

# LARRY N. BOLCH

## visual communications

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### Basic Image Processing for Digital Photography

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Digital cameras have serious flaws - they see what is there, not what the photographer sees in imagination and they can not read the photographer's mind. Professional and prosumer cameras offer the experienced shooter a lot of control, but overwhelm the snap shooter with arcane detail.

No longer does the point-and-shoot snapper have the one-hour lab with its breathtakingly expensive print machine and trained operator to save their misdeeds. With digital, photography has reverted to early times when photographers had to do their own processing.

This site is dedicated to them - then and now and hopefully will show how easy it is to make the left image above glow like the one on the right.

This tutorial is based upon Photoshop, but Paint Shop Pro has tools that work in a similar fashion. Mac users will need to check their documentation for keyboard commands, since my last Mac is now nonfunctional.

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## Basic Processing

Over-exposure can ruin any digital shot, so the camera makers bias the exposure to give the shooter a bit of headroom, causing lower contrast subjects to look a bit dull and flat. This is a good thing.

**Never work on an original image direct from the camera. It is well to keep a duplicate folder of your work on a partition separate from the image extracted from your camera. Work on these, leaving the originals intact. Back up to CD-ROM or tape frequently. As you grow in skill, you may want to go back to early images and reprocess them. If you have saved over the original images, there is no way to go back.**



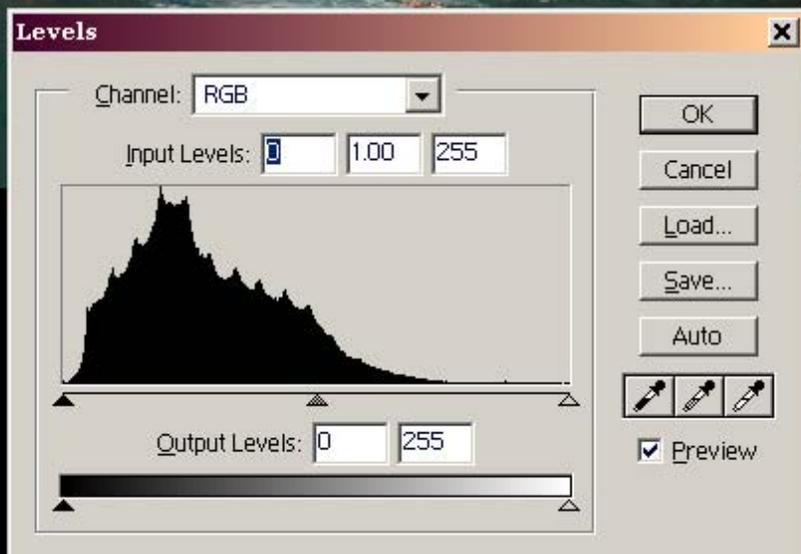
### Levels

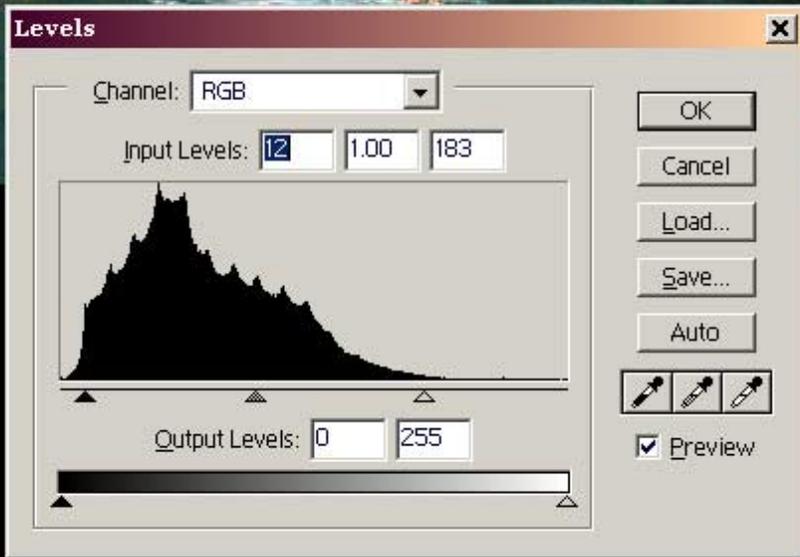
Since Levels will be used for almost every digital image, it is well to learn the key combination - Ctrl+L.

When Levels is called, it makes a graph of how the data is distributed between the darkest and the lightest. It is called a histogram.

The histogram on the left does not touch either margin, meaning that all the data the camera could gather from the scene is there. Since the bulk of the data is toward the left, the image appears dark.

The triangles below the histogram can be moved to indicate where you want black and where you want white. We will do this next step below.





## Setting Highlights and Shadows

Each photograph has a unique histogram, but most will resemble the one on the left. If the mass rests against the left side of the graph, it indicates under-exposure and some shadow detail will be lost. If it is piled against the right, highlight detail is lost.

Usually we want a little bit of pure black without detail and a bit of pure white - also without detail. The left triangle is moved just enough to assure the little bit of black, and the right triangle is just clipping the white side.

This feature is interactive, and when you move the cutoff points, you will see the change as long as "Preview" is checked.

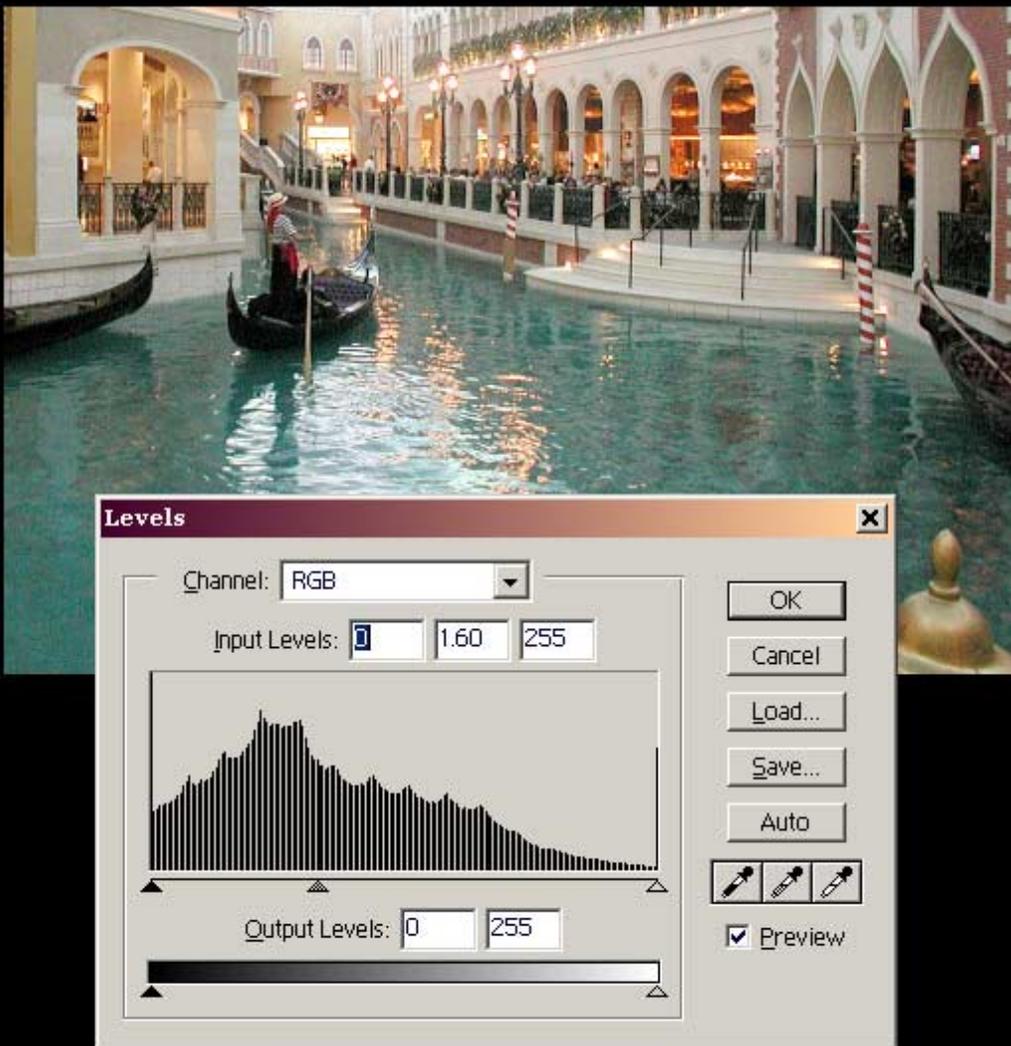
Click on OK.

## Adjusting Middle Tones - Gamma

In the previous step, we set the highlights and shadows where we wanted them, but the image still looked dark. Clipping more of the histogram with the white triangle would certainly lighten the image, but it would also throw away highlight detail.

The middle triangle adjusts mid-tones without impacting highlight or shadow detail. Since the image was biased toward dark, it was opened up by moving the triangle to the left until it began to look washed out. Then the triangle was moved back just enough to make the picture rich looking again.

Watch the preview as you move the triangle. The gamma step is done entirely visually.



## Saturation

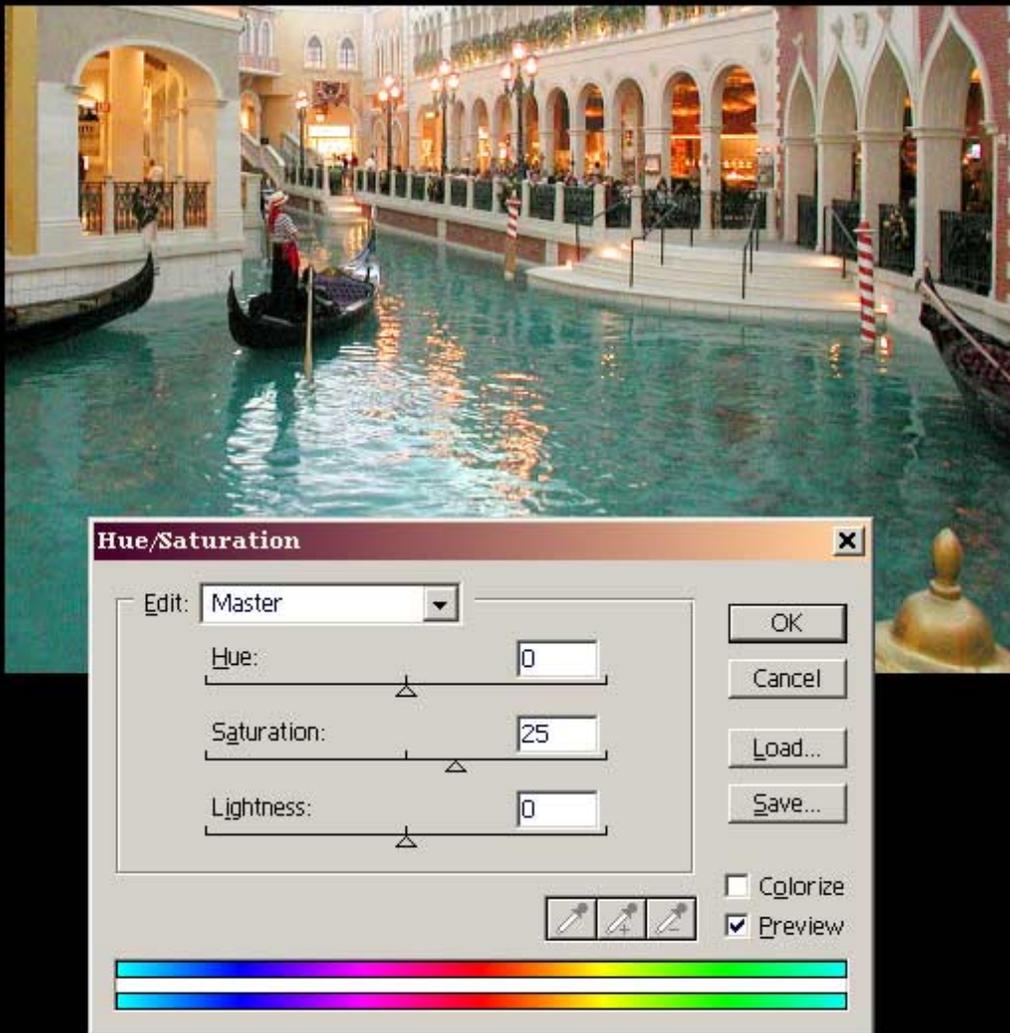
If the image is still looking a bit flat or anemic, a bit of saturation can make it sing though all images do not require it.

The key combination for saturation is **Control+U**.

While a little saturation is a good thing in many cases, a lot of saturation is not unless you are working on a special effect.

Again it is interactive. Watch the image on the screen as you add it.

Hue and lightness have considerable utility, but we will skip them for now. However, do pull the sliders if you are curious.



## Sharpening

Interestingly, an unsharp mask yields sharpening in photography!

Again this is an optional step, and one that may not be needed on every shot.

It is interactive, and again one can use to preview to decide how much one wants to use.

In many cases these few steps will give fine results and nothing more need be done.

Next we will deal with an image shot under incandescent lights with the white balance set on daylight. Colour correction!



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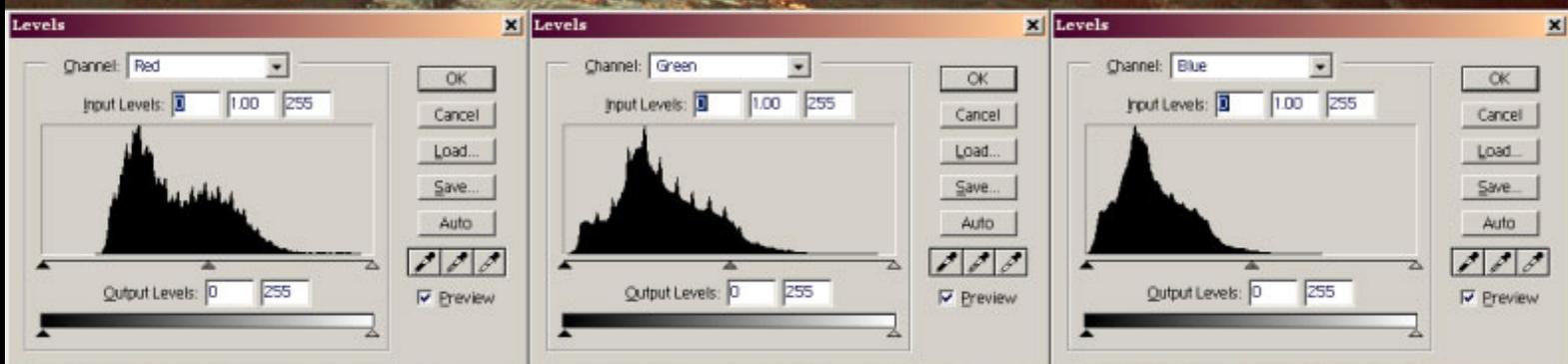


## Colour Balancing with levels

Let us suppose the camera was set for an automatic white balance that did not quite work - or worse - was set for a daylight balance while shooting with incandescent light.

Not to worry.

I have taken the previous picture and imposed upon it grievous harm. Now we will go through the steps together to make it well again. This works with scans of old faded pictures as well.



Here I have created what many should consider a total disaster. Both under-exposed and possessed of a nasty colour shift. I have done screen shots of the red, green and blue histograms and layered them over our demonstration image. As you can see they are in different places.

With a properly balanced image, the histograms will still have somewhat different shapes but will pretty much share the same real-estate.



## Correcting the Red Channel

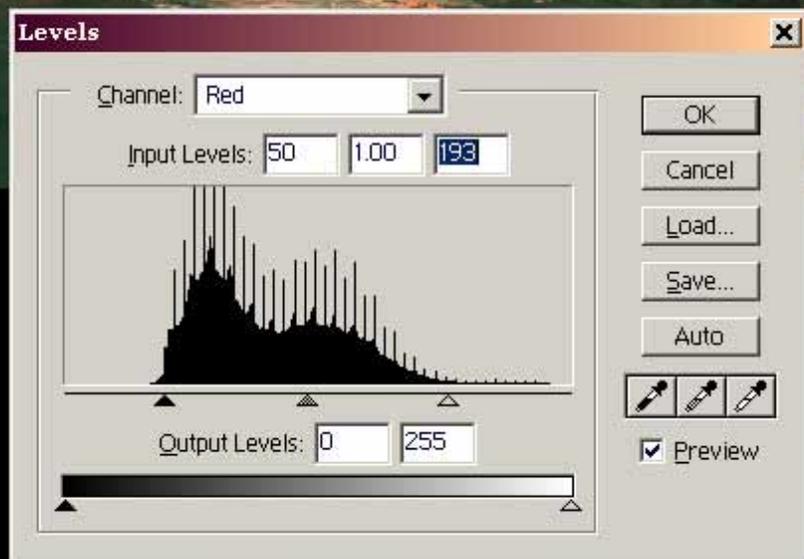
The keyboard equivalent is **Ctrl+1**.

We proceed in much the same way as we did on the previous page, except we will deal with the histograms of each channel individually.

It is pretty clear where to put the left triangle for setting the shadows, but the right triangle is a judgment call. I have placed it just inside where the graph begins to rise.

In this case, we do not hit "OK", but instead we go to the Channel drop-down list and select the green channel.

The keyboard equivalent to get the green channel is **Ctrl+2**.

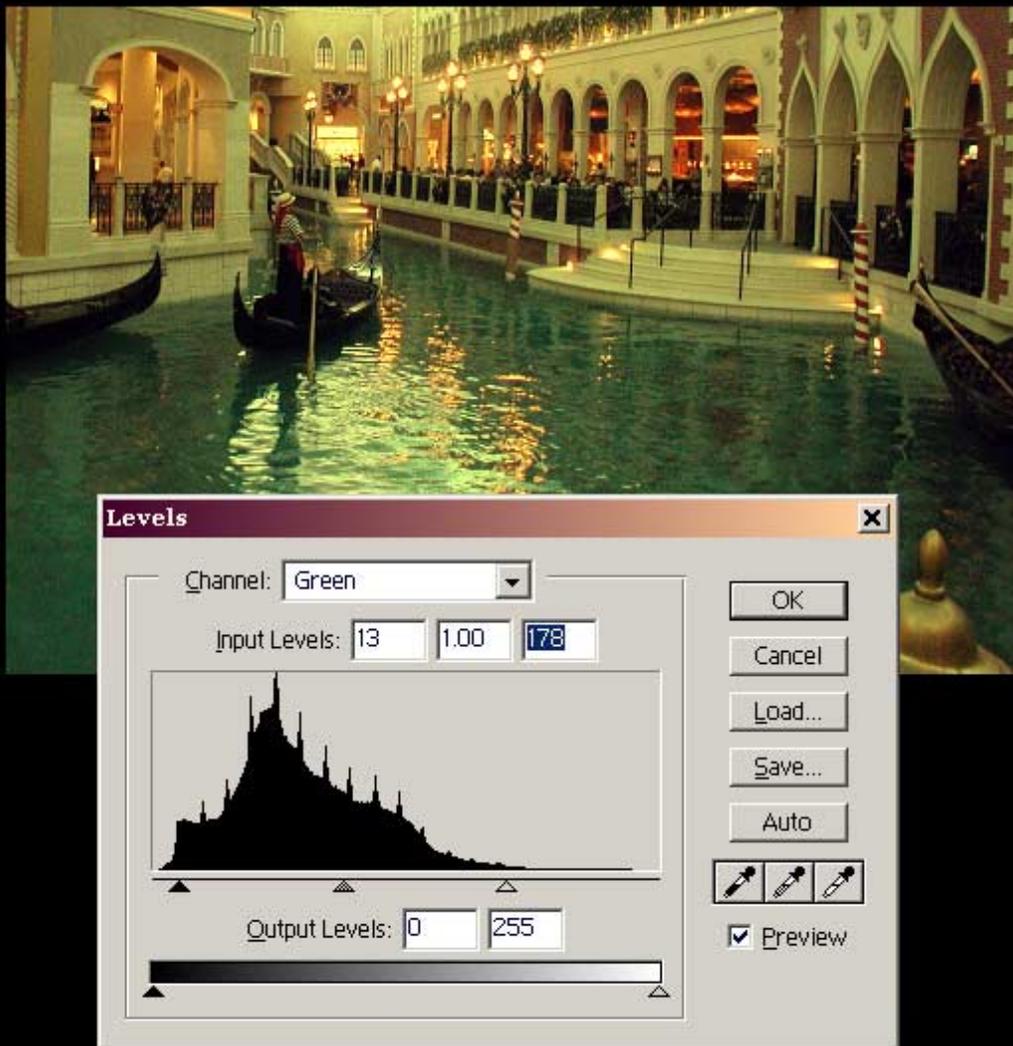


## Correcting the Green Channel

Use the same procedure as above with the green channel.

Once again do not click "OK" but rather, select the blue channel.

The keyboard equivalent is **Ctrl+3** to call the blue channel.



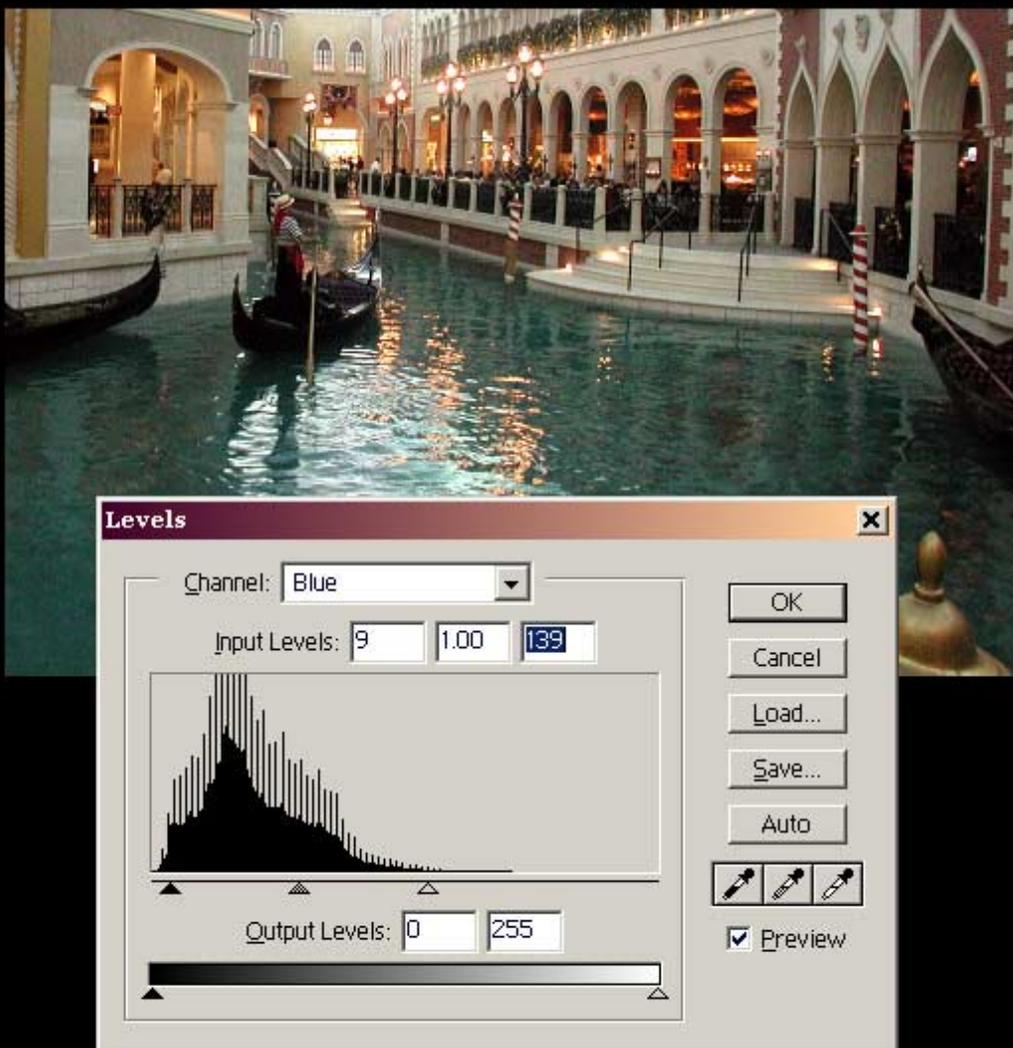
## Correcting the Blue Channel

Finally, set the highlights and shadows for the blue channel.

As you well may see, we now have a pretty well balanced picture - at least colour wise.

Until you click "OK" you can easily return to the other channels and make adjustments. If you need to trim them a bit, now is the time to do it.

Now you may click "OK"



## Highlights and Gamma

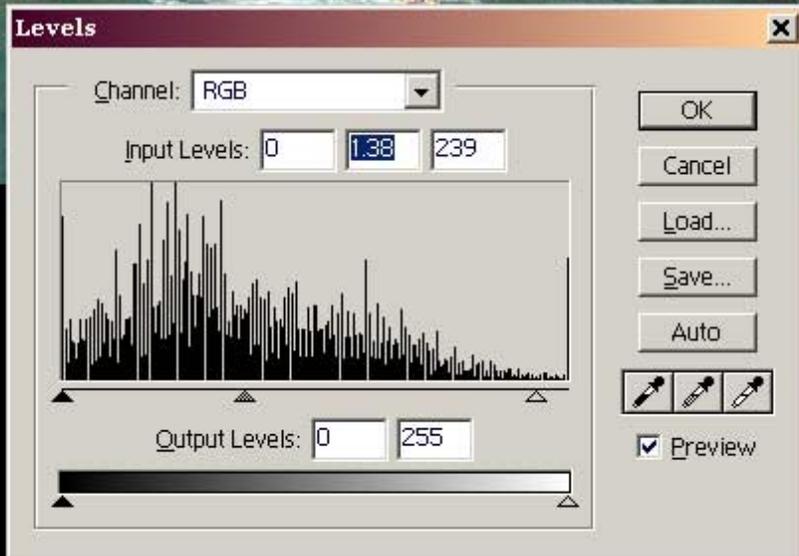
We are back working with the RGB channel mix.

I moved the highlight triangle just a little bit to make the highlights sparkle. There is still a lot of highlight detail, but this is a judgment call.

As with the previous example - since it is the same image - the bulk of the data is on the dark side. I moved the centre - gamma - slider until it looked right on my monitor. Again a judgment call.

I was content with my shadows, so did no adjustment on them. Of course, this varies from picture to picture.

Hit "OK" and do saturation and sharpening as we did on the previous page - if the image needs it.



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## Balancing Different Areas of an Image



The image we have been working with is only the lower part of a larger image. It was shot in the Venetian Hotel in Las Vegas.

The artificial sky was much brighter than the lower part of the picture and very different in character. None the less, we can quickly and easily balance the image.

This technique has many applications. By selecting a dark forest on a light mountainside, one can increase the highlight and thus the detail. Even a portrait with one side of the face too dark, can be lightened subtly.



### Selecting the Highlights

In Photoshop there are many ways of selecting an area - marquee, lasso, by colour range and so on. In this case I chose the magic wand. See palette, or use the keyboard command w.

Some of the sky was entirely blown out so I clicked in the white area. I tried several times with different tolerances set. A setting of 48 got most of the sky and just a little of the buildings.

In order to get all the bright areas in the picture, I could have clicked Contiguous off, but instead used Select Similar - Ctrl+s,r.



## Invert the Selection

On the Select menu, pick Inverse - Ctrl-Shift+I.

Now everything BUT the bright area is selected.

Again on the Select menu pick Feather - Ctrl-Alt+D.

In this case I used eight pixels for a soft - but still well defined transition between the areas.



## Balancing the Area.

Back to old familiar Levels, and by now you know what to do. Just watch along the marquee line and make the levels within the marquee balance the area that is excluded.

If the picture demands it once again select Inverse - Ctrl-Shift+I and adjust the levels on the other area.

Where the highlights are burned out, all detail is lost and nothing will bring it back. In this image it looks absolutely fine however.

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You are welcome to join any of the following groups in which I am an active participant, and I will be glad to answer your questions there. While we are as friendly and helpful as possible, please read the rules. *If you Spam on any of these groups - you are instantly gone.* Everyone else is very welcome to join and participate. It is the questions that keep the groups going, and no one will be rude about "newbie" questions. Even if the same question was answered a couple of days before, we will consider "review".

<http://groups.yahoo.com/group/PhotoGallery>

<http://groups.yahoo.com/group/coolpix990>

<http://groups.yahoo.com/group/digital-darkroom>

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