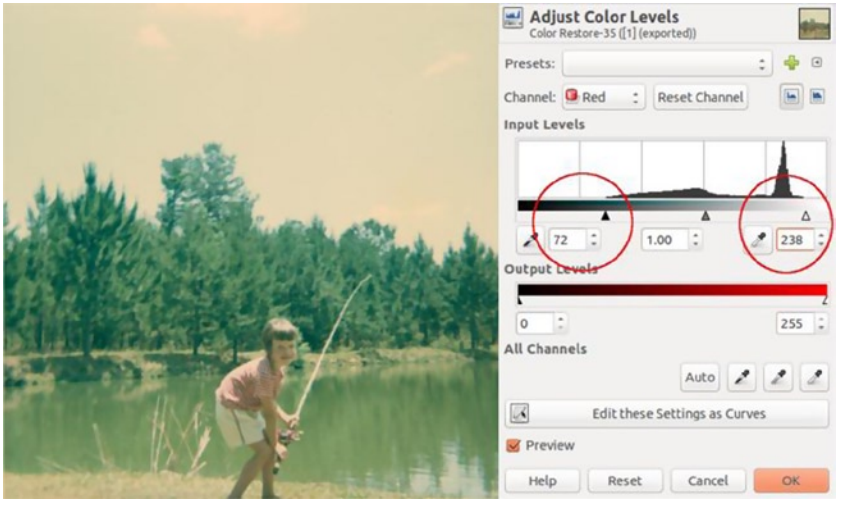

Figure 4-28. *Adjusting the levels in the Red channel*

5. Select the Green color channel and repeat the same steps with the black and white point sliders as before (Figure 4-29).

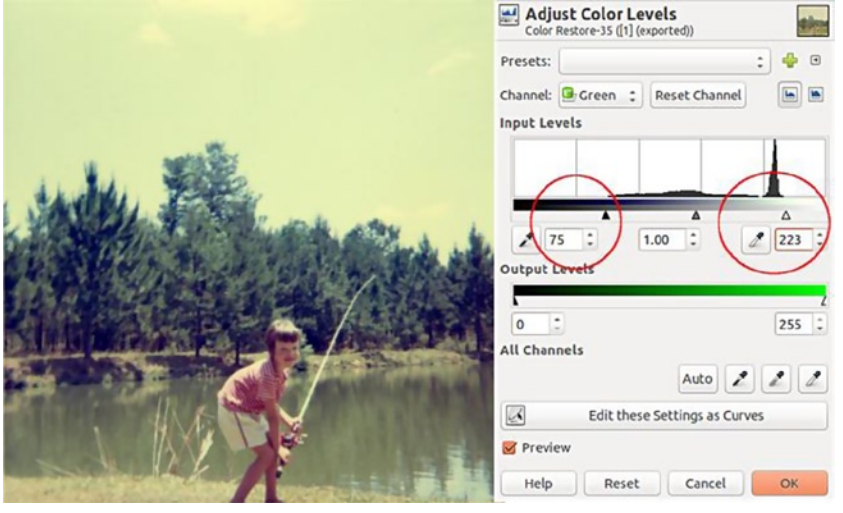

Figure 4-29. *Adjusting the levels in the Green channel*

6. Finally, select the Blue color channel and repeat the same steps with the black and white point sliders as previously (Figure 4-30) and click OK.

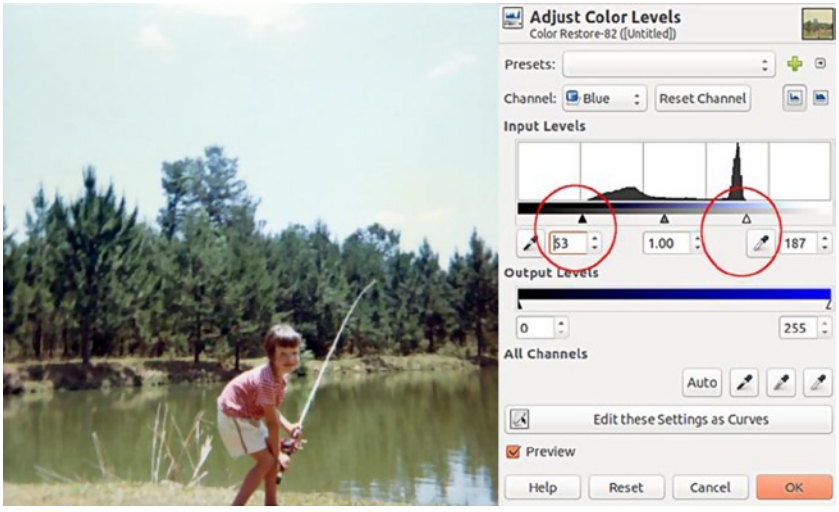

Figure 4-30. *Adjusting the levels in the Blue channel*

The final result is brighter, with enhanced contrast and improved colors (Figure 4-31). The Levels feature can perform minor miracles on color images.

Figure 4-31. *Before and after comparison*

Tutorial 13: Restoring Severe Color Loss

The following image has lost a great deal of color information over the years. The photograph (Figure 4-32) was taken in 1966 and has suffered severely since then. This tutorial will be a little longer than usual. We'll use curves to do the majority of the corrections, but there will be some extra steps required to bring it back to (almost) new.

Figure 4-32. *An image from the mid-1960s with severe color loss*

To correct this image, follow these steps:

1. Open the image (*Ch4_little boy*) found in the Practice Images folder.
2. Open the Crop tool (Shift + C) and trim the borders away from the image (Figure 4-33), so they don't "contaminate" the adjustment (as discussed in the Introduction).

Figure 4-33. *Cropping the borders to achieve accurate curves adjustments*

3. Using the Rotate tool (Shift + R), move the image slightly counterclockwise, to straighten it.
4. Duplicate the background layer and rename it Color Restore (Figure 4-34).

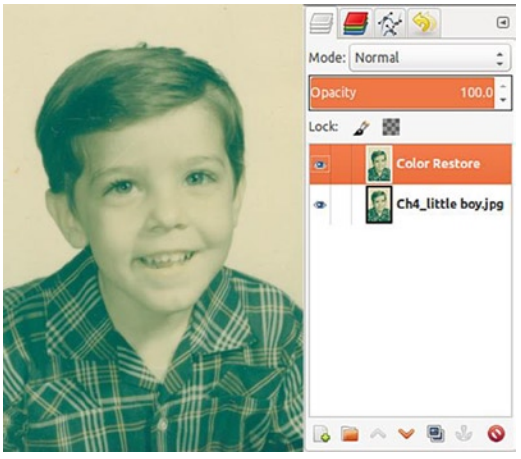

Figure 4-34. *Color correction edits will be made on a duplicate layer*

5. Open the Curves dialog box (Image Menu ➤ Colors ➤ Curves). As in the previous tutorial, because each color channel has a different tonal value, we're going to make adjustments on each one, to revive both contrast and color. In the Channels option, select the Red color channel (Figure 4-35). Move the node to the left, stopping where the image data begins. (Wait until you adjust all three color channels before clicking OK.)

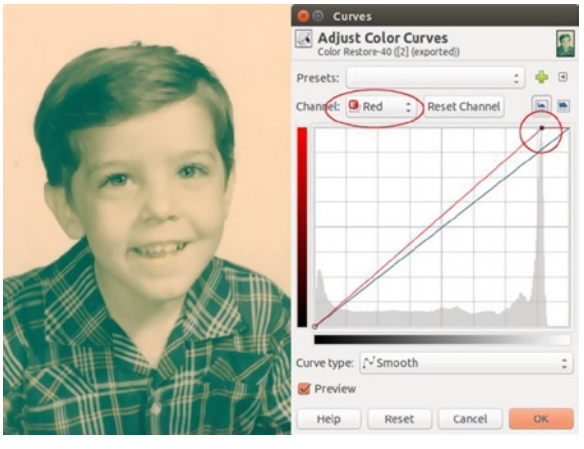

Figure 4-35. *Adjusting the Red channel in the Curves dialog*

6. Select the Green color channel and move the nodes to where the image information begins on the sides of the histogram (Figure 4-36).

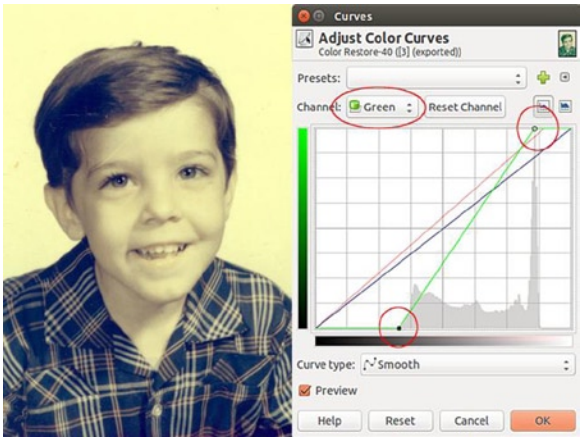

Figure 4-36. *Adjusting the Green channel in the Curves dialog*

7. Select the Blue color channel and move the nodes to where the image information begins on the sides of the histogram (Figure 4-37). *Don't click OK just yet*. We're going to make one more minor Curves adjustment.

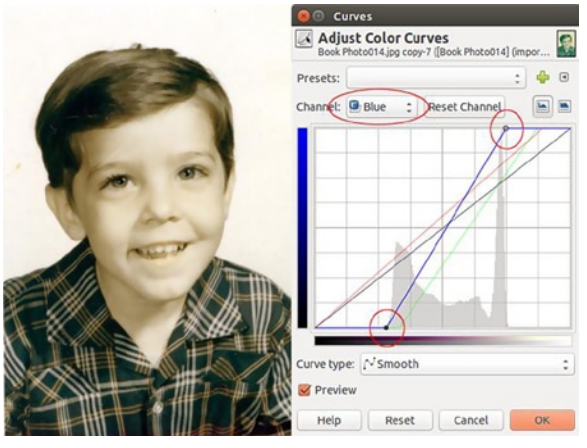

Figure 4-37. *Adjusting the Blue channel in the Curves dialog*

8. The image is now much better. The skin looks pale, so now we'll warm it up just a little. Click the Curves adjustment in the center and pull down just slightly (Figure 4-38). Now you can click OK.

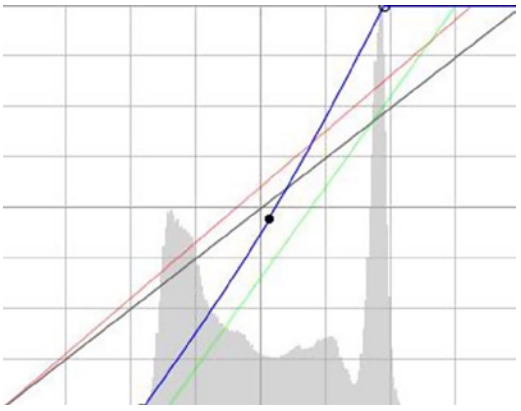

Figure 4-38. *This minor adjustment on the Blue channel warms the image slightly*

9. Now, open the Hue/Saturation dialog box (Image Menu ➤ Colors ➤ Curves). Adjust the Hue setting to -10 and boost the saturation by 10. This will further improve the overall color balance and saturation (Figure 4-39).

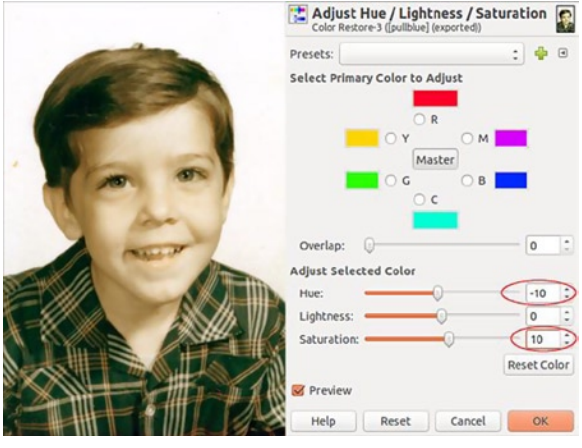

Figure 4-39. *Making further improvements with Hue/Saturation*

10. We'll now replace some of the density that was lost over time. Duplicate the Color Restore layer and rename it Density Restore. Set the blend mode to Multiply and lower the opacity to about 30% (Figure 4-40). Merge the Density Restore layer down to the Color Restore layer.

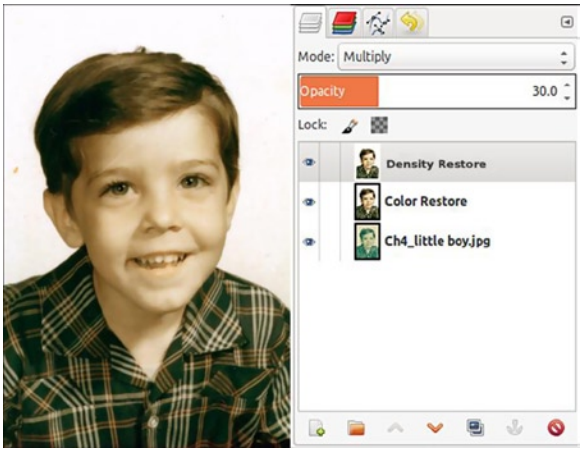

Figure 4-40. *Improving density with the Multiply blend mode*

11. Duplicate the Color Restore layer again.
12. Open the Dodge/Burn tool (Shift + D). In the tool options, use the following settings:
    1. Burn
    2. Midtones
    3. Exposure -15%

Using a large, soft brush, darken the lips slightly on the Color Restore layer copy (Figure 4-41). If you overdo it, you can lower the layer's opacity to reduce the effect.

Figure 4-41. *Darkening the lips slightly with the Burn tool*

13. The darker areas in the hair have a green tinge, so we'll correct that now. Create a new layer and name it Hair. Change the blend mode to Color. Using the Color Picker tool, sample some brown from the hair, to change the active color.

14. Paint over the darker areas using a large, soft brush to paint over the green tinge with brown (Figure 4-42). Lower the layer's opacity some, if necessary.

Figure 4-42. *Removing the green tinge by painting brown over a layer set to the Color blend mode*

15. Create a new layer, set the blend mode to Color and the opacity to about 8%. Using red as the active color and a large, soft brush, paint over the cheeks and ears, to add a little natural coloring. It's a subtle but important touch (Figure 4-43).

Figure 4-43. *Adding a slight amount of red to the cheeks and ears*

The image is now looking more like it should (Figure 4-44). It's amazing how far along GIMP brought this image. The only thing left to do is to clean up the specks, small scratches, and dust. We'll work with this image later, in Chapter 6.

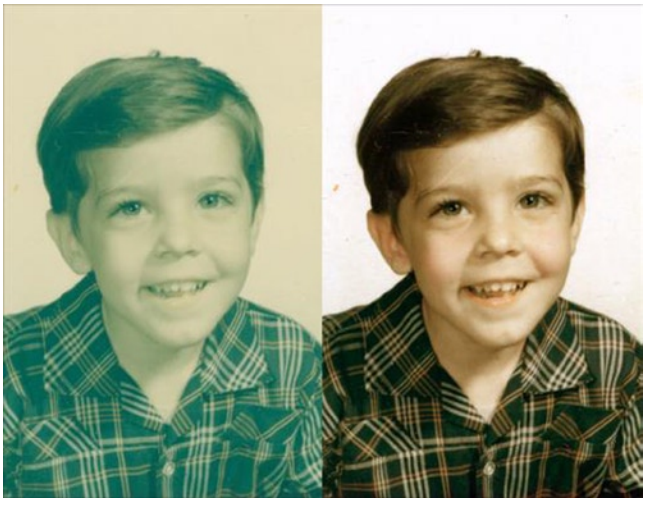

Figure 4-44. *Before and after comparison*

Tutorial 14: Restoring an Uneven Color Shift

This image was displayed in a frame for more than 35 years (Figure 4-45). You can see the portion that was exposed to light has a bluish cast, while the rest of the image, protected by the frame, has a more subtle reddish cast. This tutorial will be even longer than the last one (but not terribly long).

Figure 4-45. *This image had been in a frame for more than 35 years*

1. Open the image (*Ch4_middle school picture*) found in the Practice Images folder.
2. Images with this type of issue often have damage to one of the color channels (usually the blue one). We'll examine the channels in this image to see what we're up against (Image Menu ➤ Colors ➤ Components ➤ Decompose). This will create a separate file and extract the channels as layers (Figure 4-46).

Figure 4-46. *The damage is apparent on the Blue color channel*

3. As you toggle through each layer, you'll see the Blue channel has some tonal damage.
4. Close the decomposed image without saving. (We only needed it long enough to find the damaged channel.)
5. Go back to the practice image, duplicate the background layer, and rename it Color Correction.
6. Using the Freehand tool (F) with the Feather Radius set to 25 pixels, draw a rectangle around the damaged area of the image, extending slightly beyond the damaged portion (Figure 4-47).

Figure 4-47. *A selection drawn around the damaged area*

7. Open the Levels dialog (Image Menu ➤ Colors ➤ Levels). Select the Blue color channel and move the black point slider to the right, where the image data begins (Value setting around 36). Move the midpoint slider to the right (Value setting around 0.88), until the colors in both parts of the image match as closely as possible (Figure 4-48).

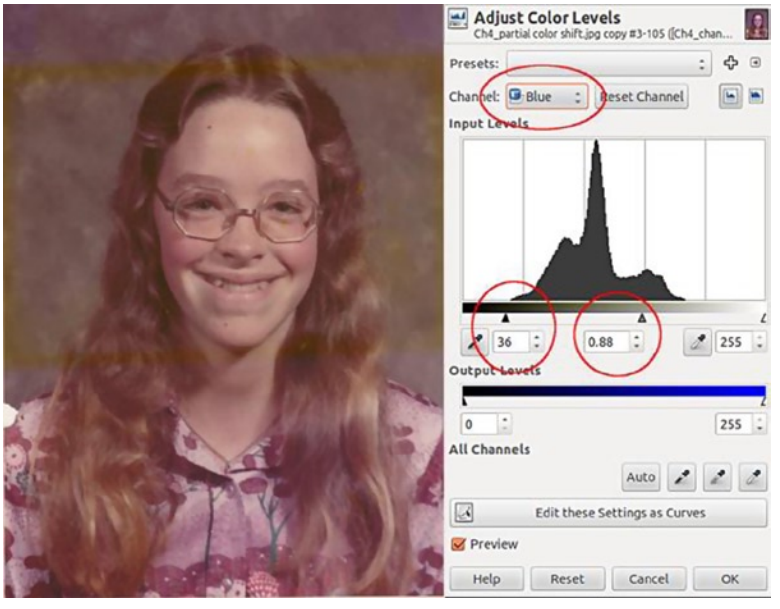

Figure 4-48. *Adjusting the Blue channel brings the image into greater balance*

8. Deactivate the selection (Image Menu ➤ Selections ➤ None). Add a layer mask to the Color Correction layer (Right-click Layer ➤ Add Layer Mask).

9. Using black as the active color and a large, soft brush, paint the yellow tinge out. Vary the brush opacity, if necessary, as you work (Figure 4-49).

Figure 4-49. *Removing the yellow tinge by painting on a layer mask*

10. Now that the image is evened out, duplicate the background layer, then merge the Color Correction layer down onto the background layer copy. (It will now have the same name as the background layer.)

11. Duplicate the layer and rename it Levels Correction. Open the Levels dialog (Image Menu ➤ Colors ➤ Levels). We're going to adjust each color channel to further correct the color and tone in the image. First, select the Red color channel, and move the black point slider to the right, until the value is about 56. Move the white point slider slightly to the left, until the value is about 233. The midpoint slider should be set at about 1.15 (Figure 4-50).

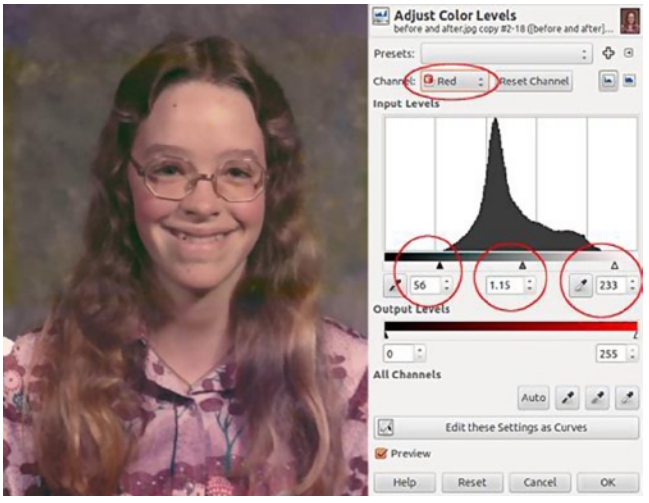

Figure 4-50. *Adjusting the levels in the Red channel*

12. Select the Green color channel and move the black point slider to the right, until the value is about 30. Move the white point slider to the left, until the value is about 218. The midpoint slider should be set to around 1.17 (Figure 4-51). Wait until you adjust all three color channels before clicking OK.

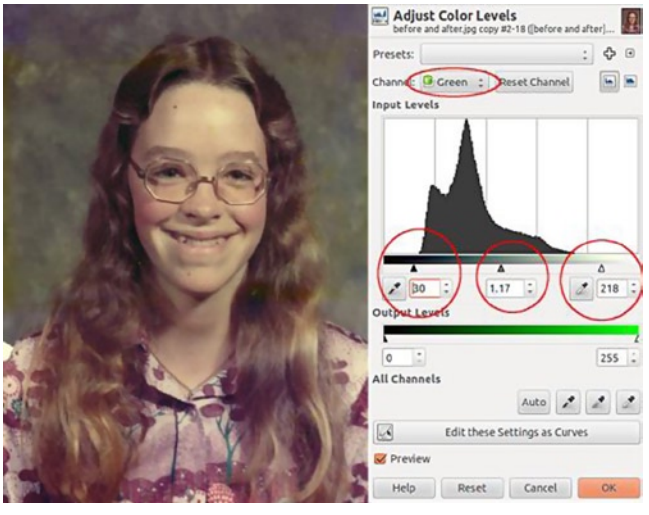

Figure 4-51. *Adjusting the levels in the Green channel*

13. Select the Blue color channel and move the black point slider to the right, until the value is about 30. Move the white point slider to the left, until the value is about 218. The midpoint slider should be set to around 1.17 (Figure 4-52).

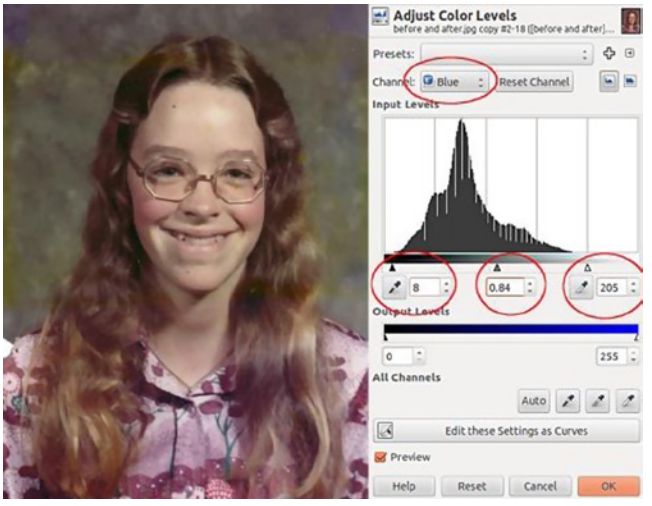

Figure 4-52. *Adjusting the levels in the Blue channel*

14. Create a new layer and name it Background Color. Set the blend mode to Color.

15. Using the Color Picker tool, sample some blue from the background in the image's upper right-hand corner. Paint on the Background Color layer, to replace some of the blue that faded out (Figure 4-53).

Figure 4-53. *Replacing the blue in the background*

16. Create a new layer, name it Skin, and change the blend mode to Color. Sample an area from the face and paint over remnants of the yellow tinge on it, to even out the color. Re-sample as you go along (Figure 4-54).

Figure 4-54. *Painting over remnants of the yellow stain*

17. Create a new layer, set the blend mode to Color, and name it Hair. Sample from an area of lighter colored hair and paint, to even out the hair color (Figure 4-55).

Figure 4-55. *Evening out the hair color*

18. After cleaning up some minor spots and blemishes, and boosting the saturation about 15%–20%, the end result turns out well (Figure 4-56).

Figure 4-56. *Before and after comparison*

Summary

Color correction is a vital part of the photo retouching and restoration world. Being familiar with the additive and subtractive color models, color channels, and use of the Color Picker tool helps in making color corrections. Color casts are common in both old and newer photographic images, and GIMP has numerous options for correcting them.

GIMP is capable of restoring images with severe color loss, through such powerful features as Levels and Curves and layer blend modes, and by adjusting damaged color channels. In the next chapter, we'll look at ways to enhance images through the creative use of color, such as digital sepia toning and colorizing grayscale images.

CHAPTER 5

Creative Use of Color

In This Chapter

- Reimagine Your Pictures
- Converting Color into Black and White
- Digital Sepia Toning
- Selective Colorizing
- Colorizing Black and White Images

Reimagine Your Pictures

GIMP is the ideal program to reimagine your favorite images. Transport pictures back in time by converting them into black and white or sepia tone. You can give an old black-and-white portrait a new dimension by colorizing it. With GIMP and some imagination, you can be as creative as you want with the images you work with.

Converting Color into Black and White

The widespread availability of color photography certainly revolutionized the industry. I mentioned in the previous chapter how color opened up a new world to our photograph-viewing pleasure. However, black and white is still enjoyed by many. Some images you capture will just naturally seem to lend themselves to black and white—it's basically working with color in reverse (for lack of a better phrase).

It might seem that converting a color image into black and white is just a matter of draining the color away. You can simply use the Hue/Saturation dialog and reduce the color saturation to zero. While that does work, in the sense that it removes color, it will often leave behind an image that is flat, dull, or even unnatural looking, depending on the colors in the original image (see Figure 5-1). There is usually some tweaking required to achieve optimal results. An ideal black-and-white image has a wide range of grays, with deep, rich shadows for the darkest areas and bright highlights, without being washed out to pure white (except for specular highlights, such as reflection of light off of chrome).

■ **Note** You've probably noticed that I've used the term *grayscale* in earlier chapters when referring to what are normally known as black-and-white images. Grayscale is technically the proper term to refer to a digital image that is made up of black, white, and shades of gray. In the world of photography, such an image is typically referred to as black-and-white, so for the purposes of this book, I use the terms interchangeably.

In the following example (Figure 5-1), you can see the image in the center looks a bit flat—especially the woman in the pink dress with the dark tan. This was the result of using the Hue/Saturation dialog to simply remove the color. The black-and-white image at the bottom of Figure 5-1 was achieved by using the Decompose dialog, to separate the image into its Red, Green, and Blue color channels as layers. For the woman in pink, the best tonal information is in the Red channel, so I used a layer mask with light gray as the active color, to refine her image, and various grays and black for other parts of the image, to fine-tune it.

Figure 5-1. *Using the Hue/Desaturation dialog vs. fine-tuning the color channels converted to layers*

By finishing off with a slight S curve, I achieved a better black-and-white image. (Notice that the woman's dress doesn't look so flat, and the skin looks more natural.)

Tutorial 15: Converting Color to Black and White (No. 1)

The first method of converting a color image to black and white is relatively straightforward and will generally work well for making quick conversions.

To convert this image, follow these steps:

1. Open the image (*Ch5_old church*) found in the Practice Images folder.
2. Duplicate the background layer and rename it Black and White Layer.
3. Open the Desaturate dialog box (Image Menu ➤ Colors ➤ Desaturate). This is different from the Hue/Saturation dialog. It offers a choice of shades of gray, based on Lightness, Luminosity, or Average (Figure 5-2).

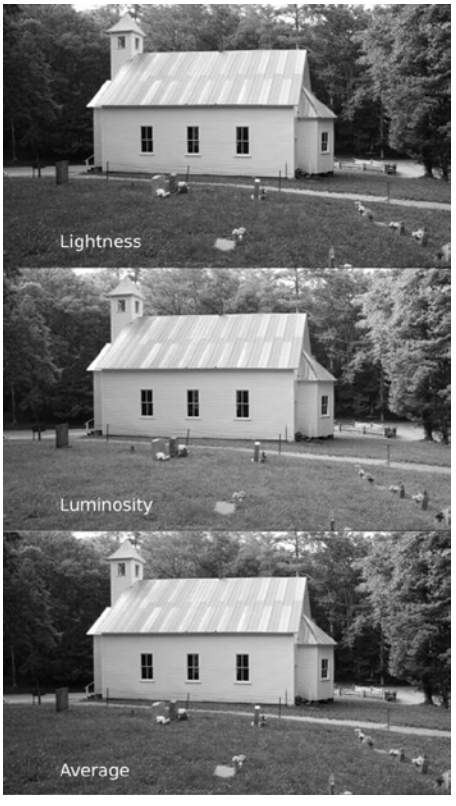

Figure 5-2. *The Desaturate dialog offers some limited but often useful options for converting color images to black and white*

Determining which option to choose really depends on what looks best to you. As with many aspects of image editing, there is an element of subjectivity involved. Personally, I thought the Luminosity setting looked the best, so I chose this option. It works very well for a quick conversion. (Figure 5-3).

Figure 5-3. *Before and after comparison*

Tutorial 16: Converting Color to Black and White (No. 2)

Using the Channel Mixer for converting color into black and white offers a greater degree of fine-tuning but takes some time and practice. It's worth the effort, so that you can end up with superb color to black-and-white conversions.

To convert this image, follow these steps:

1. Open the image (*Ch5_old church*) found in the Practice Images folder.
2. Duplicate the background layer and rename it Black and White Layer.
3. Open the Channel Mixer dialog box. Check the Monochrome and Preserve Luminosity options.
4. Experiment with the settings until you get the result you want. I found, for my liking, the following settings were about right: Red 190.9, Green 124.2, and Blue -18.2 (Figure 5-4).

Figure 5-4. *Fine-tuning color to black-and-white conversions with the Channel Mixer creates an image with good contrast*

This method is worth investing some time and practice in, when using the first "quick" method of conversion doesn't quite give you the results you want. In this case, the result was only marginally better. If you are converting a color image that has a damaged color channel into black and white, this method can make a world of difference in the finished version.

Tutorial 17: Converting Color to Black and White (No. 3)

As we briefly saw earlier, another way of converting color images to black and white is to use the Decompose dialog, to create a new image with the separated color channels as layers. This method offers a great deal of control in the final outcome, because you can use the best attributes from each channel, employing a layer mask (or masks).

We'll convert this wedding photo (Figure 5-5) into black and white, by working with the Decompose dialog.

Figure 5-5. *A wedding color photo that would look great as a black-and-white image*

To convert this image, follow these steps:

1. Open the image (*Ch5_just married 2000*) found in the Practice Images folder.
2. Open the Decompose dialog (Image Menu ➤ Colors ➤ Components ➤ Decompose). Choose the default RGB Color Model setting and select the Decompose to Layers option.
3. The image will appear in black and white, with the Red channel on top (Figure 5-6).

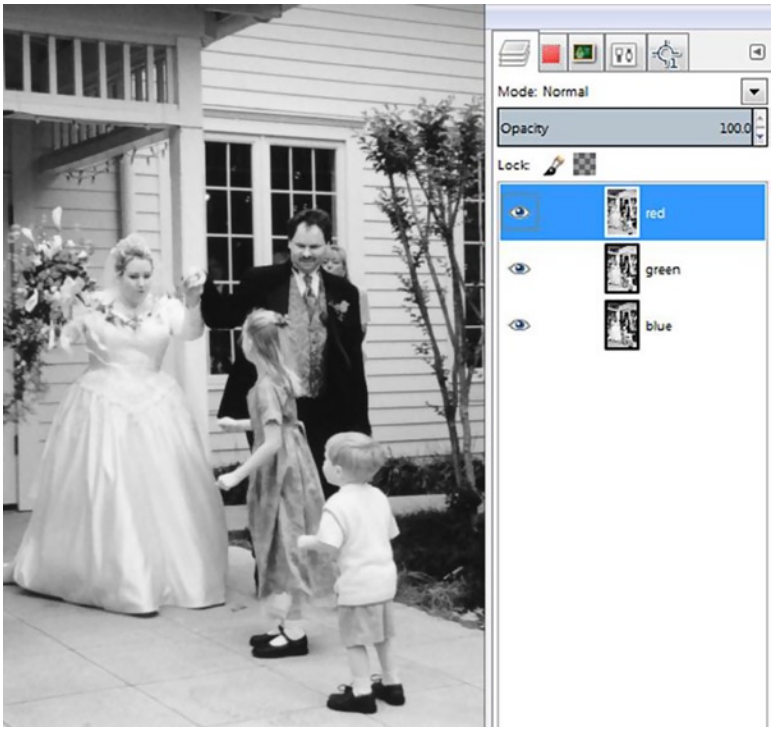

Figure 5-6. *The color image split into the Red, Green, and Blue color channels. Red is at the forefront*

4. Right-click the active layer (Red) and add a layer mask from the drop-down menu.
5. Using a soft brush and a 25%–35% gray as the active color, paint the faces of the bride and groom and the red flowers, to reveal some of the tonal information of the layer (green) underneath. Use black to paint the heads of the children and the top of the small tree (Figure 5-7).

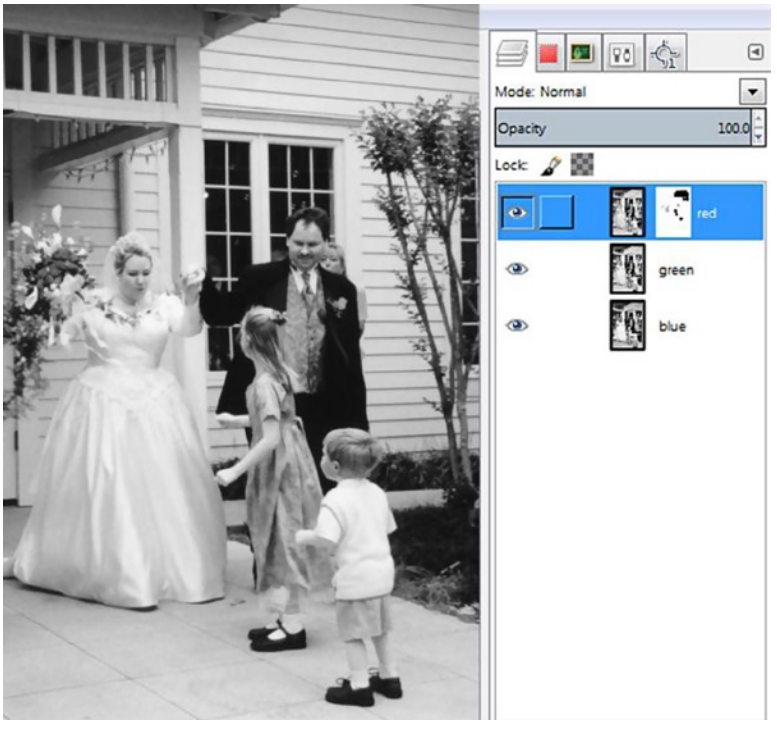

Figure 5-7. *Using a layer mask to fine-tune the results*

As we've seen in these tutorials, achieving good color to black-and-white conversions requires some degree of manual control, but it's worth it to take the time to practice. You'll develop a keen ability to create aesthetically pleasing black-and-white images (Figure 5-8).

Figure 5-8. *Before and after comparison*

Digital Sepia Toning

GIMP can effectively emulate the effect of sepia toning. In the traditional darkroom method, a chemical process is used on silver-based black-and-white photographic prints to give them a warm, brownish tone. Many photographs from the late 1800s and early 20th century are sepia toned. There are several ways to digitally apply a sepia tone using GIMP. We'll look at two in this chapter.

In the way that some images lend themselves to conversion from color to black and white, some can also be enhanced (or just given an artistic element) by applying a sepia tone. It works well with images such as the church we worked with previously. Like conversion to black and white, sepia toning seems to take an image back in time.

Tutorial 18: Converting Color to Sepia (No. 1)

We're going to work with the same image of the church that was converted to black and white in the previous tutorial. This first method is a very easy and quick way to produce a sepia tone.

To convert this image, follow these steps:

1. Open the image (*Ch5_old church*) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Sepia Layer. Open the Colorize dialog box (Image Menu ➤ Colors ➤ Colorize) and set the Hue slider to a value of about 30 and the Saturation to around 40 (Figure 5-9) and click OK. If you decide you don't like the results, just undo the effect (Control + Z) and start over.

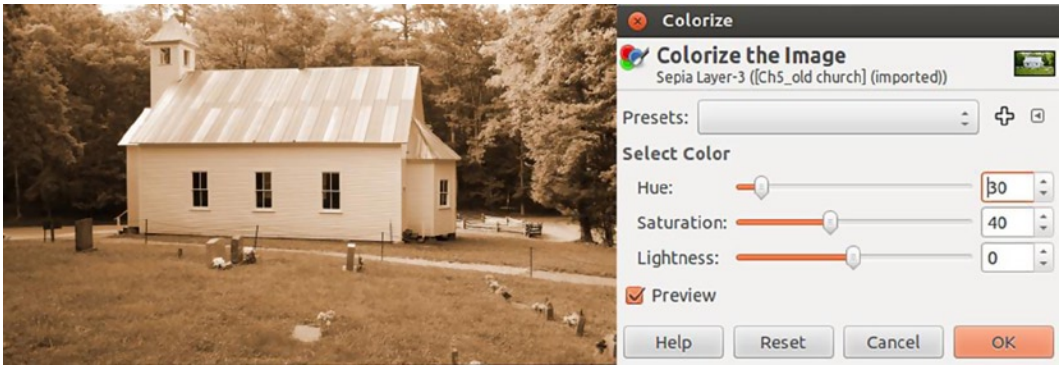

Figure 5-9. *Using the Colorize dialog to apply a sepia tone to this image*

Tutorial 19: Converting Color to Sepia (No. 2)

In this tutorial, we'll use a different approach to achieve a sepia tone. Although the method is different, the results are similar. I prefer this way of applying a sepia tone, but the previous method is no less valid.

To convert this image, follow these steps:

1. As in the previous lesson, open the image (*Ch5_old church*) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Black and White Layer.
3. Create a new layer (Shift + Control + N) and name it Sepia. Change the blend mode to Color.
4. Fill the Sepia Layer with a brown-orange color. If you'd like to duplicate the same color used in this lesson, double-click the foreground color swatch and enter the values R 176, G 116, and B 62 in the Change Foreground Color dialog (Figure 5-10).

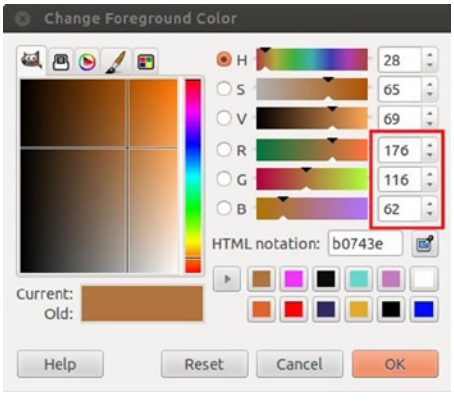

Figure 5-10. *The Change Foreground Color dialog*

5. Using the Bucket Fill tool (Shift + B), fill the Sepia Layer. The image will now have a sepia appearance (Figure 5-11).

Figure 5-11. *Sepia tone applied to a layer set to the color blend mode*

You might prefer a more subtle sepia tone. If you want to reduce the sepia effect, simply lower the layer's opacity. In the following example (Figure 5-12), the effect is less intense.

Figure 5-12. *Lowering the layer's opacity reduces the sepia effect*

Selective Colorizing

If you've ever seen the 1998 movie *Pleasantville,* then selective colorizing will probably seem familiar. In the movie, a teenage boy and his twin sister are transported into a fictional 1950s black-and-white sitcom. As the movie progresses, color begins to emerge here and there, mixed with a world made up of shades of gray.You can create some interesting images using this technique. I like to use it sparingly, by accenting a black-and-white image with small splashes of color. It's a fun technique to experiment with. Give it a try, using your own images.

Tutorial 20: Mixing Color with Black and White

This is the image we converted into black and white earlier. It is also a good subject for selective colorizing (Figure 5-13).

Figure 5-13. *A good image for mixing color and black and white*

To convert this image, follow these steps:

1. Open the image (*Ch5-selective color*) found in the Practice Images folder. This is a `.PSD` (Photoshop) file with two layers.

■ **Note** I chose to use a `.PSD` format, in case there are some readers who might be using Adobe Photoshop instead of GIMP for these tutorials. GIMP is perfectly capable of handling these files.

2. Right-click the Black and White Layer and add a layer mask from the drop-down menu (Figure 5-14).

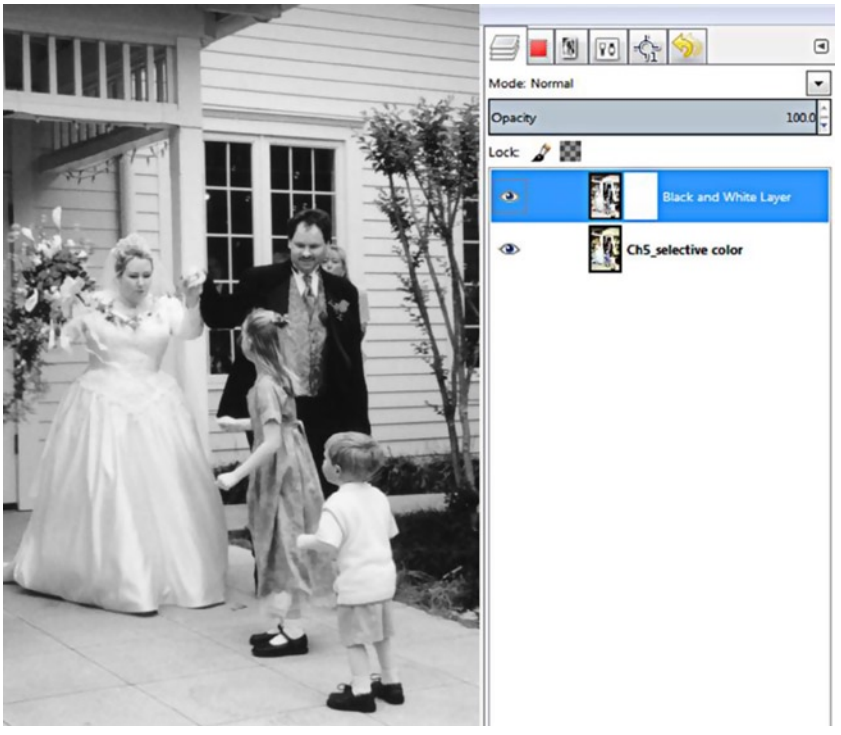

Figure 5-14. *A layer mask added to the Black and White Layer*

3. Choose a soft brush with black as the active color and paint on the flowers, the girl's hair bow, etc., to reveal color from the layer beneath (Figure 5-15). You can do more than what is shown, if you'd like to play around. If you don't like your results, switch to white and add the gray back to the areas where you don't want any color (Figure 5-15).

Figure 5-15. *Before and after comparison*

Tutorial 21: Mixing Color with Sepia

In this tutorial, we'll be mixing color with sepia. In this instance, the colors will be more muted, giving the image a unique look. Figure 5-16 shows the image we will be converting.

Figure 5-16. *The original image to convert to a sepia/color mix*

To edit this image, follow these steps:

1. Open the image (*Ch5_old church 2*) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Sepia.
3. Open the Colorize dialog box (Image Menu ➤ Colors ➤ Colorize), set the Hue slider to a value of about 30 and the Saturation to about 40 (Figure 5-17) and click OK.

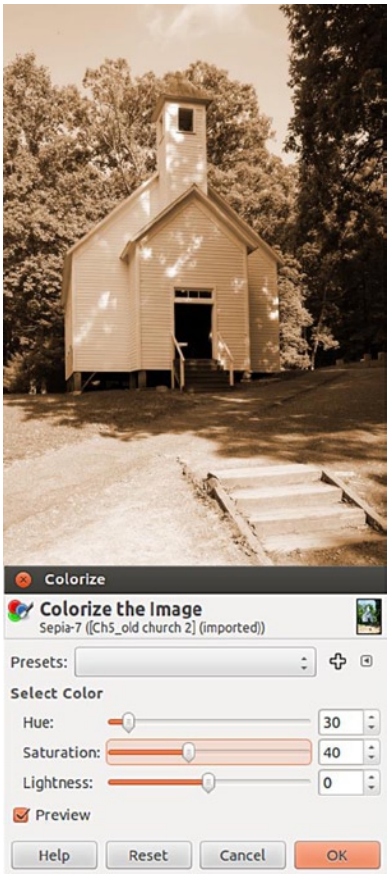

Figure 5-17. *Using the Colorize dialog to apply a sepia tone to the image*

4. Add a layer mask to the Sepia Layer (Right-click Layer ➤ Add Layer Mask).
5. Activate the background layer by clicking it. Choose the Select by Color tool (Shift + O). Check the Feather Edges option and set the Radius to 10 pixels. Set the Threshold to 25.
6. Click inside the sky area (Figure 5-18).

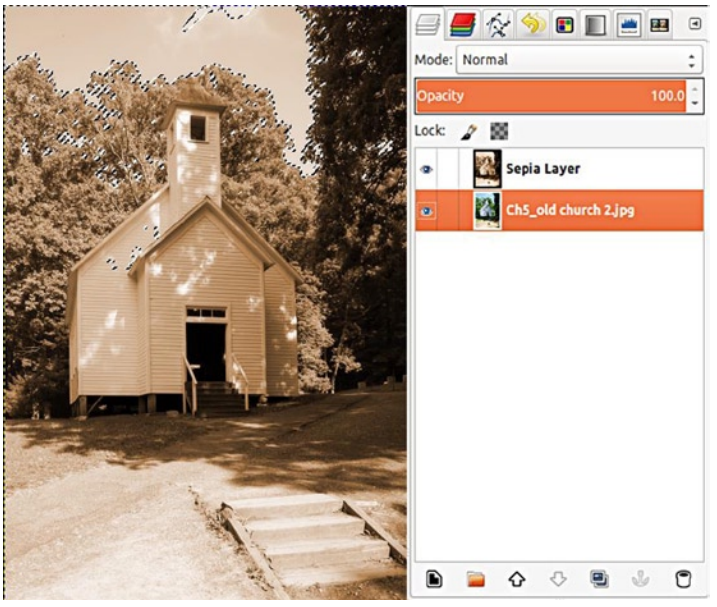

Figure 5-18. *Selecting the sky, using the Select by Color tool*

7. For parts of the sky that weren't selected, choose the Free Select tool (F) and add to the selection by holding the Shift key and drawing around those areas (Figure 5-19). For areas that were selected but shouldn't have been, hold the Control key and draw around those areas, to subtract them.

Figure 5-19. *Using the Free Select tool to add to the selection*

8. Click the layer mask to activate it. Double-click the foreground color swatch and choose a middle gray (about 50%). Using the Bucket Fill tool (Shift + B), fill in the selected area to reveal the blue in the sky. It will be muted, because we used gray (Figure 5-20).

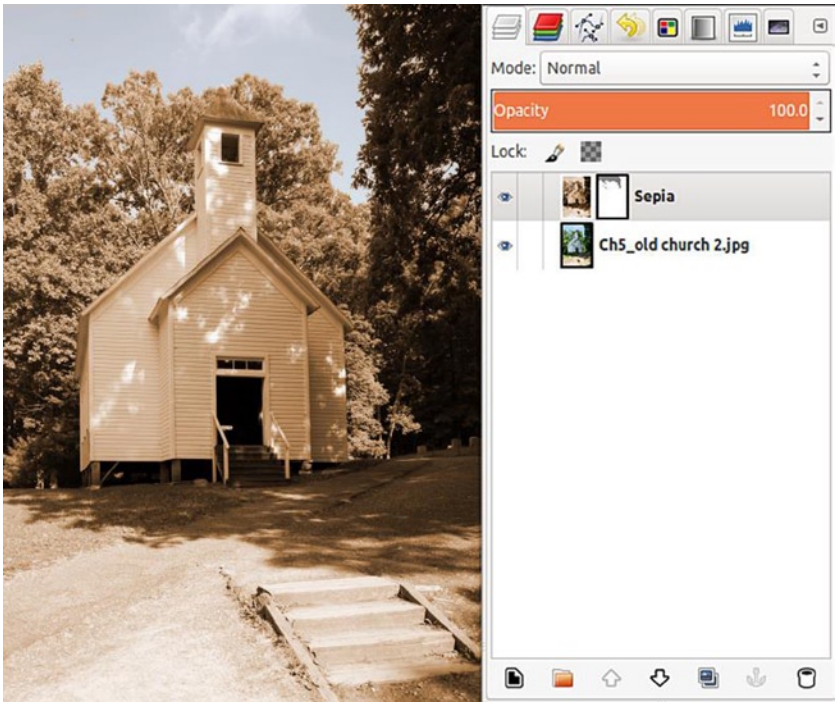

Figure 5-20. *The gray in the layer mask reveals a muted blue sky*

9. Choose a soft brush and paint around on the layer mask with various shades of middle-range and darker grays, revealing subtle colors throughout the image (Figure 5-21).

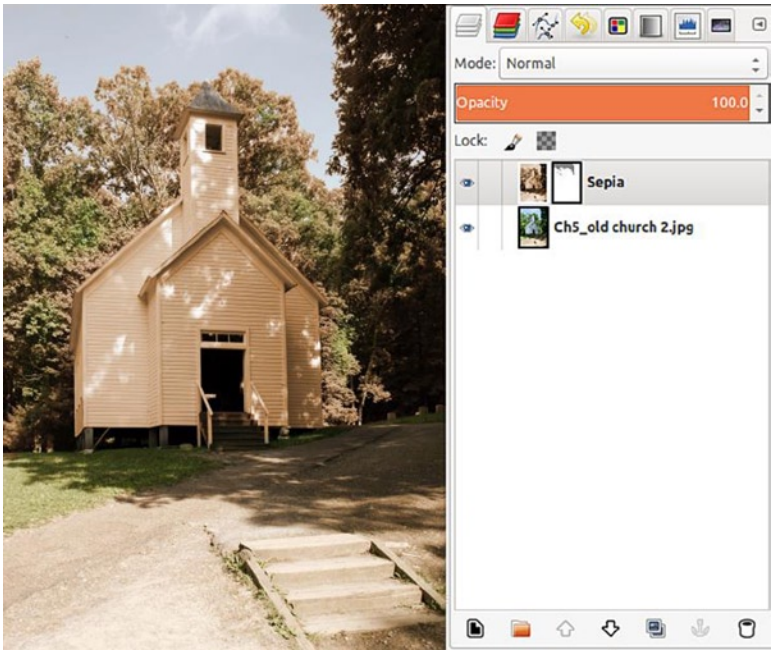

Figure 5-21. *Painting with various grays on the layer mask to reveal subtle colors*

The end result is an image with a quaint, vintage look (Figure 5-22). You can vary the results by painting on the layer mask with black (which will reveal full color), various grays, and white (which will completely mask the colors).

Figure 5-22. *Before and after results*

Colorizing Black-and-White Images

I must admit this is one of my favorite editing activities. It's almost like working on a grown-up version of a coloring book—but with much better results. Adding color to old black-and-white images is requested by my clients fairly often, so it's a good skill to acquire for those offering their services professionally.

Tutorial 22: Colorizing Black-and-White Images

In this tutorial, we'll colorize an old family photo from the mid-1950s (Figure 5-23).

Figure 5-23. *1950s image perfect for colorizing*

In this lesson, I'll provide the skin and hair values. The rest you can approximate, if you like. You don't have to match the clothing, wall, or table covering exactly. You can use the Hue/Saturation dialog (Image Menu ➤ Colors ➤ Hue/Saturation) on any layer you colorize to change the hue.

To colorize this image, follow these steps:

1. Open the image (*Ch5_colorize little boy*) found in the Practice Images folder.
2. Duplicate the background (Shift + Control + D) and rename it Edit Layer.
3. Create a new layer (Shift + Control + N) and name it Skin (or Skin Tone). Change the layer's blend mode to Color.
4. Using the Change Foreground Color dialog, pick a flesh color. You can double-click the foreground color swatch and input the values R 247, G 202, and B 153 in the Change Foreground dialog (Figure 5-24).

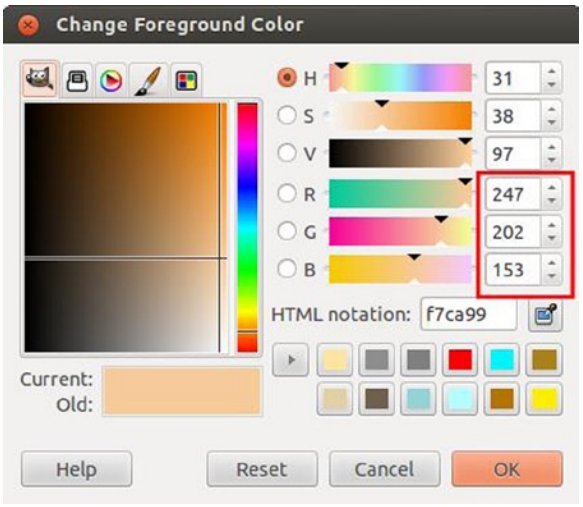

Figure 5-24. *The values to enter for flesh color*

5. Lower the Skin Layer's opacity to 30%–35% and paint in the flesh color, using a soft brush (Figure 5-25). You'll have to vary the brush size as you work, enlarging it to cover large areas and reducing it to paint small areas.

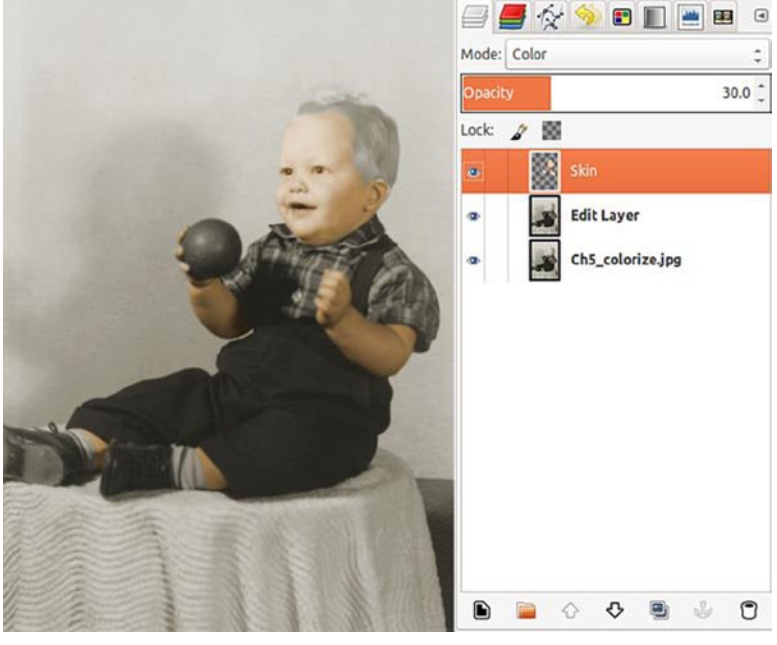

Figure 5-25. *Painting a translucent flesh color on a layer set to the Color blend mode*

6. Add a layer mask to the Skin Layer (Right-click Layer ➤ Add Layer Mask). Using a small, soft brush and a middle gray as the active color, paint on the layer mask to remove some of the skin color from the eyes (Figure 5-26).

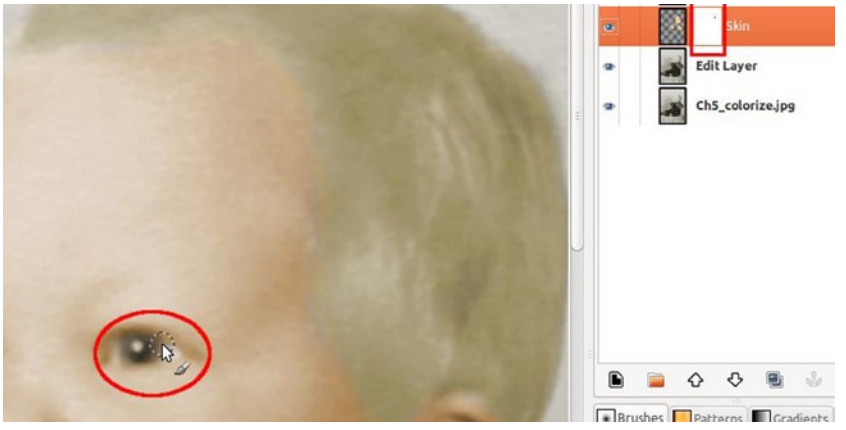

Figure 5-26. *Removing some of the color by painting on a layer mask*

7. Create a new layer (Shift + Control + N) and name it Hair. Change the layer's blend mode to Color.

8. Using the Change Foreground Color dialog, pick a pale yellow to use for a very light blond. The values used here are R 254, G 229, and B 162, which can be entered in the Change Foreground Color dialog.

9. Lower the Hair Layer's opacity to about 20%, and paint the blond color in, using a soft brush. You'll have to vary the size of the brush as you work, enlarging it to cover large areas and reducing it to paint small areas.

10. Repeat this process with the overalls, ball, socks, shoes, etc. All the layers will be set to the Color blend mode, with the opacity varying from 30% to 35%. You'll have to experiment some to get the look you want (Figure 5-27). Add layer masks to your layers, if you have to remove any excess color from around the edges.

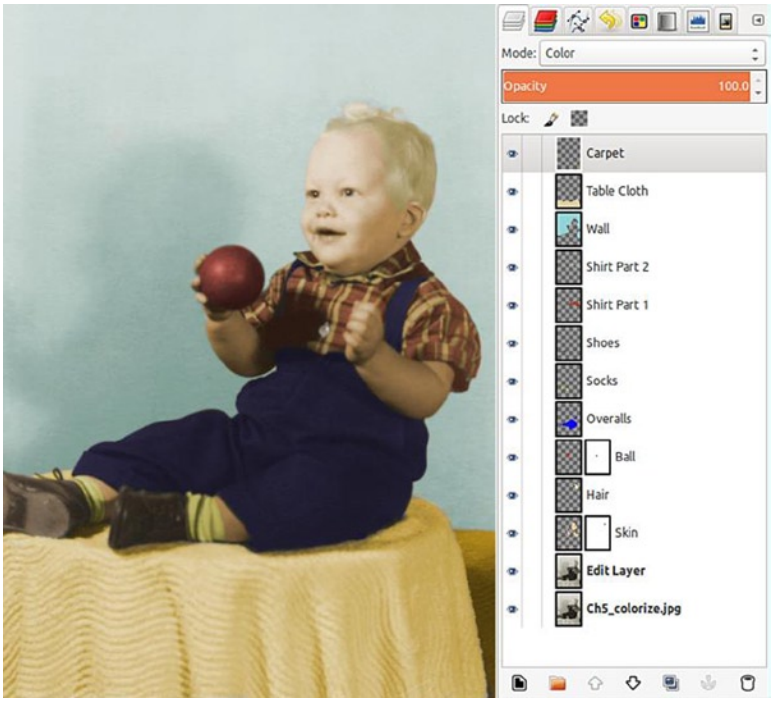

Figure 5-27. *Adding color on layers set to the Color blend mode*

11. The finishing touches will be the eyes and the face. Create a new layer (Shift + Control + N) and set the blend mode to Color. Paint a little light blue to color the eyes. Don't over do it, so that it will look natural. The layer opacity should be about 15%.

12. Last, create a new layer (Shift + Control + N) and set the blend mode to Color. Paint some red on the lips, cheeks, and ear. This layer will require low opacity—about 9%–10%. Even set that low, I added a layer mask (Right-click Layer ➤ Add Layer Mask) and painted away some of the excess red from the cheeks, using a mid-gray as the color. You want just a *hint* of red, for a look as close to natural as possible (Figure 5-28).

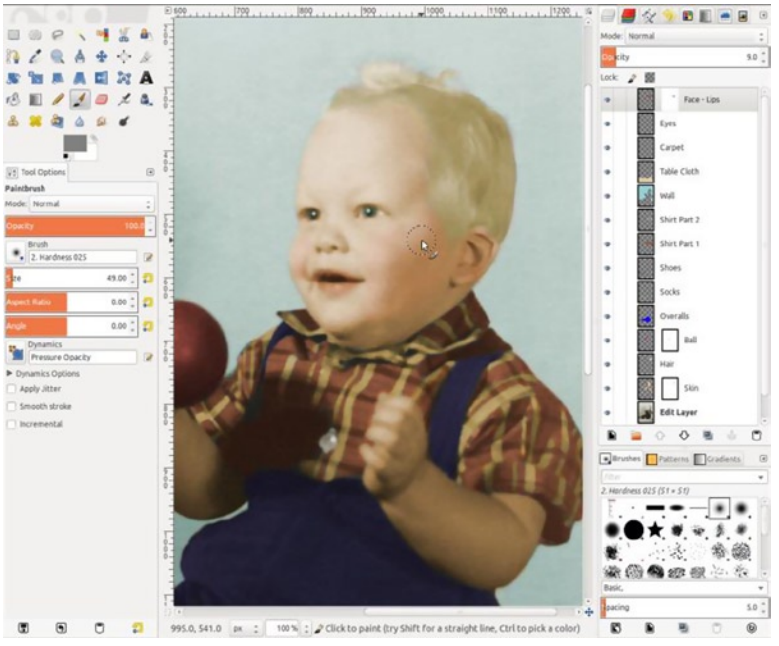

Figure 5-28. *Finishing with a hint of red in the cheeks*

Your version may look a little different from this one. It's okay to choose different colors for the wall, tablecloth, etc. The main thing is making the eyes, skin, lips, and hair look as natural as possible. For the wall and table covering, I chose colors that looked like they would fit the time period, but they can be varied.

One thing to remember when colorizing images is that it's better to have colors that are a little undersaturated than too saturated. Oversaturation doesn't look natural. That's why it's important to use a separate layer for everything you colorize. You want to be able to fine-tune color intensity by adjusting layer opacity. With practice, you can achieve results that look reasonably realistic (Figure 5-29).

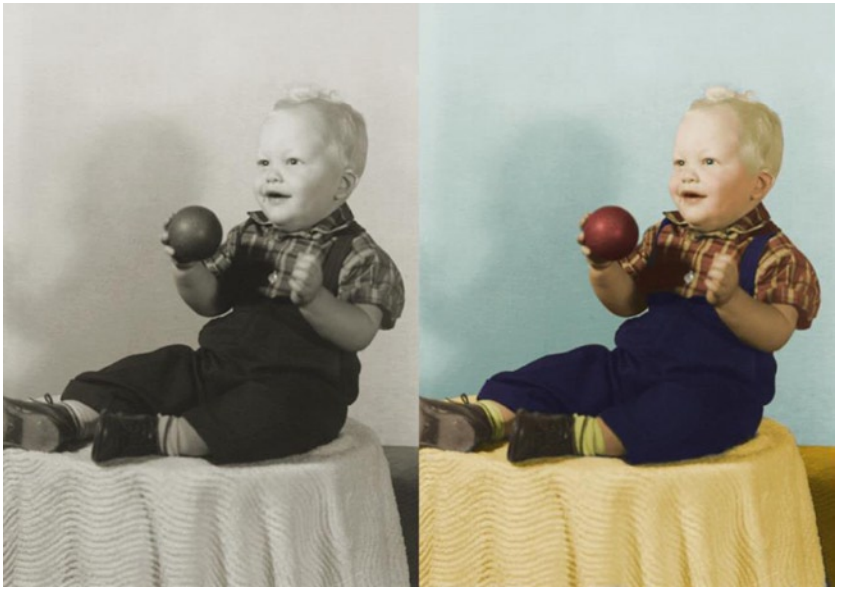

Figure 5-29. *Before and after comparison*

■ **Tip** I recommend joining Retouch Pro (www.retouchpro.com). Membership is free, and you can see many examples of image colorizations, as well as photo retouching and restoration. As a member, you can participate in editing challenges, which is a great way to develop your skills.

Summary

By using GIMP, you can get creative in the use of color in your images. Converting color images into black and white (I suppose one could argue) is still working with color. Adding a sepia tone to your images can give them a vintage look, and combining color with black and white or sepia introduces a unique, artistic look to images.

Colorizing black-and-white images can be really fun. Clients often request this service, so it pays to be skilled in colorizing images.

PART III

Digital Clean-up & Repairing Damage

CHAPTER 6

Dust, Light Scratch, and Stain Removal

In This Chapter

- Digital Cleanup with GIMP
- Removing Dust and Crud from Images

Digital Cleanup with GIMP

Many of the images you'll work with will require digital cleanup and repair. GIMP is the perfect tool for removing dust from scanned slides (that is, the embedded dust that won't come off when doing the pre-scan cleaning we covered in Chapter 2). Using GIMP, you'll be able to remove unsightly small spots and scratches as well.

Removing Dust and Crud from Images

Older prints and slides often have embedded dust, small particles of dirt, etc. that will have to be digitally removed after scanning. Transparencies, in particular, are often plagued with dust, dirt, and mold particles. While some scanners have built in "dust removal" features in their software, these can often soften the image a great deal in the process. Using the tools GIMP has to offer will allow a more precise, surgical approach to removing imperfections, thus maintaining the overall sharpness of the image. The tutorials in this chapter will give you some useful practice for eventually tackling heavy damage, as we'll see in the next chapter.

Tutorial 23: Removing Dust from a Slide

This slide from the 1950s (Figure 6-1) has a great deal of dust particles embedded throughout, but this is most noticeable in the sky area. Dust removal can be a time-consuming task, but in some instances, it can be sped up. The dust in the sky area can be almost completely obliterated in a couple of minutes.

Figure 6-1. *An image with a great deal of embedded dust (Image courtesy of the Bundt family)*

To correct this image, follow these steps:

1. Open the image (`Ch6_dust busting`) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Dust Clean Up Layer.
3. Open the Free Select tool (F) and set the Feather Edges radius to 10 pixels (Figure 6-2).

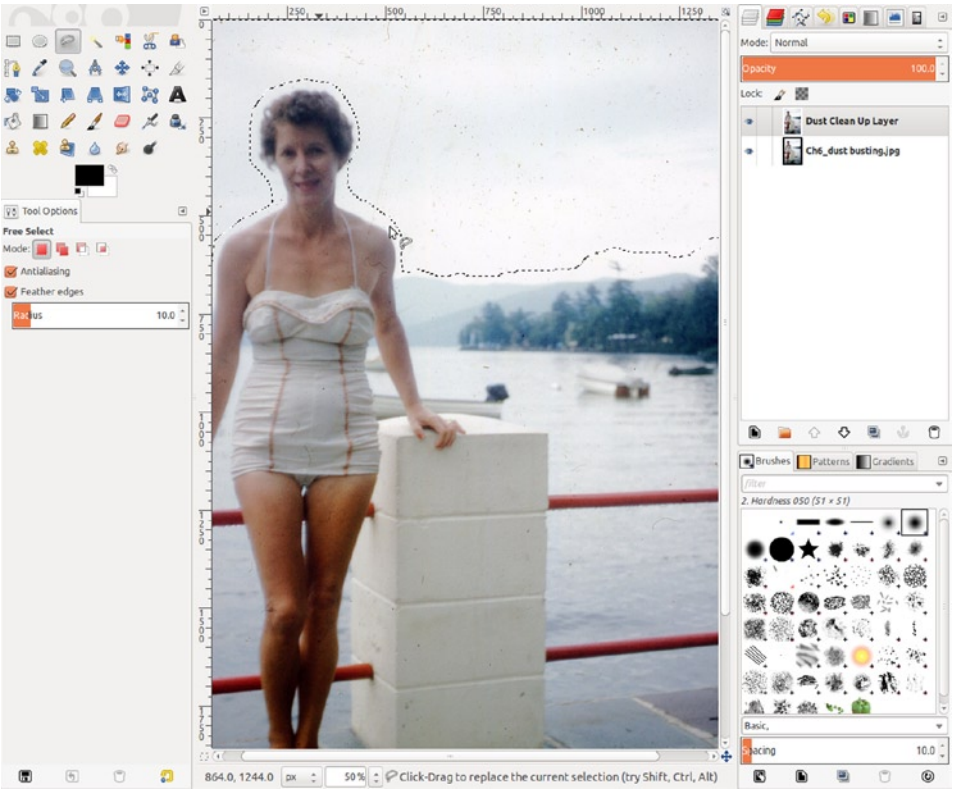

Figure 6-2. *An image with a great deal of embedded dust*

4. We'll now copy this selection and paste it as a new layer (Control + C and Control + V). It will appear as Floating Selection in the Layers palette. Right-click Floating Selection and select the To New Layer option from the drop-down menu.

5. Rename the layer Sky and change the blend mode to Lighten only (Figure 6-3).

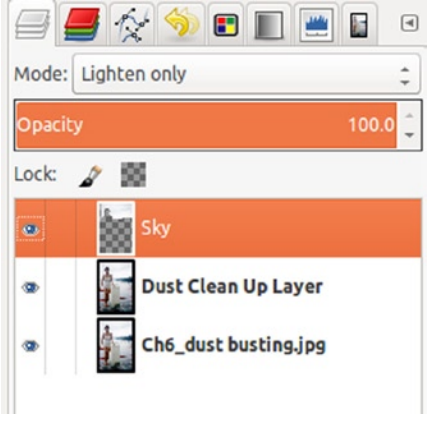

Figure 6-3. *Changing the blend mode to Lighten only*

6. Select the Move tool (M) and click in the sky area (Figure 6-4). Using the left arrow key, nudge the layer two or three times until most of the dust vanishes (the Lighten only blend mode lightens the dark dust specks).

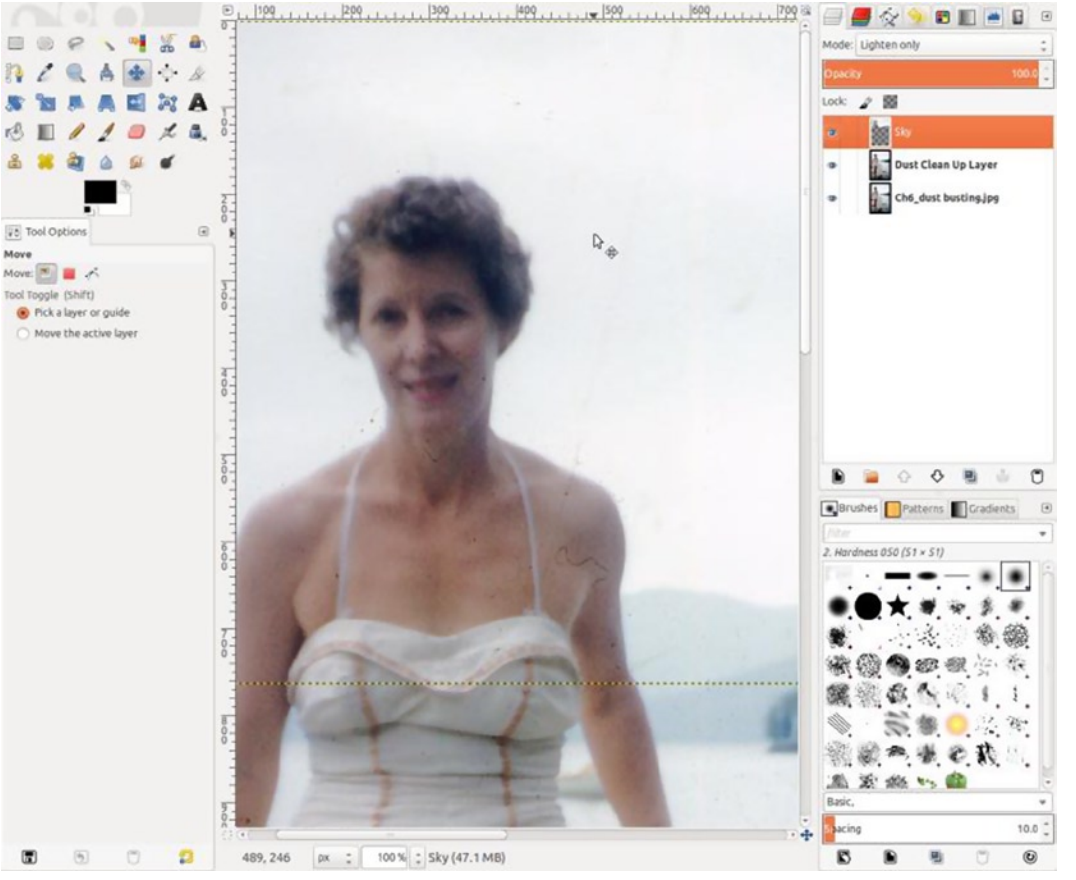

Figure 6-4. *Nudging the layer slightly to remove the dust*

7. Repeat the process for other areas with large areas of dust, such as the tile (Figure 6-5).

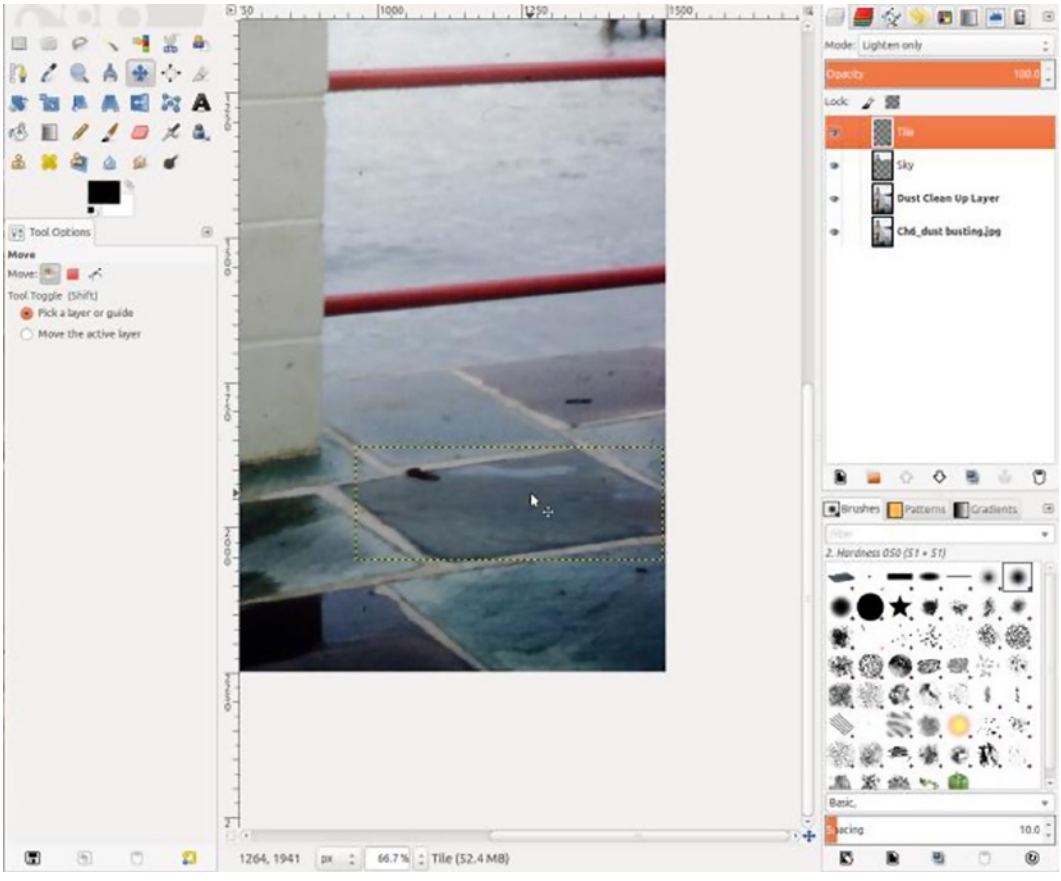

Figure 6-5. *Repeating the dust removal process in the tile area*

8. There will be some dust that will have to be removed manually, using the Healing tool and the Clone tool. Use the Dust Removal Layer to do your cleanup work (Figure 6-6).

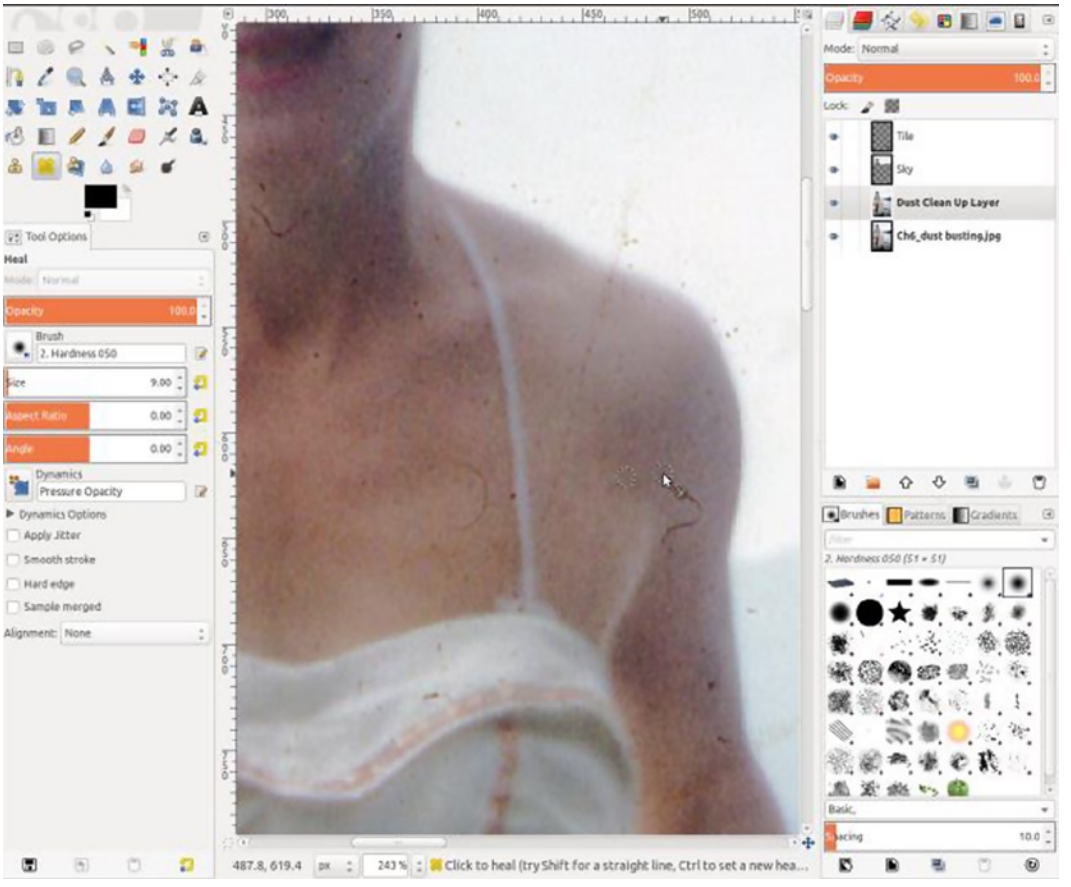

Figure 6-6. *Cleaning up the remaining dust with the Healing and Clone tools*

This method of dust removal greatly reduces the amount of time required for repair (Figure 6-7). This can be extremely useful when cleaning up batches of slides or negatives.

Figure 6-7. *Before and after comparison*

■ **Note** This method of mass dust removal, which we performed on the sky portion of the image, should be used on areas of unimportant image detail, such as sky and clouds, solid walls (with no patterns), concrete sidewalks, etc.

Tutorial 24: Removing Dust and Light Scratches

We corrected the color in this image back in Chapter 4 (Figure 6-8), and now it's time to clean up the light scratches, blemishes, and dust.

Figure 6-8. *Image requiring light cleanup*

To correct this image, follow these steps:

1. Open the image (`Ch6_light clean up`) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Heal-Clone Layer (Figure 6-9). These are the two tools we'll be using for most of the editing on this image.

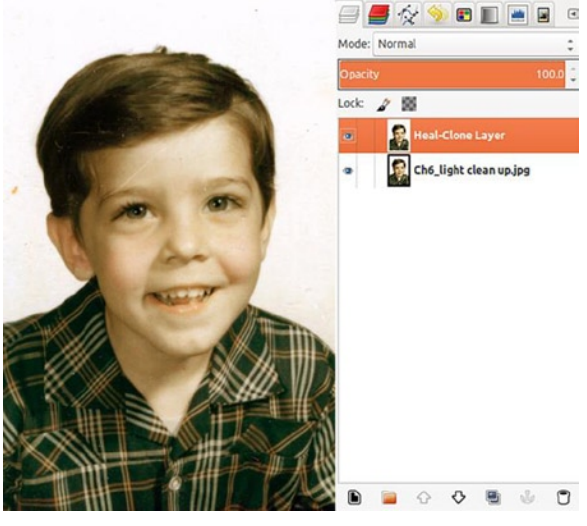

Figure 6-9. *The Heal-Clone Layer, where most of the editing will be done*

3. We'll start with the scratch above the eye. Activate the Healing tool (H). Choose the brush with the 050 hardness value from the tool options. Set the brush size to just slightly larger than the scratch.

4. Click an area nearby to sample the tone and texture and drag along the scratch to remove it. Resample frequently as you work (Figure 6-10).

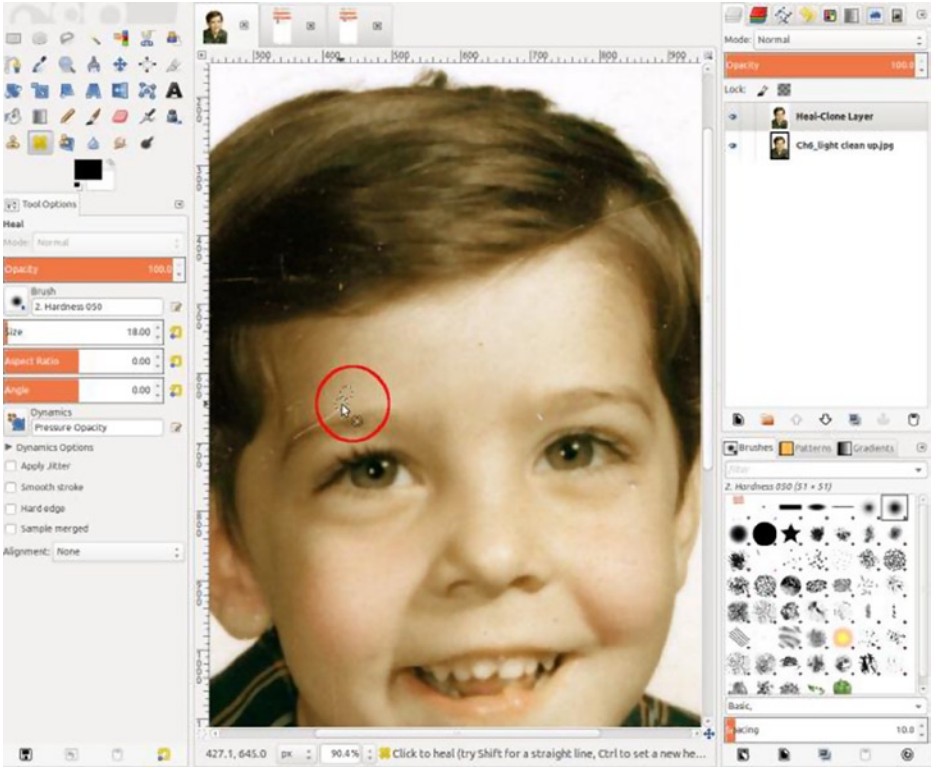

Figure 6-10. *Removing the scratch with the Healing tool*

5. In the two large shadow areas in the hair, use the same method of mass dust removal as you did in the previous tutorial (when removing dust from the sky area). The only difference here is that you'll set the layer's blend mode to Darken only, because there are light dust specks against a dark background (Figure 6-11).

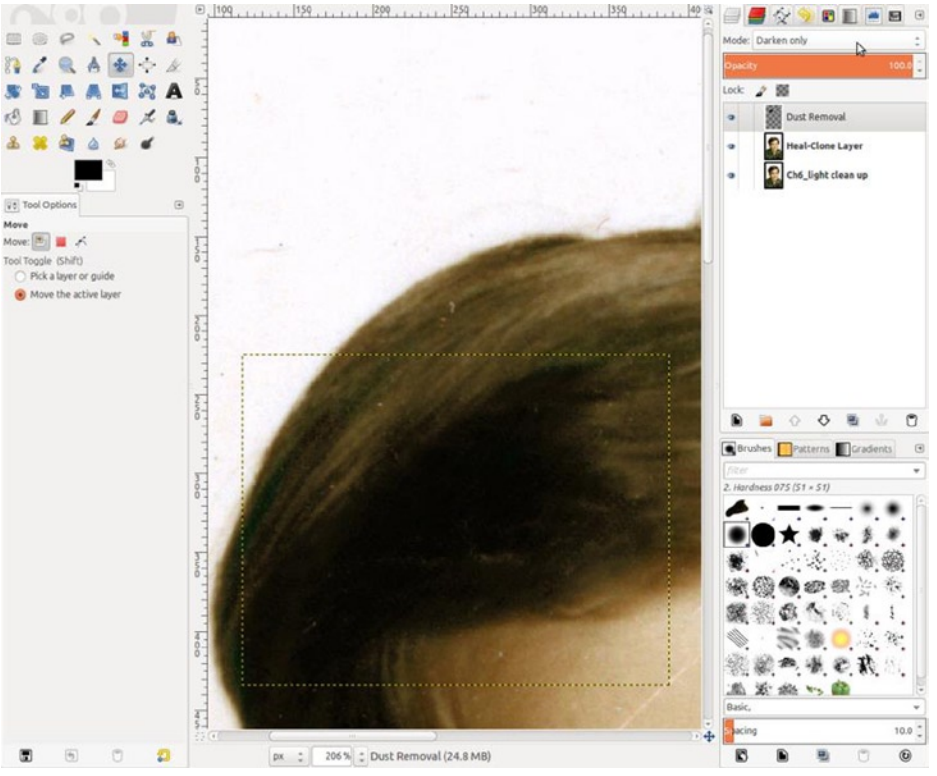

Figure 6-11. *Removing the light dust specks by selecting the Darken only blend mode*

6. The remaining work is just a matter of removing the dust specks, using the Healing tool in most cases. Larger blemishes are usually better removed with the Clone tool (Figure 6-12).

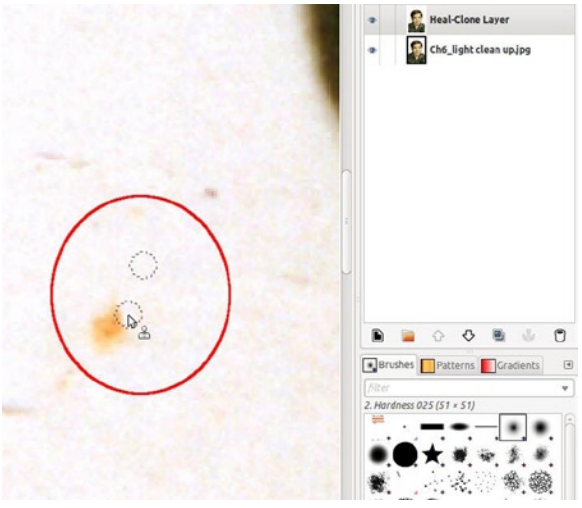

Figure 6-12. *Removing larger imperfections with the Clone tool*

This image had a great deal of dust, some small scratches, and a few other imperfections that required some time and work to remove, but the result is a much cleaner image (Figure 6-13).

Figure 6-13. *Before and after comparison*

■ **Note** Gently cleaning a photograph, slide, or negative with a clean, lint-free cloth can go a long way toward removing loose dust (as we saw in Chapter 2) and can reduce the digital-editing workload a great deal.

Tutorial 25: Removing Stains

Stains on old photographs are fairly common, such as in the example in Figure 6-14. Even though it looks rather nasty, this one can be removed fairly easily by separating the image into its RGB channels.

Figure 6-14. *An old photograph with a rust-colored stain*

To correct this image, follow these steps:

1. Open the image (`Ch6_stained photo`) found in the Practice Images folder.
2. Separate the image using the *Decompose* feature (Image Menu ➤ Colors ➤ Components ➤ Decompose). This will create a separate file and extract the channels as layers (Figure 6-15).

Be sure to use the default RGB color model and leave the Decompose by layers option checked.

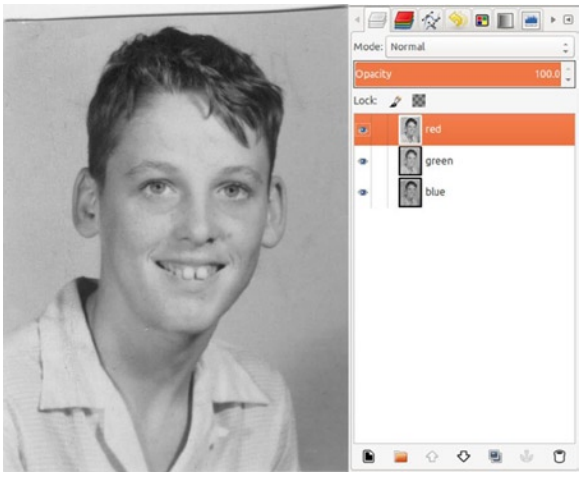

Figure 6-15. *The stained image separated into layers, using its RGB channels*

3. Close the original image (`Ch6_stained photo`). You'll be editing this copy from this point on.
4. Change the color mode to RGB (Image Menu ➤ Image ➤ Mode ➤ RGB).
5. We can see that it already looks much better, but it does need some work. There is some writing on the back of the photograph that is bleeding through slightly. Just to see where the damage is, hide the Red layer. There is slight damage on the Green layer, most of it is on the Blue layer (Figure 6-16).

Figure 6-16. *The Green and Blue channels (now layers), respectively*

6. Delete the Green and Blue layers. Rename the Red layer "Background Layer." Duplicate it and rename it "Clone-Heal Layer."

7. The rest of the repair work entails cleanup. Remove the larger imperfections on the face, shirt, and background, using the Clone and Healing tools (Figure 6-17).

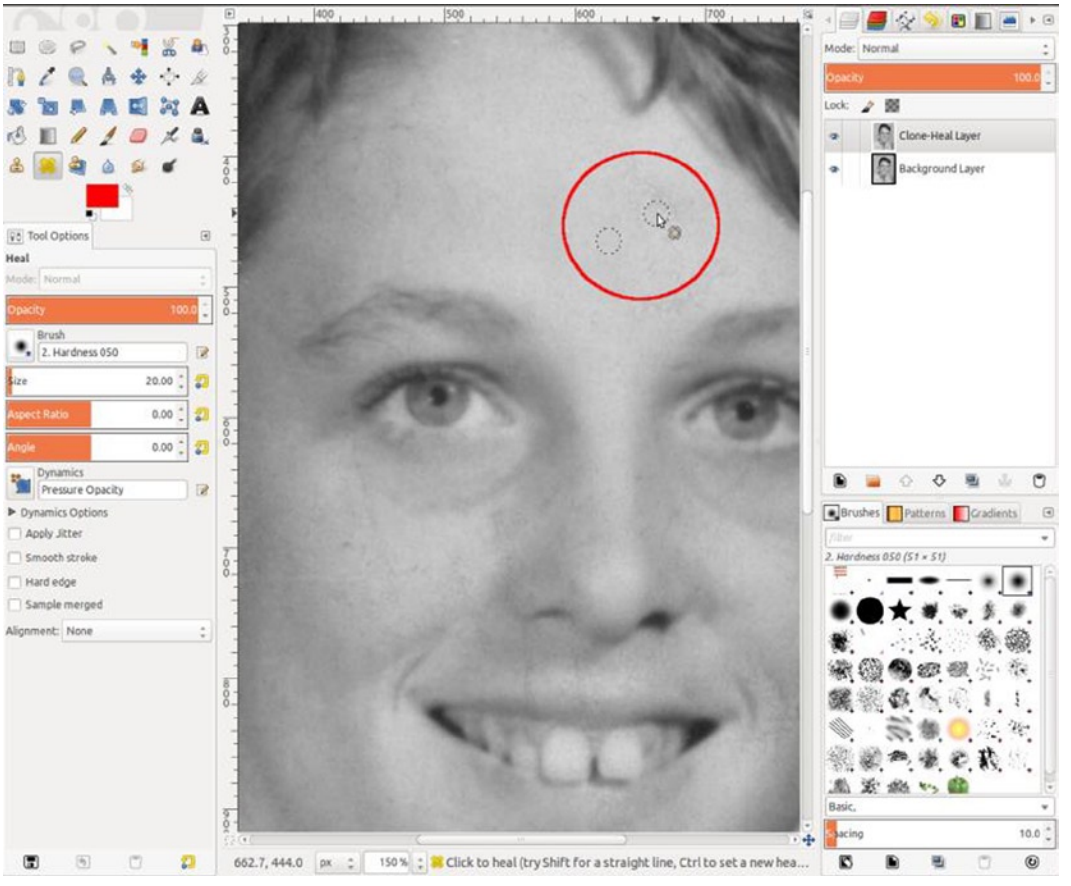

Figure 6-17. *Cleaning up the face, using the Healing tool*

8. After your digital cleanup work, rebuild the missing area along the top of the image, using the Clone tool (C), to give it a straight edge (Figure 6-18).

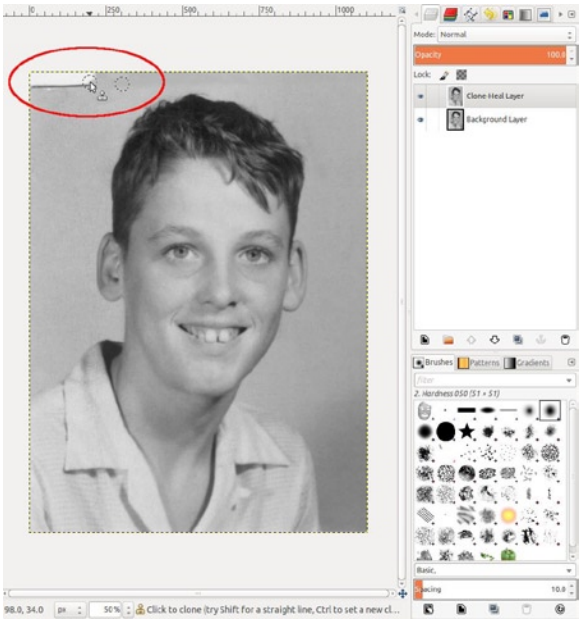

Figure 6-18. *Rebuilding the missing area along the top*

9. Colorize the image by opening the Colorize dialog (Image Menu ➤ Colors ➤ Colorize). By using a Hue value of 60 and the Saturation set to 10, the result is a nice, subtle sepia tone (Figure 6-19).

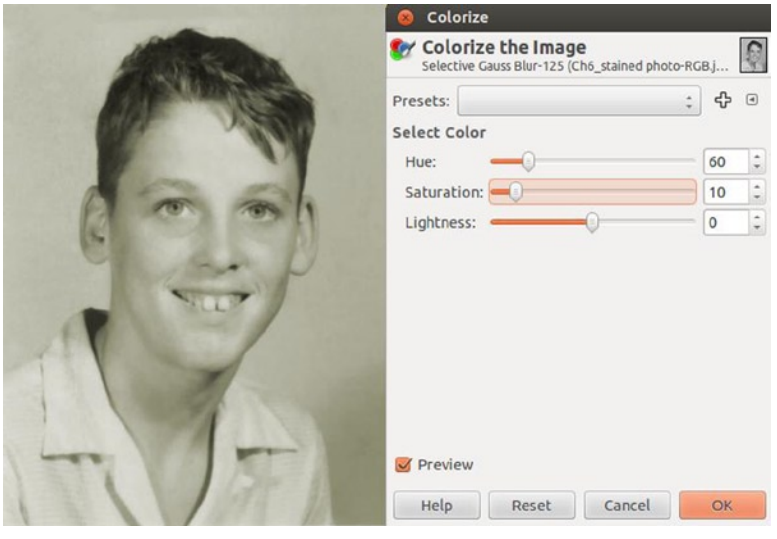

Figure 6-19. *Applying a light sepia tone to the image*

If not for the Red channel being largely undamaged by the stain, this restoration task would have been much more difficult and time-consuming. The result is a nice, cleaned-up image (Figure 6-20). In some color images that are stained, try decomposing the channels into layers to isolate the problem area(s). It is sometimes possible to edit the problematic channel to correct the issue.

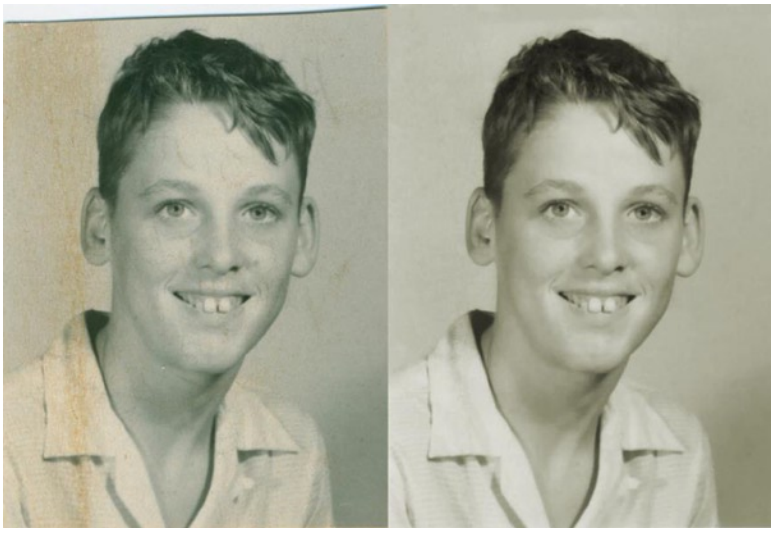

Figure 6-20. *Before and after comparison*

Summary

GIMP is extremely useful for removing dust and other minor imperfections from your photos, negatives, and slides. You can remove dust quickly in areas with unimportant image detail, such as sky, clouds, solid walls, etc., in a few operations, saving time. The Healing and Clone tools are essential tools for cleaning up stray dust, light imperfections, and scratches. By using the Decompose dialog, color stains on monochrome or duotone images can often be removed by simply discarding the damaged color layer(s) and utilizing the best one.

GIMP is not limited to minor fixes and light cleanup work. It's a powerful asset for repairing and restoring images with moderate and even severe forms of damage, as you'll see in the next chapter.

CHAPTER 7

Repairing Moderate and Heavy Damage

In This Chapter

- Repairing Moderate Damage
- Repairing Heavy Damage

Repairing Moderate Damage

GIMP is a very capable program for restoring and repairing damaged photographs. Of course, like anything else, photo restoration takes practice and patience to master. The tutorials in this chapter may be a bit challenging if you're a beginner, but stick with it! If your first attempts aren't as good as you'd like them to be, try again. You'll get the hang of it before you know it—if you apply yourself.

Covering Up the Damage

The vast majority of digital restoration is simply "borrowing" from good parts of an image and covering up the damaged portions. Of course, the cover-up must be seamless, to avoid detection. In the tutorials that follow, you'll be patching large areas of damage, as well as using the Clone and Healing tools for the majority of your work. You got a feel for these tools in two of the previous tutorials—now you'll use them to repair damage on a much greater scale.

Tutorial 26: Patching Damaged Areas

The following photograph was stuck to the glass of a picture frame (a fairly common issue) and, as you can see, resulted in some nasty torn areas (Figure 7-1).

Figure 7-1. *Torn areas, resulting from sticking to the glass of a picture frame (Image courtesy of the Martin family)*

Sometimes, in these editing situations, using the Clone tool in the larger areas results in a soft, detectable repair, because of the grain and texture in the surrounding image area. In such cases, creating a *patch* will offer a good repair solution.

To correct this image, follow these steps:

1. Open the image (`Ch7_torn background`) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Edit (or Repair) Layer (Figure 7-2).

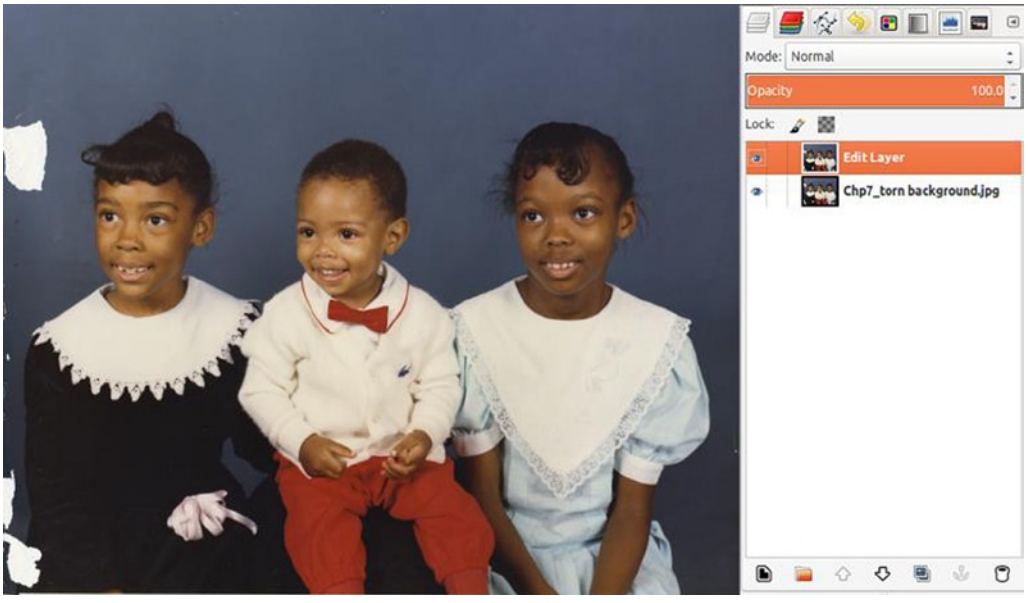

Figure 7-2. *A duplicate layer to edit and repair*

3. Using the Free Select tool (F), set the Feather Edges radius to 30–35 pixels. Make a selection above the large tear (Figure 7-3). Make sure the selection is a good bit larger than the damaged spot.

Figure 7-3. *Making a selection above the torn area*

4. We'll now copy this selection and paste it as a new layer (Control + C and Control + V). It will appear as Floating Selection in the Layers palette. Right-click the floating selection and select the To New Layer option from the drop-down menu.

5. Rename the layer Patch. Using the Move tool (M), place it over the torn area.

6. Because the background's tone is lighter at the top and gradually darkens toward the bottom, the repair patch will be lighter than the surrounding background. Open the Levels dialog (Image Menu ➤ Colors ➤ *Levels*) and move the midpoint (gamma) slider to the right until the tone matches. The value should be around 0.90–0.92 (Figure 7-4). You might have to move the black-point slider very slightly to the right. By now, you should have a good match, but experiment as needed.

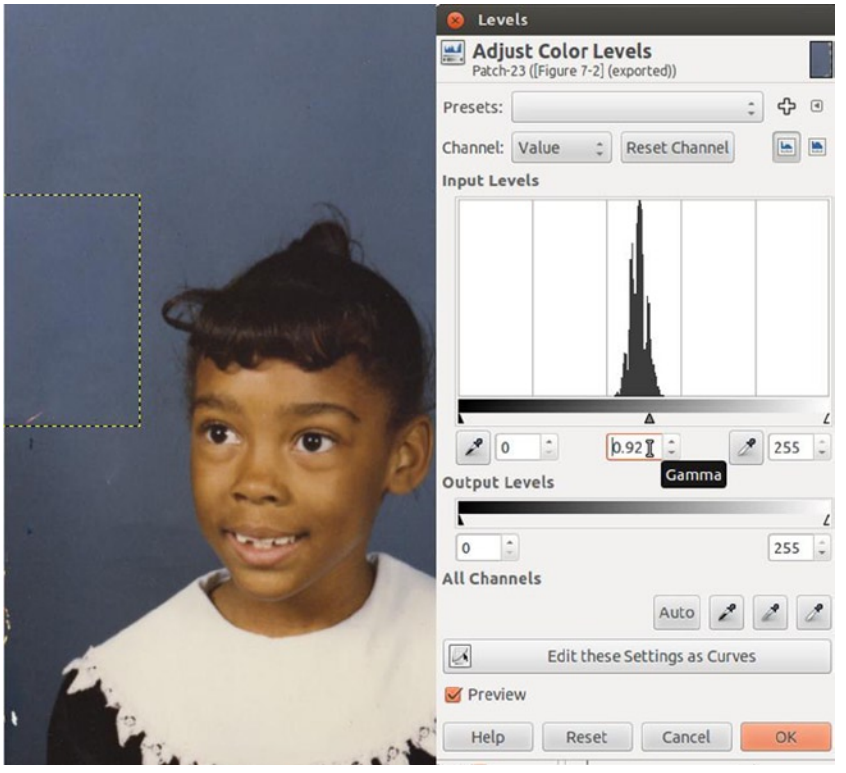

Figure 7-4. *Using Levels to match the tone of the patch to the surrounding background*

7. Expand the Patch Layer's boundary size to the same as the image (Right-click ➤ *Layer to Image Size*). Using the Eraser tool *(Shift + E)* with a large, soft brush (about 0.25 hardness), work along the edge of the Patch Layer to blend it in further—be careful not to remove too much.

8. Now we'll create a patch for the smaller damaged areas. Make a selection of the right side of the background, as shown in Figure 7-5, using the Freehand Select tool (F) with the Feather Edges radius set to 30–35 pixels.

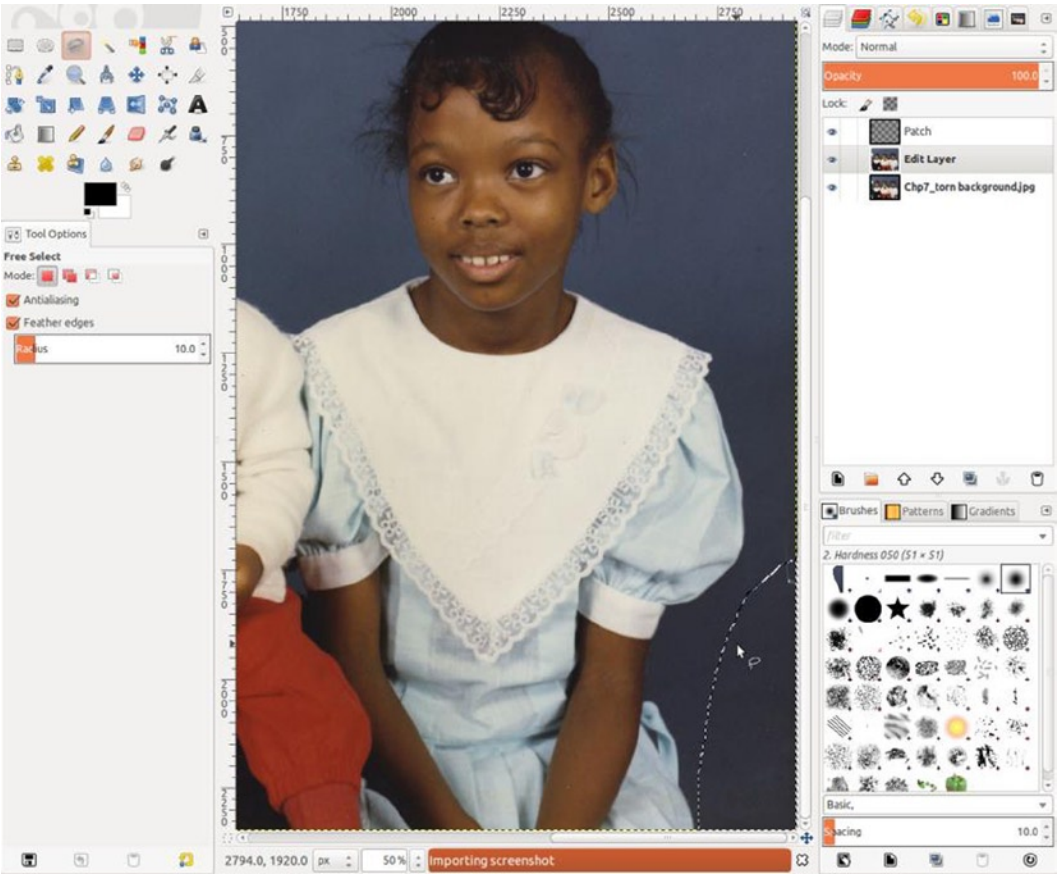

Figure 7-5. *Selecting an area with which to patch the damage on the other side*

9. Copy this selection and paste it as a new layer (Control + C and Control + V)—it will appear as Floating Selection in the Layers palette. Right-click the floating selection and select the To New Layer option from the drop-down menu.

10. Rename this layer Patch 2. Use the Flip tool (Shift + F) to reverse the direction of this layer (Figure 7-6).

Figure 7-6. *Using the Flip tool to reverse the patch repair layer*

11. Use the Move tool (M) to position the layer over the damaged area (Figure 7-7). It will overlap the girl's arm, but that's okay for now.

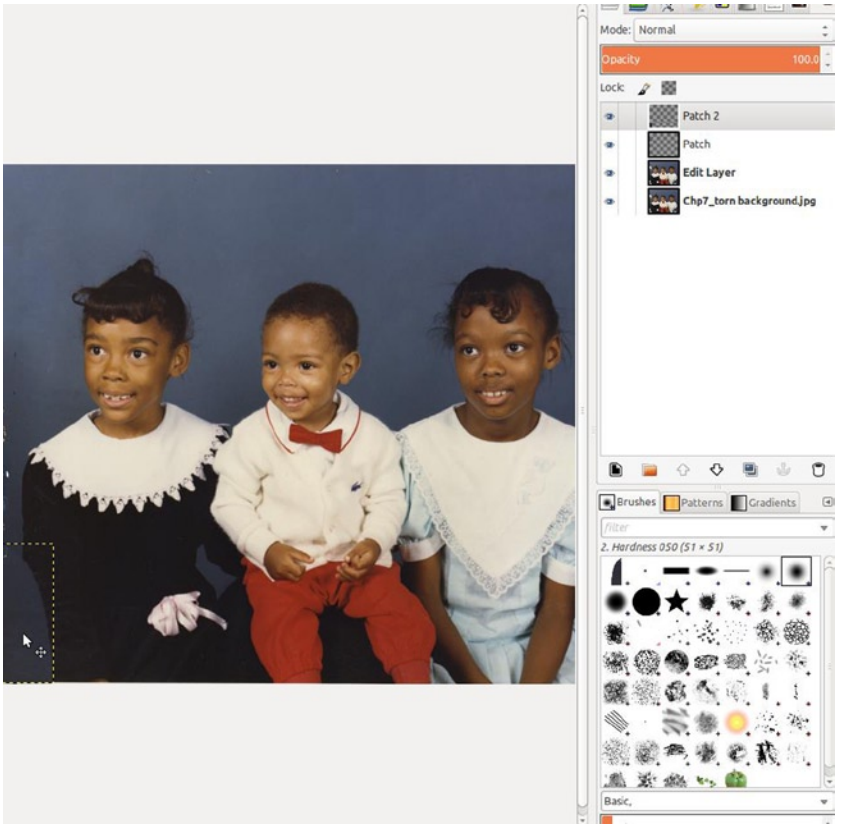

Figure 7-7. *Positioning the repair patch into place*

12. Lower the layer's opacity enough to see the area beneath. Use the Eraser tool *(Shift + E)* to remove the excess covering the little girl's dress (Figure 7-8). When finished, restore the opacity to 100%.

Figure 7-8. *Removing the excess repair patch*

13. Open the Levels dialog *(Image Menu ➤ Colors ➤ Levels)* and move the midpoint (gamma) slider to the right until the tone matches. The value should be around 0.88 (Figure 7-9).

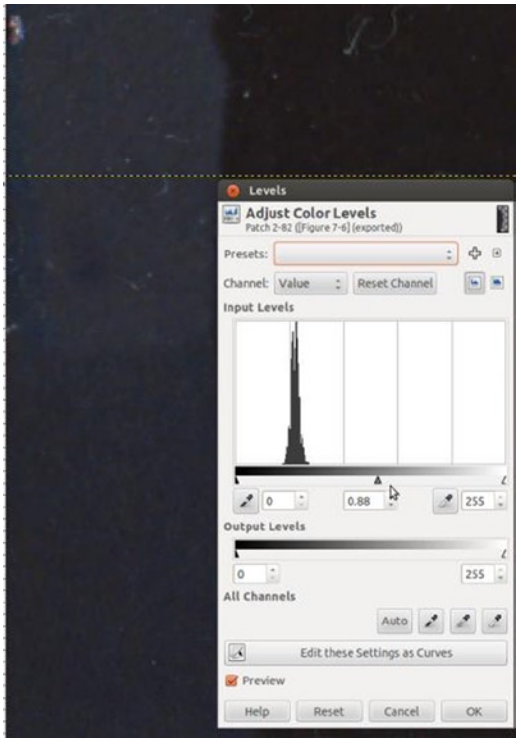

Figure 7-9. *Adjusting the Levels gamma slider to match the tone*

14. Create a new layer *(Shift + Control + N)* and name it *Clone Layer.* Move it between the two patch layers (Figure 7-10).

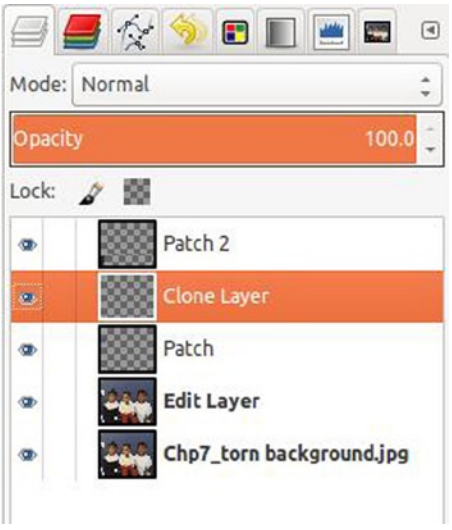

Figure 7-10. *Moving the new Clone Layer between the two patch layers*

15. Use the Clone Tool *(C)* with a soft brush on the Clone Layer to fill in the torn area on the girl's dress. The cloning won't extend into the background, because the *Clone Layer* was placed beneath the *Patch 2 Layer* (Figure 7-11). Finish off by cloning away the small section of border on the bottom and any small specks and dust throughout the image.

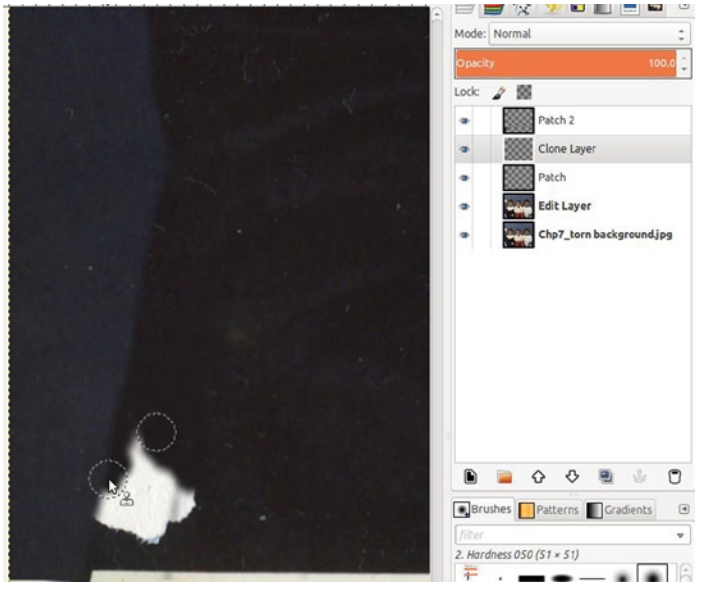

Figure 7-11. *Cloning the torn area*

In just a few steps, we now have an image that is restored and looking like new (Figure 7-12). This patch method also works well in images with missing areas of foliage, bodies of water, etc.

Figure 7-12. *Before and after comparison*

Tutorial 27: Repairing Moderate Damage

Scratches in old photographs (Figure 7-13) are very common in the world of restoration. They can be especially tricky when they occur in facial areas, as in this image. This tutorial will provide you with plenty of practice in using the "dynamic duo" of the tool set—the Clone and Healing tools.

Figure 7-13. *A moderately damaged image*

To correct this image, follow these steps:

1. Open the image (`Ch7_moderate repair`) found in the Practice Images folder.
2. Open the Crop tool (Shift + C) and trim the borders (Figure 7-14).

Figure 7-14. *Trimming the borders*

3. Duplicate the background layer (Shift + Control + D) and rename it Edit (or Repair) Layer (Figure 7-15).

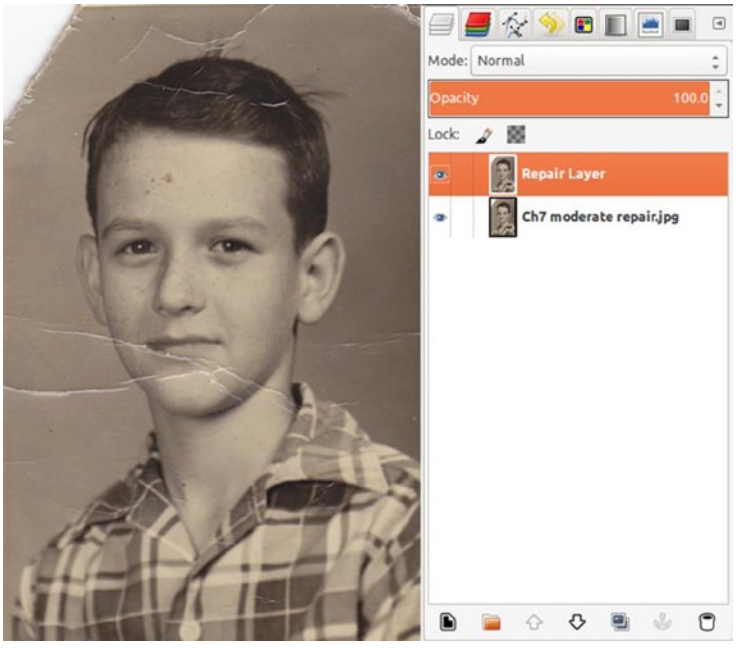

Figure 7-15. *A duplicate layer to edit and repair*

4. Using the Clone tool (C), clean up the area shown in Figure 7-16. This area will be used to patch the upper-left corner.

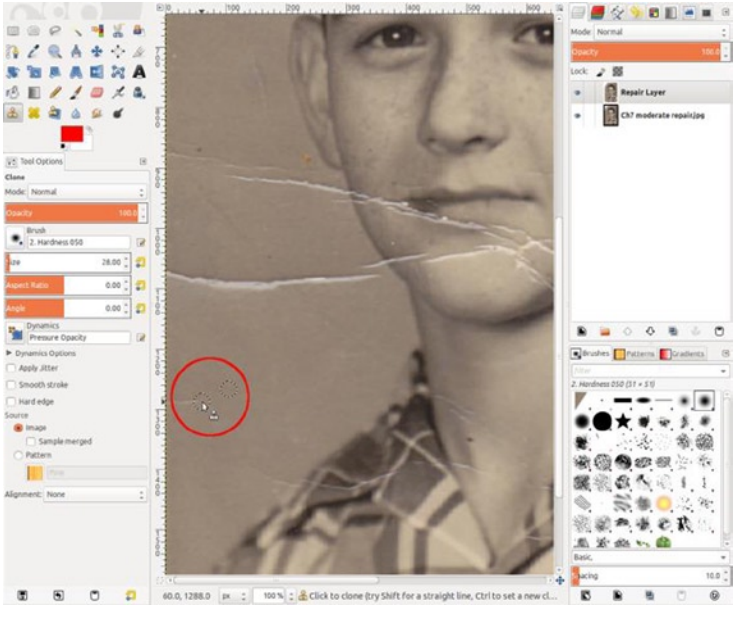

Figure 7-16. *Cleaning an area to borrow for patching the missing corner*

5. Using the Free Select tool (F) with the Feather Edges radius set to about 15 pixels, draw a triangle larger than the missing area on the area you just cleaned up. Copy this selection and paste it as a new layer *(Control + C and Control + V)*—it will appear as *Floating Selection* in the Layers palette. Right-click the floating selection and select the *To New Layer* option from the drop-down menu (Figure 7-17).

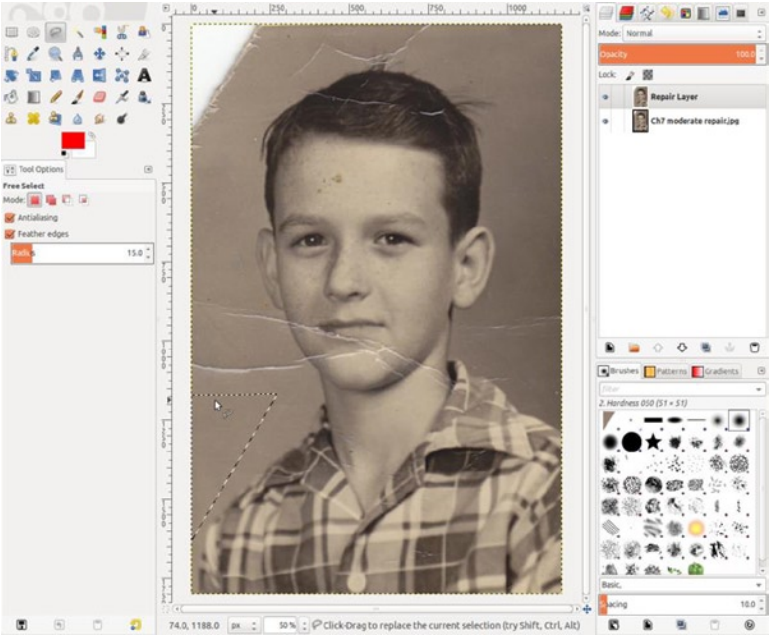

Figure 7-17. *Make a triangular selection of a good area to create a patch for the missing corner*

6. Rename the layer *Corner Patch.* Using the Move tool *(M),* place it over the torn area. The background's tone will be lighter than the patch. Open the Levels dialog (*Image Menu* ➤ *Colors* ➤ *Levels*) and move the midpoint (gamma) slider slightly to the left until the tone matches. The value should be around 1.10 (Figure 7-18). You might have to move the black-point slider very slightly to the right. By now, you should have a good match, but experiment as needed.

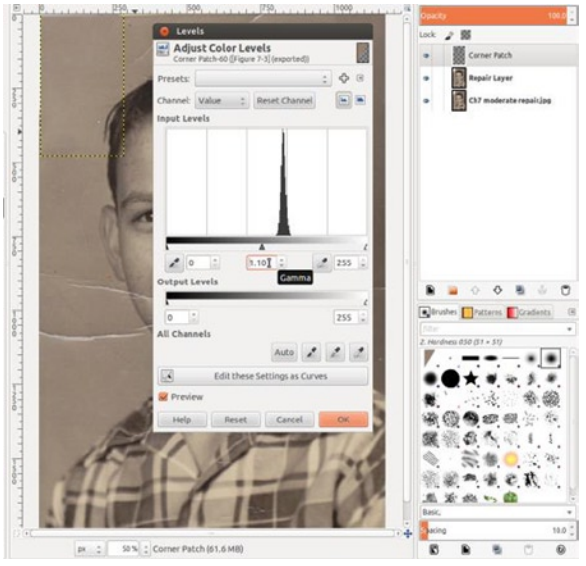

Figure 7-18. *Using Levels to match the tone of the patch to the surrounding background*

7. Duplicate the background layer *(Shift + Control + D)* and rename it *Edit (or Repair) Layer.*

8. Using the Healing tool *(H),* start working on the small scratches in the hair. The Healing tool will blend in the surrounding texture for a seamless repair (Figure 7-19).

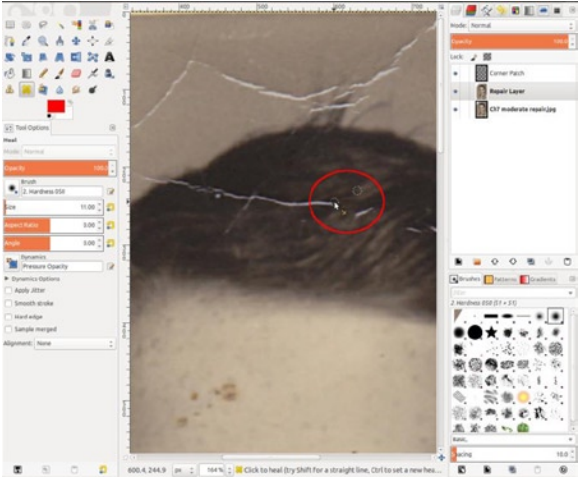

Figure 7-19. *Using the Healing tool to remove the scratches in the hair*

Larger areas are often better repaired with the Clone tool (C), so alternate between the two as needed (Figure 7-20).

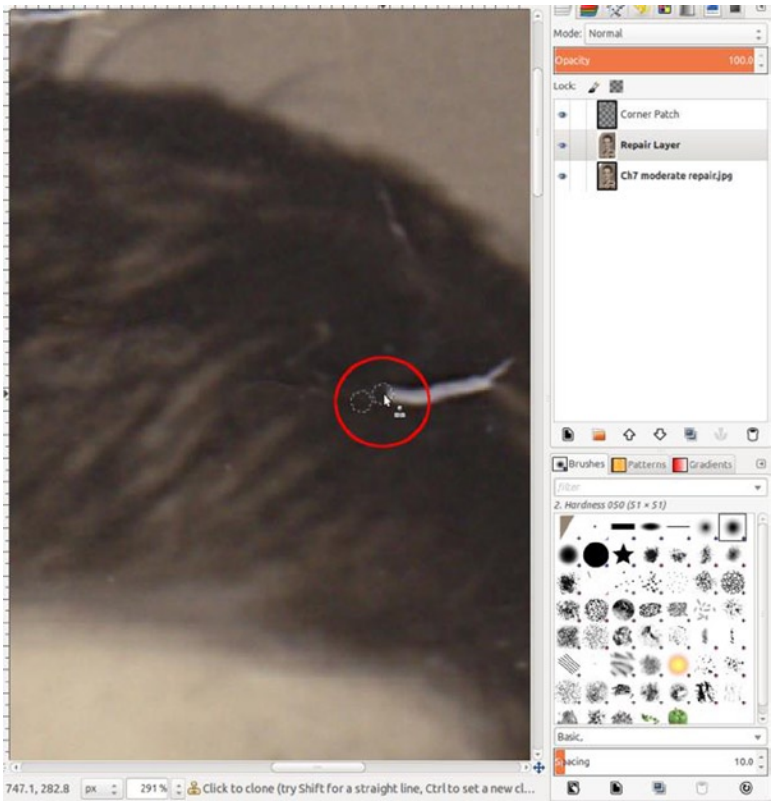

Figure 7-20. *Using the Clone tool for repairing a wider scratch*

9. When finished with the hair, move on to the face. Use the Healing tool *(H)* to remove the stains, as shown in Figure 7-21.

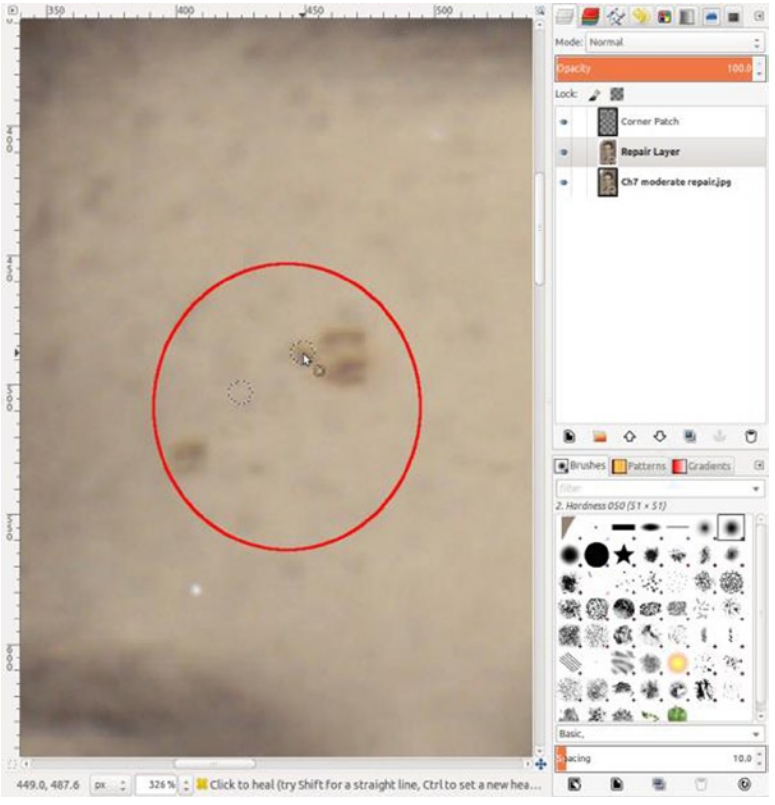

Figure 7-21. *Using the Healing tool to remove stains*

10. Now, it will get a bit tricky. The damage around the mouth has to be addressed and may require more than one attempt. Create a new layer (above the Repair Layer) and name it *Lip Repair Layer.* Use the Clone tool *(C)*, and with a soft brush rebuild the missing area below the lower lip (Figure 7-22).

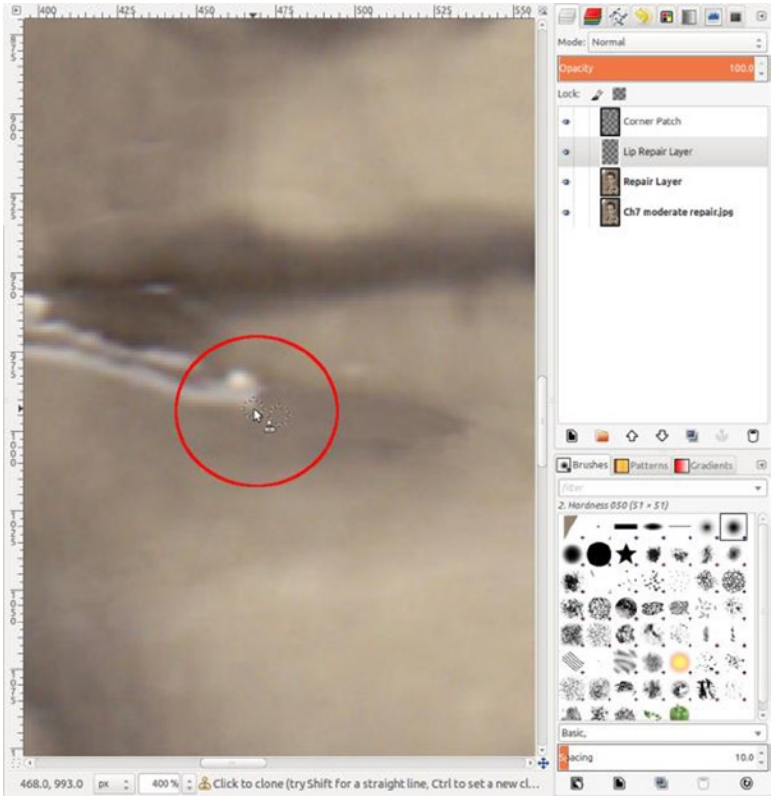

Figure 7-22. *Using the Clone tool to repair the damaged area around the lip*

11. Use the Blur/Sharpen tool *(Shift + U)*, set to Blur, to smooth out the cloned areas and blend the repair in.

12. Use the Dodge/Burn tool *(Shift + D)*, set to Burn, and an exposure of about 15–20 to gently replace the shadow that may have been removed during the repair work (Figure 7-23).

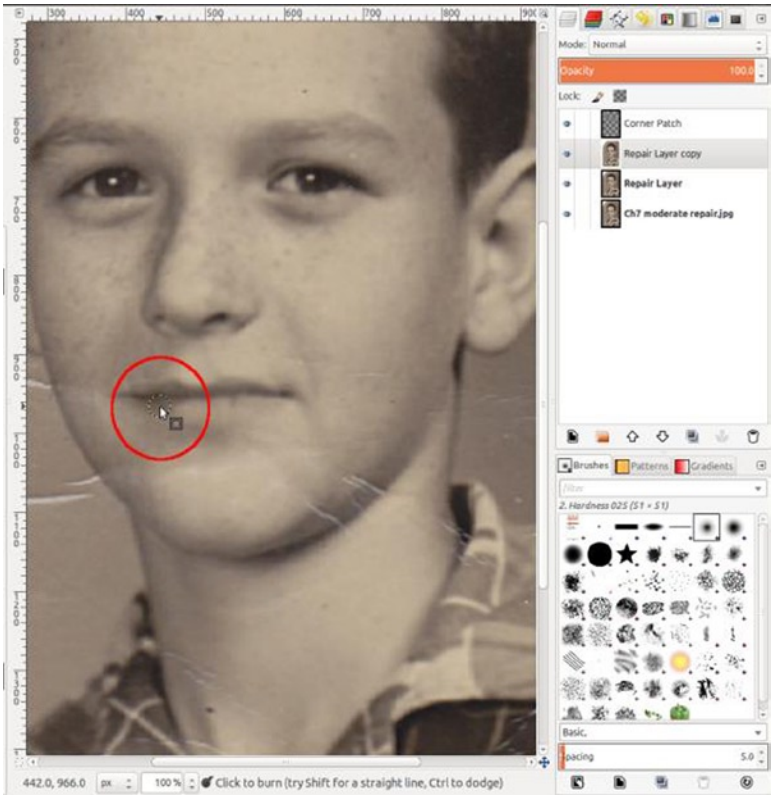

Figure 7-23. *Replacing the shadow with the Burn tool*

13. After you repair the mouth area, clean up the rest of the photograph with the Healing and Clone tools. The next thing we have to do is smooth out the background some. Using the Free Select tool ***(F)*** **with the Feather Edges radius set to about 35 pixels, draw around the subject**, **as shown in Figure 7-24**.

Figure 7-24. *Replacing the shadow with the Burn tool*

14. Copy the selection and paste it as a new layer (Control + C and Control + V)—it will appear as *Floating Selection* in the Layers palette. Right-click the floating selection and select the To New Layer option from the drop-down menu.

15. Open the Gaussian Blur dialog (*Image Menu* ➤ *Filters* ➤ *Blur* ➤ *Gaussian Blur*). Set the Blur Radius to about 30 (both Horizontal and Vertical) and the RLE Blur Method.

16. The background is now much smoother, but the texture is gone and must be replaced. Open the RGB Noise dialog (*Image Menu* ➤ *Filters* ➤ *Noise* ➤ *RGB Noise*). De-select the Independent RGB option and move one of the sliders to about 0.03—each slider for Red, Green, and Blue will move in unison (Figure 7-25).

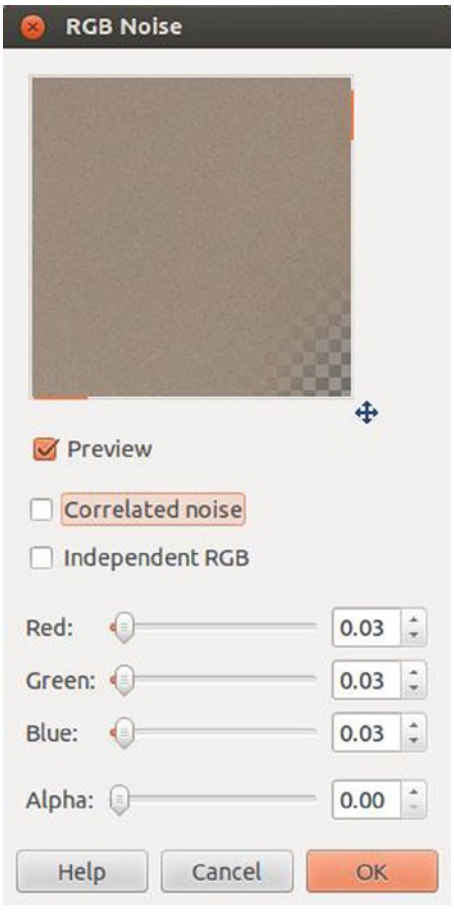

Figure 7-25. *Adding some noise to replace the lost texture*

17. Apply the Blur filter (*Image Menu* ➤ *Filters* ➤ *Blur*). This will blur the noise just enough to create a match to the texture in the surrounding image area.

18. Hide the background layer and merge the visible layers (Right-click in the layer palette and choose Merge Visible Layers from the drop-down menu). Turn the background layer's visibility back on.

19. The finishing touch is now to boost the contrast just a little. Open the Curves dialog (*Image Menu* ➤ *Colors* ➤ *Colors* ➤ *Curves*). Make a slight "S" curve, as shown in Figure 7-26.

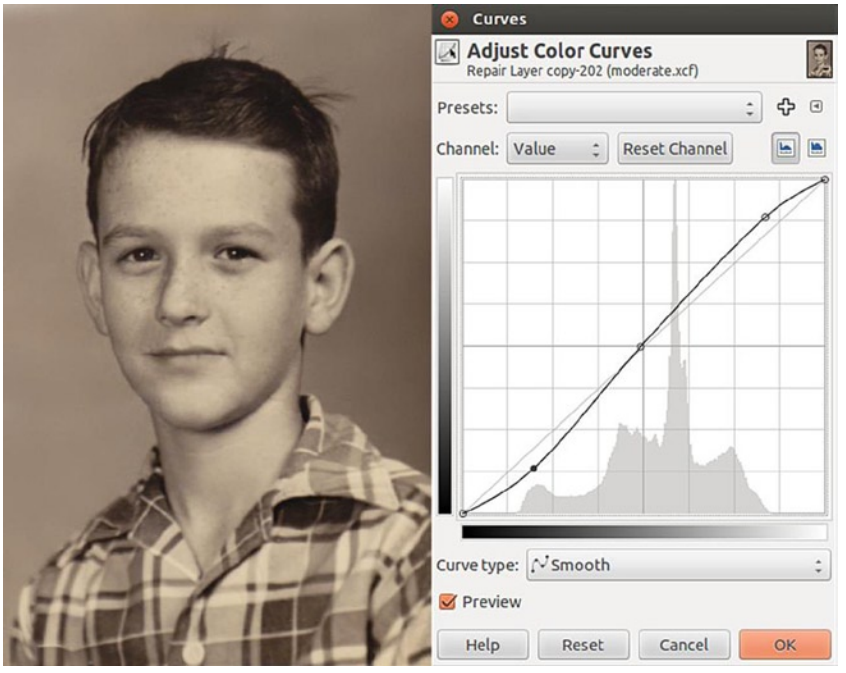

Figure 7-26. *Boosting the contrast with a slight "S" curve*

There's quite an improvement in the end result (Figure 7-27).

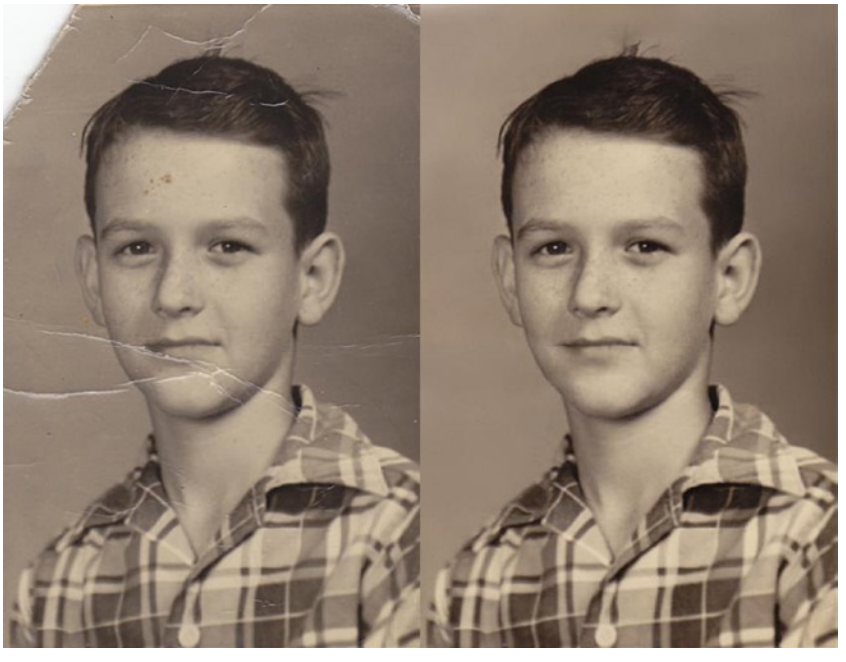

Figure 7-27. *Before and after comparison*

Repairing Heavy Damage

Over the years, it seems that most of the restoration work that comes my way results from damage like that on the image shown in Figure 7-28 (or worse). Heavy damage such as this requires extensive use of the Healing and Clone tools, and in this case, you'll also be using the Resynthesizer plug-in to quickly repair the larger cracks. This can be very helpful, by automatically blending in surrounding texture and tone. It can be a huge time-saver.

Figure 7-28. *An image with heavy damage*

Tutorial 28: Repairing Heavy Damage

To correct this image, follow these steps:

1. Open the image (`Ch7_cracks and creases`) found in the Practice Images folder.
2. Duplicate the background layer (Shift + Control + D) and rename it Edit (or Repair) Layer. You'll use this layer mostly for the Healing tool and the Resynthesizer plug-in.
3. Create a new layer (Shift + Control + N) and name it Clone Layer. I find it helpful to have an extra layer available to work on when the damage is this bad. Sometimes, the first cloning attempts don't work the way you want, so it's useful to be able to erase and try again if necessary (Figure 7-29).

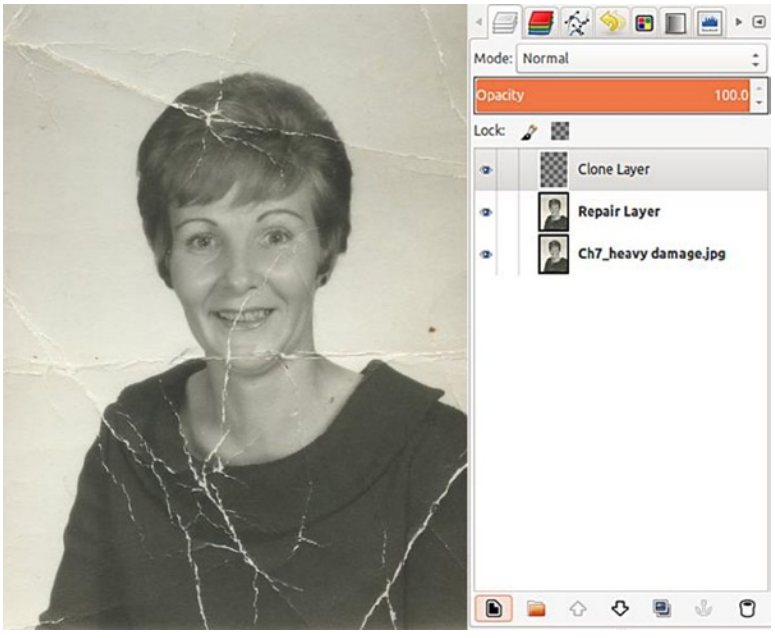

Figure 7-29. *An extra layer for cloning*

4. Repairing the damage in faces is usually the most difficult; I prefer to start there to get it out of the way before moving on. Working on the Repair Layer, use the Healing tool to work on the face and hair (Figure 7-30).

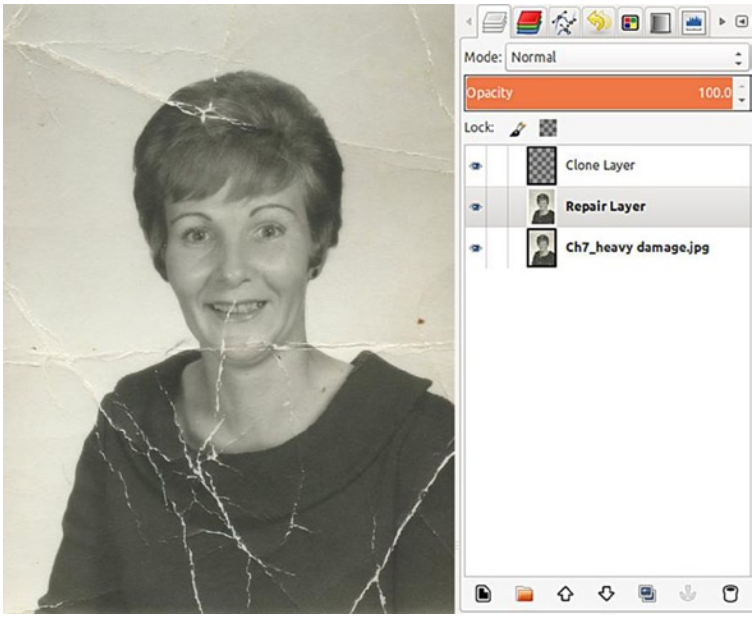

Figure 7-30. *Beginning repairs on the face and hair with the Healing tool*

5. Repairing the tooth and lips will require some careful cloning. Working on the Clone Layer, use the Clone tool to work on this area. Make sure the Sample Merged box is checked in the Tool Options (Figure 7-31).

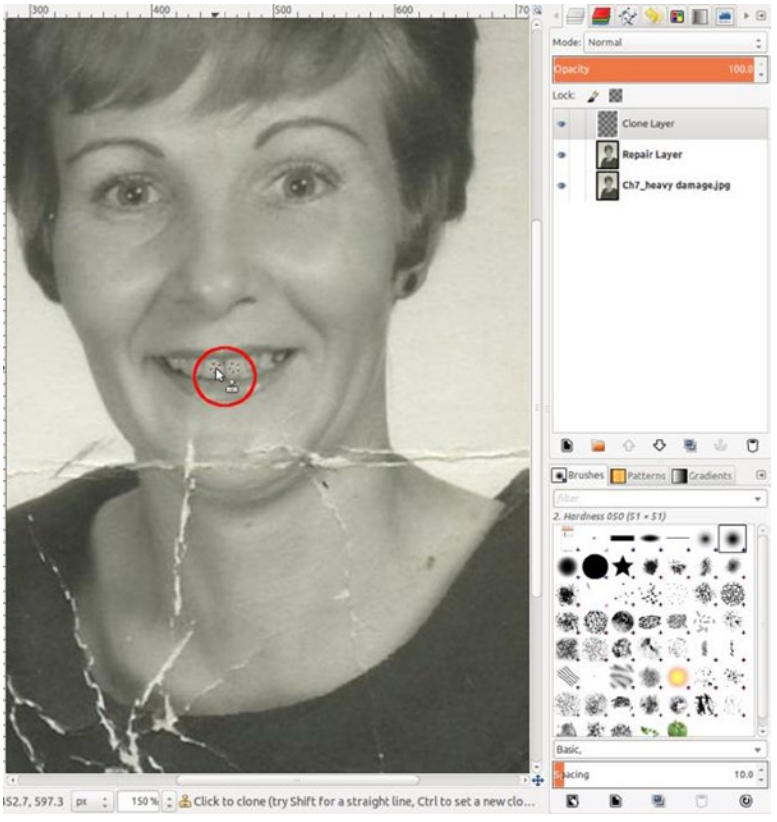

Figure 7-31. *Fine work on the tooth and lips using the Clone tool*

■ **Note** The Resynthesizer plug-in is run by a script called Heal Selection that you'll use in this tutorial. It is a useful feature designed for removing unwanted objects in images and can often be used to repair wider cracks, creases, and other large areas of damage. Using the Free Select tool (F), make a selection around the cracks, as shown on the Repair Layer (Figure 7-32).

Figure 7-32. *Make a selection around the large cracks, to use Heal Selection*

6. Run the Heal Selection filter (Image Menu ➤ Filters ➤ Enhance ➤ *Heal Selection*). Use the default radius setting of 50 pixels. It did a decent, but not perfect, job. You can undo the two previous functions *(Control + Z twice)* and try again, or use the Healing tool *(H)* to refine the results. It will take a little experimentation (Figure 7-33).

Figure 7-33. *Resynthesizer removes the bulk of the damage caused by the large cracks*

7. After touching up the little imperfections and the image is sufficiently cleaned up, merge the Clone Layer down (Right-click ➤ Merge Down). I managed to repair the background without any additional steps. However, if needed, you can smooth out the background by following steps 15–20 in the previous tutorial.

8. Duplicate the Repair Layer and rename it Teeth/Eyes. Use the Dodge/Burn tool (Shift + D) set to Dodge and an exposure of about 15 to gently brighten the teeth (Figure 7-34). If the effect is too strong, lower the layer's opacity.

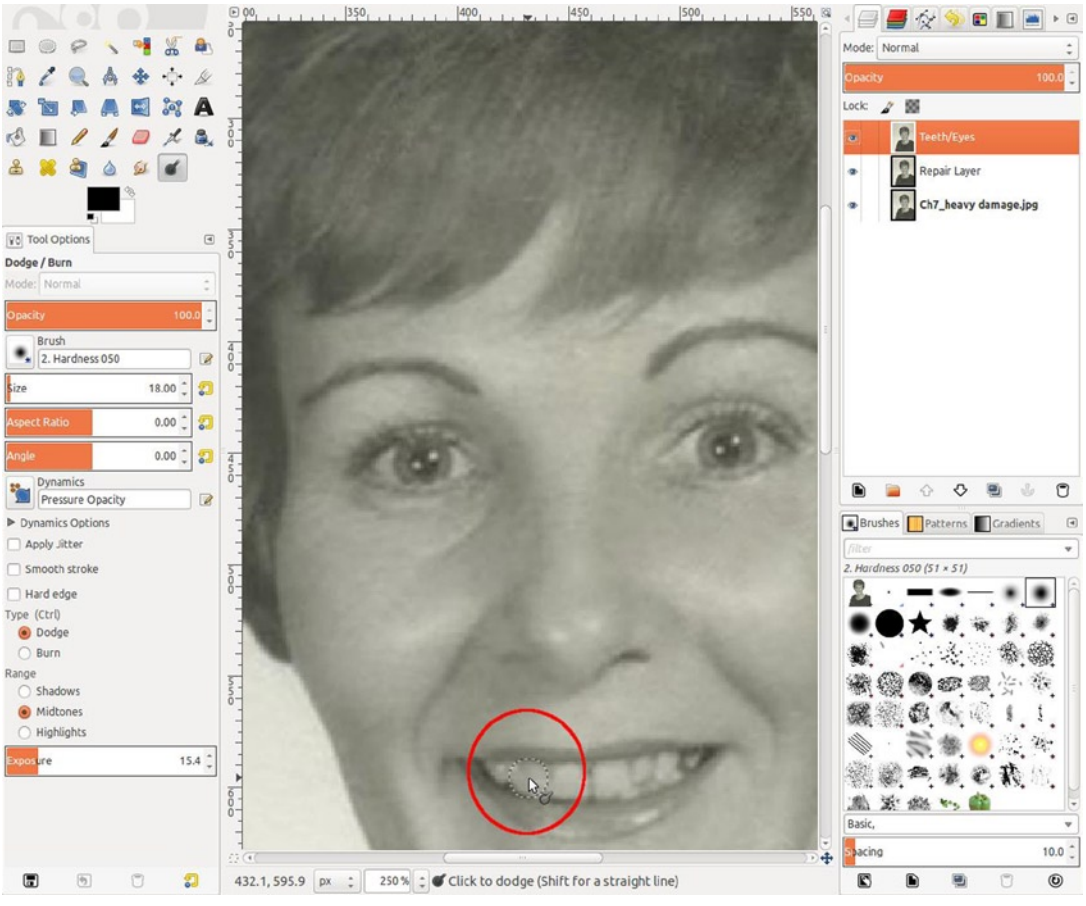

Figure 7-34. *Use the Dodge/Burn tool to brighten the teeth slightly*

9. Use the Blur/Sharpen tool *(Shift + U)* set to Sharpen to *very slightly* sharpen the catch lights in the eyes (Figure 7-35).

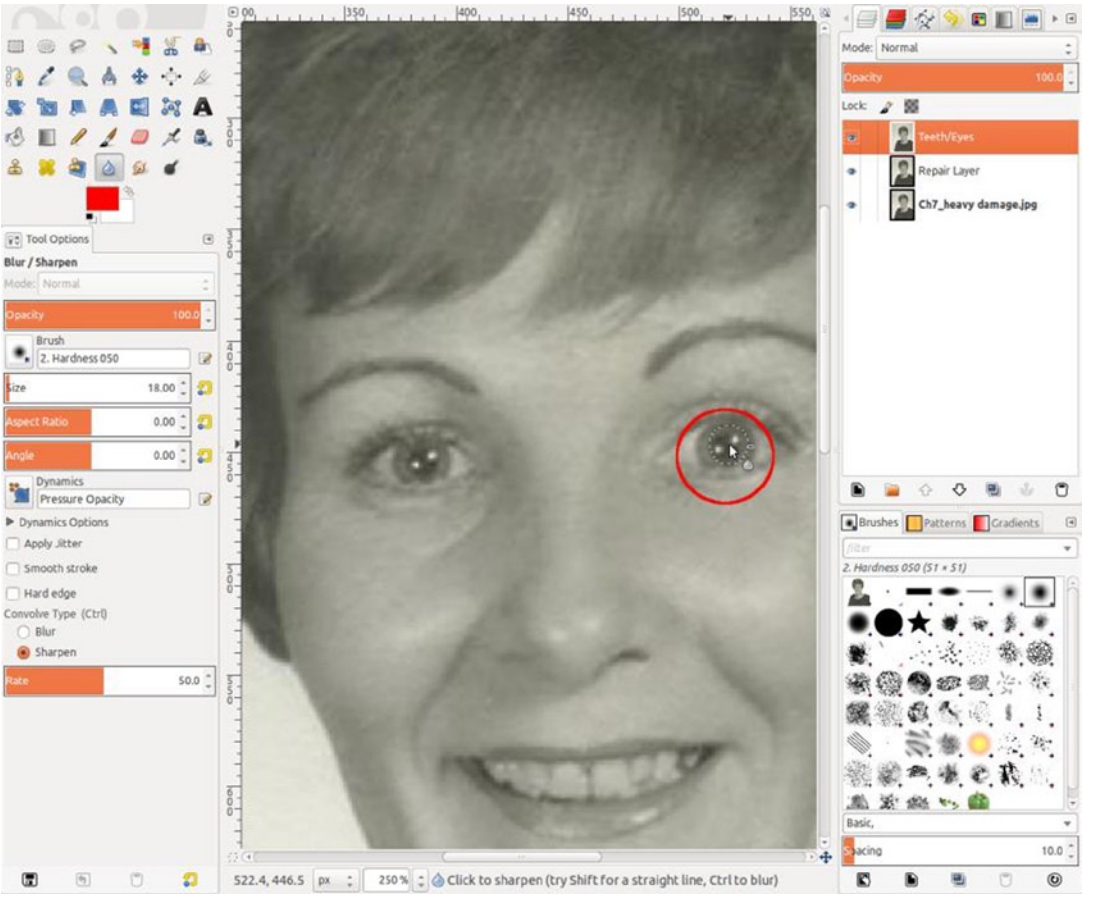

Figure 7-35. *Use the Blur/Sharpen tool to sharpen the catch lights slightly*

10. Merge the Teeth/Eyes Layer down. Open the Curves dialog (*Image Menu* ➤ *Colors* ➤ *Colors* ➤ *Curves*) and boost the contrast very slightly (Figure 7-36).

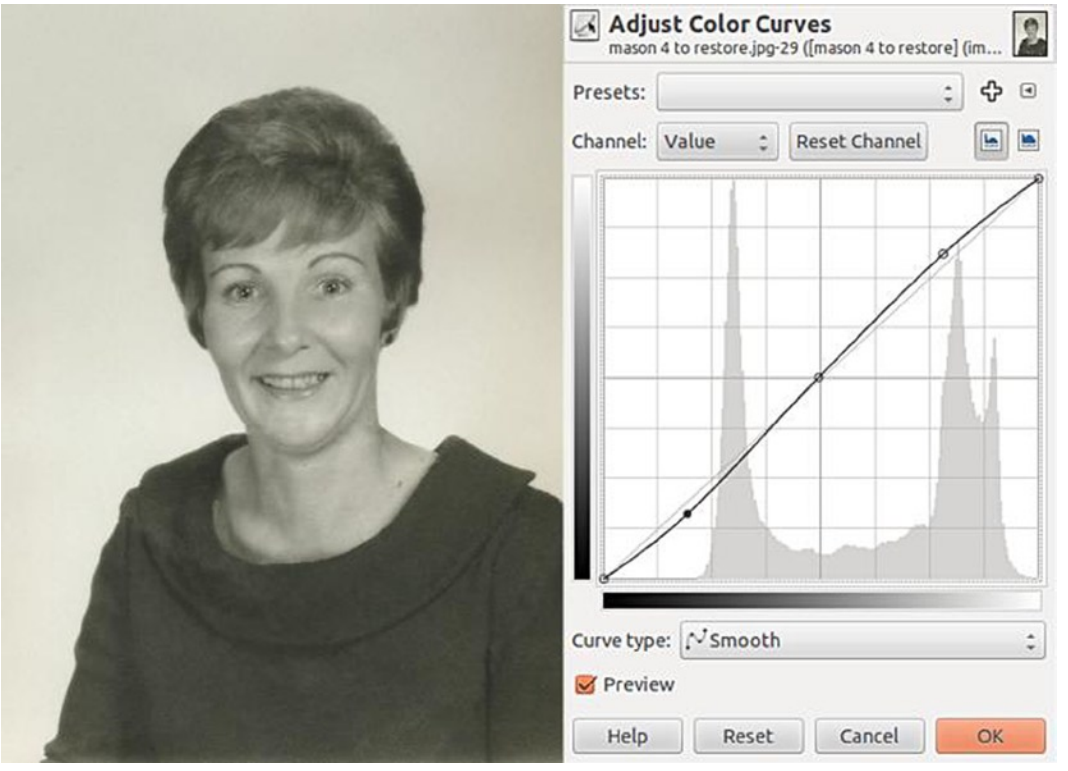

Figure 7-36. *A very slight "S" curve to lightly boost contrast*

This is a tough project. If your results are less than optimal, just try again. Remember, restoration takes practice. If your results resemble the example in Figure 7-37, congratulations!

Figure 7-37. *Before and after comparison*

Summary

GIMP is extremely useful for fixing damaged images. The tools at your disposal will let you repair cracks, tears, and all types of damage. With time and practice, you'll be able to salvage images you thought beyond hope. If you plan to offer image restoration as part of your professional services, your customers will appreciate you all the more!

PART IV

Retouching Faces, Fun Projects, Preserving Your Images

CHAPTER 8

Editing Portraits and Recomposing Images

In This Chapter

- Retouching Portraits
- Recomposing Images

Retouching Portraits

Even the best of portraits can often benefit from a little digital magic. GIMP is ideal for touch-up work and enhancing the best attributes of the photographed subject, while diminishing the distractions that can overpower a great image. Imperfections such as wrinkles and crow's feet can be lessened. Skin can be made smoother and more radiant. Dull or yellowing teeth can be digitally brightened and enhanced.

Diminishing Imperfections and Removing Distractions

It's important to do your retouching as sparingly as possible. When it's overdone, it will look too artificial. Retouching can take a few years away from a portrait's subject, but trying to make someone in his/her mid-40s look 23 might not be the best approach. The objective is to minimize distractions and imperfections and to emphasize the best attributes (and maintain the character) of the person in the photograph. It pays to take some time to study the image and determine your course of action for the necessary editing.

Figure 8-1 illustrates the distractions and imperfections that are present and a strategy for dealing with them, to bring out the best in this image.

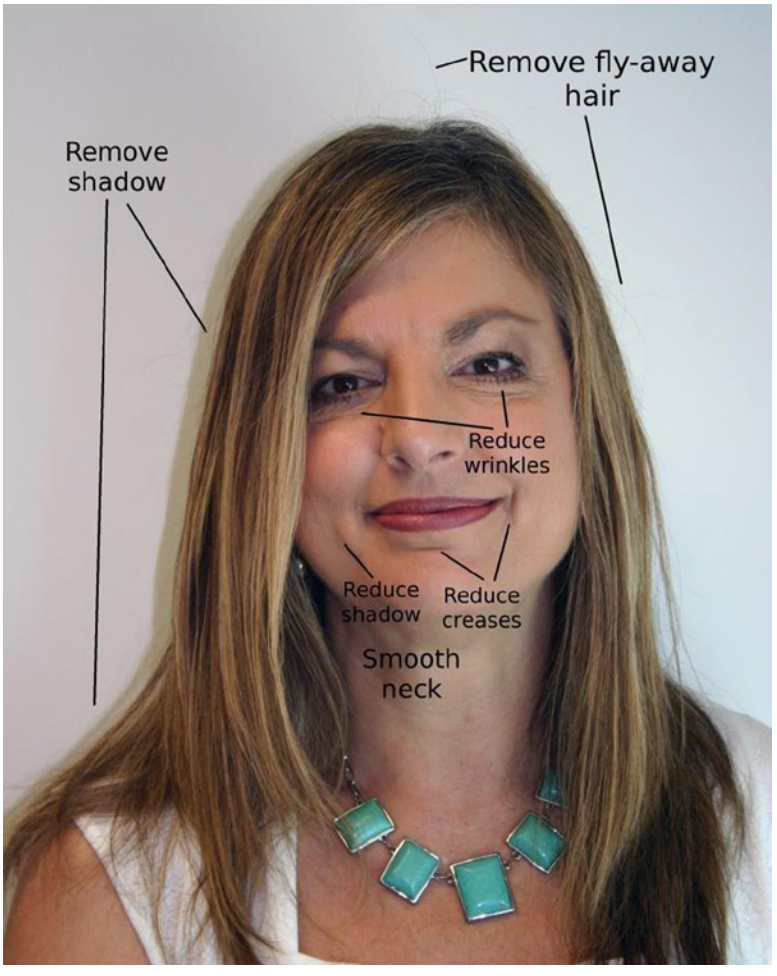

Figure 8-1. *Take some time to determine your course of action*

Tutorial29: Portrait Retouch

In the image you are about to retouch, the key is to reduce the severity of the facial issues (seen in Figure 8-1) but not to completely eliminate them, to prevent looking like plastic surgery was performed.

The Wavelets Decompose plugin must be installed to follow this tutorial.

To edit this image, follow these steps:

1. Open the image (*Ch8_retouch portrait*) located in the Practice Images folder. Duplicate the background layer and rename it Retouch Layer.
2. Create a new layer (Shift + Control + N) and name it Shadow/lFlyaway Hair Removal (Figure 8-2).

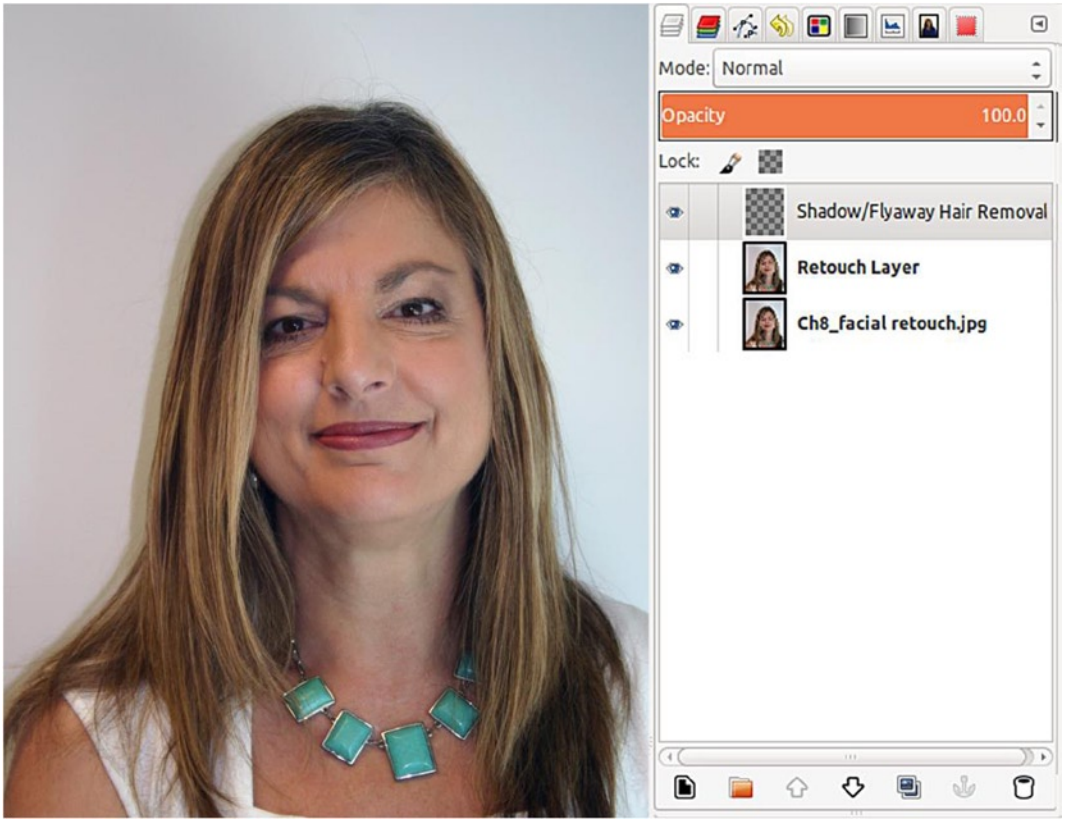

Figure 8-2. *Creating layers on which to perform retouching tasks*

3. Use the Clone tool (C) with the Sample Merged option enabled, to remove the stray fly-away hairs on the Shadow/Flyaway Hair Removal layer (Figure 8-3). Set the brush size just slightly larger than the hair strand on lone hairs. Increase the brush size to remove clusters of hair.

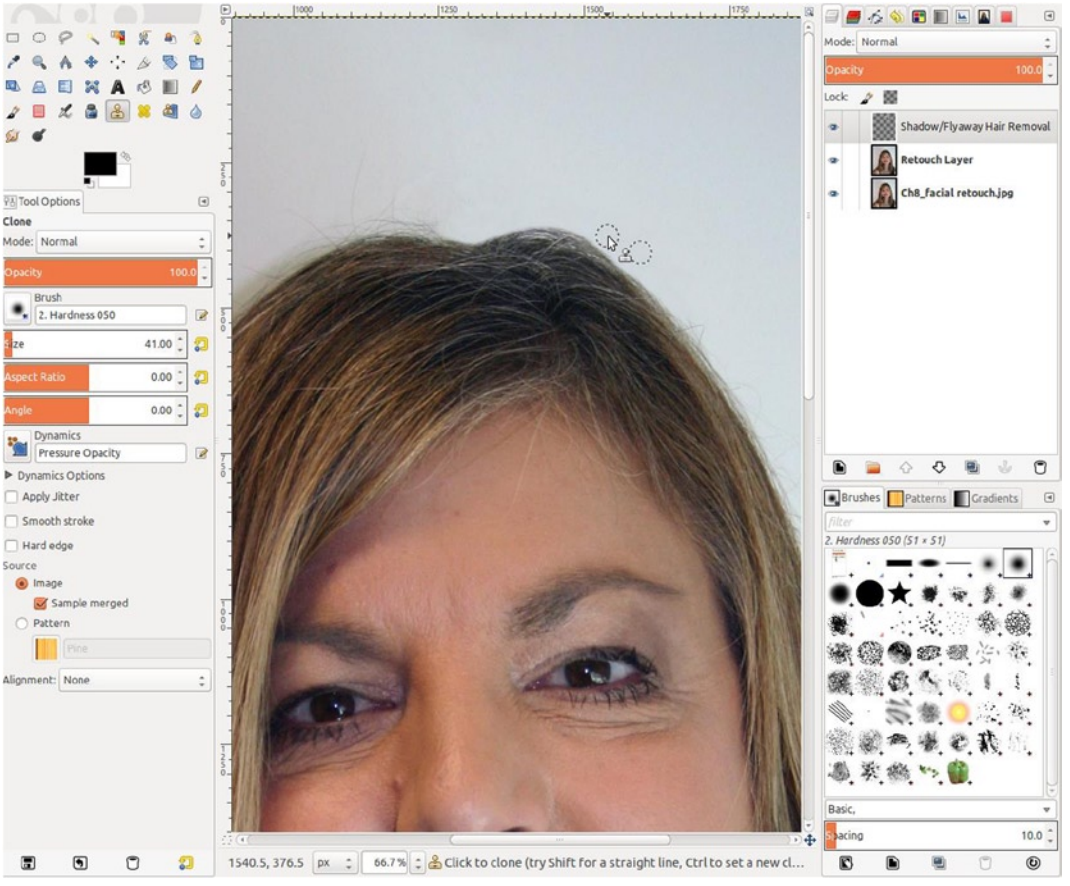

Figure 8-3. *Use the Clone tool to remove flyaway hair*

4. Use the Clone tool (C) to remove the light shadow (and fly-away hairs) on the side of the woman's head. Re-sample often as you work down (Figure 8-4). Use athe brush preset name hardnessf 050.

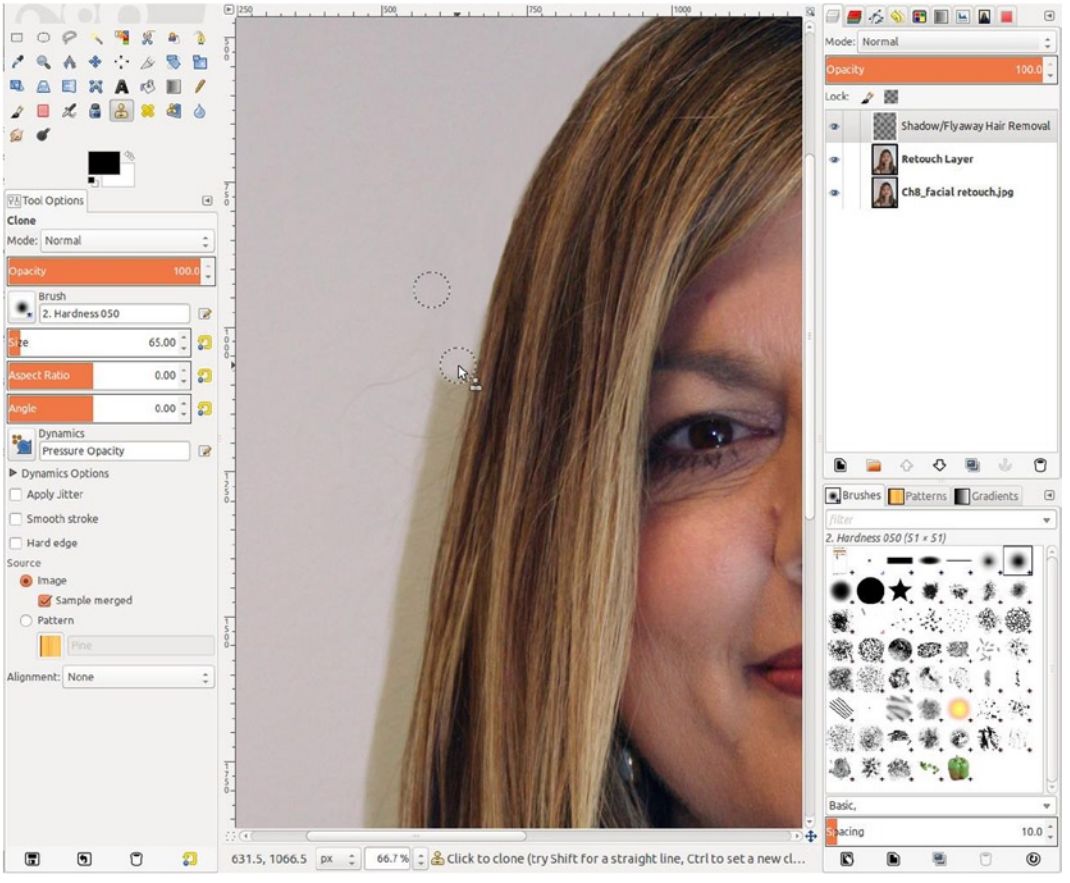

Figure 8-4. *Removing the shadow and flyaway hairs using the Clone tool*

5. This procedure may give the repaired area a slightly smooth appearance, as compared to the surrounding background, when viewing zoomed in. If necessary, add a minimum amount of noise (Image Menu ➤ Filters ➤ Noise ➤ RGB Noise). Uncheck the Correlated noise and Independent RGB options and set the noise to the lowest setting of 0.01, then click OK (Figure 8-5).

Figure 8-5. *Add a minimum amount of noise to the Clone/ Flyaway Hair Removal layer, if needed*

6. When the cloning is completed, merge the Clone/Shadow/Flyaway Hair Removal layer down. Figure 8-6 reveals an improved image, as a result of the removal of the shadow and fly-away hair.

Figure 8-6. *Removing the distracting flyaway hair and the shadow improves this image*

7. Now it's time to do some retouching on the face. Open the Wavelets Decompose dialog (Image Menu ➤ Filters ➤ Generic ➤ Wavelets Decompose). Use the default option of creating five scales. The Wavelet scales contain varying degrees of edge detail (Figure 8-7).

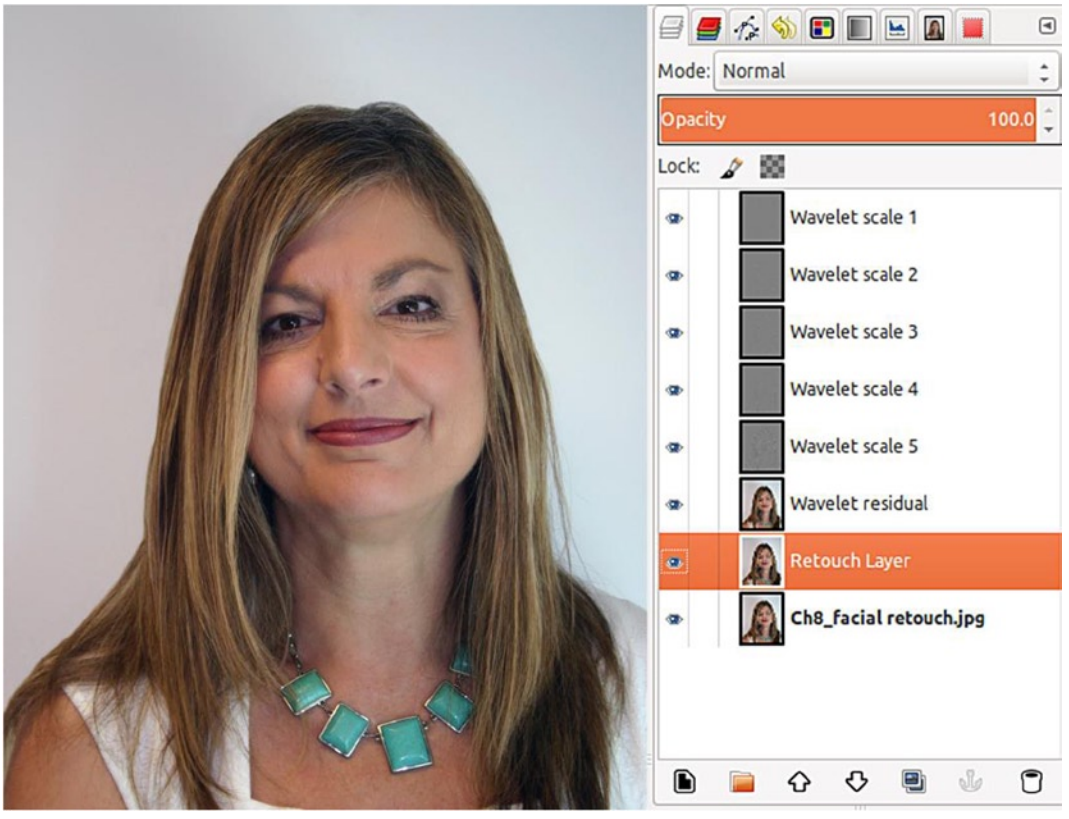

Figure 8-7. *Wavelet scales*

8. Use the Free Select tool (F) with the Feather Edges radius set to 10 pixels to draw around the under-eye creases and the two near the mouth (Figure 8-8).

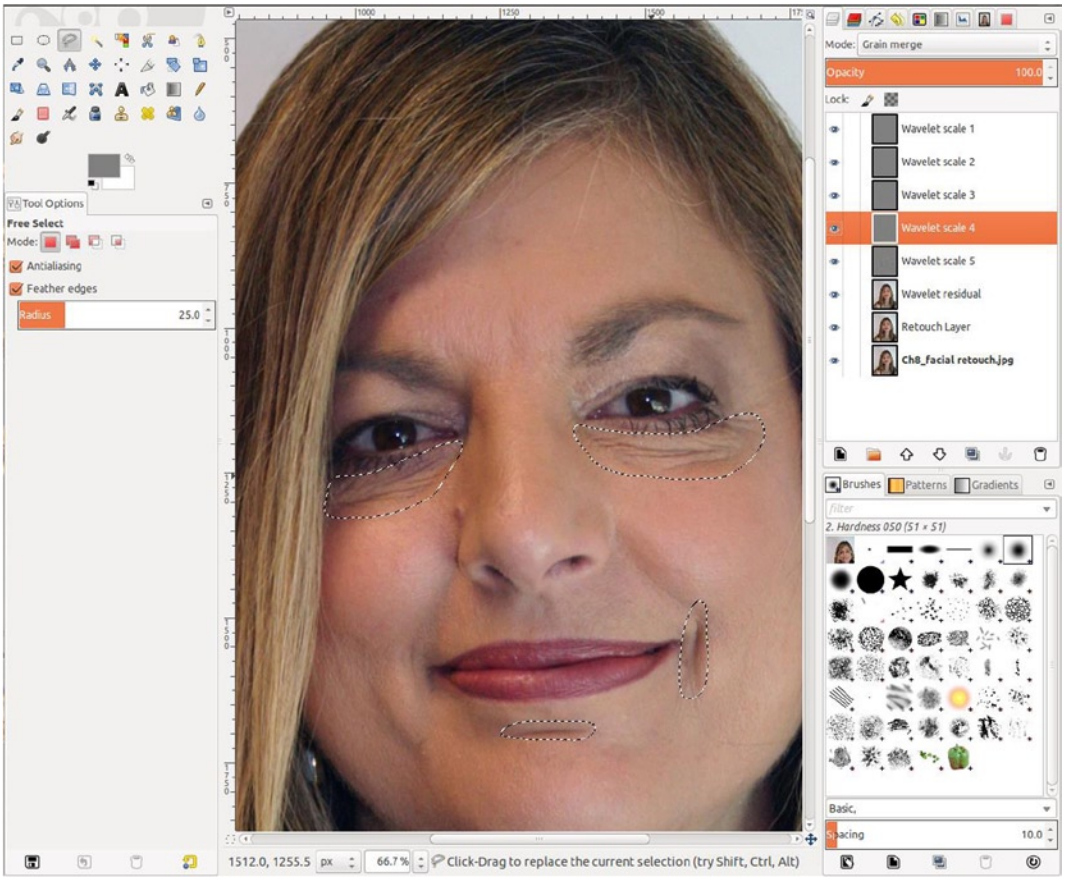

Figure 8-8. *Selections made around the harsher areas to be retouched*

9. Click Wavelet scale 3, and apply the Gaussian Blur filter (Image Menu ➤ Filters ➤ Blur ➤ Gaussian Blur) with the blur radius (vertical and horizontal) to 30.

10. Click Wavelet scale 4, and reapply the Gaussian Blur (Control + F). The under-eye creases are noticeably diminished. The mouth creases look less harsh (Figure 8-9).

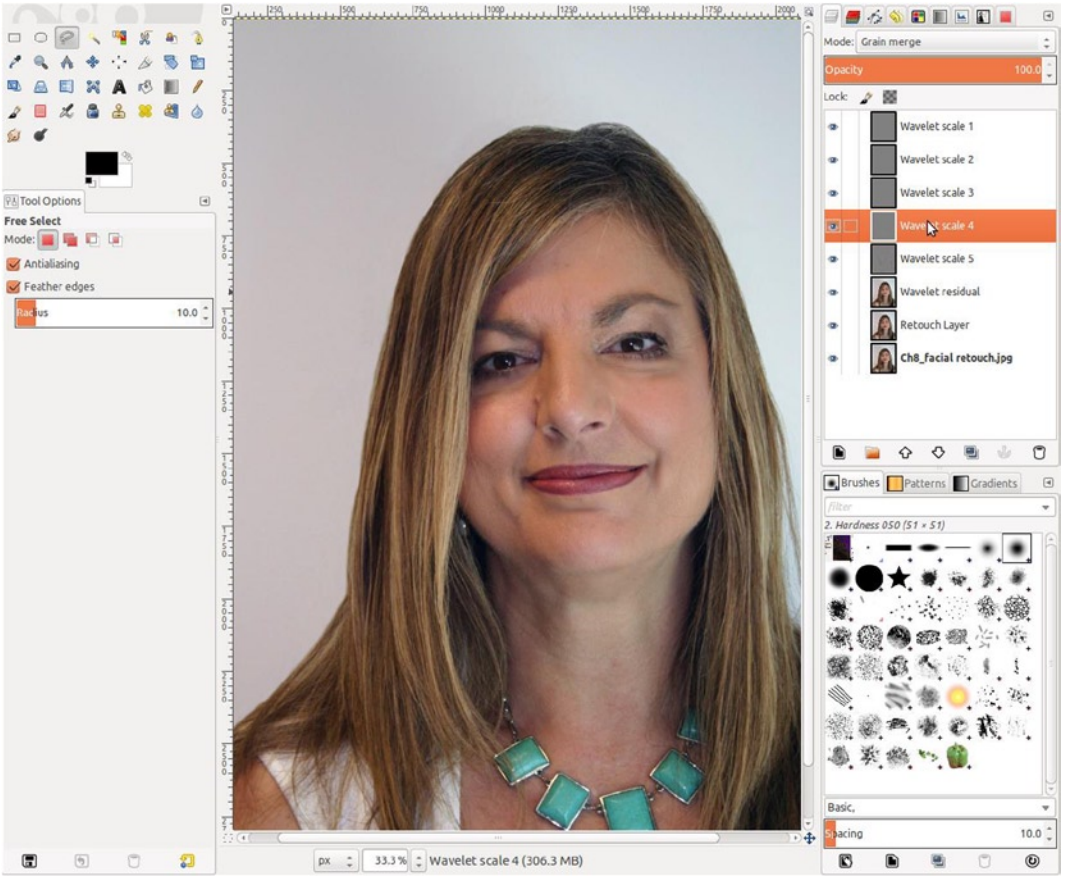

Figure 8-9. *The retouched areas looking a bit better*

11. Use the Free Select tool (F) to draw around the forehead, cheeks, chin, and neck. Click Wavelet scale 3 and apply the Gaussian Blur filter, using a blur radius of 15 pixels (Figure 8-10).

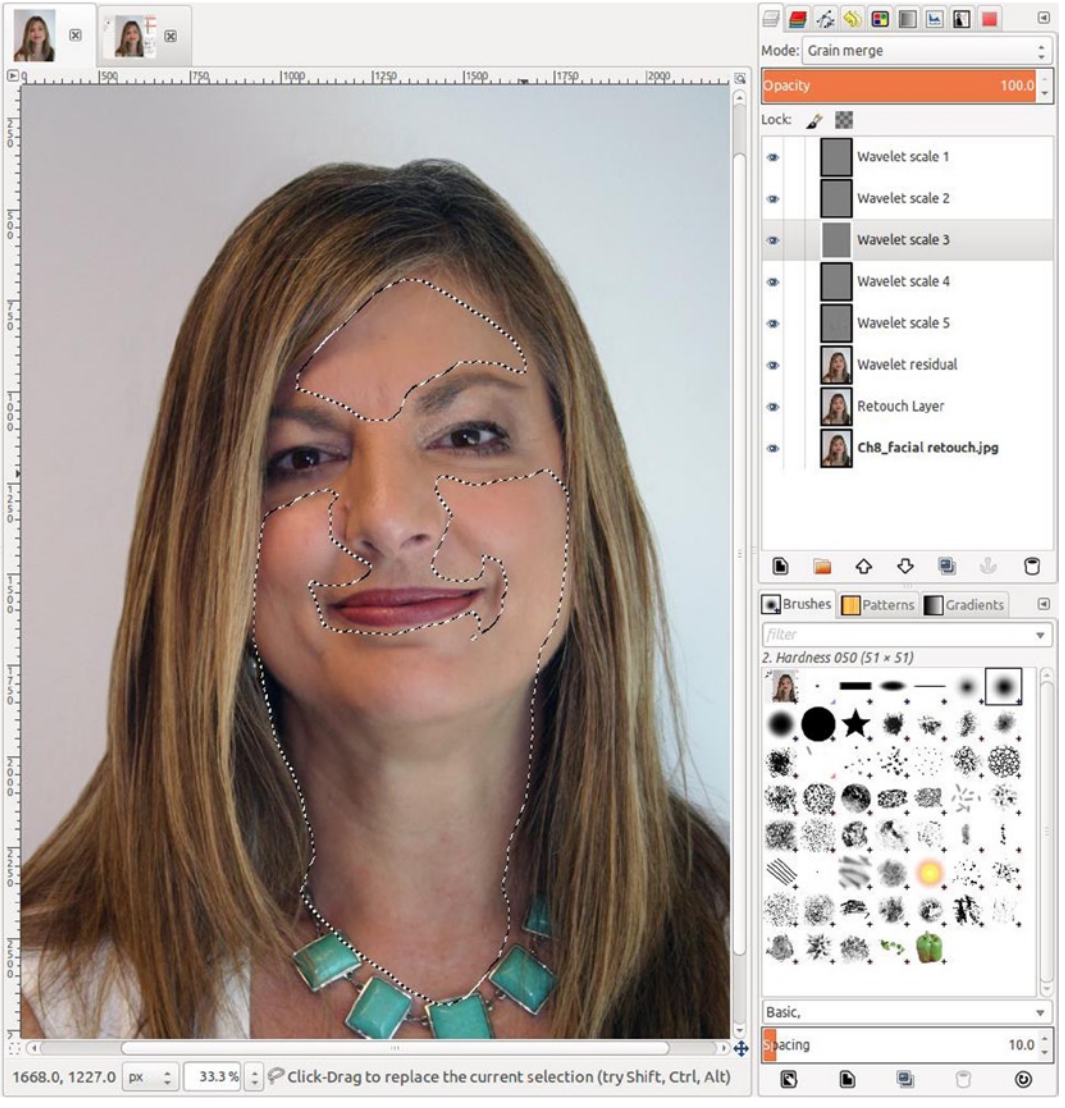

Figure 8-10. *Areas to be smoothed*

12. Hide the background layer and merge remaining visible layers (Merge Visible Layers).
13. Add a new layer (Shift + Control + N) and change the blend mode to Soft Light.
14. Fill the layer with 50% gray, and using the Airbrush tool (A) with the opacity set to 15 and white as the active color, paint along the deeper creases in the face and neck, to reduce the severity (Figure 8-11).

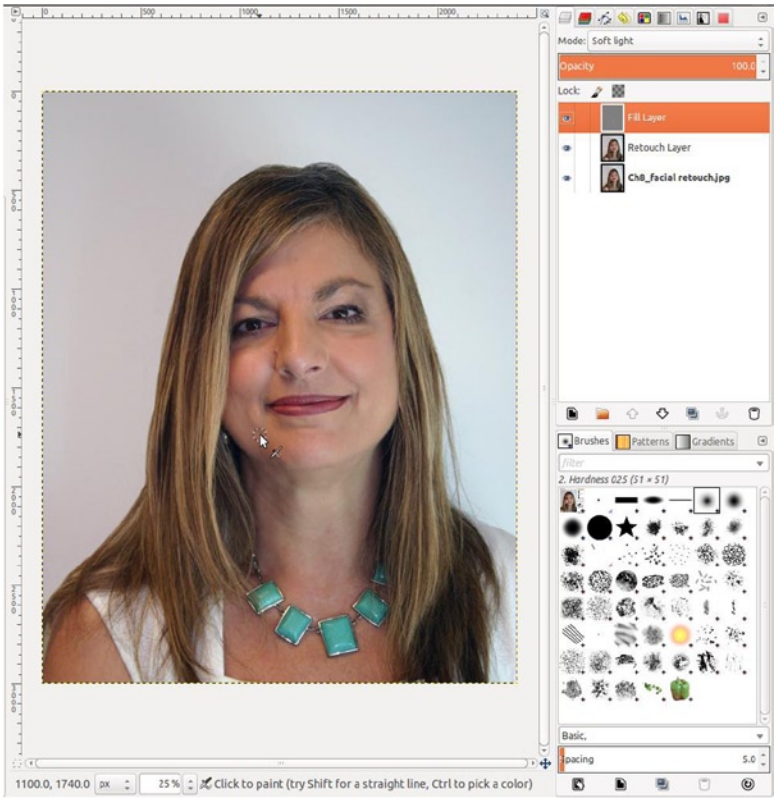

Figure 8-11. *Using a Soft Light layer and the Airbrush tool to lighten the shadows*

15. Use the Healing tool (H) with the opacity set to 35 to reduce the bump around the nose and the blemishes on the neck (Figure 8-12).

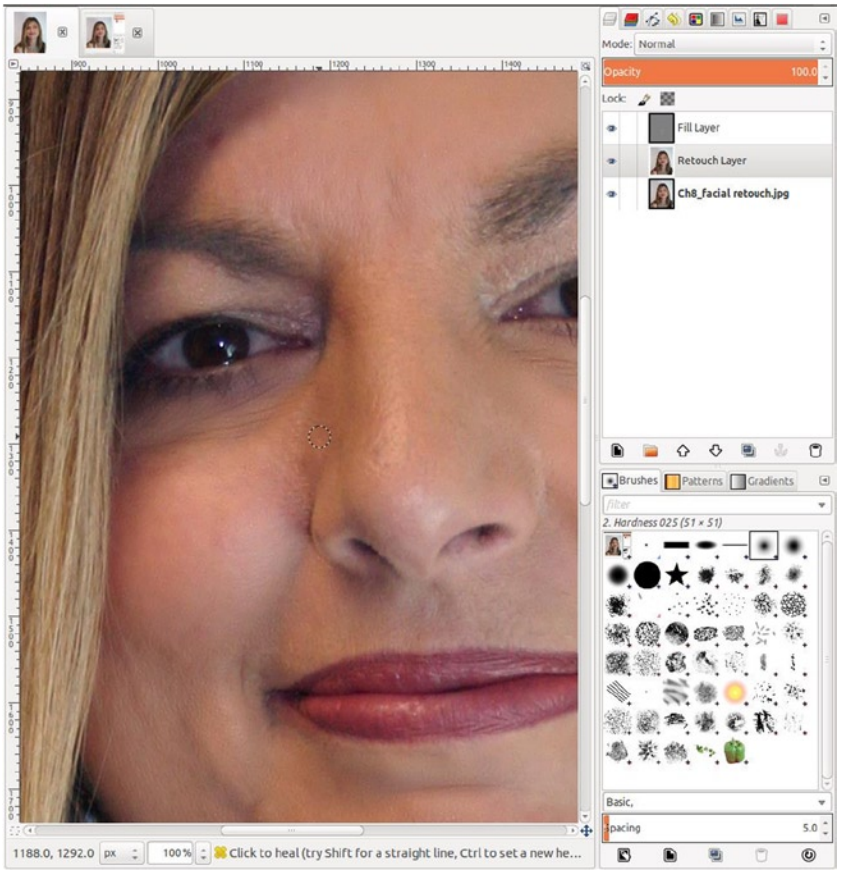

Figure 8-12. *Final touches using the Healing tool*

16. In the final result, the distractions are removed, and the imperfections are diminished (Figure 8-13).

Figure 8-13. *Before and after comparison*

Tutorial 30: Brightening Teeth

Over time, our teeth can become dingy and stained from consumption of coffee, wine, tobacco, and various other substances. Age is also a factor—most people at the age of 60 don't have the bright, white smile of an 18-year-old. Many images can benefit from some digital "cosmetic dentistry." We'll see how GIMP will subtly brighten and whiten the teeth in Figure 8-14.

Figure 8-14. *A great smile that can be further enhanced with GIMP*

As in facial retouching, use a light touch in brightening teeth, or you'll end up with results that will be obvious and appear fake or won't look right to the people who know the person in the photograph.

To edit this image, follow these steps:

1. Open the image (*Ch8_brighten teeth*) located in the Practice Images folder.
2. Use the Free Select tool (F) with the Feather Edges radius set to 1.0 and make a selection around the teeth (Figure 8-15).

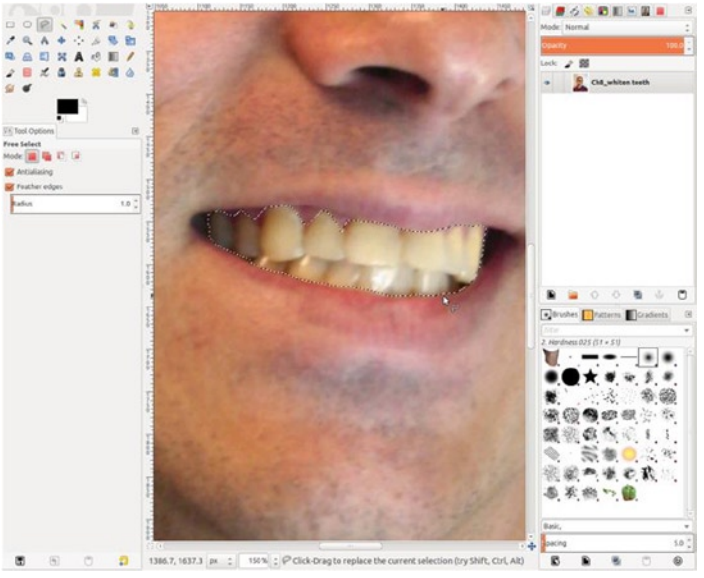

Figure 8-15. *Make a selection around the teeth*

3. Copy and paste the selection (Control + C + V) and convert the floating selection to a new layer (Shift + Control + N). Rename it Teeth.

4. Open the Hue-Saturation dialog (Image Menu ➤ Colors ➤ Hue Saturation). Select yellow as the primary color and adjust the slider to about -30, then click OK. This will reduce some of the yellow just a bit (Figure 8-16).

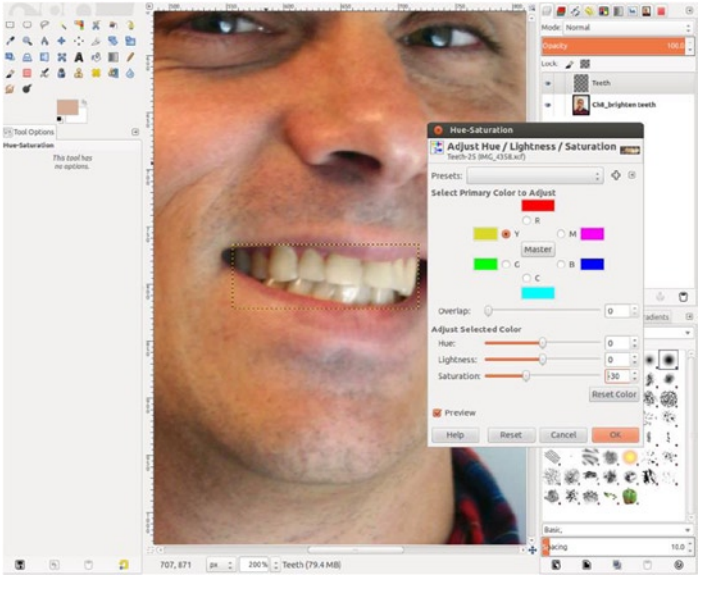

Figure 8-16. *Reduce the yellow, using the Hue-Saturation dialog*

5. Open the Levels dialog (Image Menu ➤ Colors ➤ Levels) and move the midpoint slider to the left until the value is about 1.10, then click OK. This will lighten the teeth just slightly (Figure 8-17).

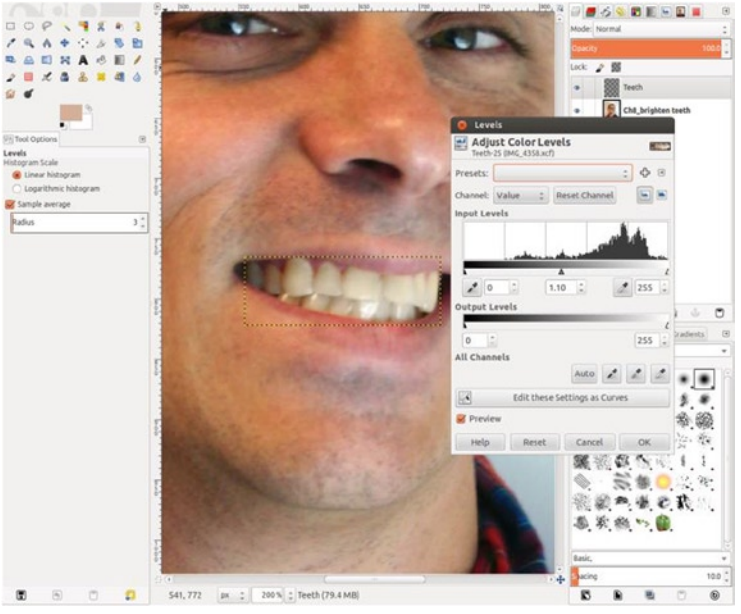

Figure 8-17. *Use the Levels dialog to brighten the teeth slightly*

We can see in Figure 8-18 that the teeth are noticeably improved, but without the end result being overpowering. Subtlety is key when working with the color and brightness in teeth.

Figure 8-18. *Before and after comparison*

Recomposing Images

Recomposing portraits or important photographs is common part of image editing. People become very emotionally attached to certain photographs, but they may contain an ugly background or an in-law, ex-spouse, or some other unwelcome person or element that the owner of the photograph finds unpleasant.

The two most frequently requested services I receive are replacing backgrounds and removing people from portraits. On occasion, I'll receive a request to add someone to an image.

Recomposing an image consists mainly of covering up unwanted image data with replacement data and working with it to create a realistic outcome. The tutorials that follow demonstrate two background replacement methods and one involving removing someone from a snapshot.

Replacing Backgrounds

In my line of work as a retouch artist, replacing backgrounds is one of the most frequently requested editing services I provide. Sometimes it's because there's only one existing photograph of a certain person, and the client would like a "studio" version of the image, such as a muslin background behind the subject. Other times, the client desires a reimagined version of a photographic scene. Sometimes, it's just a busy, cluttered, and distracting background spoiling the photo.

Tutorial 31: Replacing a Background (No. 1)

The image shown in Figure 8-19 is scanned from a photograph that I shot in 1993 (in the days few people could afford Photoshop). It has a great subject, but the elements in the background (the open garage, orange road construction barrel, street, etc.) detract from what is otherwise a good portrait.

Figure 8-19. *A cluttered background detracts from an otherwise good image*

In the following tutorial, you'll extract the young woman's image and place it on a more suitable background, resulting in a much better portrait.

To edit this image, follow these steps:

1. Open the image (*Ch8_background change 1*) located in the Practice Images folder. (The image you'll use as the new background accompanies the practice image.)
2. Use the Free Select tool (F) to draw a loose outline around the young woman. It's okay to err outside of the edge; that will be refined shortly (Figure 8-20).

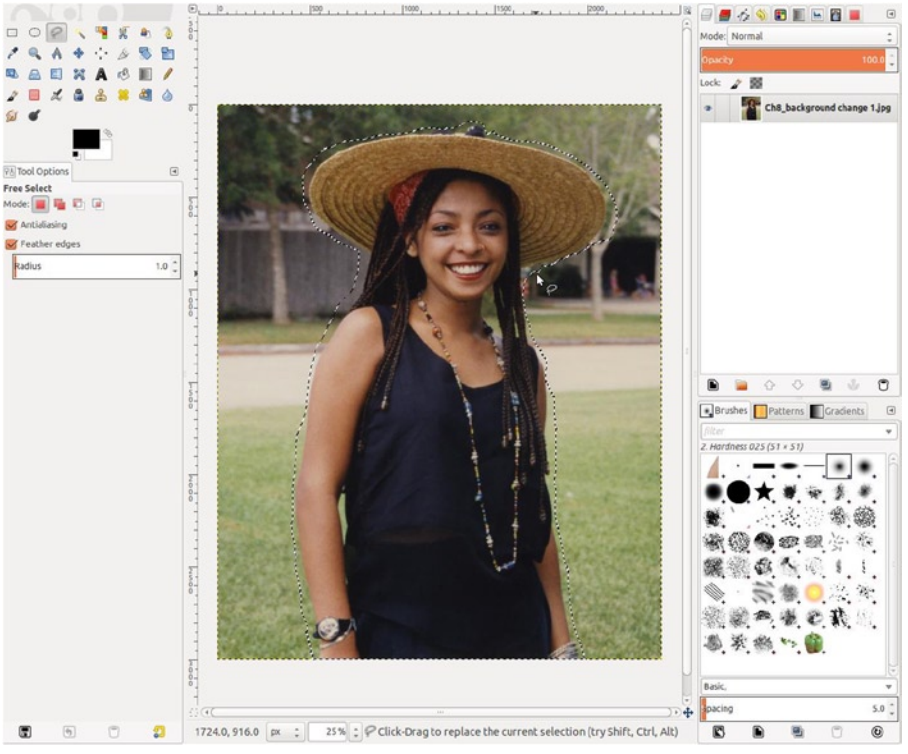

Figure 8-20. *Draw a selection around the subject*

3. Switch to the Quick Mask mode (Shift + Q). With black as the active color and the brush presetahHardnessf 050, paint along the edge to complete the selection (Figure 8-21). Be sure to paint the areas of background that show through the hair and between the arm and dress.

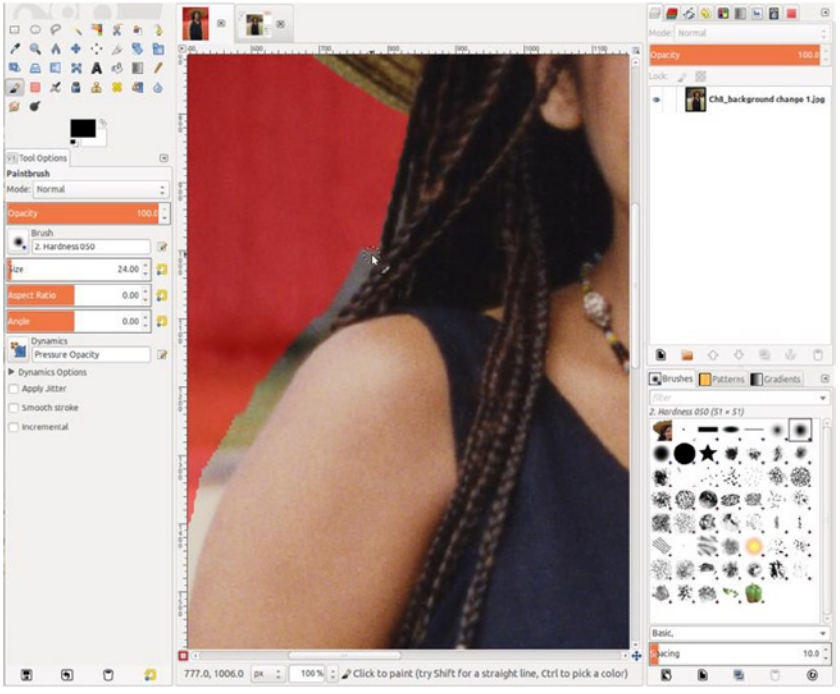

Figure 8-21. *Paint along the edge, to complete the selection*

4. Deactivate the Quick Mask mode (Shift + Q) to switch back to the "marching ant" selection. We'll now copy the selected subject to its own layer (Control + C and Control + V). Change the floating selection to a layer (Shift + Control + N). Rename the layer Isolated Girl.

5. Hide the Background layer by clicking the Eyeball icon (Figure 8-22). If there are any residual pixels left to remove, add a layer mask to the Isolated Girl layer (Right-click + Add Layer Mask). Leave the layer mask at the default settings.

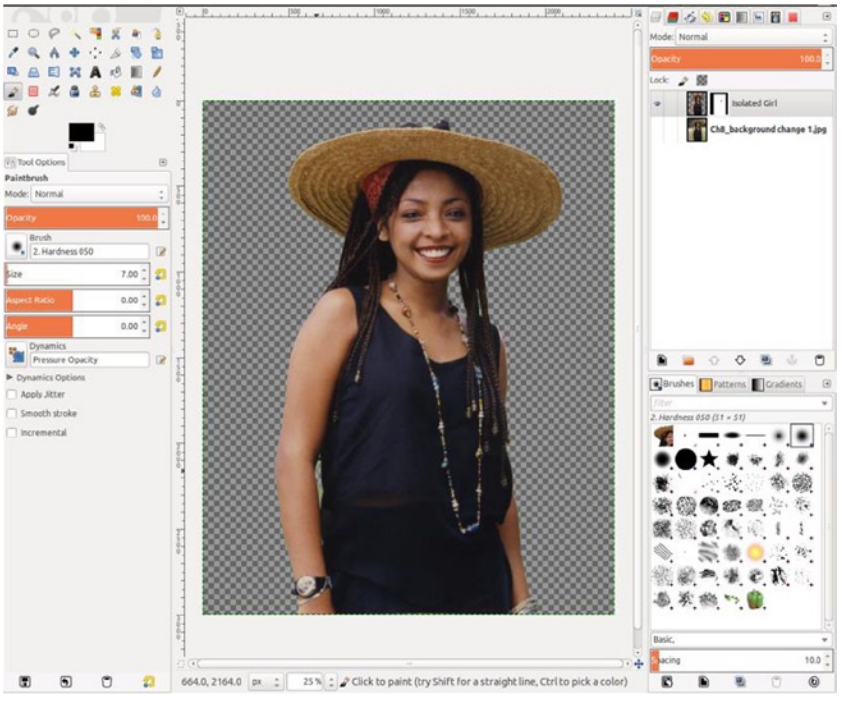

Figure 8-22. *The isolated subject*

6. Using black as the active color, click the layer mask, to make it active, and paint on the stray pixels, to make them transparent.

7. Open the image we'll use for the new background (*`Ch8_sunlight through trees`*). Copy it to the clipboard (Control + C).Paste it as a new layer into the project (Image Menu ➤ Edit ➤ Paste As ➤ New Layer). Rename it *New Background* and move it under the *Isolated Girl* layer (Figure 8-23).

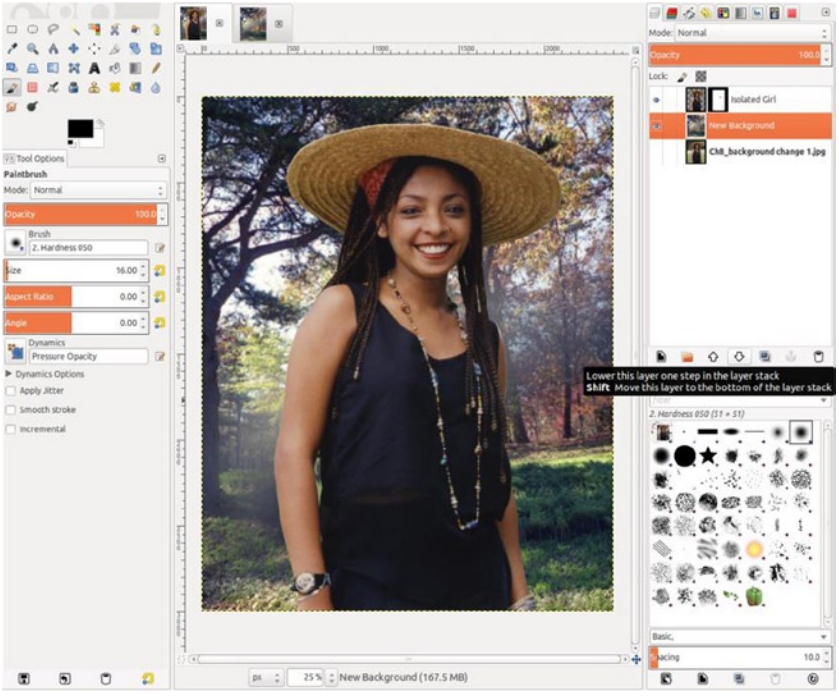

Figure 8-23. *The new background layer put into place*

8. For a more realistic look, the background should not be as sharp the subject. Blur it just a bit with the Gaussian Blur dialog, using a radius of 10 pixels (Image Menu ➤ Filters ➤ Blur ➤ Gaussian Blur).

9. After blurring, the background looks very smooth when compared to the subject. Using the G'MIC plug-in, add some film grain to the *New Background* layer, to create a better match. After experimenting, I preferred the result I got using the default settings and checking the Colored grain option (Figure 8-24).

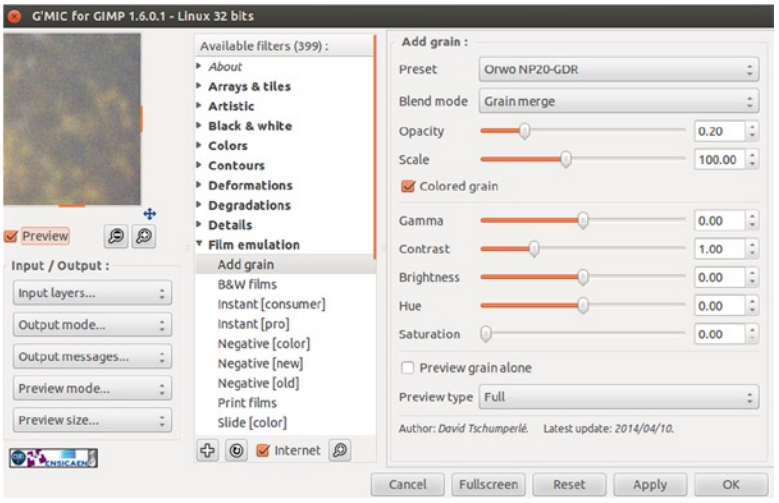

Figure 8-24. *Add film grain to the background layer to match the grain in the subject*

The end result is a much more aesthetically pleasing portrait. A different background can make a huge difference (Figure 8-25).

Figure 8-25. *Before and after comparison*

Tutorial 32: Replacing a Background (No. 2)

The image shown in Figure 8-26 is actually a decent portrait. Most people would probably like it as is, but sometimes customers will request something a little more stylish, such as a muslin studio-style background. This young woman has some tight curls in her hair, so this tutorial will involve a little more refinement than the previous one.

Figure 8-26. *A portrait that will receive a studio-style replacement background*

To edit this image, follow these steps:

1. Open the image (*Ch8_new background*) located in the Practice Images folder. (The image you'll use as the new background accompanies the practice image.)
2. Duplicate the background layer *twice*. Rename the uppermost layer Edit Layer (Figure 8-27).

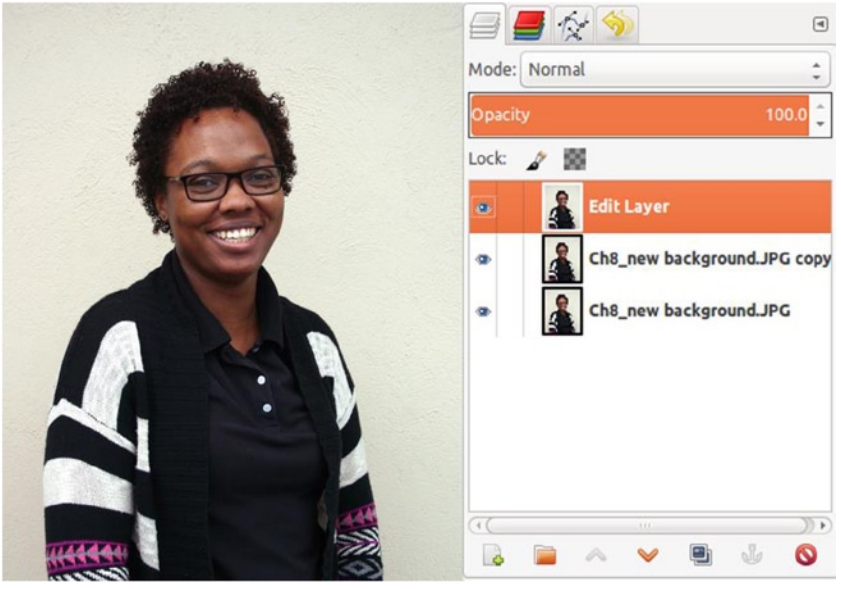

Figure 8-27. *For this tutorial, the background layer will be duplicated twice*

3. Add a transparency (in the form of an alpha channel) to the Edit Layer (Image Menu ➤ Layer ➤ Transparency ➤ Add Alpha Channel).

4. Open the Threshold dialog (Image Menu ➤ Colors ➤ Threshold). Leave the slider at the default setting (Figure 8-28).

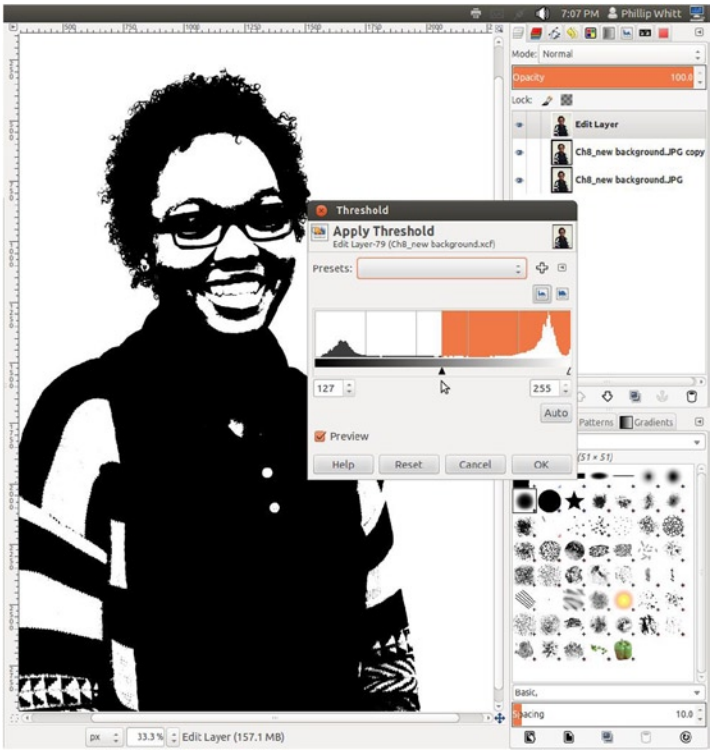

Figure 8-28. *The threshold dialog*

5. Reverse the black and white colors (Image Menu ➤ Colors ➤ Invert). Using white as the active color and a hard brush, fill in the black gaps within the inverted silhouette (Figure 8-29).

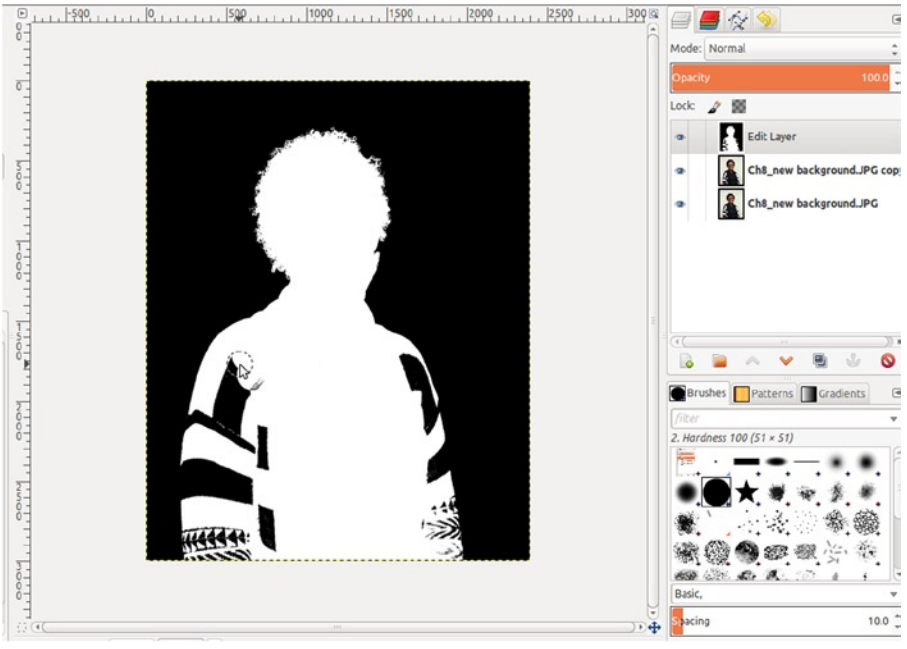

Figure 8-29. *Paint in the inverted silhouette with white*

6. Lower the opacity of the *Edit Layer* to reveal the image underneath sufficiently to use it as a guide to paint the edges of the bands in the sweater (Figure 8-30).

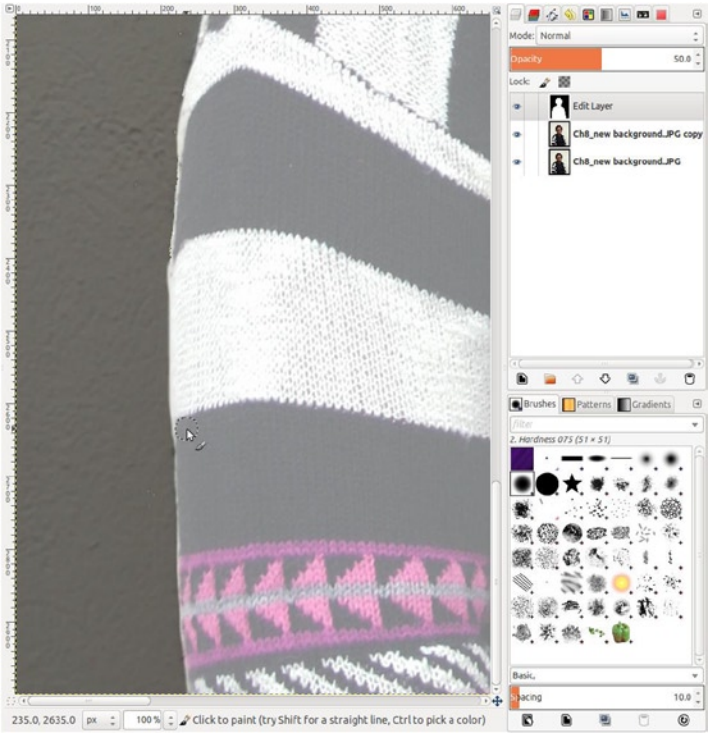

Figure 8-30. *Lower the opacity of the Edit Layer to reveal the edge in the bands of the sweater along which to paint*

7. Cut the Edit Layer to the clipboard (Control + X).
8. Add a layer mask to the background layer copy (Image Menu ➤ Layer ➤ Mask ➤ Add Layer Mask).
9. Click the layer mask to make it active, and paste the extracted subject (Control + V). The pixels of the original background have been made transparent (Figure 8-31).

Figure 8-31. *The pixels of the original background are now transparent*

10. Open the new background image (`Ch8_studio background`) found in the Practice Images folder.

11. Copy it to the clipboard (Control + C).Paste it as a new layer into the project (Image Menu ➤ Edit ➤ Paste As ➤ New Layer). Rename it Studio Background and move it under the background layer copy (Figure 8-32).

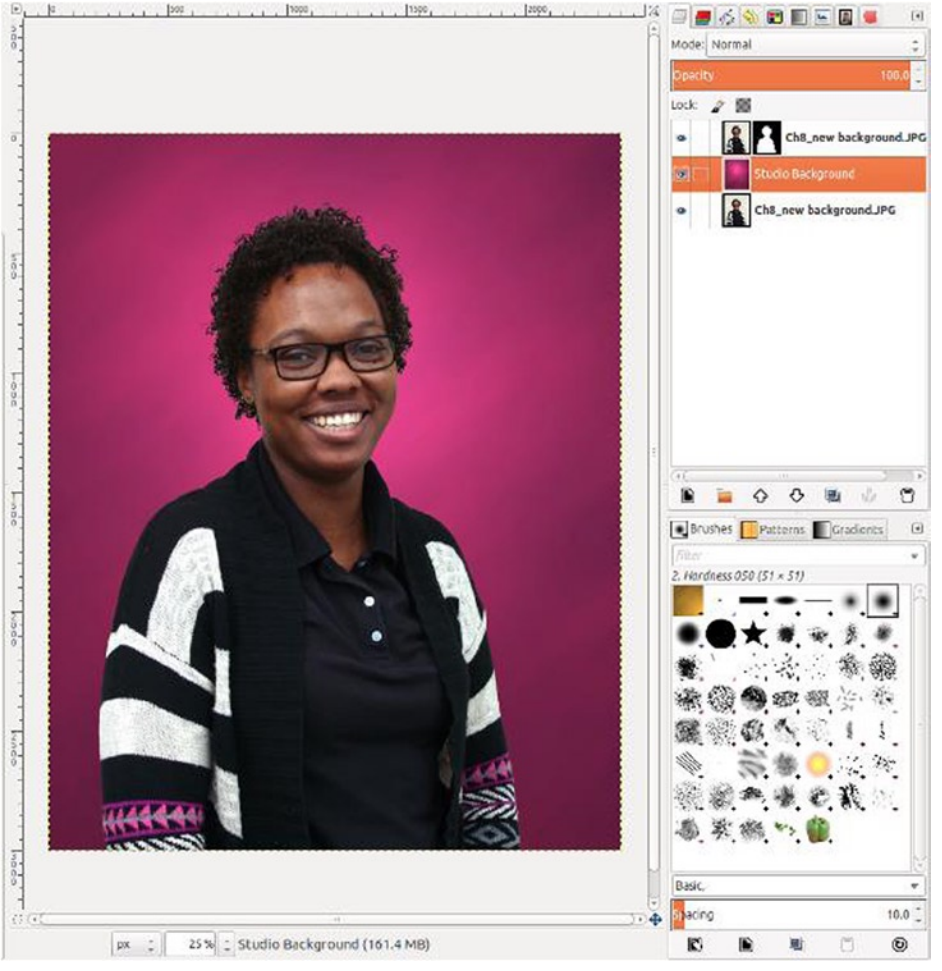

Figure 8-32. *The new background in place*

12. Use the Dodge/Burn tool (Shift + D) with the burn option selected and the exposure set to 75 and darken the curls with the light fringes.

13. Click the layer mask to make it active and use the Blur/Sharpen tool with the blur option selected to soften the edges slightly. Set the opacity to 100 and the rate to 20 (Figure 8-33).

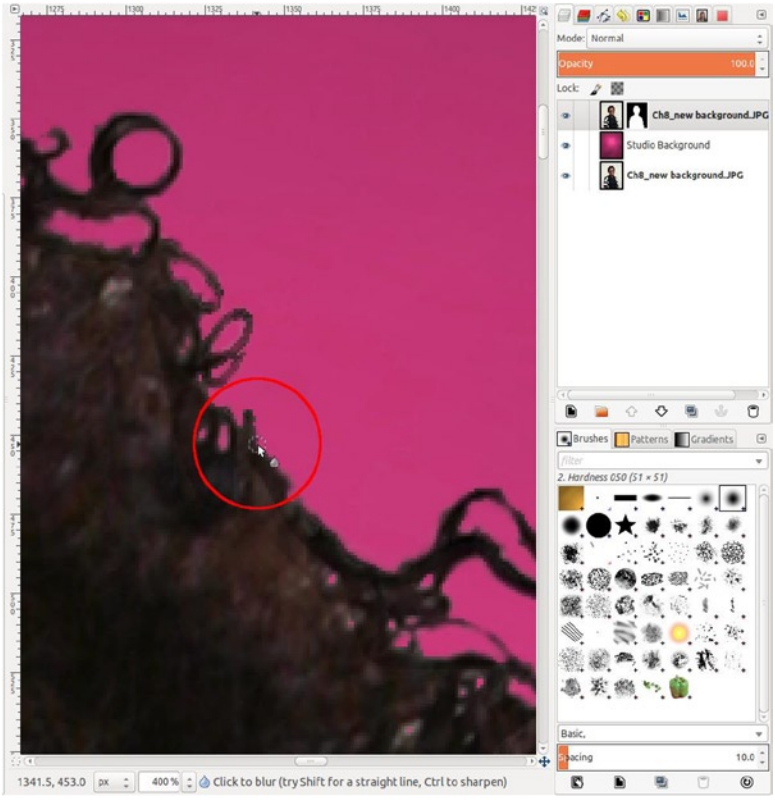

Figure 8-33. *Touching up the curls using the Burn and Blur tools*

14. Add a minimum amount of noise to the Studio Background (Image Menu ➤ Filters ➤ Noise ➤ RGB Noise).

Use the lowest setting, with the Independent RGB option unchecked.

This method of replacing the background preserves all but the finest hairs. (I used a difficult subject here; most hair will be a little easier to handle.) The result is a portrait that looks like it was taken in a studio (Figure 8-34).

Figure 8-34. *Before and after comparison*

Removing People

As mentioned previously, clients will often request having someone digitally removed from a treasured photograph. This task is basically just a matter of borrowing image data from one part of the picture to cover up the person to be taken out of the image.

Tutorial 33: Removing a Person

The example in Figure 8-35 is a Polaroid photograph of my late brother, Glenn, taken in the late 1980s or early 1990s. I've always loved this picture, because it shows a rarely seen playful aspect of Glenn's personality. I don't have many photos of him by himself, so I decided to edit this one, so that I can now have one of my favorite ones (and it makes a great tutorial).

Figure 8-35. *A photograph of my late brother, Glenn, soon to be alone in this image*

To edit this image, follow these steps:

1. Open the image (*Ch8_remove girl*) located in the Practice Images folder.
2. Duplicate the background layer and rename it Edit Layer (Figure 8-36).

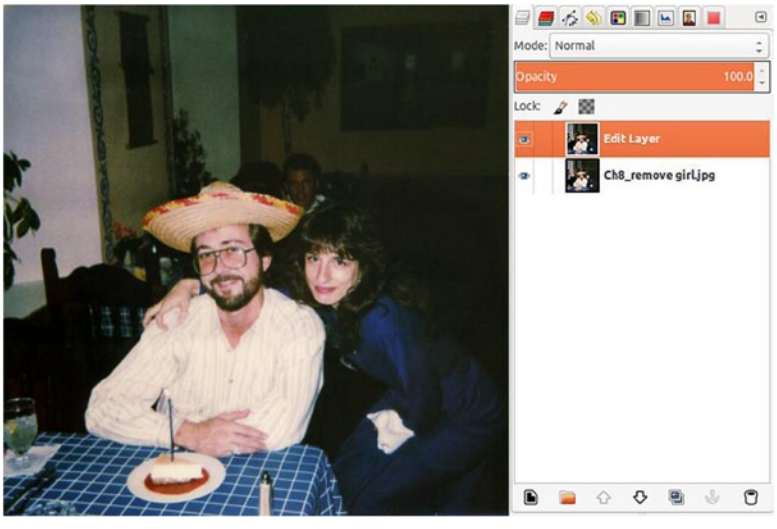

Figure 8-36. *Create a duplicate layer to edit*

3. Using the Free Select tool (F) and the Feather Edges radius set to 10 pixels, draw a selection around the area on the right side of the image (Figure 8-37).

Figure 8-37. *Make a selection around the dark area, to create a patch to cover the woman*

4. Copy and paste (Control + C and Control + V) as a floating selection. Change the floating selection into a new layer (Shift + Control + N). Expand the layer's boundary size to match to the image size (Image Menu ➤ Layer ➤ Layer to Image Size). Rename the layer Patch 1).

5. Use the Move tool (M) to move the patch over the woman's face. Some of it will cover part of the man's hair and sombrero, but that's okay for now (Figure 8-38).

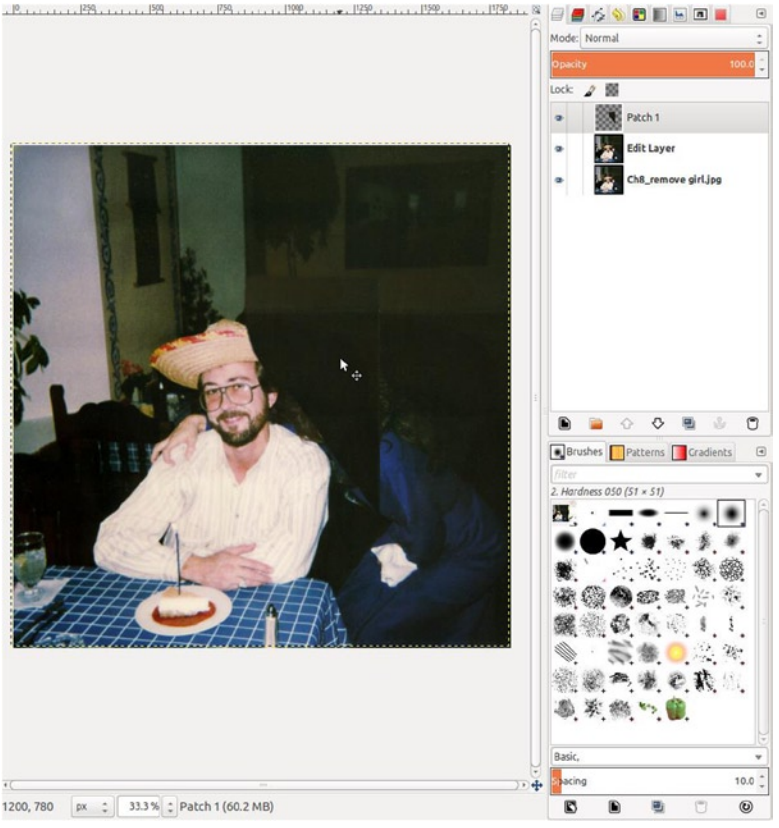

Figure 8-38. *Move the patch into place*

6. The patch layer will be a little darker than the surrounding image area. Open the Levels dialog (Image Menu ➤ Colors ➤ Levels). Move the white point slider to the left, to lighten the patch layer slightly and create a better tonal match. The value should be around 230 (Figure 8-39).

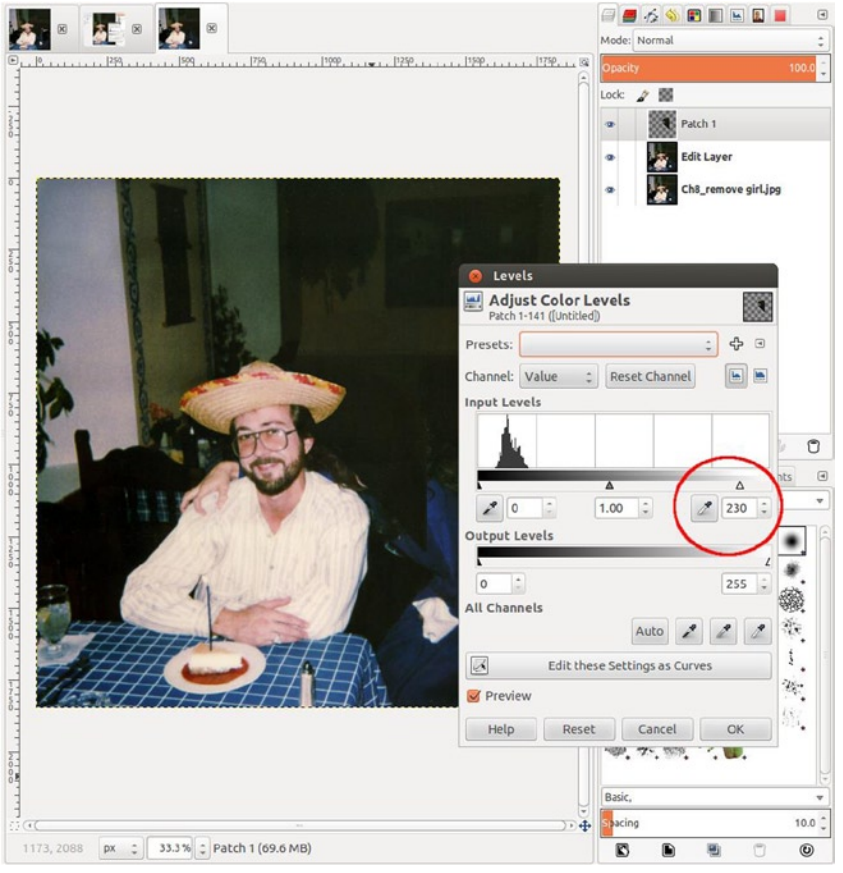

Figure 8-39. *Use the Levels dialog to create a better tonal match between the patch and surrounding area*

7. Lower the opacity of the patch layer to about 50%, to see underneath. Use the Erase tool (Shift + E) with the brush set to 050 to remove the pixels covering the man's hair and sombrero (Figure 8-40).

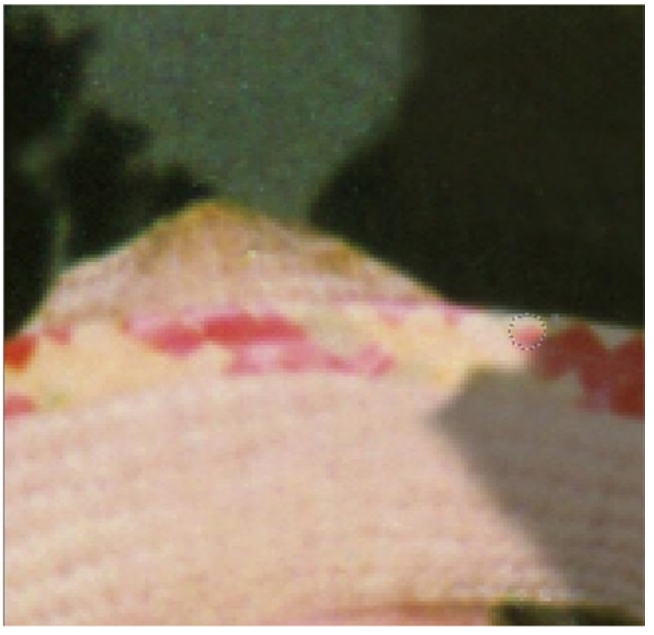

Figure 8-40. *Use the Erase tool to remove the excess pixels from the patch layer*

8. Create a new layer (Shift + Control + N) and name it Clone. Using the Clone tool (C), with the Sample Merged option box checked, clone over the remaining image of the woman (Figure 8-41).

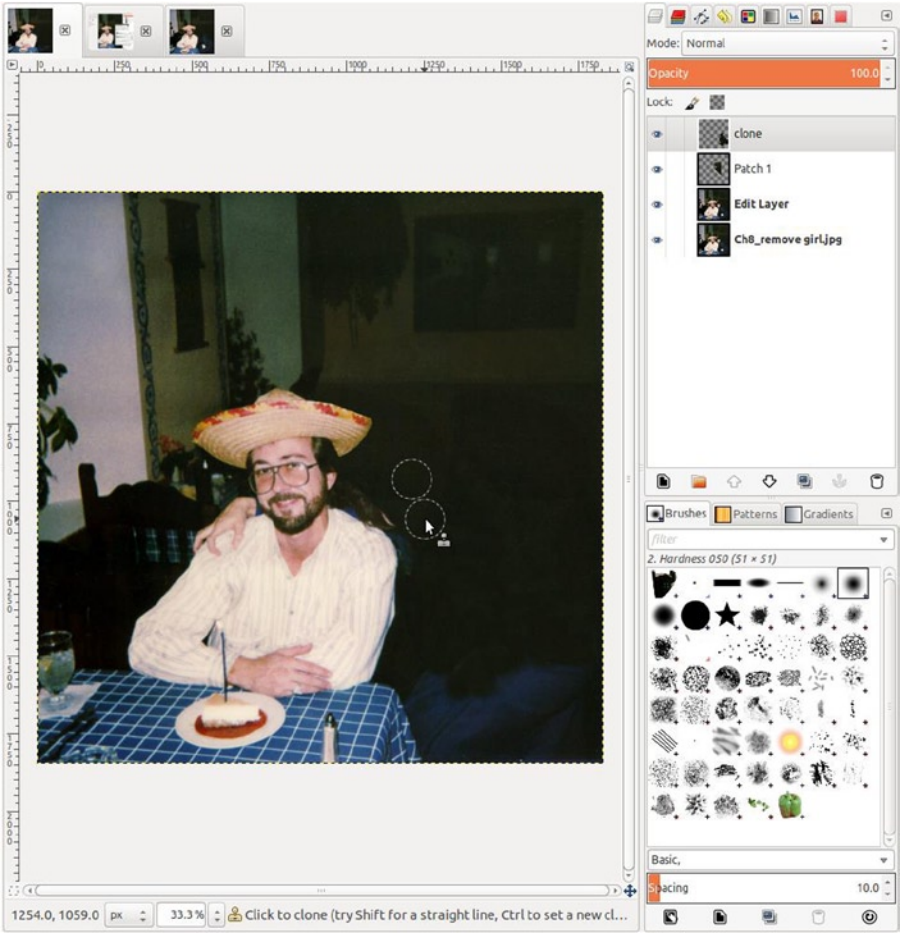

Figure 8-41. *Use the Clone tool to remove what remains of the woman*

9. Use the Free Select tool on the Edit Layer to draw an area on the sleeve just under the hand. Copy and paste (Control + C and Control + V) as a floating selection. Change the floating selection into a new layer (Shift + Control + N). Expand the layer's boundary size to match the image size (Image Menu ➤ Layer ➤ Layer to Image Size). Rename the layer Pattern (or Sleeve, if you prefer) (Figure 8-42).

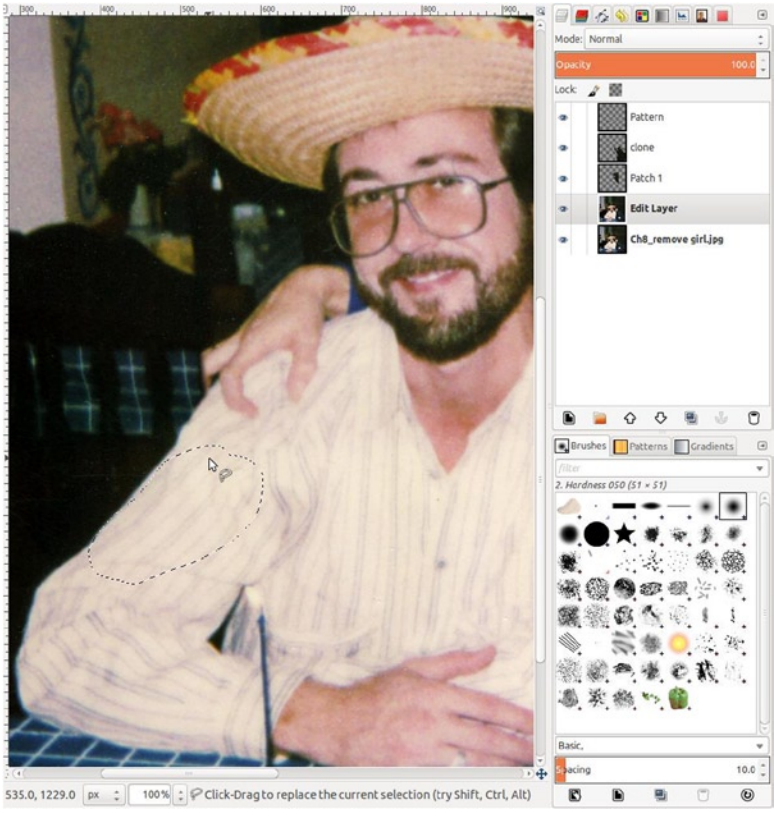

Figure 8-42. *Make a selection around the sleeve to make a patch to cover the woman's hand*

10. Move the layer into place over the hand. Use the Erase tool (Shift + E) to remove the excess. Use the Clone tool (C) for touch-up work and to remove the rest of the hand on the Clone layer (Figure 8-43).

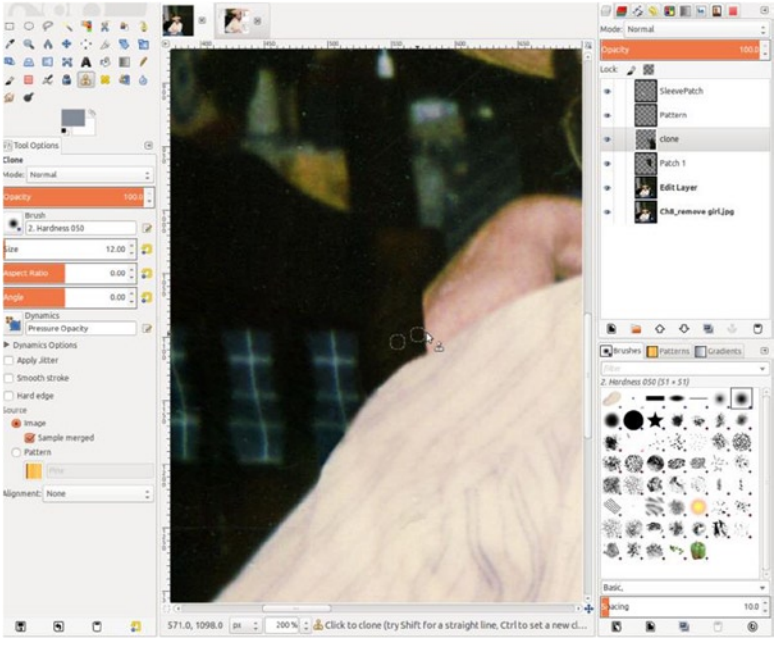

Figure 8-43. *Clone out the rest of the hadd*

11. Use the Clone tool (C) to remove the plant and the person's head (which is slightly visible) in the background (Figure 8-44).

Figure 8-44. *Clone out the plant and the portion of the person's head in the background*

12. Crop the image a little tighter to remove some of the excess area (Figure 8-45).

Figure 8-45. *Crop the excess area from the image*

■ **Note** Normally, I crop images earlier in the editing process, but in a case such as this, it's necessary to borrow from other parts of the image to cover the object or person to be removed. Leave as much image information available as possible for this purpose, then crop the image after the editing has been done.

Careful patching and cloning results in a very nice edited snapshot and a plausible image (Figure 8-46).

Figure 8-46. *Before and after comparison*

Summary

GIMP is a very useful program for correcting flaws and retouching portraits, so that people can look their best. It's great for isolating people (or pets, for that matter) and digitally replacing backgrounds and changing scenery. With GIMP, you'll be able to remove unwanted people or objects from images and end up with great results.

CHAPTER 9

Sharpening Images

In This Chapter

- Sharpening—The Final Step
- The Unsharp Mask Filter
- High Pass Sharpening
- Emboss Sharpening

Sharpening—The Final Step

In many instances, the images you work with will benefit from a little sharpening. After you complete your retouching/restoration steps, sharpening should be the final step in the editing process. Images are also generally sharpened after downscaling (such as those being prepared for use on the Web). This process will not correct images that are out of focus and blurry, but it will improve images that are slightly soft, such as scanned photographs. Some scanners employ an auto-sharping feature, which may provide satisfactory results. However, to exercise more control over the sharpening process, the auto-feature should be disabled. Figure 9-1 shows an example of how a scanned photograph can be improved with just a slight amount of sharpening. Notice how the catchlights in the eyes are just a bit crisper and brighter.

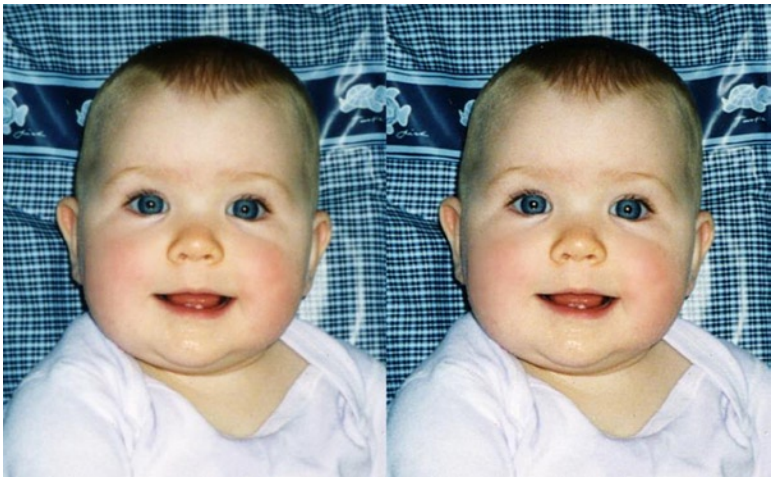

Figure 9-1. *Before and after example of a scanned photograph slightly sharpened*

The Unsharp Mask Filter

This filter's name sounds counterintuitive to making an image look sharper, but it's derived from a photographic process that uses a blurred, or "unsharp," mask of the original positive image. This mask is combined with the negative image, creating a result that has greater apparent sharpness.

The Unsharp Mask filter increases contrast between neighboring dark and light pixels, which in actuality creates the illusion of increased sharpness.

The *Unsharp Mask* dialog is nested within the filters (Image Menu ➤ Filters ➤ Enhance ➤ Unsharp Mask). There are three setting options in the dialog: Radius, Amount, and Threshold (Figure 9-2).

Figure 9-2. *The setting options in the Unsharp Mask dialog*

1. **Radius.** The slider and input boxes (0.1–120) determine how many pixels on either side of an edge are affected by sharpening.
2. **Amount.** The slider and input boxes (0.00–5.00) determine the intensity of the sharpening effect.
3. **Threshold.** This allows you to protect areas that are similar in tone from sharpening. Areas of smooth tonal transition can be protected from sharpening, minimizing the creation of unwanted blemishes or artifacts.

The main disadvantage of using the Unsharp Mask filter is that the effect can accentuate film grain and digital noise and create unsightly artifacts around the edges in the image (Figure 9-3). This filter can be somewhat destructive, so I recommend applying it with a light touch. Always work on a duplicate of the background layer. If the sharpening effect is too strong, you can lower the layer's opacity to reduce the effect.

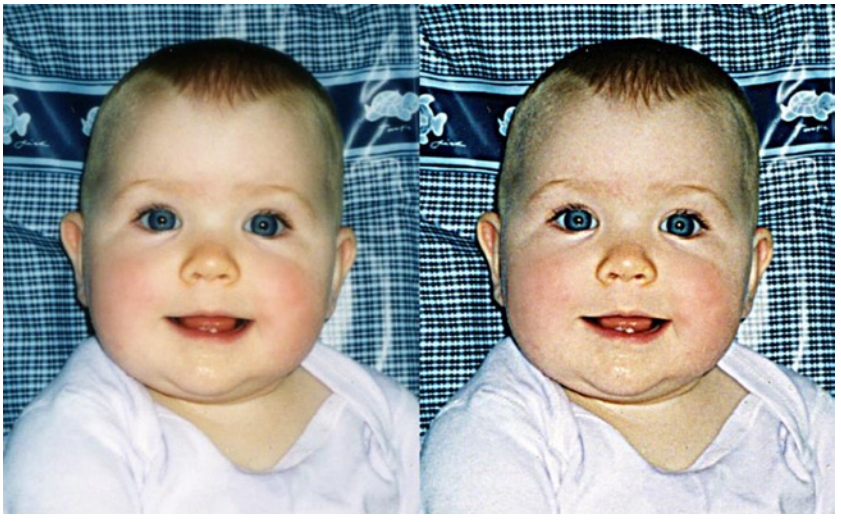

Figure 9-3. *The results of over-sharpening an image*

High Pass Sharpening

The High Pass method sharpens an image's edges without affecting the area between them. This is generally considered a better way to sharpen images than Unsharp Mask, at least in certain instances.

Tutorial 34: Sharpening Using the High Pass Filter

In this tutorial, you'll sharpen the image of the baby, using the High Pass technique. The G'MIC plug-in must be installed for this lesson.

To sharpen this image, follow these steps:

1. Open the picture of the baby (`Ch9_baby`) found in the Practice Images folder. Duplicate the background layer and rename it *Sharpen* (Figure 9-4).

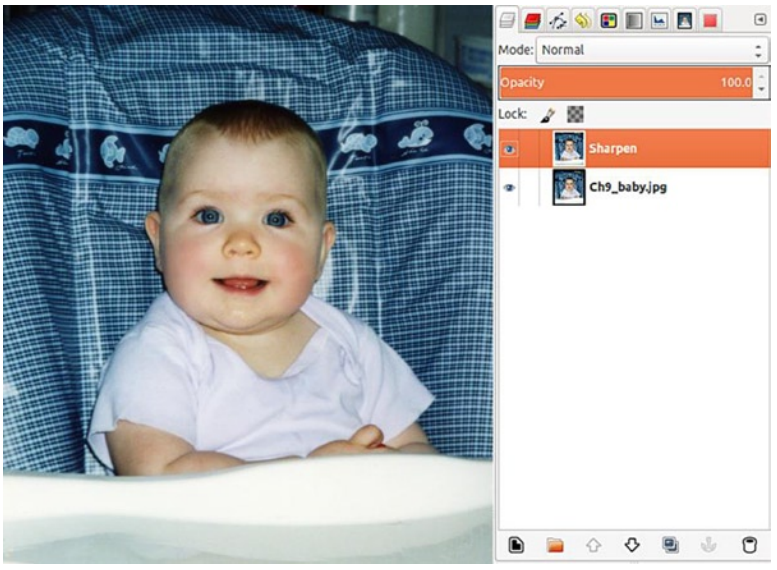

Figure 9-4. *A duplicate layer created to use the High Pass sharpen technique on*

2. Apply the High Pass filter (Image Menu ➤ Filters ➤ G'MIC).
3. Click the triangle (or + sign) next to Details to open the available options and select High Pass. Adjust the Radius to 4.00 and leave the Contrast setting at 2.00 (Figure 9-5).

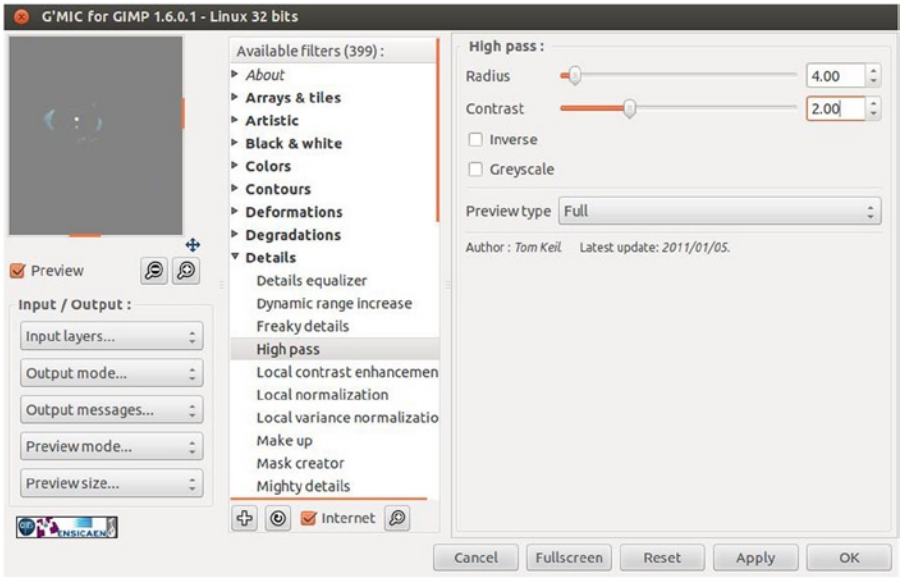

Figure 9-5. *Applying the High Pass filter*

4. The High Pass filter emphasizes the edges of the image (Figure 9-6).

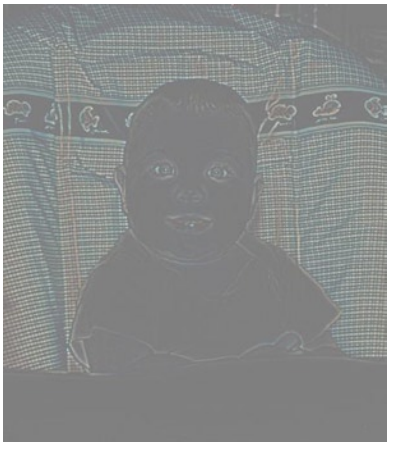

Figure 9-6. *The High Pass filter emphasizes the edges of the image*

5. Change the Blend Mode of the Sharpen layer to Overlay (Figure 9-7). This will slightly boost the contrast of the edges, improving the appearance of sharpness without accentuating the film grain.

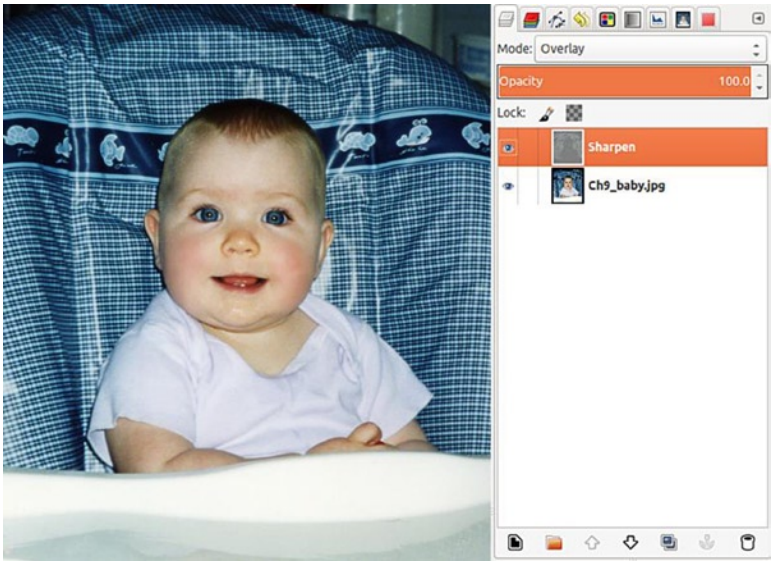

Figure 9-7. *The appearance of sharpness is enhanced*

The High Pass method of sharpening is generally very effective yet gentle, so the destructive effects are kept to a minimum. Although the difference is subtle, the image has more snap, compared to the original (Figure 9-8).

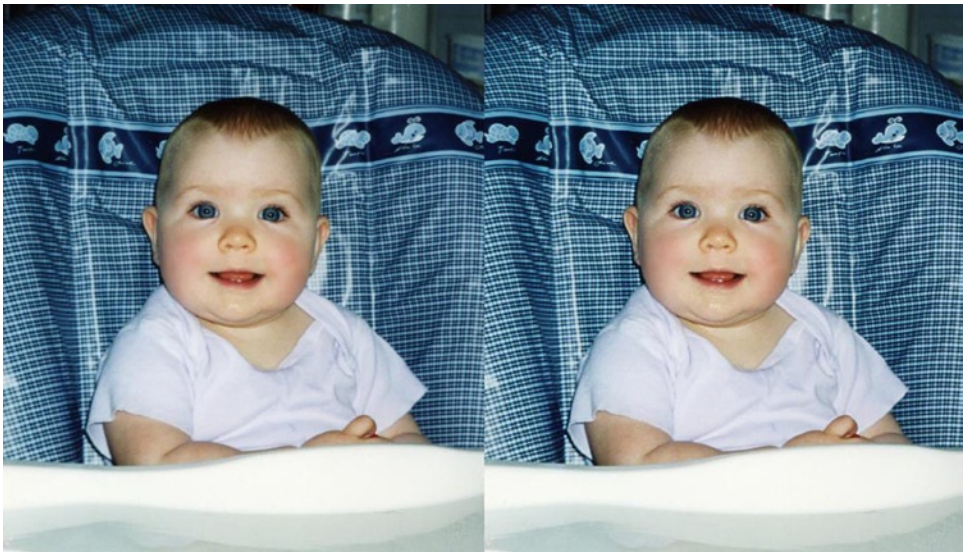

Figure 9-8. *Before and after comparison*

Emboss Sharpening

This technique is effective on images that are soft or slightly out of focus. It won't necessarily achieve perfection, but it can make a huge improvement. The image of the coat of arms is a bit soft, due to some slight camera shake (Figure 9-9).

Figure 9-9. *This focus on this image is a bit soft*

Tutorial 35: Sharpening Using the Emboss Filter

The following sharpening technique will help restore some of the texture in the stone and accentuate the details of the coat of arms.

To sharpen this image, follow these steps:

1. Open the image (`Ch9_coat-of-arms`) found in the Practice Images folder. Duplicate the background layer and rename it *Sharpen* (Figure 9-10).

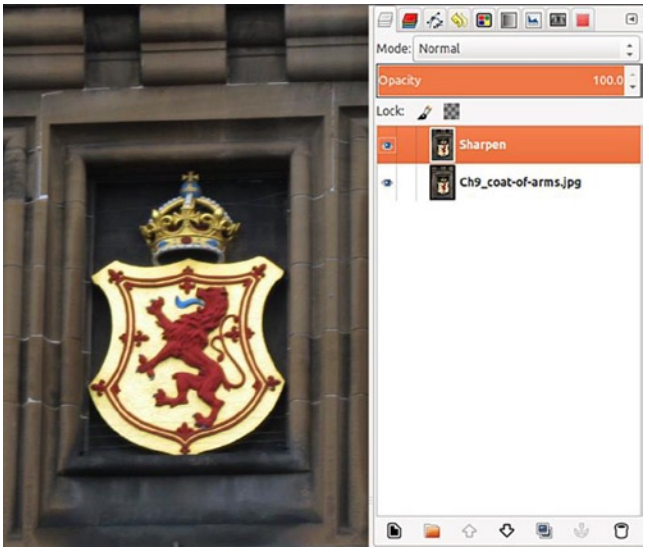

Figure 9-10. *A duplicate layer created to use the Emboss sharpen technique on*

2. Apply the Emboss filter to the Sharpen layer (Image Menu ➤ Distorts ➤ Emboss). Lower the Depth to 5.00 but leave the other options at their default settings (Figure 9-11).

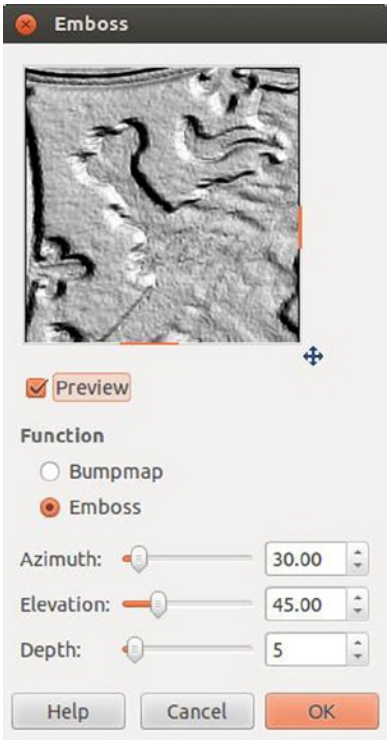

Figure 9-11. *Lower the depth option to 5.00*

3. The Emboss filter creates a relief effect in the image—similar to the surface of a coin (Figure 9-12).

Figure 9-12. *Relief effect created by the Emboss filter*

4. Change the blend mode of the Sharpen layer to Overlay. Note that the texture in the stone is now more pronounced, as is the detail in the coat of arms (Figure 9-13).

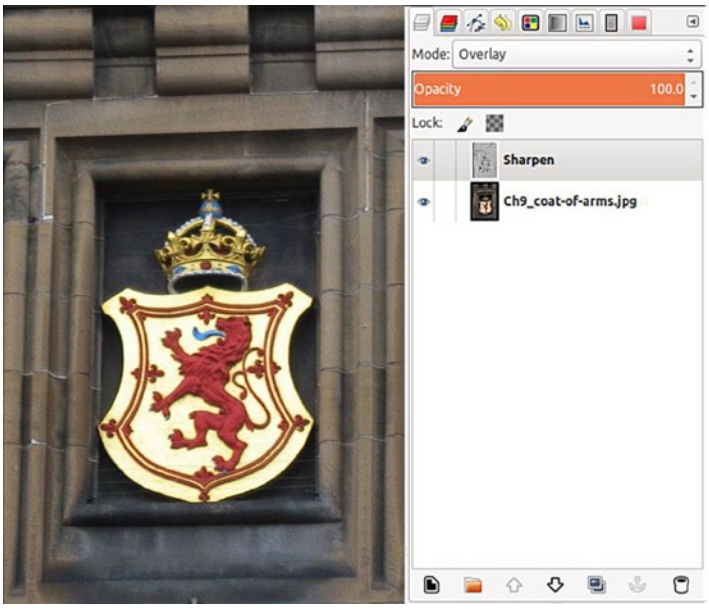

Figure 9-13. *The detail enhanced*

This technique of sharpening can be very effective in many cases. As long as the image isn't too soft, the detail can be noticeably enhanced, as we can see in Figure 9-14.

Figure 9-14. *Before and after comparison*

Summary

Images can often benefit from a light application of the Unsharp Mask filter; however, it can accentuate film grain, digital noise, and, when overused, create unwanted artifacts around edges. For a gentler type of sharpening, the High Pass method enhances the edges of the image without overaccentuating film grain or digital noise. Images that are slightly soft or out of focus can be improved by using the Emboss technique. The relief effect helps recover lost texture and detail.

CHAPTER 10

Fun and Artistic Projects with Your Photos

In This Chapter

- Turn Photos into Digital Works of Art
- Creating Collages

Turn Photos into Digital Works of Art

GIMP offers a number of filters that can turn your images into digital works of art. Image retouching and restoration can be tedious and difficult work at times, so this can be a fun way to work with your images. You can experiment to your heart's content without the messiness of actual paints, brushes, or inks.

For the professional retoucher, converting photographs into digital art can be an added service to offer to clients. For the hobbyist, it can be a fun and creative way to make gifts for family and friends, or even spruce up decor.

Figure 10-1 illustrates two different artistic filters applied to the photograph of the Mill Mountain Star: Photocopy (center) and Predator (bottom).

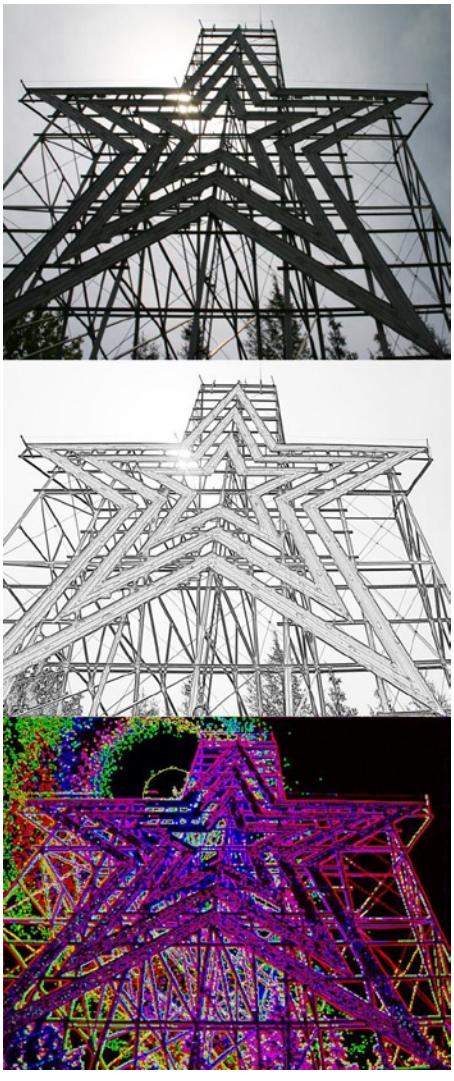

Figure 10-1. *Examples of the Photocopy (center) and Predator (bottom) artistic filters*

The artistic filters are nested in GIMP's Filters (Image Menu ➤ Filters ➤ Artistic). You can control various parameters of the filter. For example, when converting an image to a digital oil painting using the Oilify filter, you can control how detailed it appears. Increasing the mask gives it more of a "painterly" look (Figure 10-2).

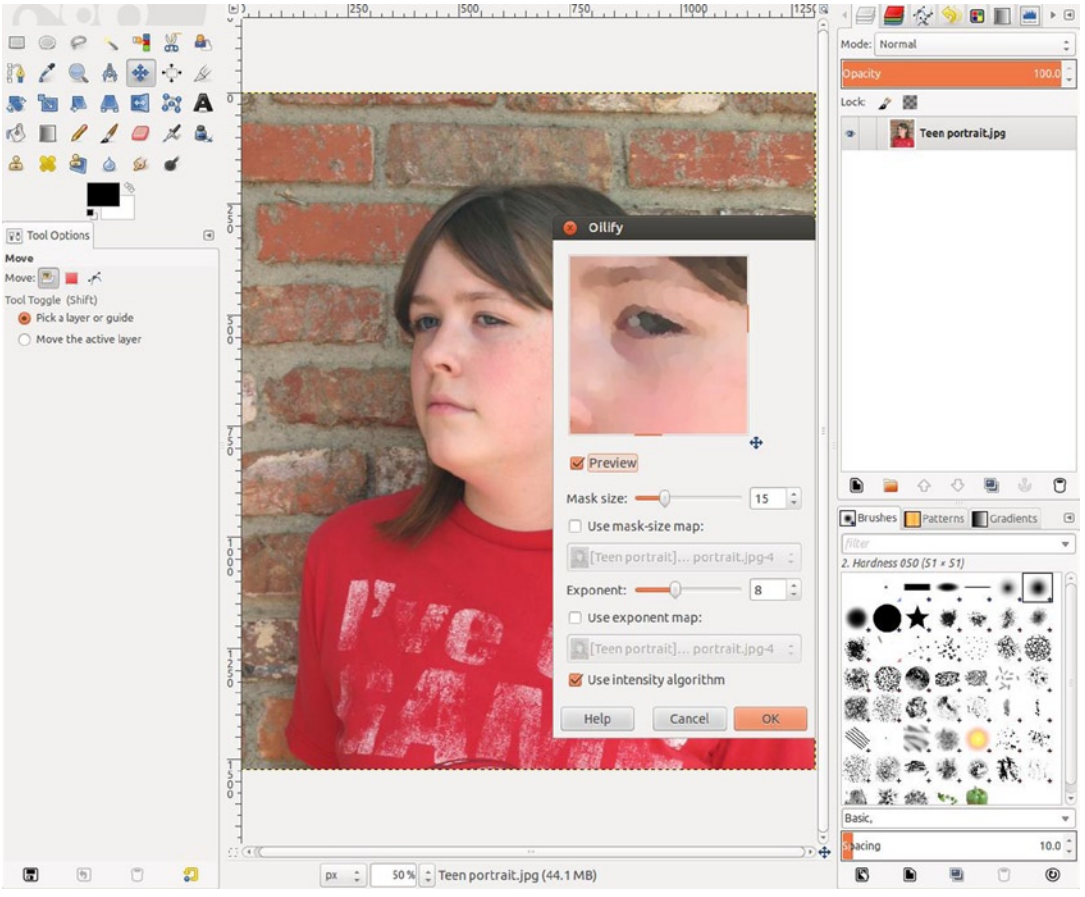

Figure 10-2. *Applying the Oilify filter to create the appearance of a painting*

After applying the Oilify filter, this image was finished by using the Apply Canvas filter. The result is a facsimile of an oil painting (Figure 10-3).

Figure 10-3. *A digital facsimile of an oil painting*

Add Artistic Functionality with G'MIC

The G'MIC plug-in (which we looked at in the Introduction) offers a ton of options for adding artistic effects. It's well worth taking the time to become familiar with it, to bring out your "inner artist," especially if traditional art materials aren't your strong suit. G'MIC is available from `www.gmic.sourceforge.net`. The image in Figure 10-4 was converted into a digital pen-and-ink style drawing, by using the Pen Drawing filter nested within the G'MIC filters.

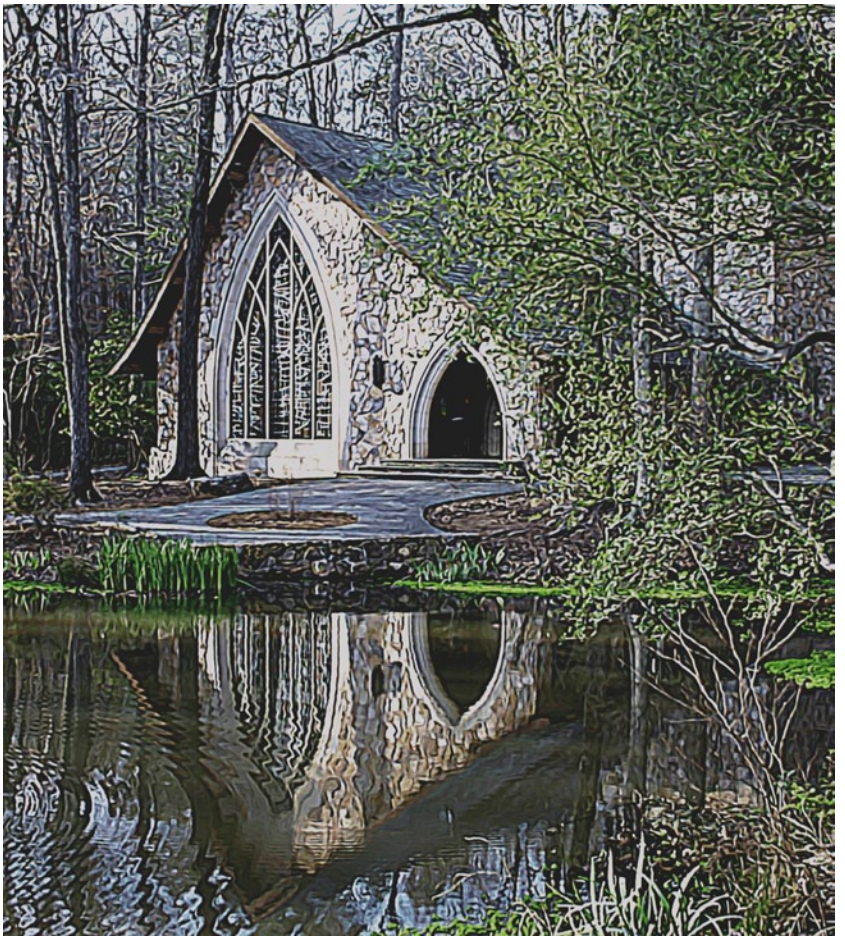

Figure 10-4. *An example of the Pen Drawing filter included in the G'MIC plug-in*

Art Project No. 1: Salvaging "Unfixable" Photos

Some of your photos may have focus issues that can't be repaired in the conventional sense of image editing. The example in Figure 10-5 is one of many photographs I shot in New Orleans in 1993. Most of them turned out fine, but as you can imagine, I was very disappointed at how out of focus this one turned out.

Figure 10-5. *A blurry photograph that has potential to become digital art*

It won't be possible to get a good photograph from this image. Even the Unsharp Mask filter can't make much of an improvement; there's just no sharp detail to rescue. Although it's not a usable image as a photograph, it does have potential as digital art. If you'd like to give this technique a try, this image (`Ch10_blurry girl`) is located in the Practice Images folder. Then try it on some of your own images. Of course, this technique doesn't have to be limited to out-of-focus images. Use it on any of your favorite pictures that would look great as digital art.

You must have the G'MIC plug-in installed for this exercise.

1. Open the image (Ch10_blurry girl) and apply the Rodilius filter (Image Menu ➤ Filters ➤ G'MIC).
2. With the G'MIC dialog box open, click the small triangle (or + sign on Windows) next to the Artistic option (Figure 10-6).

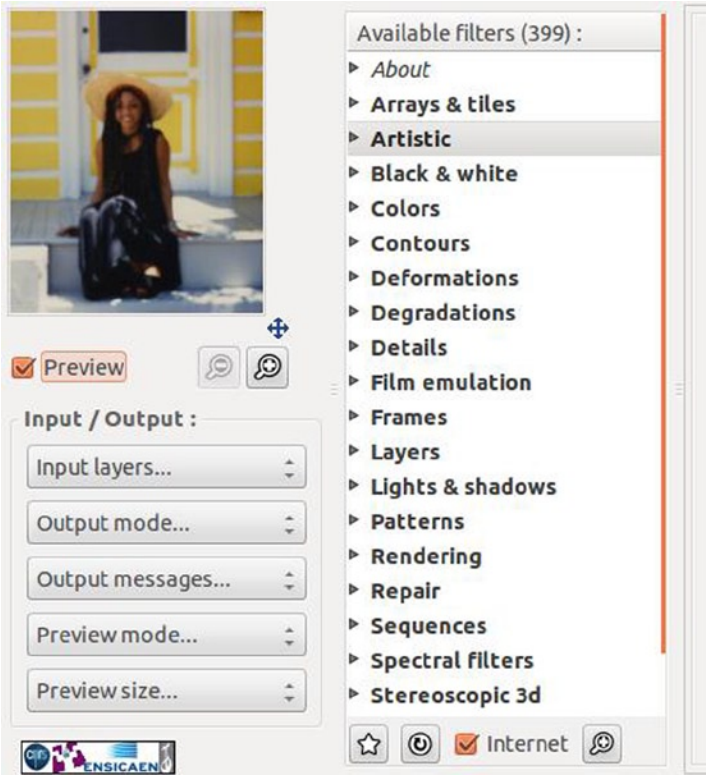

Figure 10-6. *The Artistic option in the G'MIC dialog box*

3. Select the Rodilius filter. I dialed the Amplitude setting back to 7.00 but left the other options at their default settings (Figure 10-7).

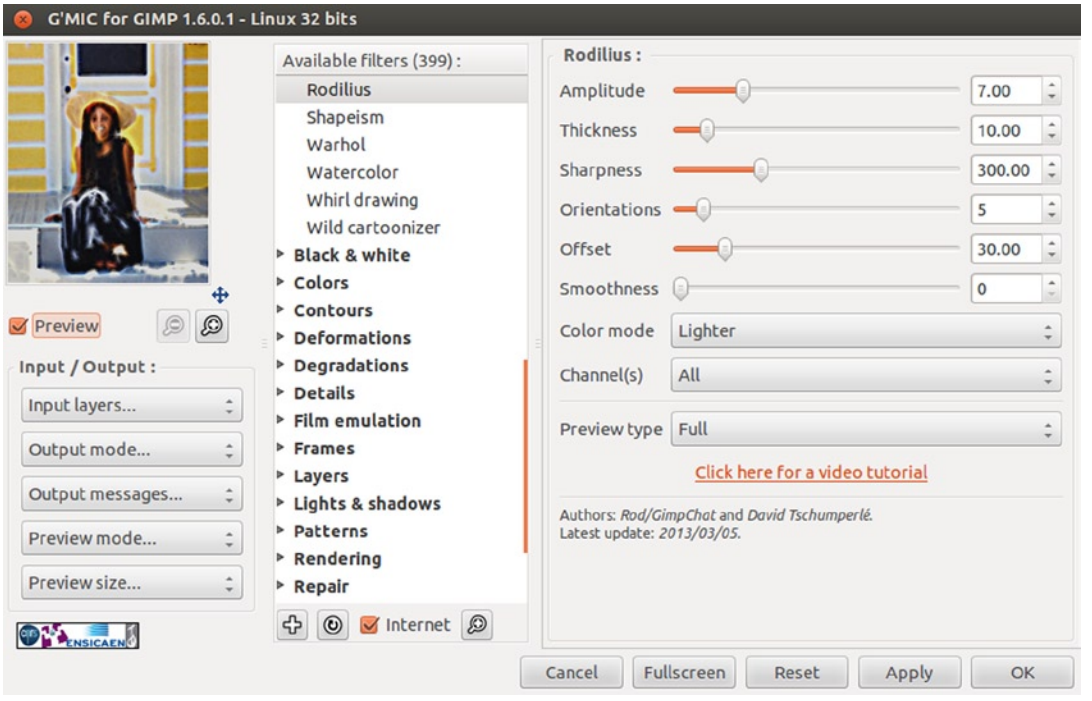

Figure 10-7. *Applying the Rodilius filter*

The end result is an image that is quite usable as digital art. Of course, my preference would be a photograph that is sharp and in focus. Because that isn't possible, I was able to preserve the essence of the original image that (I think) many would find an acceptable and pleasing alternative (Figure 10-8).

Figure 10-8. *The resulting digital art from a blurry photograph (Image © Phillip Whitt)*

After trying this on your own photographs, experiment with different filters. Because art is subjective, you might not like the results from using the Rodilius filter and would prefer a different style. If you have similar photos that can't be saved by conventional restoration, this might be the ticket to salvage those less-than-perfect images. If you like the results, you can enlarge the image and have it framed, or printed on canvas at your local photo lab or by an online service (Figure 10-9).

Figure 10-9. *Newly created digital art can be framed or printed on canvas*

Creating Collages

With some imagination, you can assemble your photos into themed collages. A collage can be the perfect gift for sentimental family members (or family members that are hard to find gifts for for). Collages don't necessarily have to be themed. They can be composed of your favorite family photographs. The following example (Figure 10-10) was well received by my now deceased father-in-law as a Christmas present. The images in the collage span the time from his wedding day to his 80th birthday.

Figure 10-10. *A collage of family photos spanning time*

Art Project No. 2: Assembling a Collage

If you've never created a collage before and would like to re-create this one for practice (Figure 10-11), you'll find all of the images contained in the Scottish Collage folder located in the Practice Images folder.

Figure 10-11. *Collage of images taken in Scotland in 2012*

1. Open the Brick Walkway image.
2. Open the Hue/Saturation dialog (Image Menu ➤ Colors ➤ Hue-Saturation). Set the Lightness value to 75, to give it a subtle, washed-out appearance (Figure 10-12).

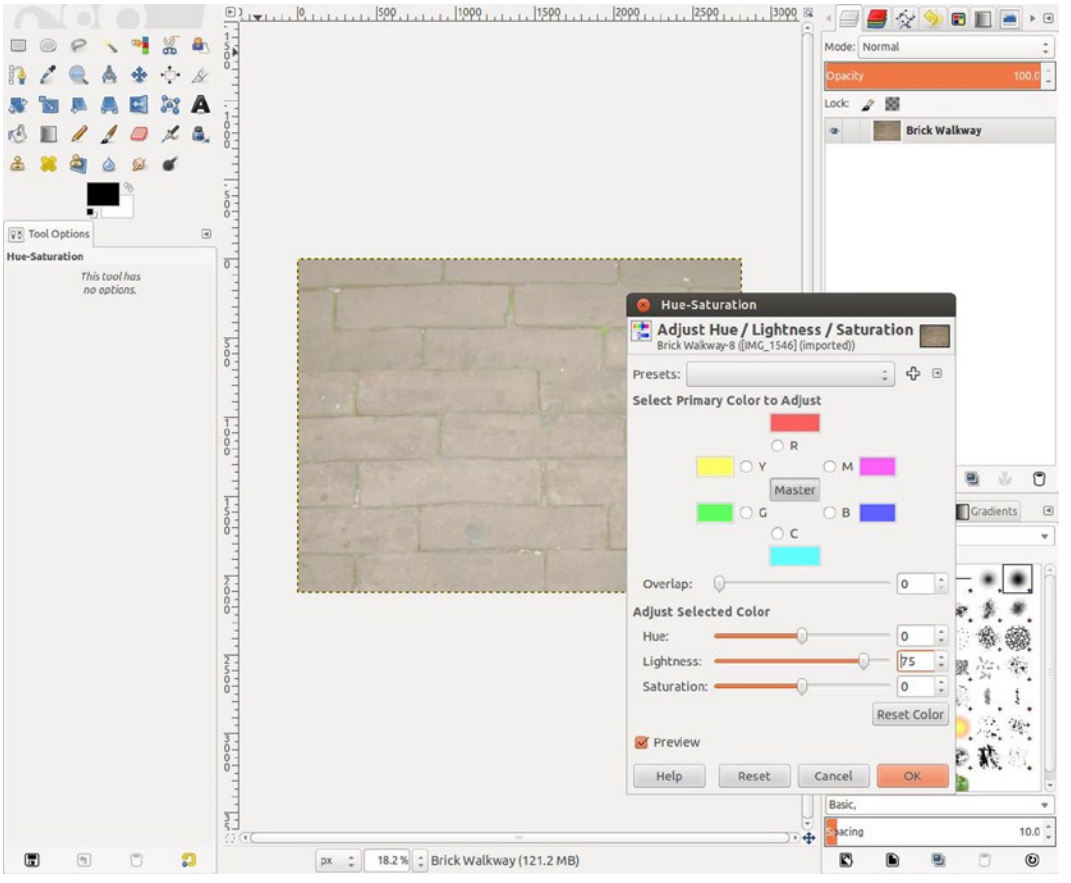

Figure 10-12. *Set the Lightness value to 75 in the Hue-Saturation dialog box*

3. Open each image and use the Rectangle Select tool (R). Set the Feather Edges option to a radius of 50 pixels.

4. Make a selection around the image, allowing adequate space within the image edge (Figure 10-13). Copy the selection to the clipboard (Control + C).

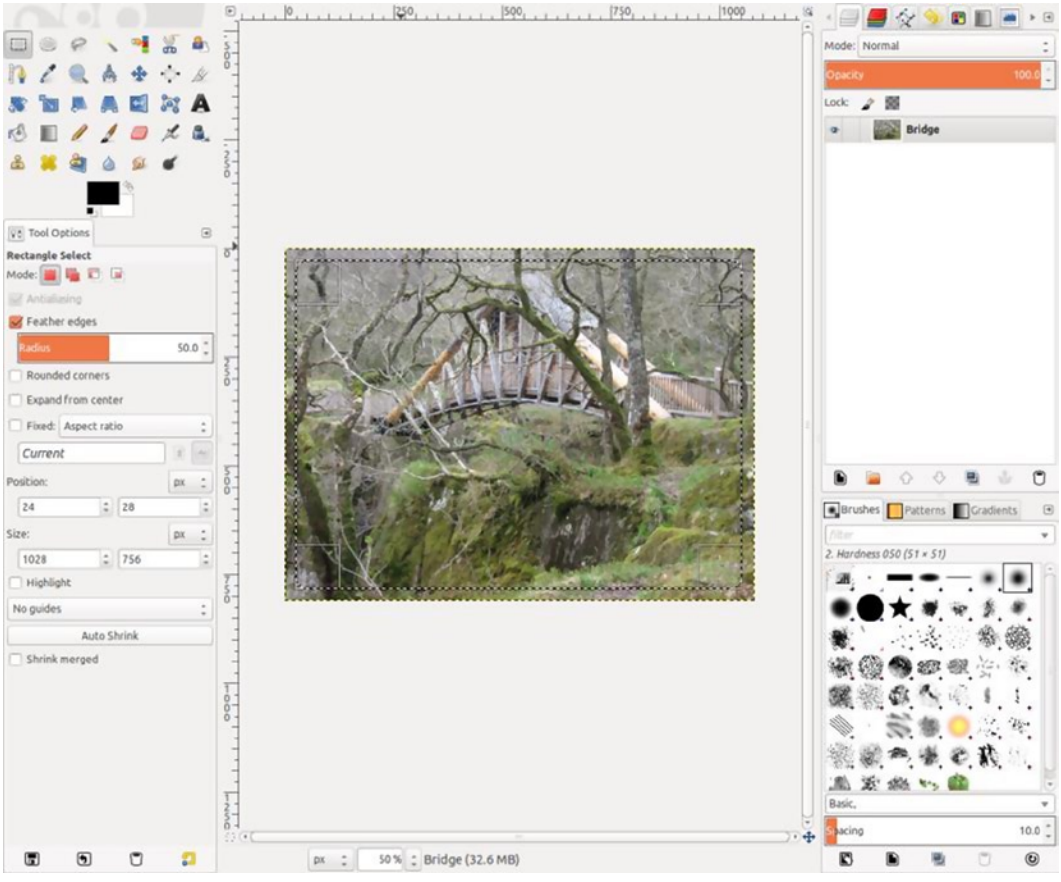

Figure 10-13. *Making a selection within the image edge*

5. Paste as a new layer (Image Menu ➤ Edit ➤ Paste As ➤ New Layer) on to the collage in progress (Figure 10-14). Scale and arrange the layer orders as necessary, to use the background layer as a border.

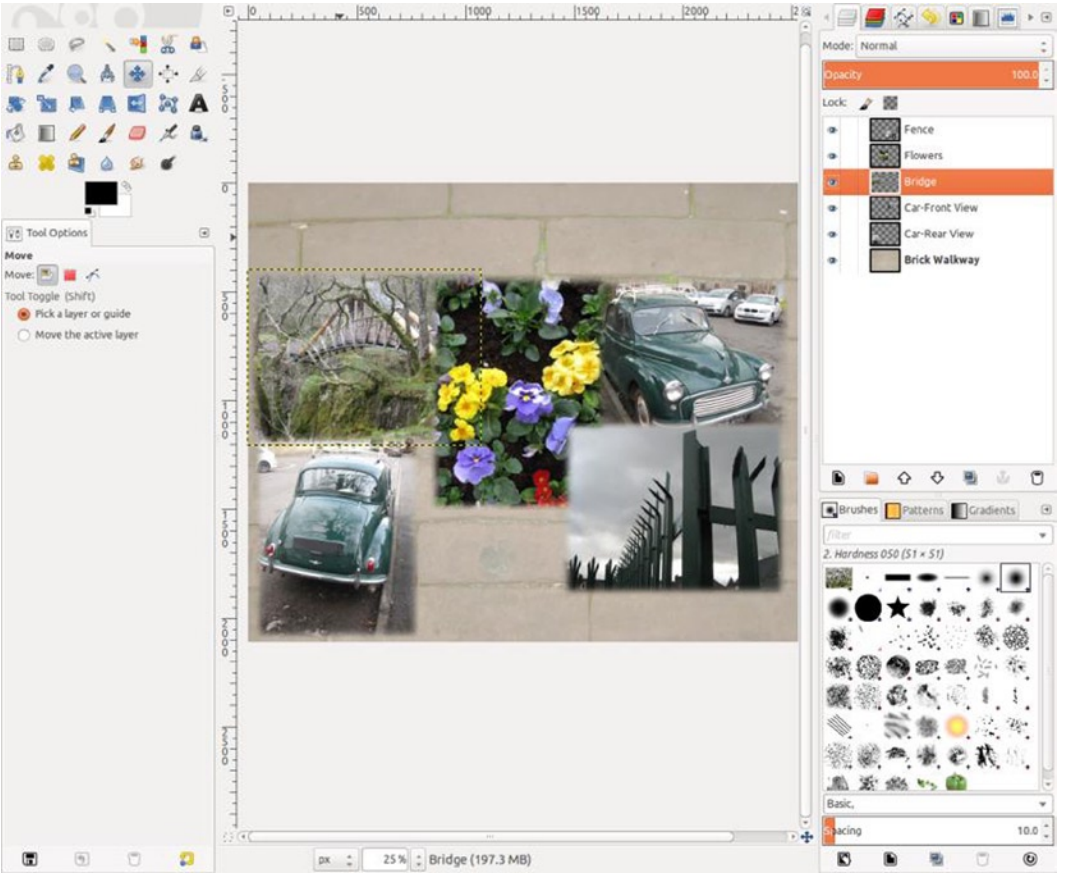

Figure 10-14. *Pasting as a new layer to the collage in progress*

6. Open the Text tool (T) and, using the URW Chancery L Medium font, set at 200 pixels and type "Scotland 2012".

Don't worry if your results don't exactly match the example. The idea is to get a feel for the process. If you get to a point where you make collages on a regular basis, you'll likely develop your own style. You can also visit online services that offer predesigned templates for collages. One such service is `Collage.com` (`www.collage.com`). Log on to see the options offered.

Summary

GIMP is not only useful for image retouching and restoration, it also offers many filters for creating works of art from photos. The G'MIC plug-in expands the options of artistic filters, offering literally hundreds to choose from. You can give photographs that are out of focus and can't otherwise be repaired new life as works of art, by utilizing one of the many filters that capture the essence of the image—the next best thing to actually repairing it. Any of your favorite photographs are good candidates for conversion to digital art.

Assembling collages is a fun way to display your images. You can create themed collages to commemorate special events, or a collage can be a collection of your favorite photos from past to present. Collages make great gifts for sentimental family members, and most will appreciate them.

CHAPTER 11

Printing and Preserving Your Images

In This Chapter

- Photo-Quality Printers
- Protecting and Preserving Your Prints
- Storing Images Digitally

Photo-Quality Printers

Photo-quality printers have come a long way from the first-generation models that were around in the early 1990s. The output quality rivals that of traditional photo lab prints. The prints produced from those early models (particularly ink-jet printers) were prone to rapid fading—sometimes in a matter of months. Obviously, you want your prints to be the best quality available, as well as to last for generations. This is especially important when providing your services to paying customers.

Ink-Jet Printers

Photo-quality ink-jet printers have advanced by leaps and bounds over the years. The papers and inks used by modern printers are capable of producing beautiful, high-resolution images (Figure 11-1). Ink-jet printers spray on paper micro-sized dots that make up the image. The dots are only visible when the image is greatly magnified, not when viewing a print with the unaided eye.

Figure 11-1. *Modern photo-quality printers can produce beautiful images (© iStock by Getty Images)*

Ink-jet printers are designed to use one of two types of ink: dye-based or pigment-based. Most models use dye-based inks, but there are some high-end models geared toward the professional that use pigment-based inks to produce archival-quality prints that are rated to last about 200 years when framed under glass and displayed under normal lighting conditions. Even some models using dye-based inks (when combined with the paper it's formulated for) will produce prints that are rated to last for about 75–100 years under the same conditions.

Desktop photo-quality ink-jet printers are available in small models that print 4" × 6" images to large-format models that produce prints up to 13" × 19". While general-purpose ink-jet printers use four ink colors (CMYK), dedicated photo-quality printers use (depending on the manufacturer) colors such as red, orange, green, and variations of black. This offers the widest color gamut possible. There are a variety of photo-quality ink-jet papers available, such as gloss, semigloss, and matte (flat). Most photo-quality printers are designed to use their own brand of inks and paper, for the best results and maximum life span.

One of the main disadvantages of ink-jet prints is that they are generally not very water-resistant, so they must be kept dry. Even a single drop can ruin a print.

Dye-Sublimation Printers

Dye-sublimation (also known as dye-sub) printers have been around for a while and are commonly used in digital photo labs. They work by using a thermal process to transfer dye contained on a ribbon to the surface of the paper. Dye-sublimation printers produce very high-quality prints that are continuous in tone and more water-resistant than ink-jet prints. One disadvantage of dye-sublimation printers is that they are usually limited to glossy paper and only print up to 8" × 10" (with the exception of some wide-format commercial models costing thousands of dollars). Another is that the paper and ink ribbons they require are expensive, compared to their ink-jet counterparts.

Dye-sublimation printers have made their way into the consumer market in recent years and are well worth looking at while conducting your research, if you are considering which type of printer to buy. Either type will produce high-quality prints—which type to choose will depend on your particular needs (and print longevity should be considered as well).

■ **Tip** Log on to the Wilhelm Imaging Research web site (www.wilhelm-research.com) for data concerning the longevity performance of various printer and paper manufacturers.

Protecting and Preserving Your Prints

After you've gone through the hard work of editing your image (or possibly many images), you will probably be highly motivated to protect your newly printed pictures (as well as your original photographic materials) from potential harm. Many of the images you restored may have been damaged, because they were kept in catchall boxes, drawers, or other places where miscellaneous household objects are stored. Others may have faded, because they were displayed in frames and exposed to UV light over the years. Proper archiving will avoid those mishaps from occurring again.

Archiving Your Prints

There are many products available to archive your prints (as well as negatives and slides): acid-free sleeves for three-ring binders (Figure 11-2), storage boxes, and albums are some examples. These products can be purchased at your local camera shop or an online supplier such as B&H Photo (www.bhphotovideo.com).

Figure 11-2. *Photo archival sleeve for use in a three-ring binder*

Cheap photo albums with “magnetic” pages should be avoided; they use a thin layer of tacky adhesive to secure the photograph on the album page. The materials used in the album may damage the photos over time. In Figure 11-3, you can see a page that is deteriorating in an album purchased in the early 1990s. There is also a risk the photos will eventually be permanently stuck to the page.

Figure 11-3. *Cheap photo albums can potentially damage your prints over time*

After archiving your photographic materials, make sure they are stored in a cool, dark place with low humidly. Avoid keeping them in places with temperature extremes, such as attics and garages, as these are prime breeding grounds for mold and fungus.

It’s a good idea to make sure that all of your photographic materials are digitized as well as archived. It can be a big job if your prints, negatives, and slides number in the hundreds or thousands, but it’s well worth the time and effort to preserve your family history. It can be a long-term project; it doesn’t have to be done all at once.

Displaying Your Prints

For the new prints you want to display, a good-quality frame using acid-free materials is important. Like cheap photo albums, poor-quality materials in frames can be destructive. The ink-jet print image in Figure 11-4 began to discolor along the bottom in a few short years, because the mat the print came in contact with was of poor quality.

Figure 11-4. *Cheap materials in a frame caused discoloration in this ink-jet print*

It's obvious that for important prints, cheap frames from the discount store should be avoided. Your local custom frame shop can provide frames that use high-quality materials. Many have UV-resistant glass that will help extend print longevity.

For an added layer of protection, special spray lacquers formulated for ink-jet prints are available that protect the image from UV light, dirt, moisture, and other contaminants. They are available in gloss, satin, and matte, to match the type of paper your pictures are printed on.

If you use a spray lacquer, read the directions carefully and follow all of the safety instructions. Use in well-ventilated areas and keep away from open flames.

Storing Images Digitally

It's important to exercise the same care in the storage of your digital images that you would extend to the printed versions. They serve the same purpose as negatives do in relation to traditional photographs; they are backup copies. The images currently on your computer should be backed up as soon as possible, either to an external hard drive (Figure 11-5), flash drive, or disk, such as a CD-ROM or DVD. For maximum protection, consider using all three.

Figure 11-5. *Backing up images to an external hard drive (© Getty Images)*

It's a good idea to keep your digitally archived images stored in multiple locations. You can keep extra copies on a CD-ROM, DVD, flash drive, or external hard drive in a safe-deposit box or with a trusted family member. If the unthinkable, such as a fire, flood, or other disaster, occurs, at least you'll have copies of your treasured memories preserved.

There is also the option of online data storage services (commonly referred to as the "cloud"). These services have become popular in the past several years. There are a couple of noteworthy benefits, such as the ability to share your photos anytime and anywhere you have Internet access. Also, they routinely back up their data, so the risk of loss is small. However, I personally wouldn't feel entirely comfortable storing my images on a cloud service exclusively. If you choose to use the cloud, I recommend using *at least* one other method of storing your images.

Follow the same guidelines for storing electronic media as you would photographic materials—protect your external hard drives, flash drives, and disks from temperature extremes and high humidity. Keep disks safe and organized in archival sleeves or storage boxes.

How Long Will Digital Images Last?

It would seem logical to assume that digital images will last forever, but it's not necessarily that simple. The digital storage devices of today might very well be obsolete in the not too distant future. Optical disks, such as the CD-ROM and DVD, could suffer the same fate as VHS tapes. Even if there are devices that can read them 20, 30, or 40 years from now, the data might become corrupted over time.

It will likely be a matter of migrating your images to the most current storage devices every few years. If you have images stored on an older external hard drive, you might consider transferring them to one of the newer, solid-state models (the data should be accessed about every six months, to avoid potential loss). Images that are stored on old CDs (from the late 1990s or early 2000s) should be transferred to newer disks. (There are archival-quality disks available that are estimated to last up to 300 years.)

If you have images stored in an online cloud service, what would happen if the company went out of business? Or if your photos were accidentally deleted? I wouldn't bet that it couldn't happen (it probably already has). The expression "Don't put all your eggs in one basket" comes to mind.

Video Montages

One added benefit of digitizing your images is they can be assembled into a video montage, using slide show software . In addition to paid programs, there are a number of free titles available that allow you to add transitions and music. Figure 11-6 is an example of a free program for Linux called PhotoFilmStrip. (There are also free programs for Windows and Mac systems.) It's more convenient than flipping through a photo album. The production can be put onto a disk, such as a DVD, or uploaded to mobile devices. For the professional retoucher, this can be a great add-on service to provide. Customers will often purchase multiple copies on disk to give as gifts.

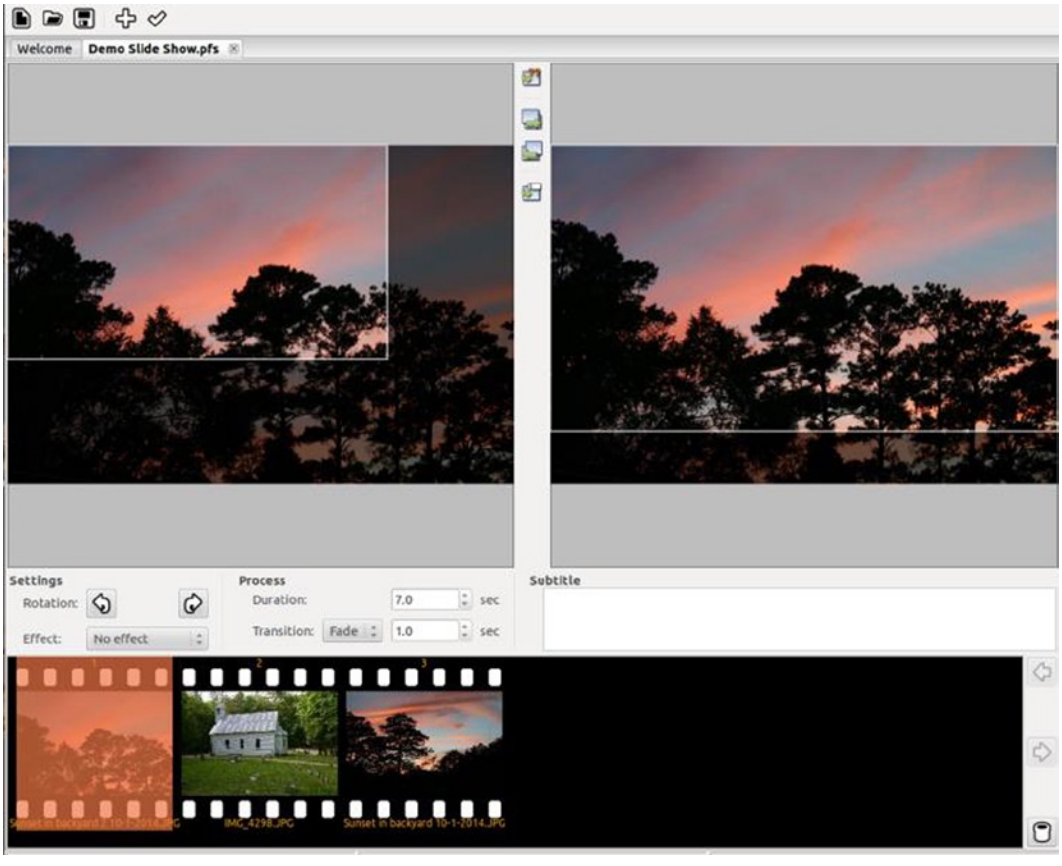

Figure 11-6. *PhotoFilmStrip is a free slide show program for Linux*

Summary

In this chapter, I covered the attributes of photo-quality printers, as well as the expected longevity of images printed using archival paper and ink. Storing and displaying prints properly is important for long-term preservation. Environments having high humidity and temperature extremes should be avoided. Cheap photo albums and picture frames can potentially damage your images. Storage sleeves, boxes, albums, and frames should be made of high-quality, acid-free materials.

It's equally important to exercise great care in storing digital images. Keeping them on various types of storage devices and media such as CD-ROMs or DVDs will help protect against loss. This is especially true when copies are kept "off-site," such as in a safe-deposit box, with a trusted relative, or online storage service.

Migrating your digital images to current storage devices every few years can help "future proof" them, should the current technology become obsolete and unavailable to access your images years from now.

Using software to create video montages is a great way to share images with family members and can be a great add-on service for the professional retoucher.

Closing Thoughts

I hope you've enjoyed working on the tutorials, and that you learned a lot from this book. You can take what you've learned and apply them to your own images. Each new image you edit will probably require some experimentation, but the techniques outlined in this publication should take a great deal of the trial-and-error out of the process.

Just remember to keep learning and keep practicing!

PART V

Appendix

APPENDIX

Useful Resources for GIMP

GIMP Resources

A list of helpful web sites and resources related to all things GIMP follows.

The Official GIMP Web Site Tutorials Page

www.gimp.org/tutorials/

The GIMP web site offers tutorials from beginner to expert levels and is a great place for those new to GIMP to become better acquainted with this software (see Figure A-1).

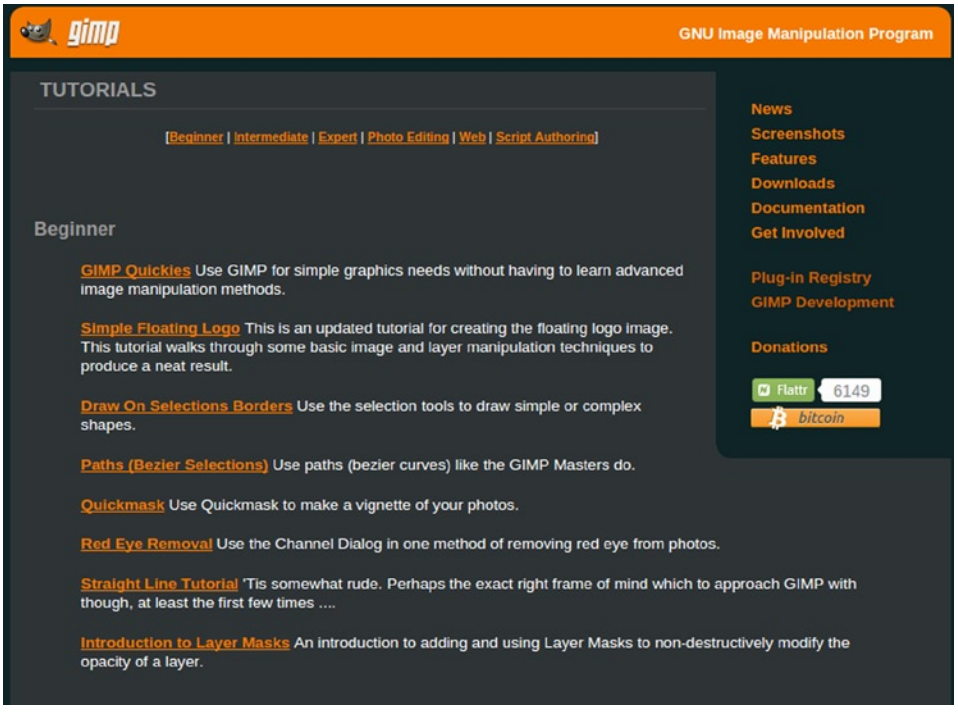

Figure A-1. *The GIMP web site tutorials page is a great place for beginners to acquaint themselves with this software*

GIMP's Official Google+ Page

https://plus.google.com/+gimp/posts

This is the official communication channel between developers of GIMP and its users. Apart from project news, posts feature artwork by GIMP users, artist features, links to useful tutorials, etc.

Partha's Place

www.partha.com

Partha's Place contains useful links to photography tutorials, Inkscape (the free illustration program), and various GIMP topics. They provide a build of GIMP for Macintosh with the Resynthesizer plug-in already included. Partha's Place also provides preliminary builds of the next stable version of GIMP.

GIMP Magazine

www.gimp9.org

GIMP Magazine is published periodically and is available as a free PDF download or can be viewed online. GIMP Magazine contains interviews with artists and photographers who use GIMP and showcases their work. If you would prefer a print version of GIMP Magazine, it is available for purchase.

gimpusers.com

www.gimpusers.com

This web site contains many GIMP tutorials, forums, brushes for GIMP, and other helpful resources for anything related to GIMP.

Photo Retouching, Editing, and Restoration

Following is alist of helpful web sites and resources related to image editing and restoration.

RetouchPRO

www.retouchpro.com

This web site (see Figure A-2) contains many tutorials on retouching, restoration, and image editing. There are many "challenges" that members of every skill level can accept (using the image-editing software of their choice) to develop and hone retouching and restoration skills.

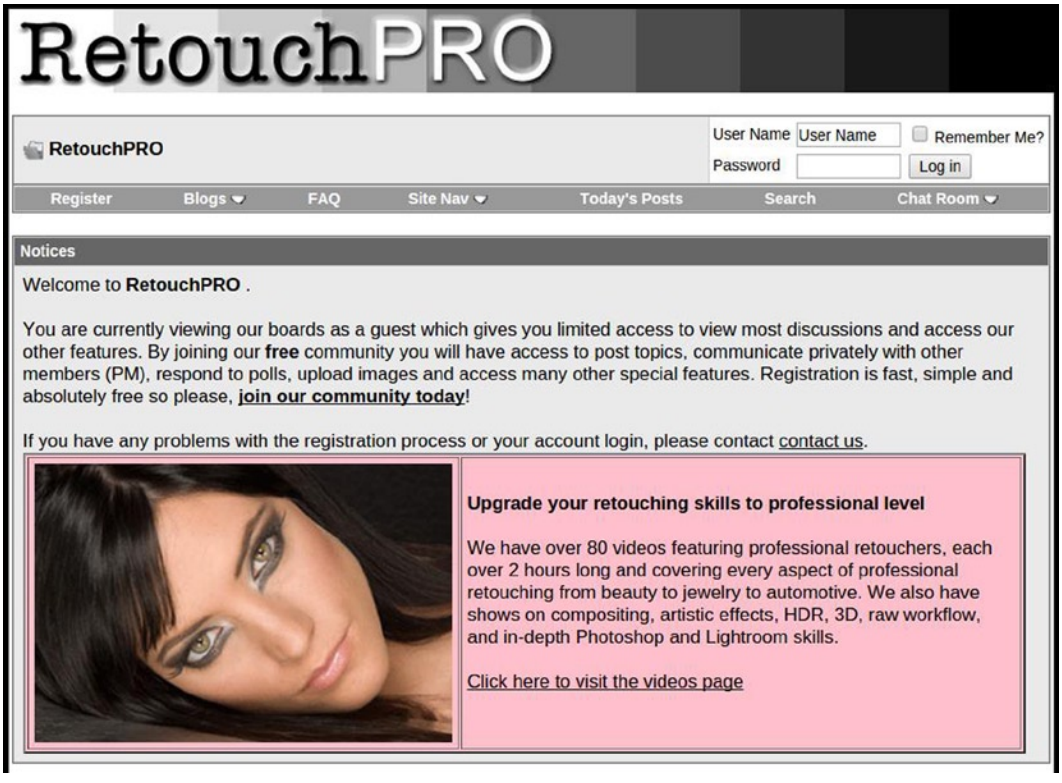

Figure A-2. *RetouchPRO is an excellent resource to help develop retouching skills*

Whitt's Image Works Free Digital Portrait Backgrounds

www.whittartworks.com/backgrounds/id14.html

This web site sells digital portrait backgrounds as digital downloads. There are several free examples available for download throughout the site (see Figure A-3). These backgrounds are useful in image editing and restoration work and graphic design (be sure to read the terms of use on the homepage).

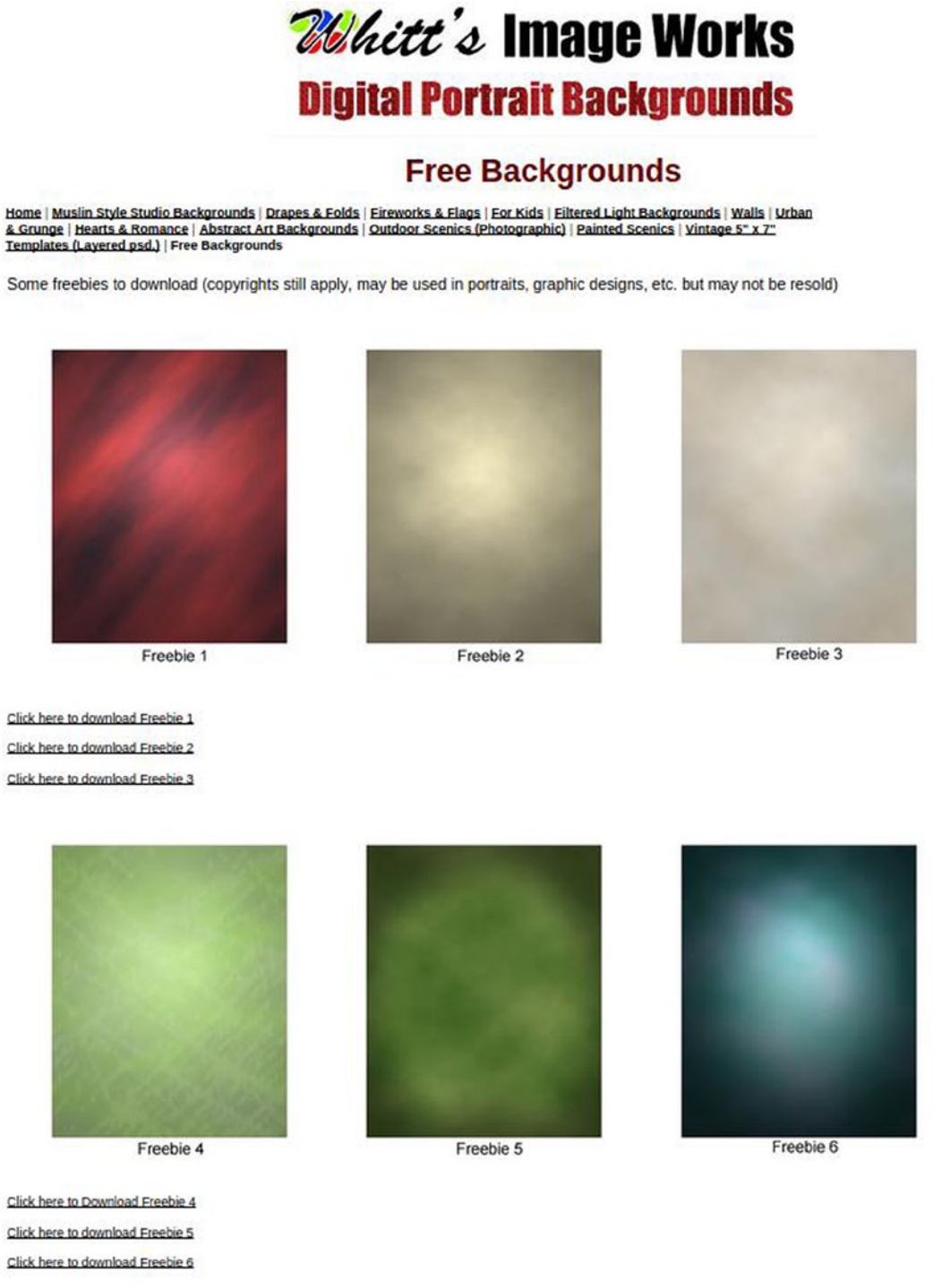

Figure A-3. *Digital portrait backgrounds available to download*

Photographic Equipment

B&H Photo-Video-Pro Audio

www.bhphotovideo.com

420 Ninth Avenue, New York, NY 10001

(212) 239-7500

This supplier carries just about anything related to photography. B&H is located in New York City, for those who would like to visit the store, and items can be purchased online as well.

Specialty Film Processing

Film Rescue International

www.filmrescue.com

1-800-329-8988

This company specializes in processing old, exposed film from still cameras, as well as old 8mm and Super 8 home movies.

Archival CD and DVD Media

GotMedia.com

www.gotmedia.com

1-866-409-1090 (Toll Free)

This company supplies a variety of CD, DVD, and Blu-Ray media, including the gold-layered archival-quality discs rated for long-term storage of data.

Protective Inkjet Spray

Ink2Image

www.ink2image.com

Protective spray lacquers for inkjet prints (important for extending print longevity) are obtainable through this company. Finishes are available in matte, satin, and gloss.

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Beginning Photo Retouching and Restoration Using GIMP

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This book is dedicated to my lovely wife, Sally, and my wonderful daughter, Myra, whose encouragement helped carry me over the bumps I encountered on occasion.

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About the Author

Phillip Whitt is a professional digital retoucher and restoration artist, as well as a film-to-video transfer technician. His love for everything related to photography began when he was ten years old. His favorite aunt gave him her old Kodak Brownie camera, and from the joy of seeing his first developed photographs, a new hobby was born. His foray into digital image editing began in the 1990s with the purchase of his first flatbed scanner, which came bundled with a basic image-editing program. Fixing a few family photographs soon led to a new passion and profession that he continues to enjoy to this day.

Mr. Whitt has digitally edited countless photos and served a number of professional clients, such as photographers, photo labs, and camera outlets, over the years.

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