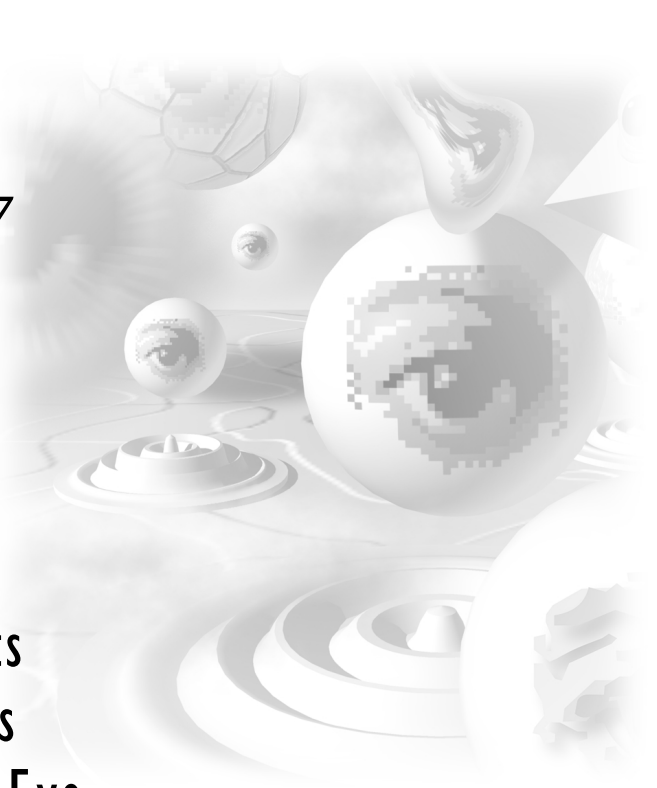# *C h a p t e r   2 7*

Creating 3D Objects and Textures: Tricks (or Treats) of the Eye

The *Inside Adobe Photoshop 6* standard edition was published, and then the authors and editors passed out for around a week. After a case of smelling salts was gratefully inhaled, we thought

and thought about how to make the *Limited Edition* even better than the regular version. What did we leave out?

Well, we didn't show you how to build a house, we didn't show you where a very valuable source for creating 3D textures lies on your hard drive (Photoshop put it there; the authors only watched. Honest.), or how to create a flamingo sanctuary.

Hey, these are valuable things to know, and if we can stop kidding around for a moment, we promise to walk you through some amazing techniques for creating even more amazing artwork. And it's all centered around how you create the illusion of depth in an image.

C'mon. Let's get deep for awhile.

Working in 3D

Before we begin the fun stuff, we need to take a quick look at some important terms. You see, we want to make sure that the authors and you are on the same page, using the same language—yada, yada, yada. If you're familiar with these concepts— orientation, horizon line, and vanishing points—please free to skip ahead to the "Working with Perspective" section. If not, hang around for a whirlwind tour.

Getting Oriented

Let's jump right in. Where you stand in relation to an object is your *orientation*. If you are squarely in front of and level with a store, you see only its front. The line where the sky and the land meet is called the *horizon line.* Our volunteer from the audience is assisting us in Figure 27.1.

If you're looking out from a second-story apartment that is squarely in front of but higher than the store, your orientation has changed. You can now see the front and the top of the building, as shown by Figure 27.2.
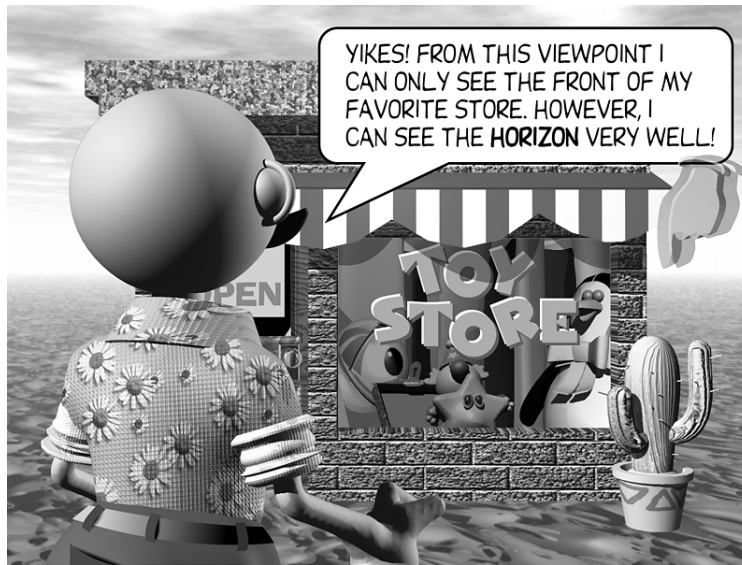
Figure 27.1   When you are looking at something from the "ground floor," the chances are you will not see more than the front of a 3D object, but you *can* very clearly see the horizon.
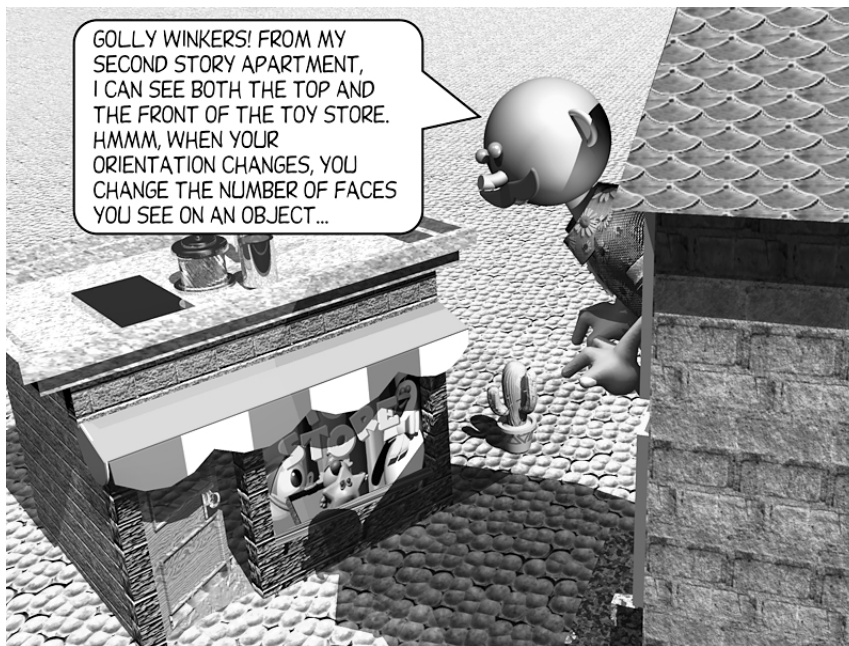
Figure 27.2   The orientation from which you view an object determines how many faces of an object are visible.

Hey, orientation brings up yet *another* important term: vanishing point. The *vanishing point* of an object is where two projections from the z-axis (the depth, the front-to-back measurement) meet at a point, usually in the distance. At this point, the two lines vanish (they *converge* into a single point), so the name is fairly appropriate.

In our example, the object is the store, the two z-axes are the left and right sides of the store, and the vanishing point is the point at which the line projecting from the left side and the line projecting from the right side intersect. Suppose that this store were lit by a setting sun. And suppose that this store were in the desert (not much business, but not too many customer complaints). Nothing would obstruct the shadow the store casts. The shadow would extend almost to the horizon, and from your own orientation (you sneaked around the corner of the building to see the shadow), the shadow would appear to converge to a vanishing point. See Figure 27.3.
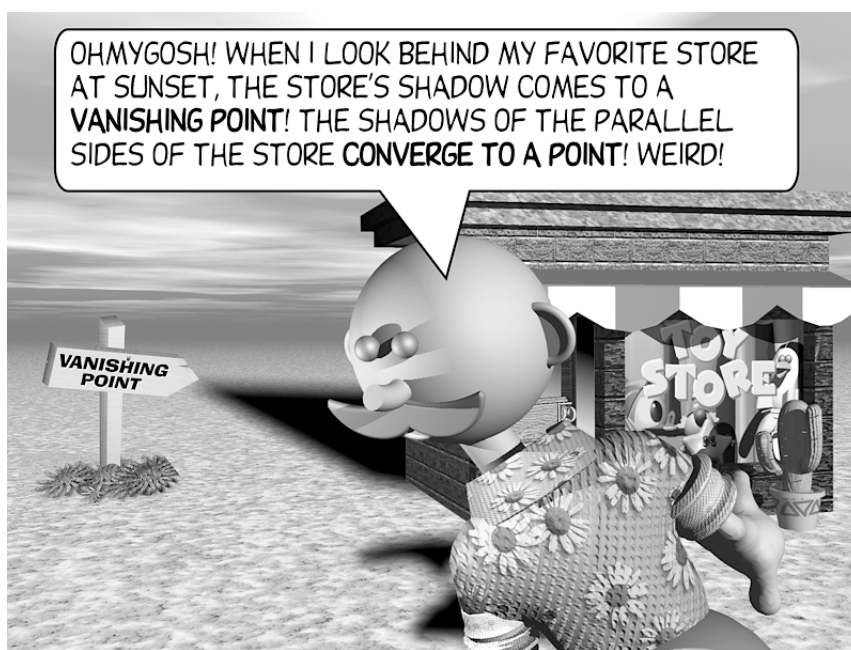
Figure 27.3   The vanishing point is where parallel lines appear to meet, due to perspective, viewer orientation, and the distortion of the atmosphere itself.

Working with Perspective

The term "perspective" is a conversational term, but also a technical one. Fortunately, both meanings are similar. When you're talking to your neighbor who is standing on the roof, you might say, "Hey, get some perspective. Even if you fix the antenna, you're probably going to kill yourself up there and won't be able to watch the TV." In other words, "Get an angle on the situation." The guy on the roof needs a wider angle on his situation.

In geometry, *perspective* is the breadth of the angle with which you view things. Viewing the world through a fish-eye camera lens provides you with a very wide perspective on the world—you can see forward and even to the left and right all at the same time. The downside to a very wide perspective is that all vertical and horizontal lines that are supposed to be straight are curved. You can see an example of this type of distortion by applying Photoshop's Spherize filter to an image.

Bringing Perspective into Focus for the Artist

What appears to be a hindrance in perspective is really a blessing to the artist: using perspective produces distortions that create more exciting views. If we add no perspective, we wind up with flat view of the source—what is called an orthogonal view of the scene. Now talk about *boring*! An orthogonal view has no perspective and does what is impossible in real life: Parallel lines that make up an object in orthogonal view, such as the opposing sides on a box, never converge. Even the naked human eye has a little perspective; if it didn't, we'd never see train tracks converge in the far distance. The less distorted and more like an orthogonal view we suggest in our drawings, the farther away is the vanishing point. This is why train tracks converge at a distance (the vanishing point), and do not converge three feet in front of us.

In Figure 27.4, we see four boxes. The far-left box is viewed straight on—we see only the front face because the perspective is orthogonal.

The second box is tilted slightly toward us. This pose for the box is hardly what we'd call artistic freedom—we can see but two sides of the box in orthogonal view.

> **Tip**
>
> **With Perspective Comes Lighting**   Be mindful of another visual element that entered the scene in the second figure. The top of the box is darker than the front. We begin now to be able to glean a source of lighting in the image.

The third view of the box shows all three dimensions, and this is usually a good thing, compositionally. But its perspective is still orthographic and still evokes yawns from viewers.

However, the far-right image is whiz-bang-wowee glorious 3D in appearance. We can clearly see that the light is coming from the right, and we have a very exciting view of the box, showing all three sides. So what about accuracy? The box looks *gooooooood.* Uh-huh.
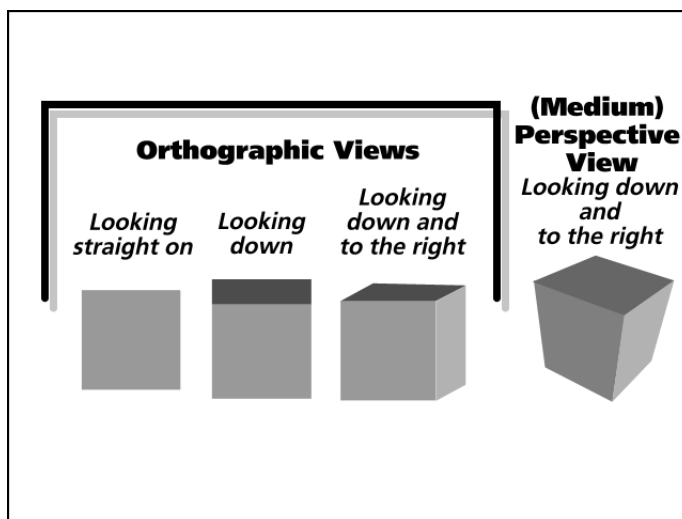
Figure 27.4   Perspective is a primary element in the composition of 3D images. Too much perspective leads to an unflattering, distorted image. Too little perspective, and you have an orthographic (mathematical, non real-world) view of the object.

### There's Orientation…and Then There's *Orientation*

One distinction of 3D modeling and rendering that we will forget about in this chapter is the following: In modeling, the camera has a position and the object has a position. We are concerned only with how much rotation an object displays relative to our eyes (often called *the camera* in modeling programs). Now, the amount of *perspective* we design into an object would be nearly impossible to define because of the way I'm going to show you, but we have free control over the *orientation* of the object. The *orientation* (sometimes called the *translation* in modeling programs) is what view we are presented of an object.

Let's return to perspective again; remember, when we talk about the view of the object, this is our *orientation*.

Understanding Vanishing Points

Perspective from your view of an object can have a narrow (*telescopic* in photographer's terms) point of view, and in this case, straight lines in the object remain fairly straight and do not converge if they were projected front to back for quite a distance. A wider angle will bring the vanishing point closer to home, and there will be some distortion of the object's angles. Try projecting supposedly parallel lines in the object; you will see that they achieve the vanishing point very close to home.

In Figure 27.5, you can see a vanishing point projected from a box. The vanishing point is quite near the box; therefore, the box is seen at quite a wide angle.
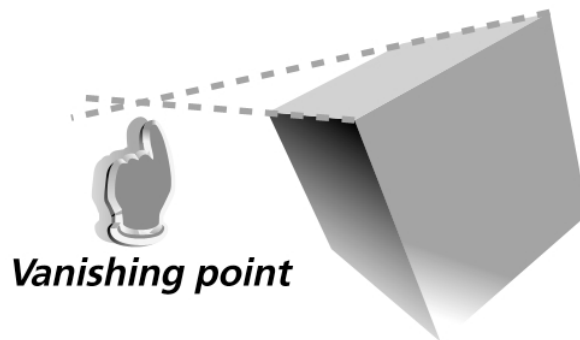

VANISHING POINT IS QUITE CLOSE TO OBJECT. THIS MEANS THERE IS
GROSS DISTORTION OF THE SHAPE OF THE OBJECT, LIKE YOU CAN ACHIEVE
USING NARROW CAMERA LENSES.

Figure 27.5   When the vanishing point for an object is close to the object, the object displays massive distortion. It's still an interesting look, though, so do not refrain from using wide-angle perspective in any of your work!

Figure 27.6 shows a vanishing point and related perspective that's just a hint broader than the human field of vision. The slight exaggeration makes the box look interesting, and you don't have to plot the perspective lines to know that the vanishing point is clear off the printed page.

VANISHING POINT IS NOWHERE NEAR THE OBJECT.
THIS CREATES A VERY MILD PERSPECTIVE,
A LOT LIKE WE SEE THINGS USING THE
NAKED EYE.

*Vanishing point
is somewhere at
the core of the
planet*
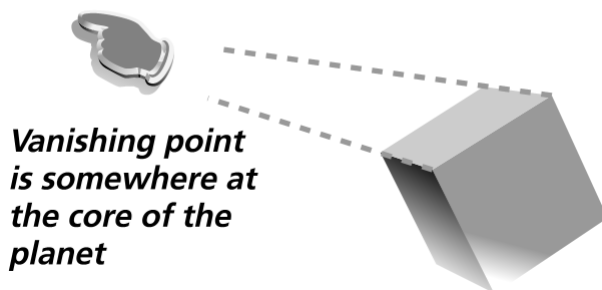
Figure 27.6   A mild amount of perspective keeps an object accurate in appearance while adding a little visual embellishment.

Through a little more explanation and some hands-on experience in the following section, you will learn how to draw this 3D box that has a little perspective.

Getting Ready to Do 3D

So far, we've discussed orientation, horizon line, vanishing points, lighting, and perspective. All these elements are the hows and whys of what makes an object appear to have three dimensions (3D). Let's take one last look at the box we've been showing to see the relationship between the front and back faces.

In Figure 27.7, on the left, you can see the back of the cube. On the right, I took a wireframe of the back and put it in the upper-left corner of the front face. It's very important to see the relationship here. Check out two truths in the figure:

- The back is always drawn from a copy of the front. The back is then modified to create perspective in the finished image.

- The back is less distorted than the front—it appears slightly less diamond-shaped, and it is smaller than the front.
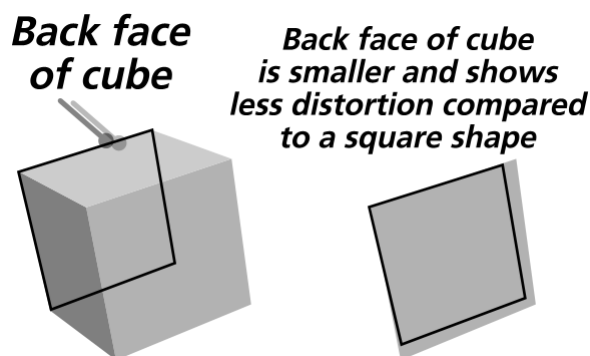
Figure 27.7   Determine the shape of the back of the 3D image and then connecting the front with the back will be a piece of cake.

Not to forget orientation before we begin! All the examples in this section show three sides of the object. That is why the bottom of the box in Figure 27.7 is the bottom-left corner, and not simply the bottom of the box.

Get your Pen tool out, and follow me!

Building Two Sides of a 3D Object

Because building a 3D box in Photoshop is boring, I'll show you how to construct a simple 3D house. The shape of the house (provided on the Companion CD) will fit within guidelines you will draw with the Pen tool. You'll use the Free Transform feature in Distort mode to squeeze the house into the front face template you design.

There's no reason not to start right now.

Example 27.1   Creating a House that Has Perspective

1. Open a new document that is 250 pixels wide and 250 pixels high. The settings of RGB color mode, a Resolution of 72 pixels/inch, and White as the Contents complete the New dialog box fields. Click OK.

2. Press F7 to get the Layers palette onscreen if it is not already, and then click on the Paths palette tab so you can see that a path is being drawn and so you can save it later.

   The house you will be creating has an orientation that dips down toward the user and rotates left a little to see the left side of the structure.

3. With Figure 27.8 as a guide, create the front of the house, using the Pen tool to click straight path segments between anchors.

It's probably easiest to click a four-sided shape and then modify the shape using the Direct Selection tool (called out in Figure 27.8) to move the anchor points to their final positions). Note that the top edge is longer than the bottom edge, and the left edge is longer than the right edge. Ironically, this is one of these design situations in which you want *no* parallel opposing lines—you won't get the house built with perspective if opposing lines are parallel.
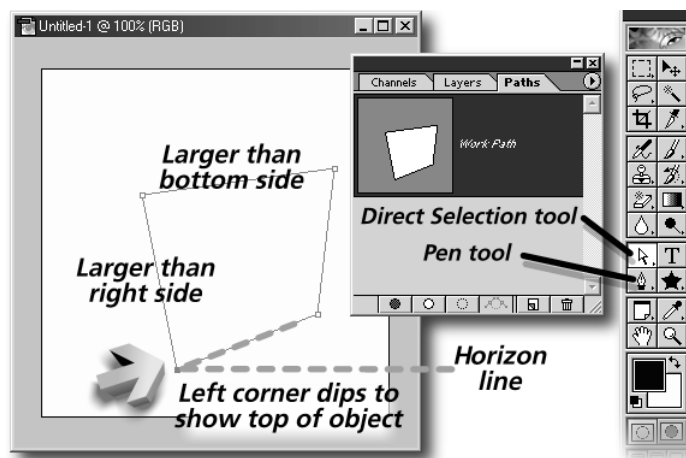
Figure 27.8   Using the Pen tool and Direct Selection tool, draw a path that looks like this one. Do NOT draw the dotted lines shown in Figure 27.8—they're only there for reference.

4. Double-click on the Work Path title on the Paths palette and then click OK in the Save Path dialog box to save the path with the default name of **Path 1**.

Although technically it makes a lot of sense to segregate paths on different layers in the Paths palette, Adobe considers everything you draw that shows up on a single Paths thumbnail to be *one* path. You start a new path (and container—layer—for the path) only if you start drawing with the Pen tool while other path titles are unselected. And you can show the contents of only one path title at a time. If you have several paths on a single Path palette title on the Paths palette, these are considered to be *path components*. Honest. I'm not making this stuff up. Therefore:

5. Choose the Path Component Selection tool, hold Alt (Opt), click on the distorted box shape in the image window, and drag up and to the left of the path. Surprise! You duplicated the path. Release the cursor.

The second path (component) is highlighted (all the anchors are filled with color), so it's the current editing path component.

6. Press Ctrl(⌘)+T to display the Free Transform bounding box around the shape. You're going to reshape the path that is bounded by a fraction or two.

7. Hold Shift. (It constrains the transformation to a proportional one. You *could* click on the circled button marked "a" in Figure 27.9 to constrain proportions, but the author feels that's the long way to an objective). Click on one of the corners of the bounding box (the upper-right corner is fine) and then drag toward the center of the shape, as shown in Figure 27.9, to make the back face template (the path component) about ¾ the size of the front face. Again, the Shift key is constraining the proportions of the active path here.
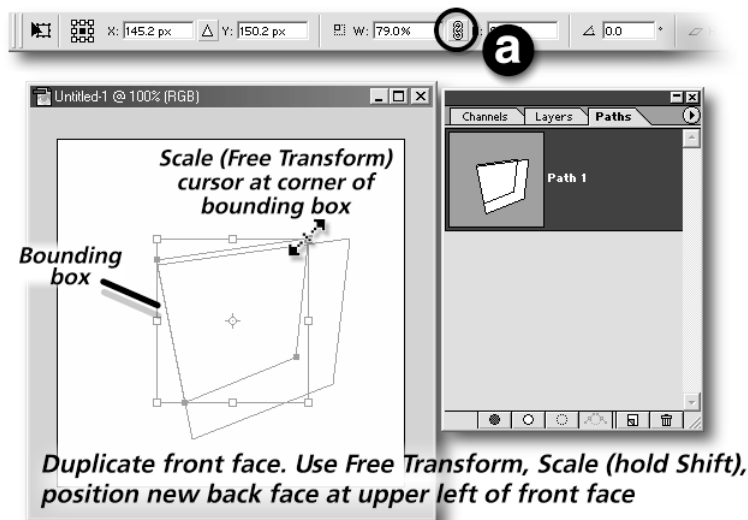
Figure 27.9   You're creating the back face of the cube now. It will not show in the finished illustration, but it provides you with guidelines to connect the side faces with the front and back.

Chances are that you will not be able to get a good idea of what ¾ of the original path component looks like because the selected path moves as you shrink it. So move your cursor to inside the shape, and drag it until it's at the top left inside the original path.

8. When you reach your ¾ scale goal with the selected path component, press Enter to finalize the Free Transform function.

9. Take a breather, and don't touch anything. We're going to put the face of the house into the path guide in two shakes of a lamb's tail.

All we need to do is move the back face path component up and to the left, and our wireframe work is finished. The amount by which you move the back face determines the depth of the house, so ½ a screen inch should make a cozy chateau and not a roadhouse.

## Applying Shapes and Color to the Path Guides

Obviously, this house will not neatly fall into the original path outline—in fact, it's not supposed to. You will use the Free Transform feature to distort a copy of the house and make its selection corners match the corners of the path.

This is more easily walked through than explained; let's go!

### Example 27.2   Putting on a Happy Face

1. Open House.psd from Examples/Chap27 folder on the Companion CD in the workspace.

2. With the Move tool, hold Shift+drag the house in the House.psd image into the image window that contains the paths. See Figure 27.10.

   When you hold Shift, the Move tool copies the selected layer to the center of the destination window, so you don't have to fuss with the new layer's placement. The title of the house layer is also copied into the Layers palette.
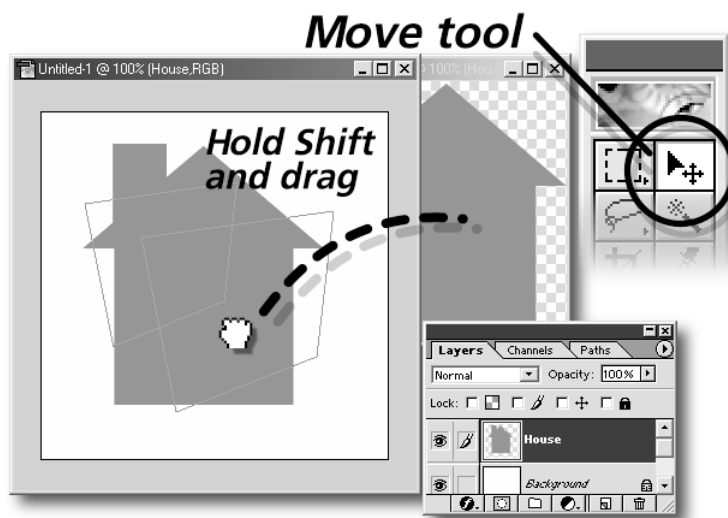
Figure 27.10 Adding the house shape to the image window is as simple as holding Shift and dragging by using the Move tool.

3. Press Ctrl(⌘)+T to display the Free Transform bounding box around the house shape. Right-click (Macintosh: hold Ctrl and click) and then choose Distort from the Context menu so that each of the corners of the bounding box can be manipulated separately.

4. Carefully line up the bounding box corners with the anchors of the original path in the image window, as shown in Figure 27.11. Cool, huh? Press Enter (or double-click within the distort bounding box) to finalize the transformation.

Line up the (Free Transform) Distortion box with the front face path
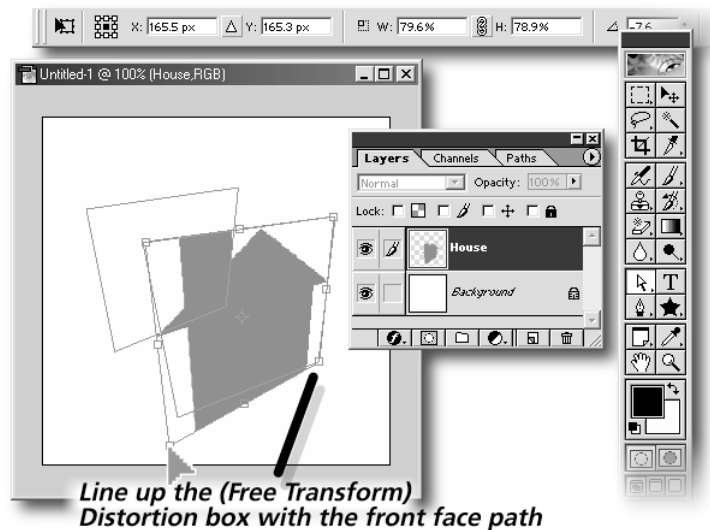
Figure 27.11   Distort the house shape to show perspective by using the Free Transform Distort option.

It's time to add the back of the house to the image. This is going to require more steps than adding the front face, but none of the steps require the manual dexterity of a surgeon, so…

5. With the House.psd image in the foreground in Photoshop, on the Layers palette, lock the Transparency (put a check to the left of the checkerboard icon).

We're going to begin to suggest lighting for the house. Now, even if the viewer will never see the back of the house, it is good to shade the back face so you, the artist, can get a better idea of the source of the light.

6. Click the foreground color selection box on the toolbox and then choose a slightly deeper red than the front of the house. R:163, G: 7, and B:0 is a good combination. Click OK to exit the Color Picker. Press Alt(Opt)+Delete (Backspace) to fill only the opaque areas on the layer with this new color.

7. Right-click the layer title, choose Layer Properties from the menu, and rename the layer **Back of House**, as shown in Figure 27.12. This layer name will carry over into the composition you're putting together.
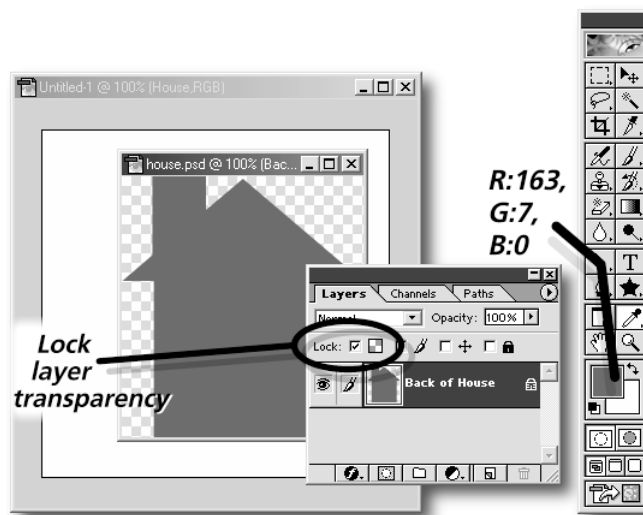

Figure 27.12   Shade the house shape with a slightly darker color, if only for reference in the image you are creating.

8. Shift+click+drag the deeper-colored house into the house image you are composing. Drag the layer on the Layers palette to below the layer named House, press Ctrl(⌘)+T to display the Free Transform bounding box around the deeper-colored house, and then right-click (Macintosh: hold Ctrl and click) and choose Distort from the Context menu.

9. Line up the corners of the bounding box with the *second* of the two path components, as shown in Figure 27.13. Then, double-click inside the bounding box to finalize the editing work.

10. Press Ctrl(⌘)+S and name the file **3DHouse.psd** in the Photoshop native file format. You can close the House.psd image without saving at any time. Keep the 3DHouse.psd file open.

Are you beginning to visualize how the house is coming together and what it will take of your skills to pull this one off? Good! All that remains is for you to add shapes that connect with the vertices (corners) of faces of the house that the viewer can see.
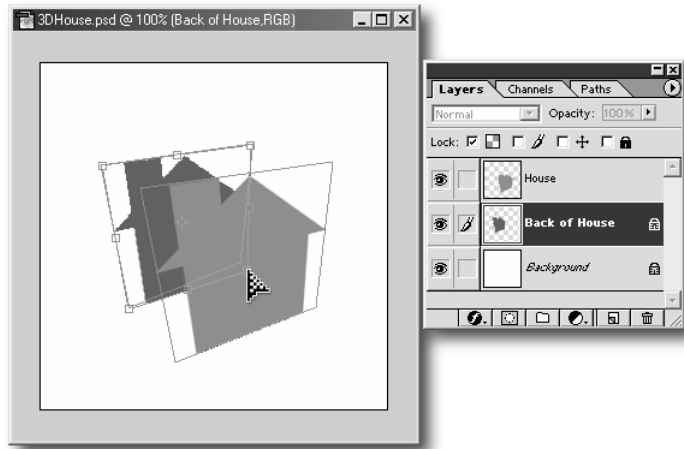
Figure 27.13   Computer simulations can have an advantage over real life. In real life, these two sides of the house would fall over.

In the following section, you'll get this house built, and shade it at the same time. Ah, what Tim Allen wouldn't give to get in on this one…

Determining Colors, Shapes, and Layer Order (for the House)

"Visualization" is the key to your success in creating a 3D house or any other object in Photoshop. You need to see the completed house in your mind in order to fill in the missing pieces. By the way, this house and other shapes in this section are called extrusions in modeling and CAD work. *Extruding* something means that you push an infinite number of points along a path either backward or forward by a certain amount to create the back and sides of an object. Extrusion is the only modeling procedure we're featuring in this part of the chapter; other 3D operations would require too much calculating (and too little fun).

Here's how to create the sides of the house:

### Example 27.3   Finishing the 3D House

1. Presume that the light is coming into the picture from the front (from you), and is overhead. This is the simplest lighting setup that works with 3D objects that are not "facing front," and presents a very straightforward rule for shading the house. *If you want a lot of different tones to describe the faces of the house and your orientation is from above and at an angle, the lighting should come from the top and "into" the scene.*

2. Click in an empty area of the Paths palette to hide the path components you saved. Click the Layers palette tab and then click the Back of House title on the Layers palette. Doing this will make the next layer you create appear on top of the Back of House layer.

3. Alt(Opt)+click on the Create a new layer icon on the bottom of the Layers palette. When the New Layer dialog box pops up, name the layer **sides of house** in the Name field and then press Enter (Return).

4. Using Figure 27.14 as a guide, choose the Lasso tool, hold Alt(Opt)and then click points in this order:

   a. The very top of the back face of the house.

   b. The very top of the front face of the house.

   c. The point on the front face of the house where the roof meets the chimney.

   d. The point on the back face of the house where the roof meets the chimney.

   Then release the cursor and the Alt(Opt) key to auto-close the marquee selection. The selection should look like that shown in Figure 27.14.

> **Tip**
>
> **The Polygon Lasso Tool Versus the Regular Lasso Tool**   You can, in fact, use the Polygon Lasso tool in step 2, and then you won't have to hold Alt(Opt) to make straight lines. But this author feels that your Photoshop education is more straightforward and you will work more quickly if you stick to the same tools and use modifier keys instead of visiting the toolbox and flying a tool flyout every time you need to do something a little differently.
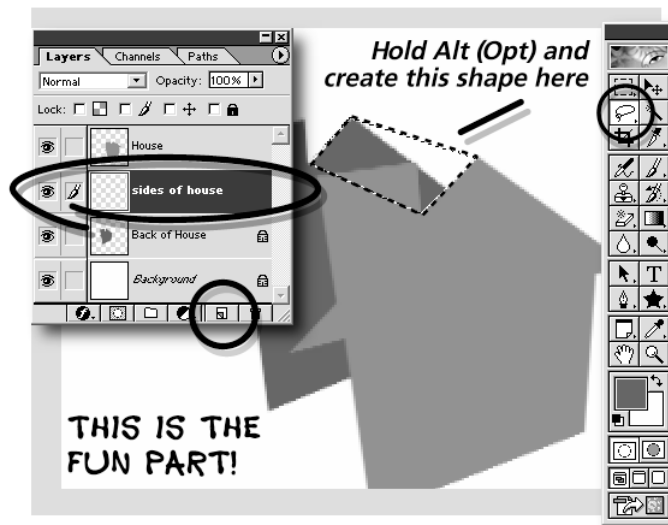
Figure 27.14 Use the Lasso tool in straight line mode to visually describe the top half of the house roof.

It's time to come up with a logical way of deciding what color this selection marquee should be. Would you like to try *my* logical way? Good!

Okay, the sun is pointing at the house from the front and top of the image; we decided on this earlier. To make the selection—part of the left half of the roof—visually separate from the front and back of the house, let's say that the sun is shining more strongly at the top of the image than in front. Therefore, the selection marquee should be a significantly lighter color than the front of the house, but not white or pink.

5. Click the front of the house with the Eyedropper tool and then click on the Color Picker. Change the RGB settings so you've defined R:255, G:151, and B:124; click OK to exit the Color Picker; and then press Alt(Opt)+Delete (Backspace) to fill the selection with the lighter color. Press Ctrl(⌘)+D to deselect the selection marquee, and press Ctrl(⌘)+S to save at this point.

Note

Creating Realistic Lighting When shading the house, you could in fact use the Hue/Saturation command and only turn up or down the brightness. Chromatically, you're doing about the same thing by using the values I recommend in the Color Picker box. I'm suggesting colors here because hue and saturation change by a subtle amount when light hits an object. It's influenced by the color temperature of the sun, and a little ambient light (light from everywhere that has bounced off objects surrounding an object) will tint the pure color of the house as you look at each of its faces.

Just keep this nugget in mind when you want to make a realistic lighting change across the faces of an object that is only one color.

The techniques you need to use to finish the house are the same as steps 1–4. Here they are:

Example 27.4   Finishing the House

1. Marquee select the top of the chimney. Because the top of the chimney faces straight up, it receives more light than the sloped roof. Fill the selection with R:255, G:201, and B:185.

2. Working counterclockwise, the left side of the house above the roof is already filled in for you—the fill comes from the part of the back of the house showing through the layers!

   The tiny part of the sloped chimney below the left side of the house (the area you didn't need to fill in) should have the same color as the slanted roof portion next to the chimney. R:255, G:151, and B:124 should fill the selection marquee you make.

3. Finally, and you can see this in Figure 27.15, carefully select the bottom left of the house holding Alt(Opt) using the Lasso tool. The figure shows the Polygon Lasso tool because this is what you'll see onscreen when you use the Lasso tool in combination with the Alt(Opt) key.

4. You can fill the entire marquee with the same color as the back of the house; or choose the Eyedropper tool, sample the back of the house color, choose the Paintbrush tool, and paint over only the white area within the selection that needs painting. (There's less risk of painting over the front of the house unless your selection work is super-precise, by painting instead of mere filling.)
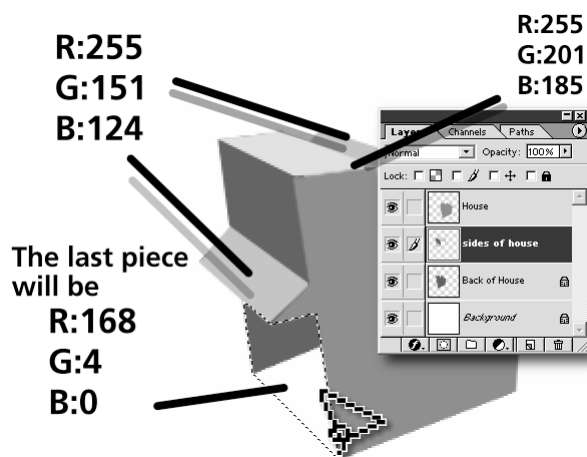
Figure 27.15 Paint the visible sides of the house according to how directly oriented they are toward the light source in the picture.

5. Press Ctrl(⌘)+D to deselect the marquee and take a look at this splendid 3D house, as shown in Figure 27.16. Notice where the sun is in this and on other 3D objects having the same orientation.

Figure 27.16   "Um, Mr. Bouton? You forgot to make a front door on the house." "Let the tenants tip it over and come in through the basement!"

You need to do three piddly little things to the 3DHouse.psd file before the house is "nailed together."

6. Hide the Background layer to make it invisible.

7. Press Ctrl(⌘)+Shift+E to merge the visible layers. Renaming this layer to **House01** is a good thing to do right after collapsing the layers. Right-click (Macintosh: hold Ctrl and click), choose Layer Options, and then rename the layer in the Layer Properties dialog box.

8. Press Ctrl(⌘)+S. You'll use this bungalow later; however, you can close it for a while so you have more room to…*build another house!*

A New House and a Fresh Perspective

That heading sounds like the cover of a real estate flyer, doesn't it?

Now that you have a fairly good idea of how perspective and shading and orientation come together to help you build an extruded object, you're going to fly a little. This section has but the bare bones of instruction because face it…you've done it before!

The following example is good reinforcement, and no, you will not be using the same orientation on the house, so you've got a lot of new angles to cover.

Here goes...

Example 27.5   Building a House on Your Own

1. Open House02.psd from the Examples\Chap27 folder on the Companion CD. Save it to your hard disk as **House02.psd**, in the native Photoshop file format.

As you can see in Figure 27.17, this is a graphical representation of what the authors expect you to do. You see a couple of hints here, including the orientation of the house (open the Layers palette, and you will see a layer titled Front and back frame).

2. Open the House.psd image (which is the image of an undistorted house— which you will distort), copy the house to the Front and back frame layer, press Ctrl(⌘)+T, choose Distort from the Context menu, and match the corners of the Distort bounding box to the corners of the front path in the image window. Double-click inside the bounding box to finalize the transformation.
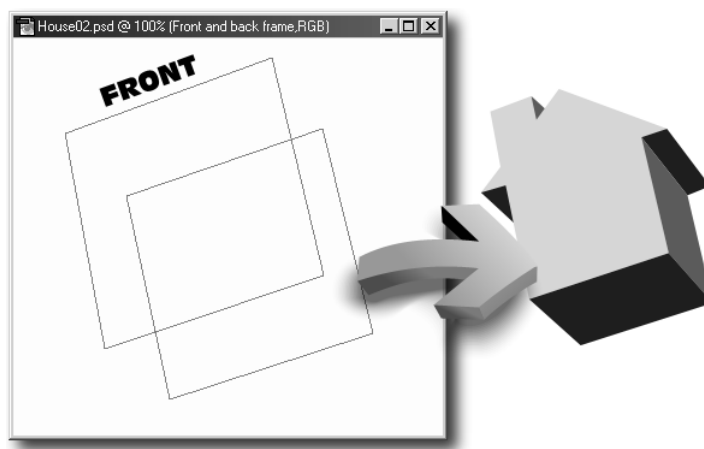
Figure 27.17   All you need is an undistorted (orthographic) 2D picture of a house front, and the back and front transformations for the house, and you're well on your way to creating a 3D object—specifically, a house.

Because this particular house is actually facing the point of light we are using for all objects in this section, the front face is going to be lighter than its default red color in the House.psd file.

3. Press Ctrl(⌘)+U to access the Hue/Saturation dialog box. Drag the Brightness slider to the right until the Lightness number field reads +75 and then click OK to return to a much lighter front of the house.

To save a little time here, let's use a coloring trick. The back face of the house is down and to the right of the front. This means that you can color the back of the house and let this coloring represent the right face of the house. This step makes a lot more sense once you begin connecting the front and back points of the house to make faces of the house.

4. Using the Move tool, drag another copy of the House.psd file into the House02.psd window, and drag the layer so it is the layer on top of the Background layer. Use the Free Transform in Distort mode to line up the back of the house's bounding corners with the path for the back of the house. Double-click inside the bounding box to apply the transformation.

5. Press Ctrl(⌘)+U to display the Hue/Saturation dialog box, drag the Lightness slider to about –35, and then click OK.

When you already have an area colored, it makes sense to use the Hue/Saturation command. When you're creating a color to be applied to your work, use the Color Picker.

Because this will actually be the right side of the house in the finished image and the lighting is from the top (not directly hitting the side), this side is darker than the side of the house facing the light.

6. In Figure 27.17, you can see that the piece between the roof and the chimney is the same color as the right side of the house. Use the Eyedropper tool to sample this dark red from the right of the house, create a straight-edged marquee selection between the front and back vertices (corners) of the area, and then fill the selection with the current foreground color.

7. Create the bottom selection marquee, and because the bottom is almost directly opposite the light source, fill it with R:26, G:26, B:26.

After you play with 3D compositions for a while, you will eventually achieve an instinct about what color goes where, so you'll do fine on your own.

8. One at a time, create the selection marquees for the left and right bottoms of the roof. These areas are aimed in the same direction as the bottom of the house, so fill them in with the same color.

9. Merge all but the Background layer together—Shift+Ctrl(⌘)+E—, and then save the file to your hard disk. You can close the image at any time now.

You're going to love this next house-building assignment. There's no more of the author's stale humor because you're *on your own* with the steps!

Creating a House Completely on Your Own. Almost.

You've been through the steps to define an orientation for an object; to make the front face as a template and then use a smaller, less distorted copy for the back face; and to connect these faces and shade them so the object looks 3D.

If you know all the steps, why not take a crack at building a house with a unique orientation by yourself? This example is a list of broad hints that will save you time reconstructing the front bounding box of the house. After that, you are home free:

Example 27.6   Numbered Hints on Making a House

1. Open House03.psd from the Examples/Chap27 folder on the Companion CD.

What's this? There's *already* a house in the file!!! Thanks for saving me the work, Bouton!

Um, saving time is not the issue here. You've been provided with a finished house here so you can duplicate it. Naturally, you can use the house the author made in the section to follow, but it would be cheating…specifically cheating *yourself*.

2. No one ever said that the bounding box has to be constructed in one piece. In fact, it will be easier for you if you draw a straight line using the Pen tool and then use the Direct Selection tool to modify the position and angle of the line relative to one side of the house.

In Figure 27.18, you can see that the author drew a line that begins at the bottom right of the house. Then the line was extended (keeping the angle of the line the same) by dragging on the top anchor point with the Direct Selection tool. Finally, by clicking on the line and not an anchor with the Direct Selection tool, you move the line until it touches the broadest part of the house—the right of the roof.

Tip

Rule for Working with the Pen Tool   If you do not deselect the previous line before drawing a new one, you will wind up with a mess of virtual twigs onscreen as the Pen tool attempts to connect and draw new lines.

The way around this headache is to press the Ctrl(⌘) key at the end of every line you create (which toggles the Pen tool to the Direct Selection tool), click on a vacant area of the background, release the Ctrl(⌘) key, and continue.
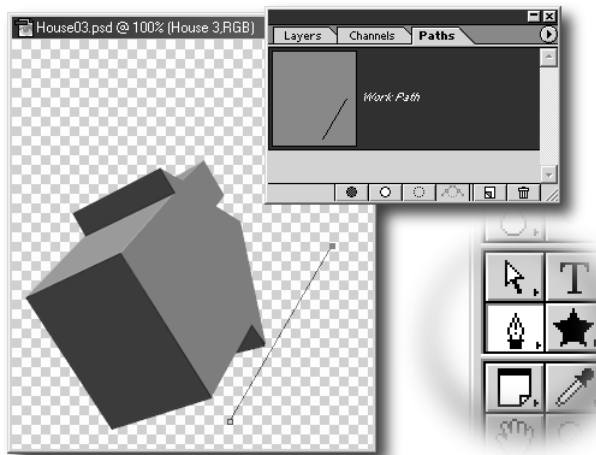
**With the Pen tool, reconstruct the bounding boxes
for the front and back faces**

Figure 27.18   The process for constructing a bounding framework for the house is to first
create a line that runs parallel to the side of the house. Next, you extend the
line so it goes farther than the top of the neighboring edge of the house and
then drag the line so it lies flush with the outermost point on the specific
side of the house.

3. Re-read the caption for Figure 27.18; it is there that the secret for building
   the bounding framework can be found. You align a line with the outermost
   straight edge on any side of the house. Therefore, the next line you draw
   should be parallel to the top of the chimney (working counterclockwise);
   you then extend the line to hit the first line and move the line so it touches
   the top of the chimney.

4. The third line touches the left side of the house. You build it by drawing,
   extending the line, and then moving the line so it touches the left side of
   the house. Ignore the left part of the roof.

5. The bottom of the house is child's play. Draw and then extend the line.
   Because there are no protrusions, such as a roof corner or a chimney, there
   will be no need to reposition the line.

6. Finally—for the house front template, you'll want to "clean up" this
   template by replacing the four lines with one, all-lines-connected box.
   Click on the four intersections of the four lines to create a closed path,
   select the straight lines (one at a time) with the Path Component Selection
   tool (on the Selection tool flyout on the toolbox), and press Delete
   (Backspace). Double-click on the Work Path title on the Paths palette,
   and name this path.

7. Creating the back template for the house is very simple. So simple, in fact, because you've done it before! Duplicate the path (using the Path Component Selection tool, hold Alt/Opt, drag a little, release the Alt/Opt key), and then move it up and either to the left or right of the front face path—the vertical direction is up to you—do you want a left or a right-facing house?

8. Proceed as you've done twice before: Load the House.Psd file, drag a copy of it into the image window that contains the template, use the Free Transform Distort tool to fit the house to the bounding box of the Distort feature—rock and roll. You should be done in less time than it takes to put up a mall.

If we take stock of things right now, you should have three houses, all of them red and lit from the same overhead angle, and all of them having different orientations. It should be noted here that there is no easy way for a human to calculate the perspectives of the houses, and further, no house has the same perspective. At this point, we say, "Forget math." The houses look fine, and it would take a geometry geek with a slide rule (remember those?) to tell us that technically the houses do not look fine. There's a huge lesson right here. I think I'll set it off from the paragraph text:

> "If an element or the whole piece of art looks correct,
>   then it *is* correct."

We are talking about *art* in this book, with a little help from math, and *not* the other way around!

Next, you will copy the houses to the only logical place for small plastic houses: a game board. We supply the game board, you'll add houses and shadows, and see how well you can integrate a bitmap drawing into a fairly realistic rendered model picture.

The Photoshop Housing Project: HUD-Approved

In this section, you'll put the houses you rendered to some use to complete a larger picture. I deliberately left out miniature houses from a rendering of a liberal interpretation of a popular bored game (sic). The first move is to get a house—the whole exercise will go easier if you use the first house—onto a layer in the image and then scale it so it's a house and not the World Trade Center.

Here's how to add a house to the "Monotony" game board:

Example 27.7   Populating a Background Image

1. Open the Monotony.tif image from the Examples/Chap27 folder. Then position the 3Dhouse.psd in the workspace so that you can easily pull a copy of the house into the Monotony image.

2. With the Move tool, drag the house image into the Monotony image, as shown in Figure 27.19. I realize that the house looks like a roach motel in scale at present, but that's what the Scale Free Transform is all about! You can close 3Dhouse.psd at any time now. Also, after the house has been copied to its own layer in the Monotony image, rename the layer to a name such as **Houses**. To do this, right-click (Macintosh: hold Ctrl and click) on the layer titled Houses, choose Layer Properties, type away, and then press Enter (Return) when you're finished. Save this file as **Monotony.psd** in the Photoshop native file format.


Figure 27.19   Be the first on your block to put a building on your property!

3. Press Ctrl(⌘)+T to surround the house with the Free Transform box. Then right-click (Macintosh: hold Ctrl and click) and choose Scale from the context menu. Finally, click down on a corner Free Transform box handle, and while holding Shift (to constrain the shrinking to proportional) drag toward the center of the house until the house is a little larger than the first joint on the hand. See Figure 27.20.
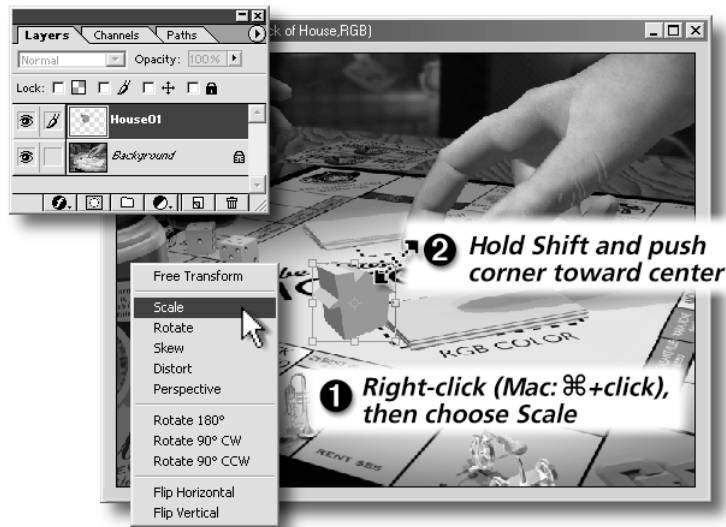

Figure 27.20   Shrink the house to the correct size by using the Free Transform Scale mode.

4. Let's make this a block party. Import the two other houses, one at a time, so you can shrink them and move them so they form a harmonious composition. Hide the Background by unchecking its eye icon on the Layers palette. Then press Ctrl(⌘)+Shift+E (Merge Visible)— see Figure 27.21. All you are left with is a single layer named Houses on top of the Background on the Layers palette. Unhide the Background after this step.

5. Duplicate the Houses layer (drag the layer title into the Create new layer icon on the bottom of the Layers palette). This Houses copy layer will be the layer you'll use in the final image, whereas the Houses layer is about to get a coat of paint, for it will become a shadow layer. Click the Houses layer, as shown in Figure 27.22, check the Preserve Transparency checkbox at the top of the palette (it's to the left of a tiny checkerboard icon), click the default colors icon located at the bottom left of the foreground/background color selection boxes section near the bottom of the toolbox, press Alt(Opt)+Delete (Backspace), and then uncheck the Preserve Transparency checkbox.
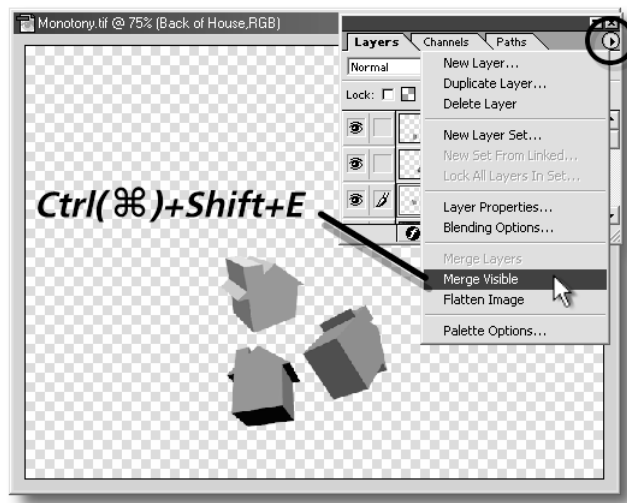
Figure 27.21   Merge the houses into one layer. The bottom layer's name
prevails over the others.
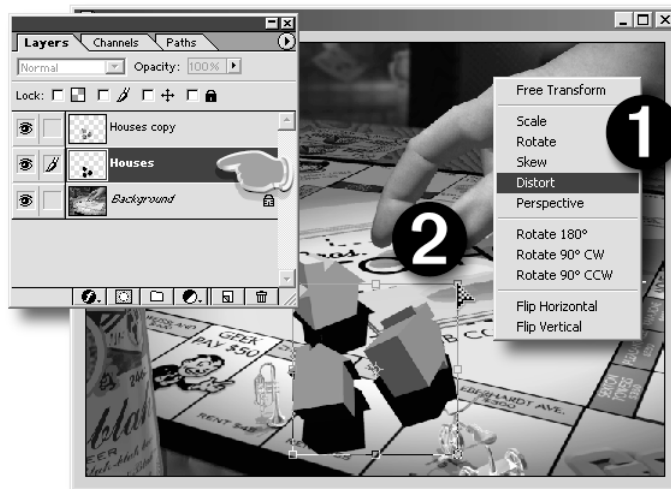
Figure 27.22   Use the Distort box, which holds the shadow elements, to perfectly integrate
the houses with the game board.

Now we have three houses sort of floating in space, which require shadows
from the top and slightly inward light source in the Monotony image.
How on earth do you calculate a top projection downward on an object
that is not only rotated, but also you have no information on what parts

of the front and top of the house—the areas that would cast the shadow projection? When in doubt, punt. The shadows would in real life be very complex. If you add complexity to the shadows you create, I estimate that only three out of 100 people will chide you for this mistake, and you're probably bigger than all three of them…

6. With the Houses (shadows) layer highlighted, press Ctrl(⌘)+T to create the Free Transform bounding box around the shadows. Then right-click (Macintosh: hold Ctrl and click), and choose Distort from the Context menu (refer to Figure 27.22). Take hold of one of the corners of the bounding box, and begin dragging it so that the bounding box will eventually be in synch with the perspective of the properties on the game board.

   Neat trick, huh? At least we are adding an element of perspective reality to the composition.

7. Keep working the corners of the Distort Free Transform box until the overall shape of the box more or less conforms to the perspective of the game board.

   See Figure 27.23 for the basic shape of the Free Transform bounding box.

Note

Comparing Reality to an *Interpretation* of Reality   As an added thrill in Figure 27.20, I took the time to set up actual three-dimensional wireframe houses in Caligari trueSpace; matched the position, rotation, and relative distances from one house to another; and then cranked up the shadow tracing feature. You can see in the upper-left corner of this figure that the house shadows, which are as optically correct as reality, aren't all that different from the "faked" perspective you're giving to the house shadows in the Monotony.psd image. Again, if it looks right, who can argue? Art is interpretation, not duplication…

Next is an easy but important step. You see, shadows in real life almost never totally hide what they cast upon. There's usually too much ambient light—light that comes from indirect reflections—to allow 100% dense shadows. So…

8. Double-click inside the Distort box to finalize the distortion of the shadow. Then drag the Opacity slider on the Layers palette down to about **75**%. Use your own judgment, and evaluate the other shadows in the image for shadow opacity.
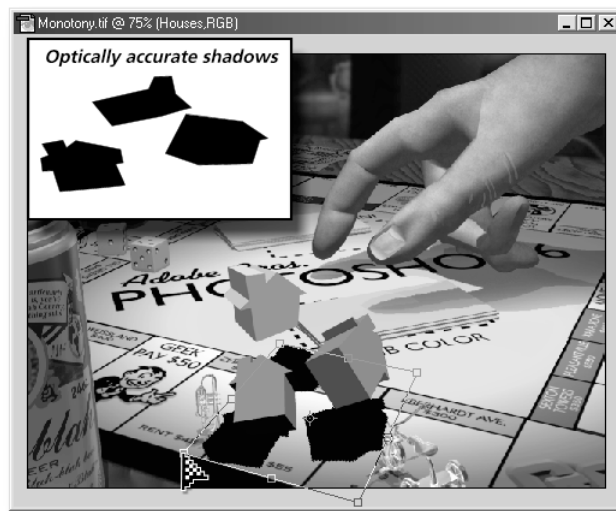
Figure 27.23   Work the corners of the Distort box until they appear to be running at similar angles to the lines drawn on the game board.

> **Tip**
>
> **The Shadow Knows**   Although it's not recommended for this example, you might want to apply a small amount of Gaussian Blur to shadows you create for things in the future. Shadows in real life can be cutting sharp, or lazy and diffuse. The real trick is to match shadows in a situation in which you're adding objects to a scene.
>
> Take a look at *Star Wars: The Phantom Menace*, and see how carefully the CG artists matched Jar-Jar's shadows and the army droid shadows with the other characters.

9. Press Ctrl(⌘)+S and save your work.

As you can see in Figure 27.24, you made a significant contribution to the image. These houses will really be examined by the viewer—they are in the foreground of the image, but you rendered them with the correct perspective, and I'm not going to say a word if you don't.

Figure 27.24   If you had one more house, you could trade them all in for a hotel.

Tip

Secrets of Creating the Game Board Image   The Monotony.psd image is obviously computer-generated, but I tried very hard to create a lot of realistic elements and add the "business" of real names of NRP's staff as properties on the board. Visual complexity in artificial images helps. But if you want to know the biggest trick, any time you need hands in a modeled piece, export them from Poser 2 or later. Break the hands off from the rest of the model and then use a scan of skin, or add noise to a fleshtone color to map (in the 3D program) to the model. The fingernails and some of the folds in the skin were simply painted on in Photoshop.

On Your Own: Experimenting with Lighting

Now we're not quite done with your education in visualization of 3D objects in Photoshop. Your lighting needs to be unique in two more "occasions" along the surface of a 3D object:

- A curve. So far, the houses were all straight-edged, but what if you want to reinvent the wheel? In this case, the lighting (from above, per the previous tutorials—trust me, you do *not* want to get into complex lighting setups)

would begin strongest at the top of the curved item, and fall off as the shape's silhouette gradually turns away from the light source as you trace it to the bottom of the object.

- A hole in something. When viewed at an angle, the lighting inside a hole in an object would be exactly the reverse of its surface lighting.

In Figure 27.25, you can see the files Train.psd and wireframe.psd—both files are included in the Examples/Chap27 section of the Companion CD. Yup, the idea is for you to create a 3D version of the train with the materials provided. I realize this is no mean feat, but consider it a challenge that is bound to do nothing less than improve your artist's eye if you give the train assignment half a chance.
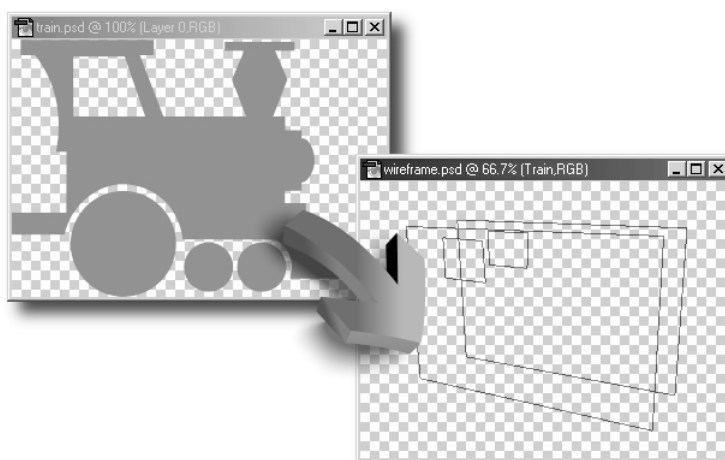

Figure 27.25   This train extrusion is more complicated than the house assignment, but you will learn more if you take the challenge.

In Figure 27.26, you can see that the finished train has a flatbed car trailing it, that the two objects have different angles of rotation, and that I've used Alien Skin's Perspective Shadow filter on the piece to anchor it to an invisible ground plane.

Now, before you start telling me to stick this assignment in my hat:

- I do not own a hat.
- Everything in this image, with the exception of the shadow, was covered in this chapter. You *can* do it. And what an illustrator you will become in the process!
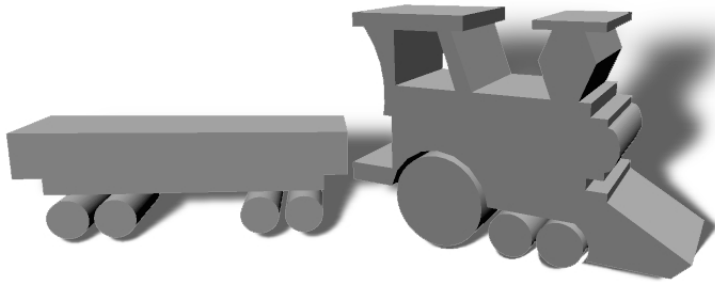
Figure 27.26   C'mon. You can't create your vision of the world with only houses. You need some wheels to get around!

With the steps you learned, you can take this 3D painting stuff as far as you like. But if you need results without a lot of calculation work, Chapter 31 shows you a plug-in or two that will paint 3D objects for you.

It's time now to move into painting 3D textures. Everything looks more realistic when it has a texture (check out Chapter 29), and you'll see in a moment how to use the Photoshop features to make seamless tiling textures.

Creating a 3D Texture

If you discovered the power of the Texture channel feature in the Lighting Effects filter, you already know that you can "fake" a bump or a recess in an image by painting into an alpha channel (or by picking the red, green, or blue channel as the Texture channel). By "faking," it is meant that obviously the image onscreen does not protrude from the screen or recess, but instead lighting rendered to the image gives it the quality of being poked or shoved.

Well, guess what? You can add 256 different degrees of bumpiness to an image (because an alpha channel has 256 different brightness levels in Photoshop), and this chapter shows how to leverage this fact to produce some really wonderful bump-creating work. Add to this the fact that we haven't discussed some of the "toys" that Adobe Systems installed on your system—seamless repeating Illustrator tiles—*and* we haven't explored the other flyout on the Filters list. There's some fun and funky stuff you can do with this combination, and that's only the taxi driver's tour of this section.

Rendering and Modifying Illustrator Files as Bitmaps

Right now, drop down Photoshop (minimize it or toggle to the desktop, where you can access your drives). Choose your Photoshop folder and then dig inside, like so: Photoshop 6/Presets/Patterns/PostScript Patterns. *The incredibly intricate path* is why nobody ever finds this gold mine! Now, we haven't started the tutorial yet, but if you look at Figure 27.27, you see oodles (okay, scads, not oodles) of Illustrator files—when you direct the Open command path to one of these files.

As you can see in this figure, both Windows and Macintosh systems display the Illustrator logo, but only if you have Illustrator on your system. If you do not, Windows users and Macintosh users alike must trust the AI extension to identify the file because the icon for the file will be the system default.
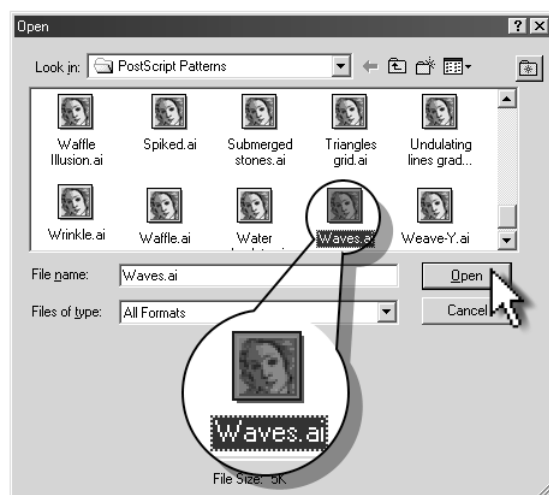
Figure 27.27　Shortly, you will open the Waves.ai file. It is an Illustrator file that will be rendered to a transparent layer in Photoshop.

If you read the caption of Figure 27.27, I guess I've blown step one in the tutorial—nevertheless, you've now found a valuable resource for the base layer of dimensional work.

Let's get started with importing and then modifying the Waves design. The lines are nice, but a little spindly. So you'll use a Filters command to make the design a tad bolder.

Example 27.8   Importing and Changing an Illustrator Pattern

1. From the File menu, choose Open, and then choose Photoshop 6, Presets, Patterns, PostScript Patterns. (Note: An Illustrator file, whether it has the EPS or AI extension, is made up of Adobe PostScript code.) Click on Waves.ai and then click on Open.

   The Rasterize Generic EPS Format dialog box appears, in which you get to decide on the color mode and size of the imported design, which is resolution-independent as a vector (Illustrator) design.

   Photoshop will offer the default size (the size at which the design was created), but it is too small for our purposes. Type **353** (pixels) in the Width field As long as the Constrain Proportions check box is checked, the Height field will turn to 100 pixels. Type **72** in the Resolution field, and choose RGB as the color mode. Take a gander at Figure 27.28. If your dialog box looks like this, click OK.

   As you can see in this figure, Waves.ai was interpreted by Photoshop as black lines against a transparent background. In your own adventures, you can use this transparency property to toss a color underneath the layer.
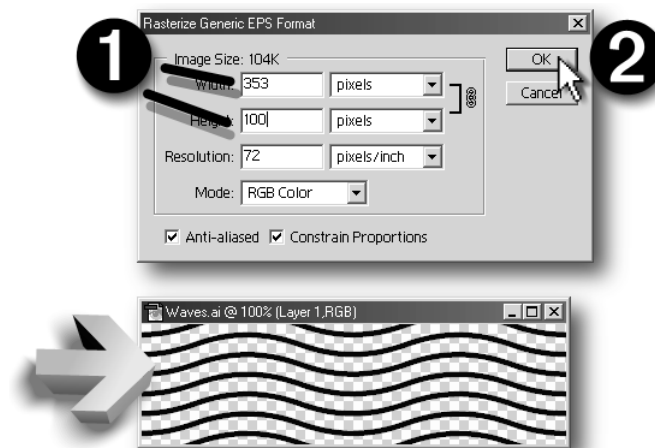

Figure 27.28   The Waves design is a nice pattern. However, the lines are too weak for our purposes. Not to fret; you'll fix this shortly with a bizarre, underused Photoshop command.

The Filters, Other, Minimize command was used for years by savvy prepress users who want to trap image areas. Bleeding (expanding) and choking (contracting) are two trapping methods that essentially overlap a part of a channel with another, so no white spaces appear within a composite image, as in an ad with the word "New" created on a spot plate using a custom color, for example. See Chapter 30 for the lowdown on spot colors.

2. Choose Filters, Other, Minimize. Choose **2** for the value of pixels that are the minimum (width) in the image, as shown in Figure 27.29. Click OK.

   As you can see, a very minor amount of Minimize makes the wavy lines very heavy and perfect for the custom design you will build.
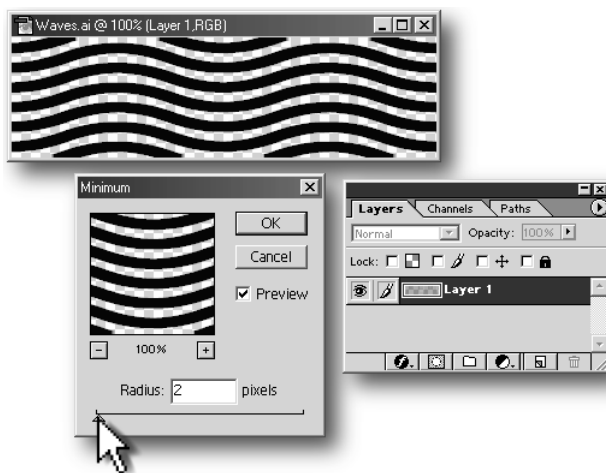
Figure 27.29   The Minimize command determines the minimum weight of a stroke in the active image window.

   Let it be known that by the act of minimizing the waves design, the design is no longer a perfectly seamless tiling image. As my grandmother used to say, "Stuff happens." We will correct some of the lopsided qualities of the finished image to make it perfectly tiled.

3. Now, if you used this wavy line information as a Texture channel, you'd get a very hard, abrupt transition between foreground and background elevations. So let's not make the lines black: Press Ctrl(⌘)+L to display the Levels command. Drag the Output Black Point slider way over to the right until the bottom-left number field reads about 116, as shown in Figure 27.30.

   If you haven't explored other areas of this book, what you've done to the picture is to tell Photoshop, "No, no. True black doesn't exist when 0 is the Output value. The lowest tone starts at 116 out of 256 possible tones." Photoshop shrugs and obliges, and now we have a gray set of waves. Choose Image/ Flatten from the Layers palette's flyout menu—we don't need transparency in this image.
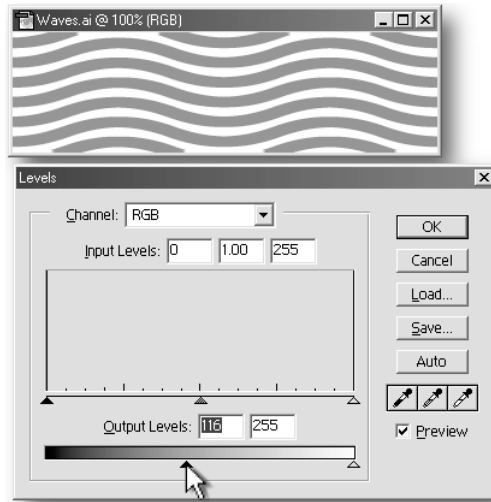
Figure 27.30   To change deep tones to make them lighter requires that you use the Output fields in the Levels command—not the Input fields as we usually do in this book.

4. Click OK to apply the tone change to the image. Now Choose Image, Duplicate; accept the default name in the dialog box by clicking OK; and then fill the duplicate image with about **45**% black, a color deeper than the original wavy lines you modified. A quick way to do this step is to click the foreground color selection box on the toolbox; in the CMYK field, type **0** (zero) in the C, M, and Y fields; type **45** in the K (Black) field; and then click OK. Then press Alt(Opt)+Delete (Backspace) to fill the duplicate with **45**% black.

5. With the Waves Copy image in the foreground in the workspace, choose Filter\Artistic\Sponge because sponges are good for more than cleaning up quick spills. Drag the Brush Size slider to 5, drag the Definition to 12, and then drag the smoothness to 5. Your workspace should look like the one shown in Figure 27.31. Click OK to create a mottled texture similar to that of a sponge daub of paint on canvas.

6. Hold Shift, choose the Move tool, and then drag the original (wavy line) layer on top of the sponged image (Waves copy), as shown in Figure 27.32. Holding Shift keeps the layer centered as it lands in its new home. (Am I sounding like Mr. Rogers, or what?) Anyway, on the Layers palette, drag the Opacity slider for this new layer down to about 65%, and change the mode in the modes drop-down field to Multiply.

Multiply is a blending mode that favors deeper colors over lighter ones, so you should now have a nice three-tone organic image in the original image window.
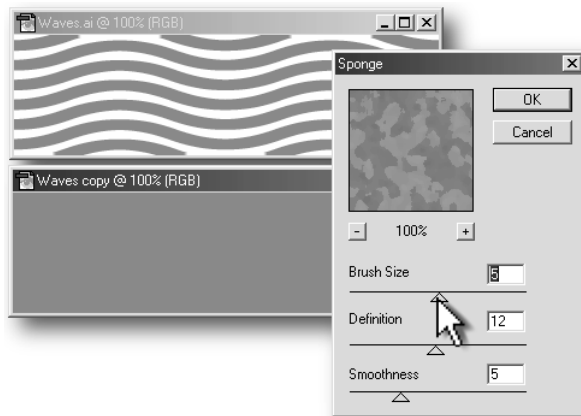
Figure 27.31   The Sponge Effect creates lighter and darker tones in a solid tone image.
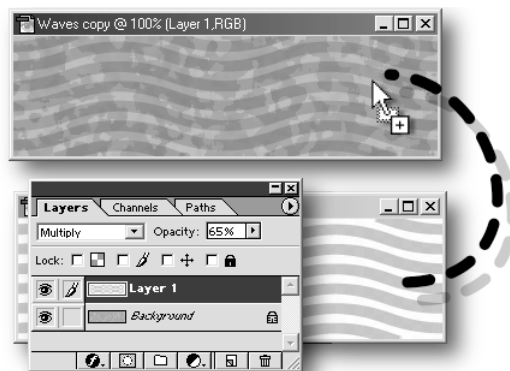
Hold Shift as you drag to center the copy

Figure 27.32   Drag the original image to be on top of the sponged duplicate and then adjust the blending controls so that you can see three distinct tones.

7. Save the Waves Copy as **Waves Copy.psd** in the Photoshop native file format. You deserve a rest, and besides, we'll be getting into new editing territory in the next section. Take a break!

From here on in, you will be using the composite of the two layers as a Texture Channel in the image to get really interesting bumps on an image. This sort of image creation is great for magazine borders; for Web backgrounds (if you lighten them a lot); and particularly in modeling, where people who use 3ds max, trueSpace, and other programs keep CDs full of interesting textures at hand.

Removing Any Tiling Qualities from the Image

Remember the goal here: It's to create an organic-looking tile that can be repeated across a canvas many times without telltale edges. And unfortunately, you have edges on this creation because the Sponge filter doesn't care whether it is rendering tiles or not. Thoughtless, eh? That's okay, though, because you'll now learn how to touch up an image to *make* it seamlessly tile.

Example 27.9   Touching Up a Tile for Seamless Repetition

   1. Press Ctrl(⌘)+E to merge down the two layers.

   Now you can use the Offset command on the single layer image to literally turn the visual content inside out. The center of the image will relocate to the outer edges, and the outer edges will meet at the center of the image. It is in this way you ensure that an image tiles seamlessly.

   2. Choose Filter, Other, and then choose Offset. Type **100** in the Horizontal field, and type **75** in the Vertical field. Then, click on the Wrap Around button. As you can see in Figure 27.33, there's no real horizontal tiling problem, but there's a vertical line visible in the image. Easily solved—click OK to apply the Offset command.
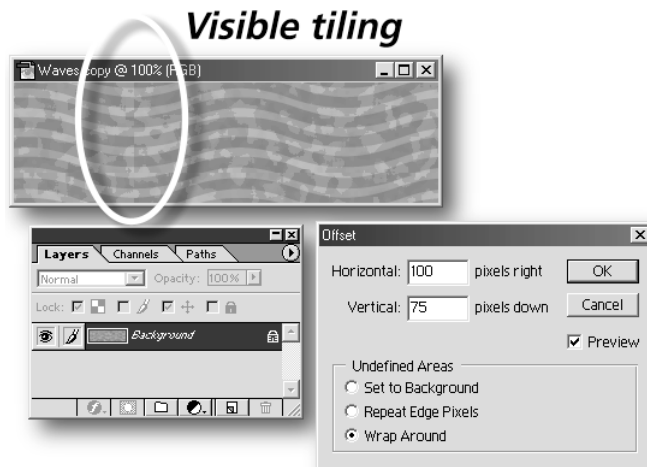
Figure 27.33   The Offset command shows you in a very clear fashion where there is discontinuity in a design—if you decide to make a pattern of repeating tiles in a larger image.

   3. Choose the Paintbrush tool from the toolbox, and press Enter to display the Brush picker while the cursor is over the image. Click the fourth-from-the-left brush tip on the top row and then press Enter a second time to make the picker go away.

The brush size was arrived at by trial and error, and if you create larger tiles on your own, naturally, you'd pick a different sized tip...

4. Right next to a visible edge in the composition, hold Alt(Opt), which toggles your cursor to the Eyedropper tool. Click to sample the color, release the Alt(Opt) key, and then paint the sampled color into the design to remove the edge.

The process looks like Figure 27.34. Because many tones run up this vertical edge, you will need to resample your paint color as you move vertically along the edge, wiping out the edge.

Figure 27.34   Sample and then paint over the unsightly edge in the image.

5. When you finish, save the file as **Texture.psd** on your hard disk. Keep Photoshop open, and take a deep breath.

In the next section, it'll be time to add dimension to the image. Now, it needs to be made clear here that what you created is only an alpha channel piece of data and will not be seen directly in the finished image. This means that step 1 will be to copy the design to an alpha channel and then to flood the RGB color composite channel with any color you like. Chances are you're sick of grayscale tones by now; indulge yourself with one of the colors that skateboards come in this season.

Finishing the Seamless Tiling Image

It's almost time to access the Lighting Effects filter. This filter will paint bumps and highlights into the RGB channel image. It will really produce a nice texture that looks nothing like a computer was used to create it. Additionally, the finished tile will have interesting hills and valleys according to how deep the grayscale pixels are in the corresponding areas of the alpha channel.

Let's dig in:

Example 27.10   Using the Lighting Effects Filter for Bump Creation

  1. Press Ctrl(⌘)+A to select the entire RGB channel of the Texture.psd file. Then press Ctrl(⌘)+C.

  2. On the Layers palette (press F7 to display it), click the Channels tab, click the Channels palette, and click the Create new channel icon. This auto-named "Alpha 1" channel is in the current view of the image, so press Ctrl(⌘)+V and then press Ctrl(⌘)+D (to deselect the pasted image).

     It's noteworthy here to tell you that it does not make much difference whether this channel interprets black as the selected color or the mask color. You have not pasted selection information into the channel—it's *bump height* information, and it will be darned hard to tell the difference between ridges and canyons when the finished image is viewed from any angle.

  3. Click the RGB color mode Channel title, and click the foreground color selection box on the toolbox. Pick a wild color and then click OK. Press Alt(Opt)+Delete to fill the RGB channel of your Texture.psd image with the wild color.

  4. Choose Filter, Render, Lighting Effects. In the Lighting Effects box, you see different attributes that you can apply to the image. The relevant ones here are Light type (choose Directional from the drop-down list) and distance of the light source from the canvas—you need to play with the end of the line in the image—drag it to above the image preview and then drag it inward and outward until the overall exposure of the light is the same as before you accessed this filter.

  5. In Figure 27.35, you can see the three other areas where you want to make changes. Drag the Material slider to zero so the surface is neither metallic nor plastic, Choose Alpha 1 from the Texture Channel drop-down list and then drag the Height slider to 3. "Less is more" with the Height controls— you need only a little Height to create visible, even pronounced effects in the finished image. Click OK when you made these settings.
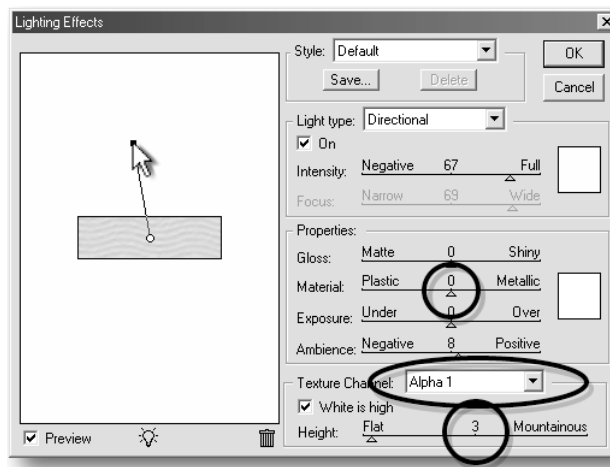
Figure 27.35 Use the settings you see here to make a bumpy RGB color channel in the image.

You now have a seamless tile that you can save to the Photoshop gallery of patterns any time you like. The gallery is a feature new to Photoshop—follow along to see how simple it is to save a tile forever, or until you don't pay your electric bill, whichever comes first.

6. Press Ctrl(⌘)+A and then choose Edit, Define Pattern, name the pattern in the Pattern Name dialog box, and click OK.

Your pattern is registered with the Photoshop Patterns gallery.

Tip

Save that Alpha channel!   As far as the alpha channel to this image is concerned, it might be a good idea to save it to the Pattern gallery too. Why? Because you might want to use a different foreground color for the pattern someday; and if you're following the steps right now, you're sort of locked into a pattern with a wild foreground color.

7. Press Ctrl(⌘)+N to display the New dialog box. Make the new image 640 pixels wide by 480 pixels high, use an RGB color mode and a 72-pixels per inch resolution, and set Contents to White. Press Enter (Return).

8. Choose Fill from the Edit menu.

9. In the Fill dialog box, choose Pattern in the Contents field, and then click the arrow directly to the left of the tiny box labeled "Custom Pattern." All the patterns you have added (or will add) to this gallery are previewed here in thumbnail form; the name appears if you hover over any of the patterns. Click on the very last preview thumbnail—your waves pattern—and then click OK in the dialog box.

In Figure 27.36, you can see that the 640×480 image has been seamlessly filled with your design. It looks sort of like muddy tire tracks doesn't it? You have to admit that many elevations are part of the pattern, and it's all because you used different tones in the alpha channel of the image.
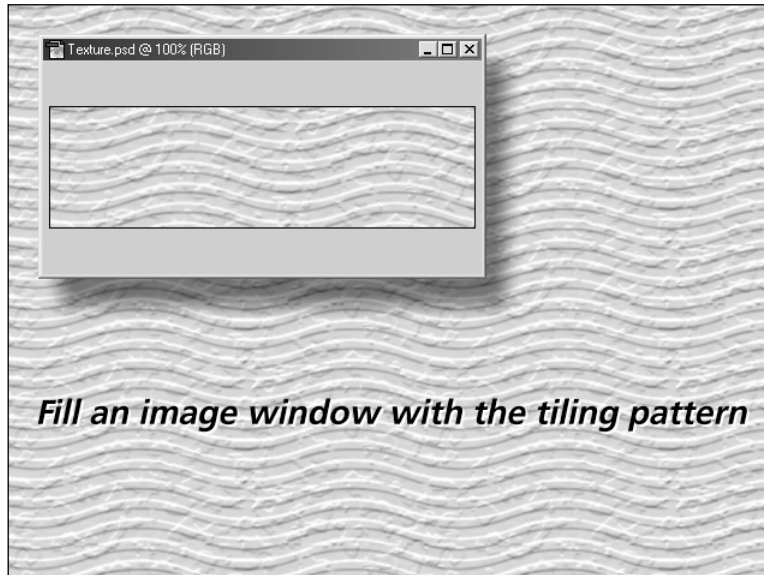
Figure 27.36   When you have seamless repeating patterns, you can fill an area of any size in Photoshop.

10. You can close the 640×480 image window without saving the file at any time. We made the point here.

Tip

Softer Tone Transitions Make More Realistic Bumps   To accentuate the different elevations in a bump map, such as the one you just finished and saved, try adding a tinch (technical term for a little, like three pixels or so) of Gaussian Blur to the Alpha channel. What this does is add tones to the alpha channel, making progressions from dark to light milder than you created. The finished pattern will not be totally sharp in focus (because, hey, you Gaussian-Blurred it), but you will achieve more organic-looking patterns by softening the bump channel visual information.

Coming up next is a lawn full of flamingos. And you don't even have to break into a zoo or fly to the Caribbean to perform this feat.

Painting Dimension into an Image

Okay, I'd be kidding myself if I didn't recognize that about seven out of every 10 Photoshop users also own Painter (formerly belonging to Fractal Design; then to MetaCreations; and now to Corel Corp. Whew! I hope it gets frequent flyer miles!). And one of the most attractive features in Painter is the Image Hose. You load nozzles of images (you can create your own nozzle, too, but that's another book) and then paint away to make fields of clover, crowds of Poser people, stones, you name it.

The point here is that there *has* to be a quick way of populating an image with foreground images without leaving Photoshop. And you'll *see* our creative procedure right now.

Creating a Pattern Disguised as a Nozzle

After thinking long and hard about this, there seems to be only two ways to populate a lawn image with flamingo images:

- Keep dragging a flamingo against a transparent background into a new image window of a field.
- Create a Pattern from an image of flamingos, and paint them into the image of the field.

In either case, in order to meet the requirements of the title of this chapter, you'll need to make some small background flamingos and larger foreground flamingos to create a 3D illusion.

Do you know *why* the second method might be smarter than the first method ? If you keep dragging copies of a flamingo (or anything else) into a host image window, you've added a layer. So if you want 50 flamingos, you will wind up with 50 image layers, an annoyance at least to compose the image when the flamingos are labeled with evocative default names such as "Layer 37." Add to this the fact that you would really need to keep merging layers regularly to keep track of the flamingo images and keep the resources used to hold multiple copies of this image in RAM and hard disk (see Chapter 4 for info on scratch disk management).

Noop. We're going to go with scenario 2 in our next adventure here, and the best part is that Bouton has already painstakingly, laboriously (feel guilty yet?) masked two plastic lawn flamingos for you. All you need to do is follow along to see how this "almost-an-image-nozzle" technique can work for you.

In Figure 27.37, you can see what the author began with. You'll be using the Greens.tif image, but, again, the flamingos are two separate images, all set to be added to your pattern collection. (You can alternate using them in the image so that all the flamingos don't face one way.)
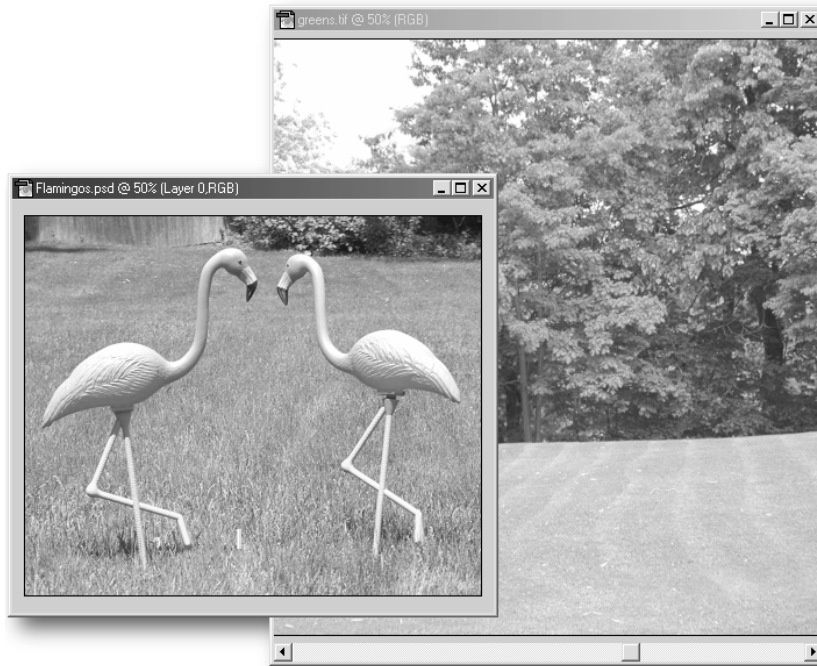
Figure 27.37   This is about as cheap as it gets for props and locations for a Photoshop collage. The flamingos were $2.99 US at Kinney Drugs on Route 57 in the Bayberry mall, and K-Mart wanted twice as much.

Example 27.11   Turning a Flamingo into a Pattern

1. Open the Greens.tif image in the Examples/Chapter 27 folder on the Companion CD. Zoom in and maximize the image because this landscape needs to be strewn with copies of Fred.psd and Ethel.psd, our plastic stars of the scene.

2. Open Fred.psd and then choose Image, Canvas Size. Type **700** (pixels) in both the Width and Height fields (see Figure 27.38), and click OK. Read the Profound Revelation below.
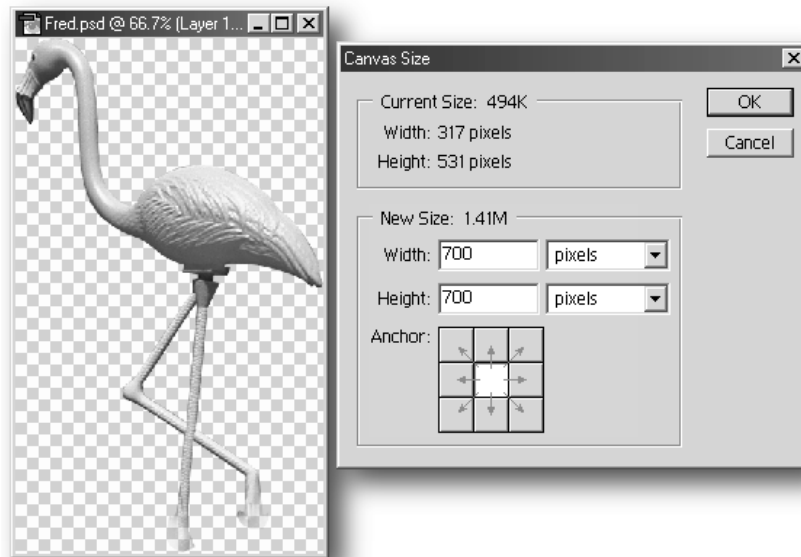
Figure 27.38   Chill for a second. There's a very good reason why we need to expand Fred's image window.

Photoshop Adds Transparent Space to Patterns   Why, for gosh sake, did Bouton ask you to surround a perfectly cropped flamingo with transparent space?

Glad you asked. When you Select All and then choose Define Pattern, *the transparent space is included in the sample*. This means you can use the Pattern Clone tool to paint a flamingo. You do not have to worry that a repetition will happen if you wander off the fixed location of a flamingo that is part of a pattern that repeats (all patterns repeat in Photoshop, by default, and you cannot change this except by deselecting part of an image background).

So you can paint with ease and confidence with the Pattern Stamp tool (coming up shortly) and then by using a selection tool and the Move tool, you can plant these flamingos anywhere you like.

3. Press Ctrl(⌘)+A and then choose Edit, Define Pattern. In the Pattern Name box, type **Fred**, and click OK. Fred, the pattern, has been saved to your Pattern gallery in Photoshop.

   If you want to get down and do some serious flamingo breeding, open Ethel.psd right now, and perform step 3 on her. You do this, and you will not have to stop the action when you start peppering flamingos on the lawn.

> **Note**
>
> **Using the Aligned Stamp Mode with Patterns** Because you created transparent space around Fred and Ethel, you cannot use the Unaligned Pattern application mode of the Pattern Stamp tool. Why? Because the unaligned mode needs to work from a sample of a tightly cropped image to begin its painting work at the center of the pattern. But this is cool—you will be able to predict where each instance of Fred will be painted, choose only one areas to work on, and completely paint a flamingo into the image.

4. Create a new layer in the Greens.tif image. Choose the Pattern Stamp tool, choose the Fred pattern, press Enter, and choose the 200-diameter pixel from the Brush picker—press Enter to dispatch the picker.

   Now, you really do not want a tile of flamingos, so the 200-pixel brush will not paint a flamingo in its entirety with one stroke. In fact, it took the author around five strokes to paint in a flamingo—but the point is that once you start painting one of these pink guys, there is little or no chance that you'll wander off and start painting another repetition of the pattern.

5. Click and drag in the Greens window until you paint part of a flamingo, and finish painting the flamingo, as shown in Figure 27.39. When Fred (or Ethel) is completely painted, it's time to move the flamingo, because you want to create a second one, and the pattern grid for this pattern places flamingos always in the same place on the canvas (because the Stamping mode is aligned).


Figure 27.39 Paint a flamingo seemingly out of thin air when you use the Pattern Stamp tool and the right pattern.

6. You will need to develop a "rhythm" to quickly make a flock of flamingos. The rhythm goes like this:

> a. Paint the flamingo.
>
> b. Click the Lasso tool on the toolbox (or type L if you're really good at remembering lots of keyboard shortcuts), and lasso the flamingo. Hold Ctrl to toggle to the Move tool and then move a flamingo away from the target spot for the next painting you'll do of flamingo #2, #3, and so on.
>
> c. Press S (for Pattern Stamp tool), and paint another flamingo.

The process should repeat itself about five times before you introduce Ethel, and get some right-facing birds in the scene. It's artistically important to space the flamingos in a random fashion and at different heights.

7. To give yourself some elbow room on this single layer, try painting way above the heads of the flamingos in the front row.

There will be a flamingo up there due to the fact that the tiling for both Fred and Ethel begins at the top left of the image (see Figure 27.40).
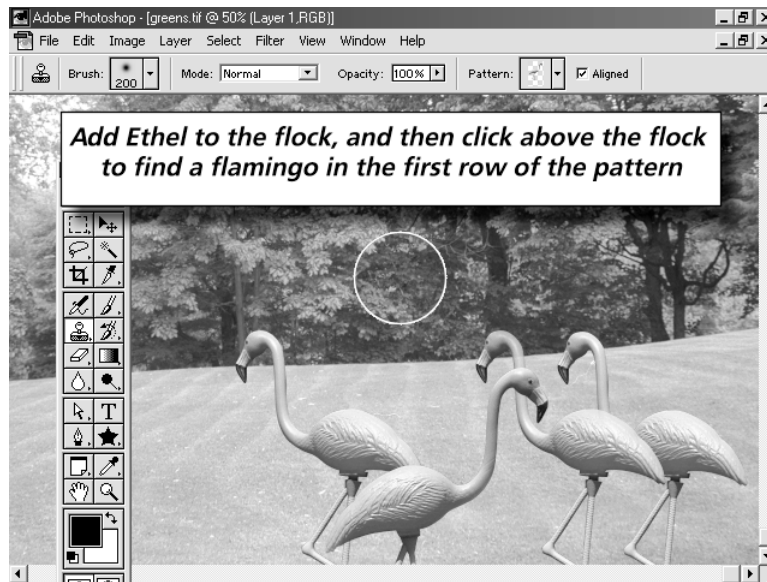

Figure 27.40   Keep the flamingo distribution uneven, add Ethel where needed, and create new flamingos to select and drag into new positions by painting above their heads.

   8. Stop when the bottom row of the image is Flamingo City. Keep the
       image open.

I added Figure 27.41 here to better show you what happens when you paint above
the bottom row of flamingos, and Ethel is loaded.
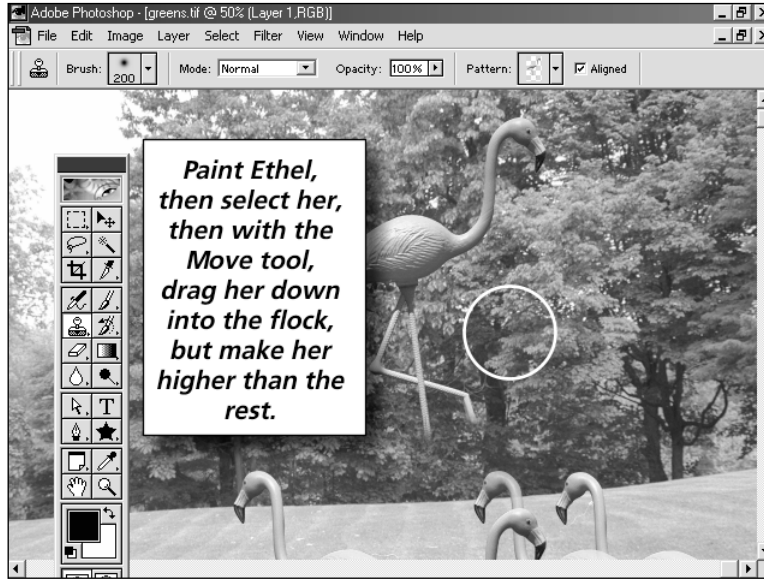
Figure 27.41 Keep the flamingos in random order and height.

Believe it or not, you're pretty much finished with the "lawn full of flamingos"
assignment. In the next section, you'll scoop up a bunch of them and add them to
the background.

Adding a Background Element to the Scene

Actually, the silliness of having 500 flamingos on a lawn helps disguise the fact that
these are pattern-perfect copies of one another. Your first sophisticated editing
move was to keep the distance between flamingos random and making their
relative heights a little different.

Now, when you move to a different layer in Photoshop, those parts of an image on
a layer that are off the window are truncated—clipped. But it will be okay to reuse
the existing flamingos, even if they don't have all their legs, because flamingos in
the background will be obscured a lot by the foreground flamingos.

Here. It's easier done than said…

Example 27.12   Flamingos, Festival-Seating Style

1. To keep better track of things going on in this image, you might want to name this current layer **Large**. Then, when you copy and shrink flamingos, you can name that layer **Small**. Drag the Large layer into the Create a new layer icon on the bottom of the Layers palette. Rename the layer to **Small** (by right-clicking on the layer title and choosing Layer Properties. (Macintosh users, hold Ctrl and click.)

2. Drag the Small layer title on the Layers palette to beneath the Large layer title. Then press Ctrl(⌘)+T to put the Free Transform bounding box around the flamingos. Hold Shift and click and drag toward the center on a corner handle of the Free Transform box. Holding Shift constrains selection proportions, and when the gaggle of flamingos is around half the size of the Large layer flamingos, double-click on the inside of the selection boundary to finalize the scaling of the flamingos. See Figure 27.42. Move the small herd by using the Move tool until you achieve this confused wandering effect commonly observed of water fowl.
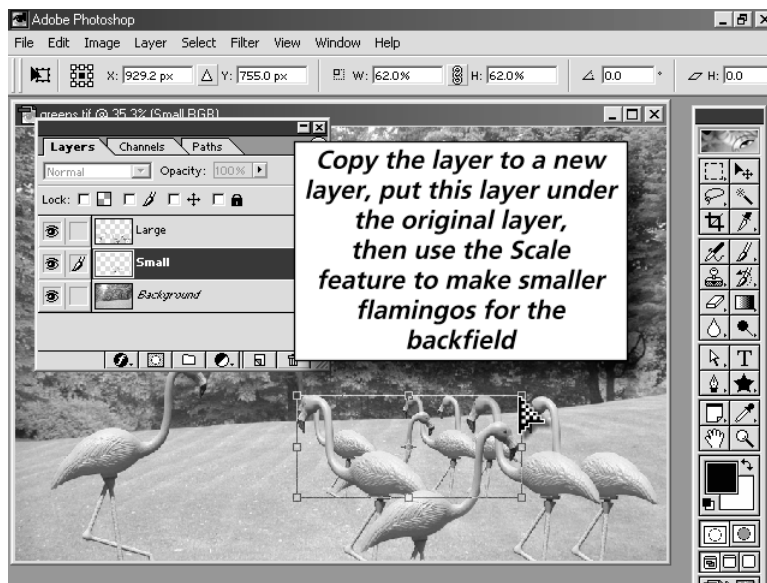
Figure 27.42   Build upon what you already created by copying layers of flamingos, and scaling and repositioning them.

3. You might want to build a middle ground for flamingos. Hey, why not? To do this, you round up a copy of the flamingos on the Large layer, and use the Free Transform Scale command at about a 30% reduction in the flamingo herd's size.

4. Save the image as **greens.psd** to your hard disk. You will definitely want to flatten a copy, save it as a JPEG image, and send it to your friends when they think you are on vacation. Done! Check out Figure 27.43.
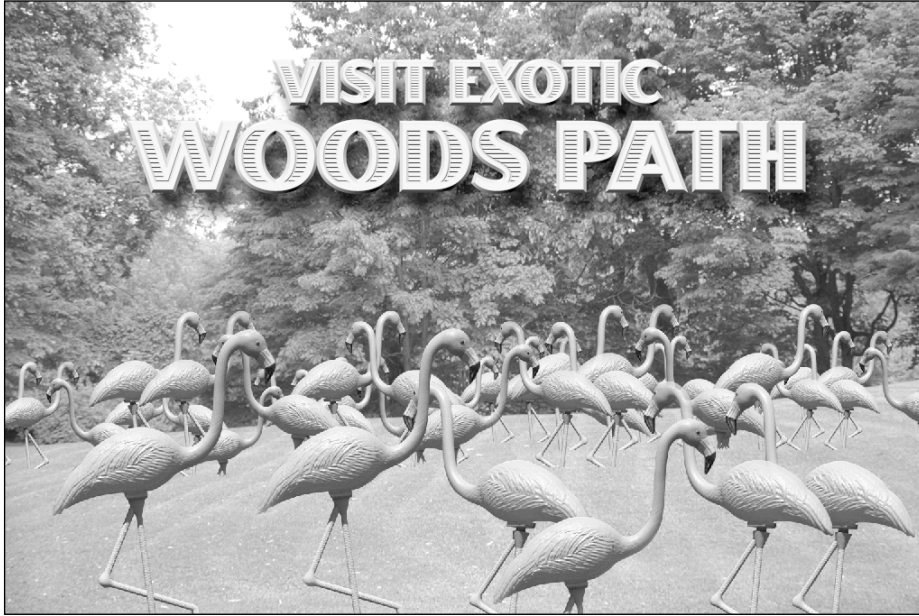
Figure 27.43   Endangered species? No problem when you know how to use the Pattern Stamp tool!

If you want to embellish your work a little further, check out the Perspective Shadow filter on the Bonus CD (it's from Alien Skin, and installs as the Eye Candy suite under Photoshop's Filters list). You can select your layer of flamingos one at a time, choose the Background image as the target, and before you know it, you have a much more visually complex image—flamingos *plus* their shadows.

Summary

This author has been creating both 2D and 3D computer graphics for around 10 years, which makes me a novice if I were in Hollywood! But one thing I've come to realize is that there is very little visual difference between a well-painted 2D painting of something and a rendered 3D model of the same thing. In the end, everything winds up in two dimensions on your screen or printout, so the *real* trick is to understand 3D properties if you want to paint work that rivals rendered models of stuff. In this chapter, you learned perspective—and essentially learned

how to make a 3D extruded shape, how height on a surface adds a 3D quality to a texture, and how size and location of the same images—flamingos—can more than suggest that somebody doesn't know how to plant shrubs or go for a more diverse selection of lawn ornaments.

Try out these steps with shapes and images of your own. You will soon become your own best source for clip art!

In Chapter 30, you'll take a look at and participate in the manipulation of channels for the purpose of creating spot color and duotone patterns to be printed. We have an absolutely breathtaking trial version of Silvertone (for a metallic gloss on your pictures) and Powertone, and you'll see in a moment how beautiful full-color pictures can look when express using only two different inks.