Varis PhotoMedia Tutorials

Welcome

This tutorial has been prepared for the photographer who is striving to learn digital imaging. I make an effort to supply current information about digital imaging techniques and general information about computer technology that is pertinent for today's professional photographer. This information is based on my personal experience down in the trenches at the front lines of the digital revolution that is sweeping the photographic industry.

One thing is certain: all of the information contained herein will be obsolete in a fairly short time - how short, I can't say. Be forewarned that things are changing very rapidly and the only way to stay competitive is to keep learning. I devote a good percentage of my time learning new things and I am attempting to share what I learn with you but this information will go out of date so you should be flexible and not take this tutorial to be the ultimate statement on the subject.

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I maintain a web site where I post additional information, examples and tutorials. You are invited to browse various portfolios as well as download free material and purchase additional tutorials at:

http://www.varis.com

I hope you find the information contained in this tutorial helpful. Please let me know if you find any errors or omissions - I'm always trying to improve these materials! You may contact me via E-mail at:

varis@varis.com

best regards, Lee Varis 2003

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Stuffit Expander

Choose your platform from the buttons at the top of the web page - Mac, Windows and Unix

False Color Technique
Creating color where little existed before

There are many times when we are challenged to create a new visual interpretation for a familiar subject. This can be difficult for a photographic rendering that is so dependent on the look of the scene as it is. The very literal nature of photography works against expressive interpretation and yet this limitation forces the artist to come up with creative applications of camera angle, framing, perspective distortion and lighting to arrive at something new. The new digital imaging tools have opened up a Pandora's box of tricks and special effects that make strange imagery tantalizingly easy and ultimately boring. Too often we neglect the old photographic techniques in favor of the quick and easy Photoshop filter in our search for a new "look".

This tutorial resurrects an old analog photographic technique that has special application in still life imagery. Tri-color filter photography was originally used to create color images using three B+W negatives shot through red green and blue filters. Later on photographers experimented with taking three separate exposures through red green and blue filters onto color film and creating interesting color effects with moving subjects. Another approach involved the use of multiple flash through colored gels, "painting" the light onto a stationary subject.

Here we will look at using digital photography and Photoshop to recreate these effects with much more control and finesse. We can now use the power of Photoshop to directly manipulate the RGB channels of an image or "layer" the lighting to create color effects that would very difficult to achieve through traditional methods.
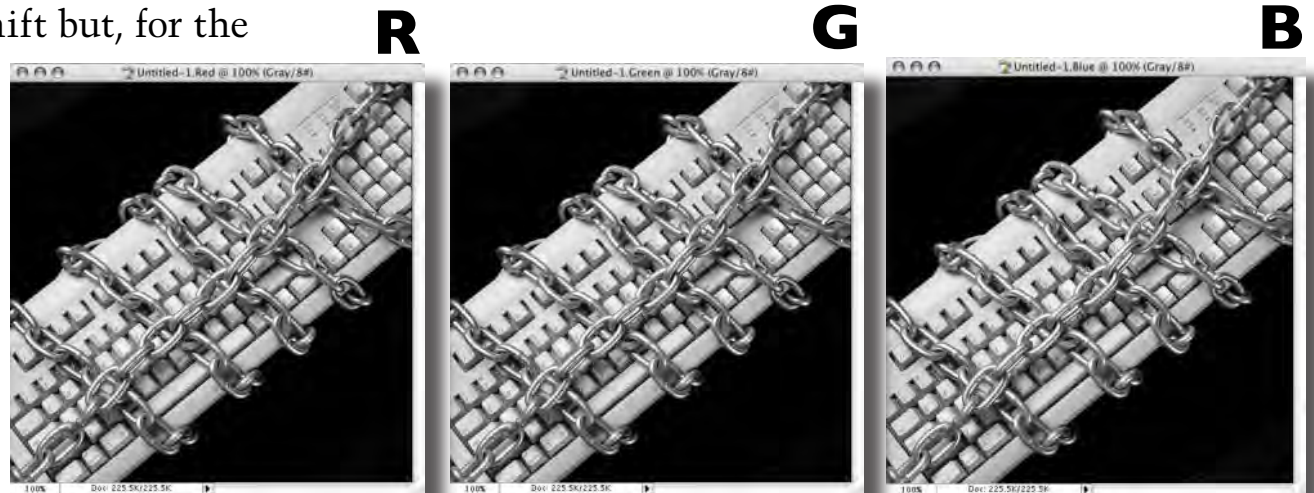
White Light
The mother of all color

Let's consider this image. It is a color shot of a rather monochromatic subject. As we know, a color digital image is made up of multiple gray-scale channels – in this case it is a digital camera file that is RGB. The reason we find no real color in the image is that the three channels are basically all the same, as we can see from the lower right. The presence of color in an image depends on there being some difference in brightness between the channels. A gray subject, such as this one, will have equal values in Red, Green and Blue because white light affects all the channels the same way.

We can edit the color in the image by changing the brightness between the channels using various controls in Photoshop. If we do that with this image we could introduce a color shift but, for the most part, we'd still end up with a fairly monochromatic image – it might end up strongly colored but only in one hue.

What would happen if we changed the character of the lighting in each of the channels to introduce value differences rather than simply shifting the brightness?

R   **G**   **B**

Color from White
Changing the lighting in the channels

Here is the result of changing the lighting direction in each of the channels. Three different shots were taken, moving the light for each – individual red, green and blue channels from each were then copied into the channels of a new document to create a new composite color image.

This is conceptually similar to tri-color filter photography. A similar result would occur if you shot through three different colored filters onto the same piece of film and moved the light each time you shot. In fact, any change in the subject, from one shot to the next, will result in interesting "rainbow" coloring. Most frequently this has been used with subject motion – running water, clouds, etc...

This effect is particularly easy to achieve with three-shot digital camera systems. One simply has to move the light between each exposure – the camera automatically moves red, green and blue filters in front of the chip to build up a full color image. Nowadays, three-shot systems are not that common so we have to use a different approach...

R G B
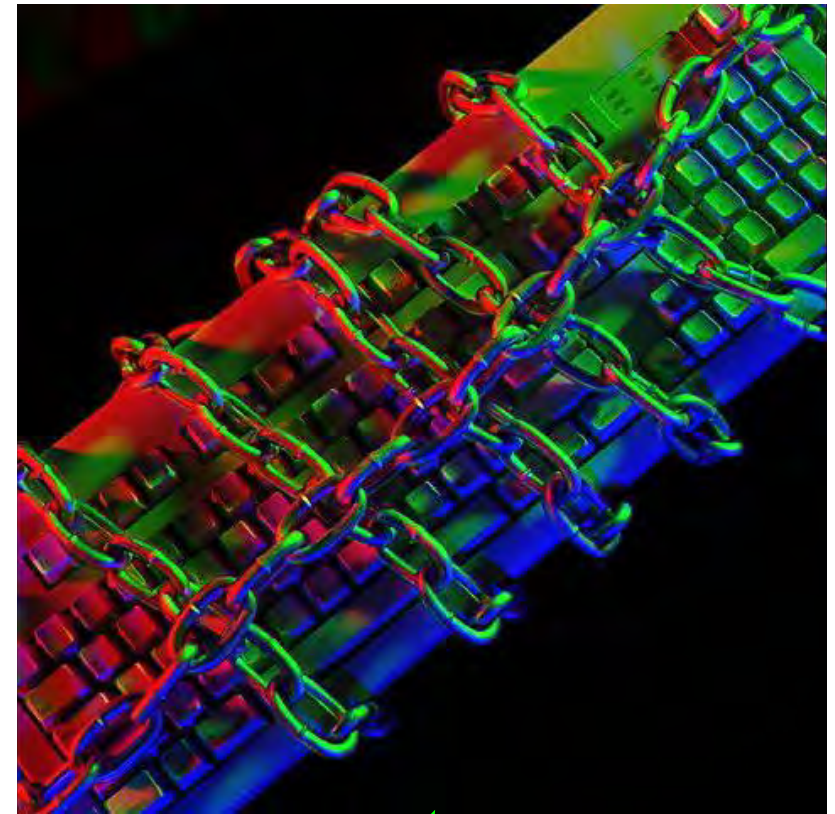
Split Channels
Separating color into 3 grayscale files

With a single shot digital camera, we take three separate shots, moving the light between shots, but this time we end up with three separate files instead of one. To composite three separate channels into one new document we first have to split off the original channels.

Start with the document from the first light position. Go to the "Channels" palette and select "Split Channels" from the palette options fly-away menu (accessed from the triangle at the upper right of the palette). The single RGB document is split into three separate grayscale documents labeled Red, Green and Blue. Through away two of these (close them without saving) – in our example we will keep the "Red" channel document.

Do the same thing with the other two image files, keeping the "Green" and the "Blue" channels respectively...

Merge Channels
Combine 3 grayscale files into 1 RGB file

Once you've assembled your grayscale "channel" documents, go to the "Channels" palette again and, this time, select: "Merge Channels". (1.)

The key here is to make sure that the three grayscale documents all have the same pixel dimensions. This is a natural consequence of taking multiple shots with a digital camera – each shot will have the same dimensions and each will be perfectly registered with the next assuming that you don't move the camera (lock it down on a tripod).

If this is the case, once you select "Merge Channels" you will be presented with another dialog that allows you to determine the color mode for the new document. (2.) Select: RGB color from the "Mode" menu and click OK...
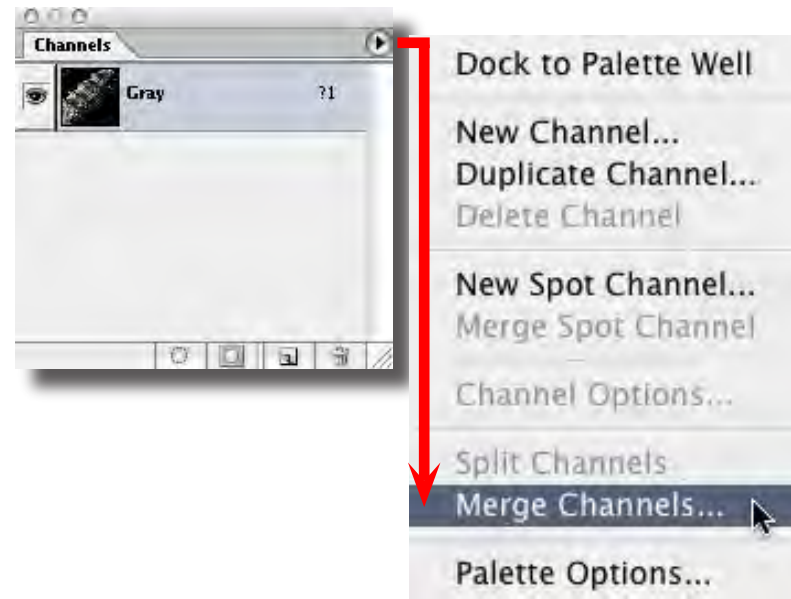
1.
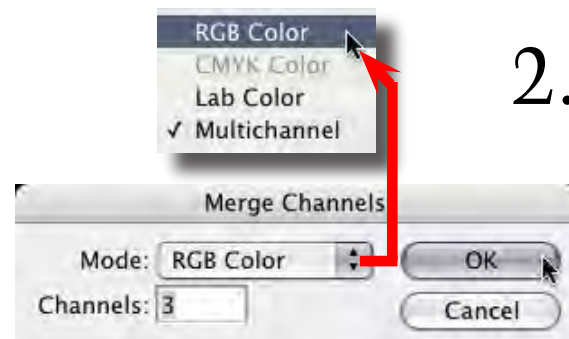
2.

Specify the Channels
Determine which document goes to each channel

After you select the color mode, you will be presented with one more dialog. (3.) Here you specify which document to use for which channel. In our example the files are conveniently named for the channel they are intended for and they are already appropriately selected in the drop-down menus. The current arrangement results in the image at the right.

You don't need to assemble the image this way! You can re-arrange the channels in any order. Different assignments result in different color arrangements within the overall image...
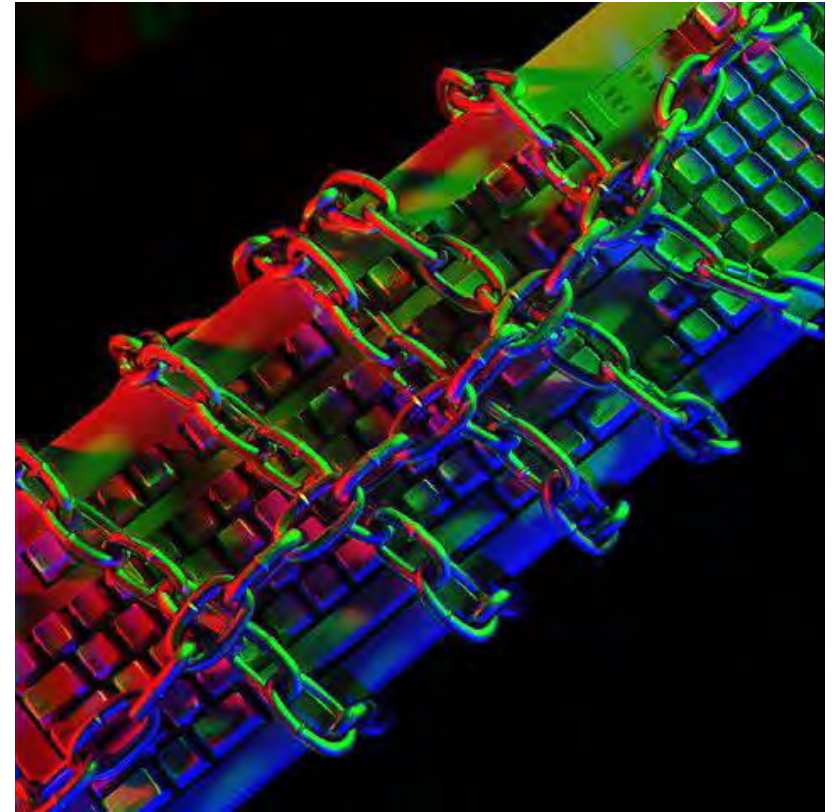
3.
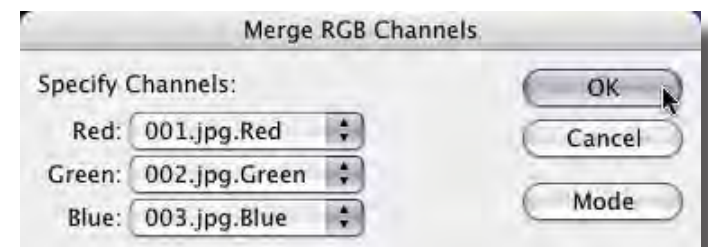
Variations
6 possible combinations of channels

Merge RGB Channels
Specify Channels:
Red: 001.jpg.Red
Green: 003.jpg.Blue
Blue: 002.jpg.Green
OK
Cancel
Mode

There are six possible combinations of the three separate documents that yield different color results. In essence, we are assigning one of three different colors to each of the three different lighting angles. The final result of any given combination is always something of a surprise and that makes this sort of mix'n match a lot of fun.

In addition to these channel variations there are a number of interesting possibilities with various combinations of white overall lighting and the RGB "False Color" versions...

Merge RGB Channels
Specify Channels:
Red: 003.Green.jpg
Green: 004.Blue.jpg
Blue: 002.Red.jpg
OK
Cancel
Mode
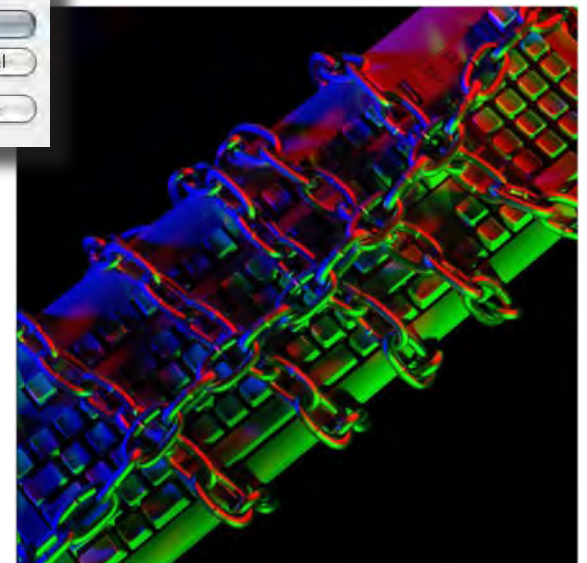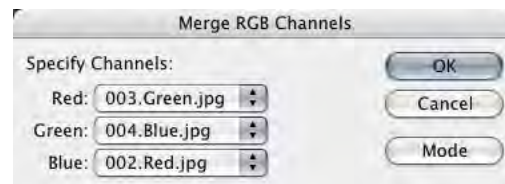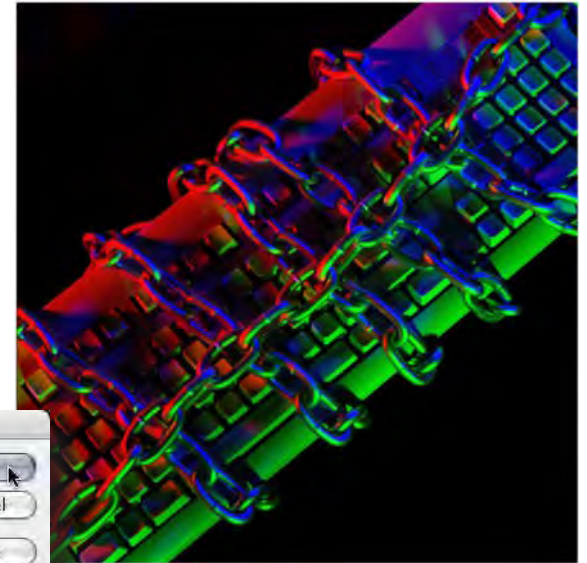
Layer Variations
Combine normal with colored versions

This variation is a very simple combination with the RGB False Color version placed in a layer above the original normal light version. In this case, the apply mode has been changed to "Difference" – you can experiment with various apply modes – modes like color, overlay, multiply, etc... will have interesting effects based on the image content. Some will work better than others so its worth trying different ones.

Change the layer apply mode here.

Remember to "shift-drag" the False Color document onto the normal light document to automatically register them.
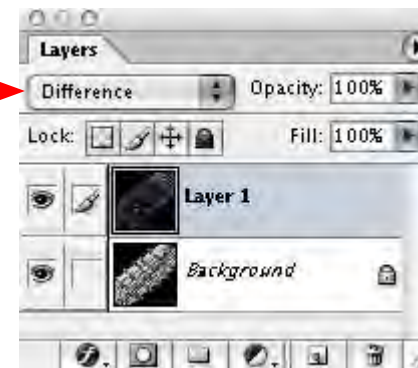
Other Layer Variations
Use layer masks for additional control

Why stop? The possibilities are endless. One simple thing you can do is to add layer masks to control where the "False Color" is applied in the image.

Here we've simple added a layer mask in the normal apply layer to isolate the False Color to just the chains. You can easily combine this with an apply mode change for even more variations. Very complex colorizations are possible using multiple layers with different apply modes.

We'll look at different variations on the following pages...
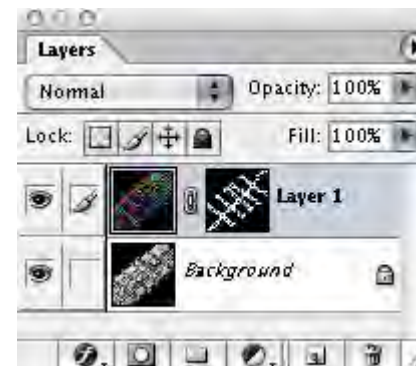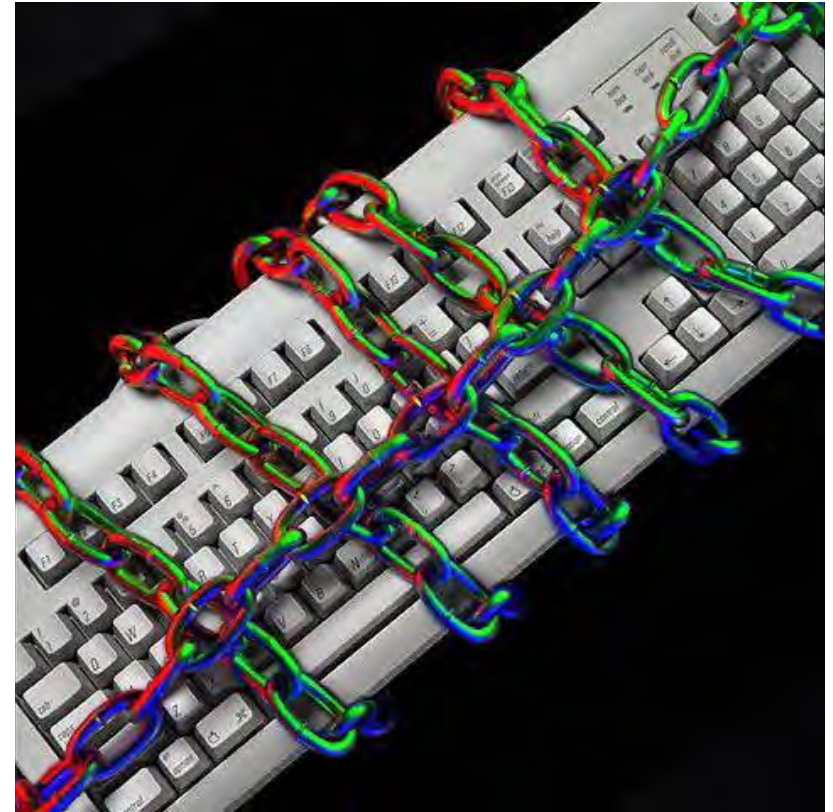
Multi-Light Setup
Using different light sources rather than moving the light

Here we have an image by Kathryn Russel. Three light sources were used for the normal rendering of this shot – a strong background light, a top light and a side light from camera-left. To create a False Color version we can expose these light sources separately as shown at the bottom right.

We can then use the split-channels / merge-channels method to generate the RGB False Color version shown on the following page...

© 1999 Kathryn Russel

RGB False Color
Using different light sources in the RGB channels

As before, placing the lighting variation into the RGB channels results in the strong colorization. Switching the placement of the channels will generate different color variations.

Most images of this type have strong primary coloration and this image is no exception. To create a more subtle effect we can utilize the original normal light version and layer apply modes...

Color Apply Mode
Preserve the original luminosity with False Color

Here we place the RGB False Color into a layer above the original normal version. The softer pastel hues result from changing the layer apply mode to "Color" – we get the new color but preserve the original pale luminosity of the white china tea cups.

Normal
Dissolve

Darken
Multiply
Color Burn
Linear Burn

Lighten
Screen
Color Dodge
Linear Dodge

Overlay
Soft Light
Hard Light
Vivid Light
Linear Light
Pin Light
Hard Mix

Difference
Exclusion

Hue
Saturation
✓ Color
Luminosity

Layers

Color   Opacity: 100%

Lock: Fill: 100%

Layer 1

Background
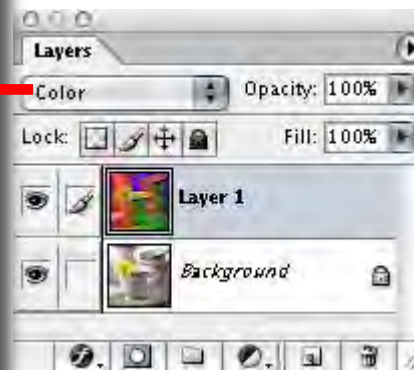
A Multi-Layer Variation
Combining multiple False Color versions

In this next example we build up an image from multiple False Color versions using layers and layer masks. The base version is shown here.

The rainbow streaks of light are the result of moving the light between exposures and shining it through some glass blocks to get the subtle reflections. Multiple False Color versions were generated from several different shots. Even if the colors don't work out 100% to your satisfaction any given version may provide raw material that can be used in combinations to generate an ideal version.

In this case, I am pretty happy with the flasks in the lower left corner but the beakers at the upper right just don't work for me. So...

Layer Mask
Blending the 2nd layer

Placing another version that has good beakers into a layer above, we can blend the two versions with a layer mask. Paint into the mask with black to hide portions of the top image – here I've hidden the blue flasks in favor of the golden hued version in the layer below.
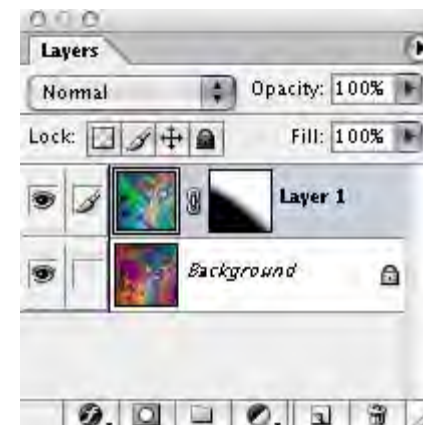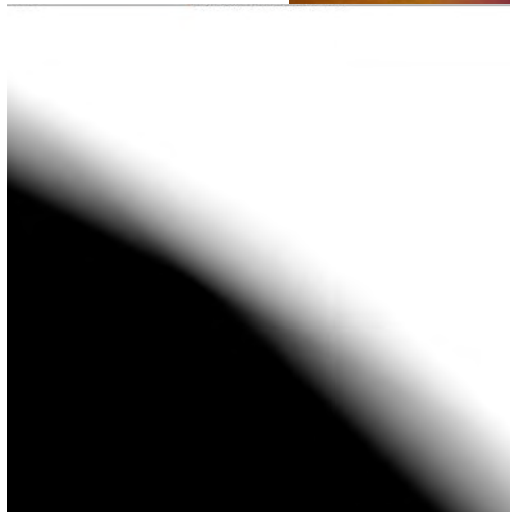
Final Version

The final step places a highlight in the cap of the larger flask. Again, a layer mask is used to blend the top layer into the composition.
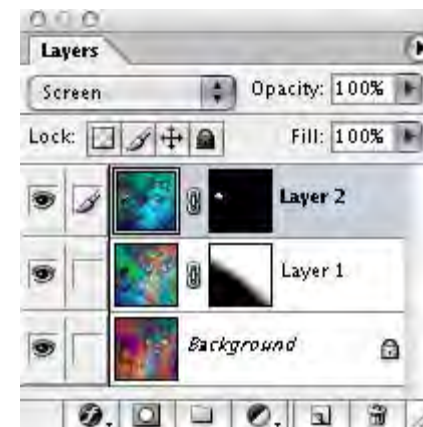
A Complex Image
Blending multiple False Color versions with layer apply modes

Sometimes, when you are assembling RGB False Color images its hard to come up with ideal color renderings. The results are always a bit of a surprise! This is a source of fascination and frustration. I often find that doing several versions and then extending the exploration into multi-layer documents can generate new surprises and discoveries that can lead to unique images.

The following pages build up a complex color rendering using apply modes, multiple False Color layers and adjustment layers.

We start here with the base image – many would stop here and call it a day but we will continue our exploration and see what other discoveries can be made by adding additional layers...
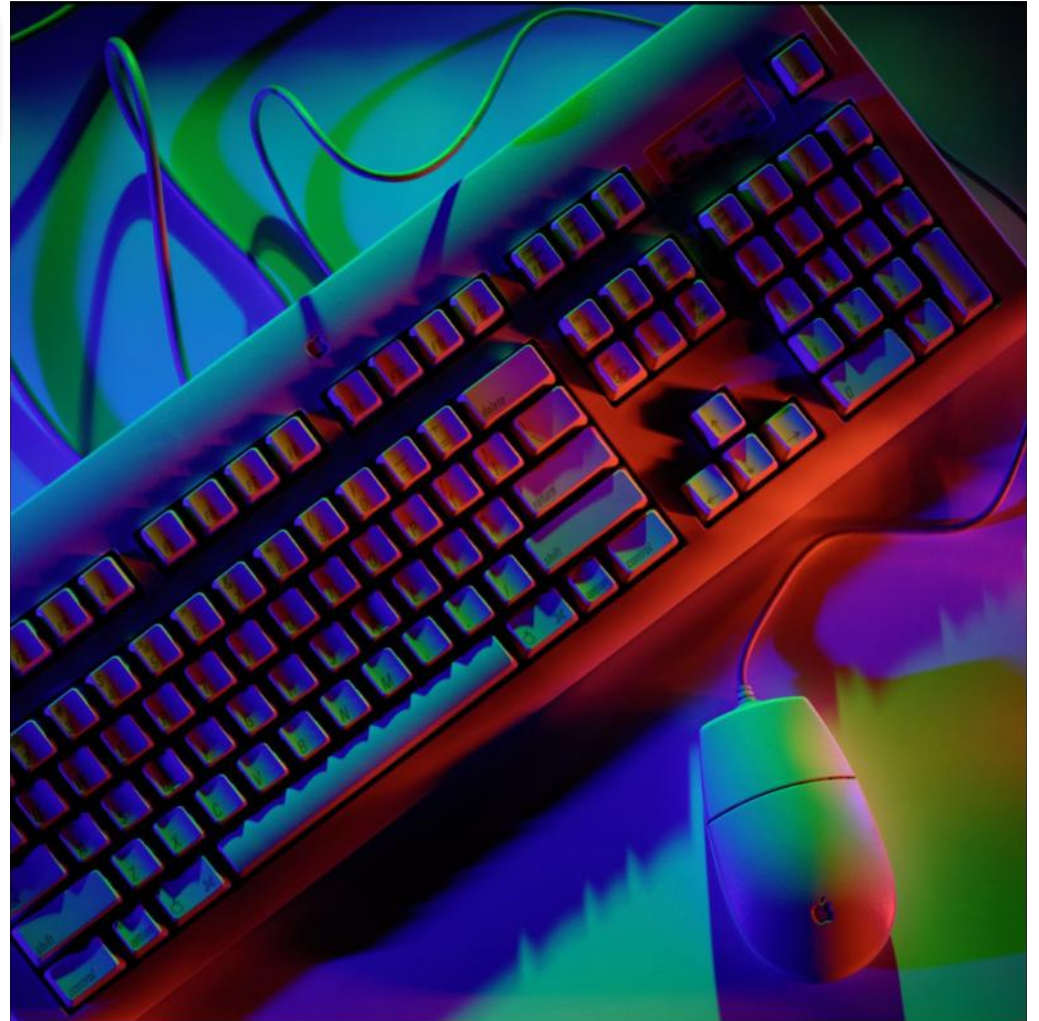
Difference Apply Mode
Generate wacked-out color for a more complex palette

The smaller image below is shift-dragged onto the previous document and the apply mode is changed to difference. This creates a lot of color complexity and adds more subtle color details but some areas suffer and it introduces some unpleasant tonal reversals.
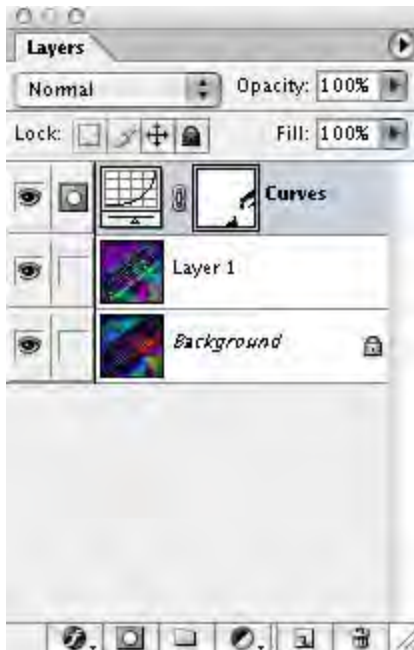
Lets see what other trouble we can get into...
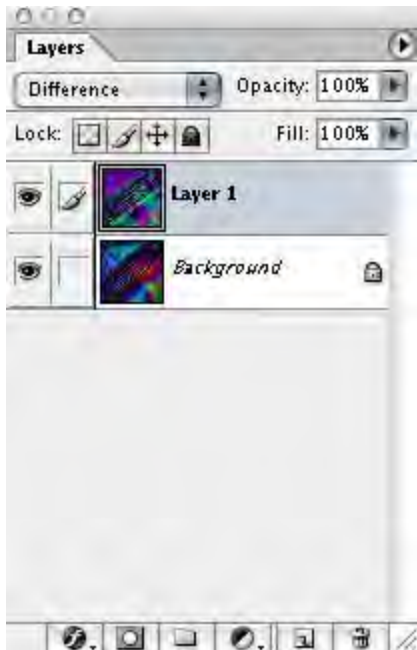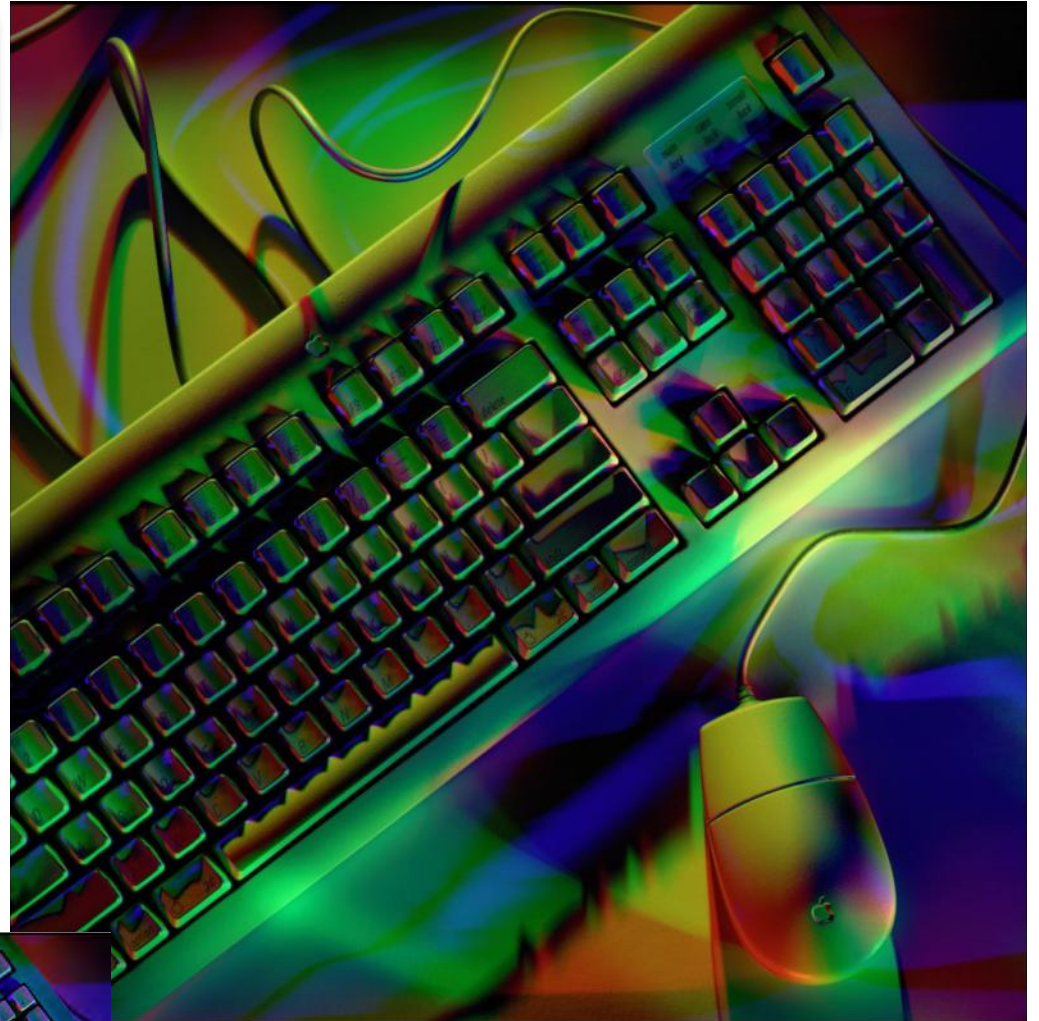
Curves adjustment
Amp up the color and brighten the image overall

These curve edits maximize the value range in each channel. It is certainly starting to look interesting but why stop now?
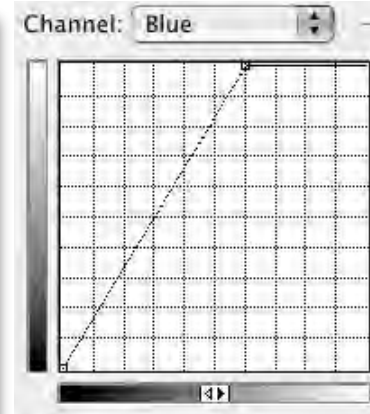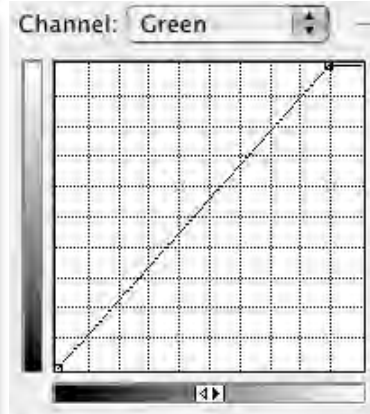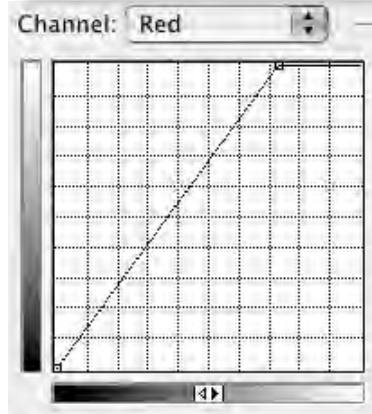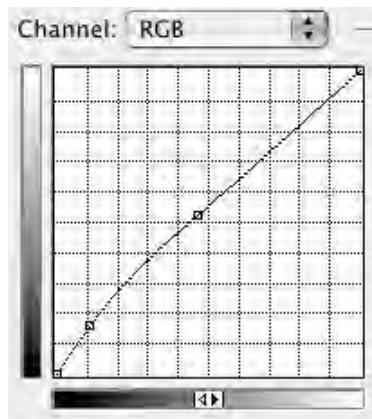
Add Back Sections
Balance the color with another layer

Here we add back the 2nd layer in the top left corner to balance out the color. Is it soup yet?

Lets keep going...
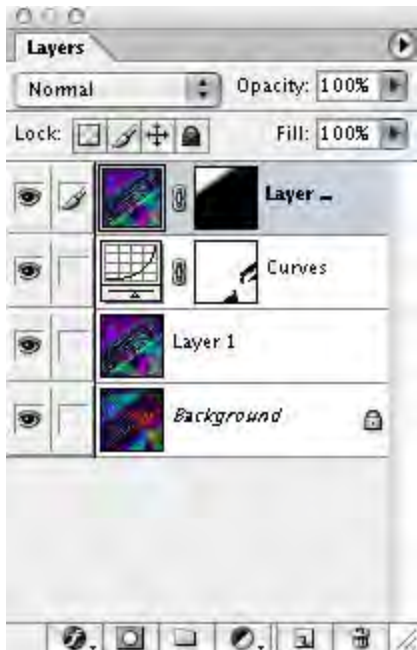
Luminosity Layer
Add an image layer to control luminosity without affecting color

Here we add a new image layer to subdue the contrast somewhat while preserving the color and saturation...
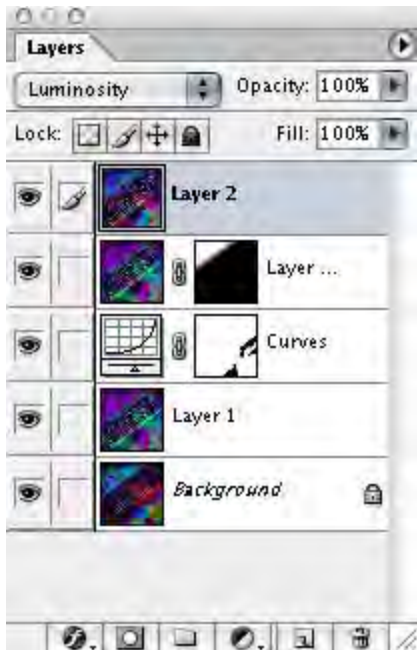
Final Tweaks
Another curves adjustment for final contrast/color tweaks

A final curves adjustment re-adjusts the tonal rage in Red and Green. The point here is not that this is necessarily the best version but to demonstrate how you can zero in on a rendering you like using various layer controls.

Images like this are somewhat arbitrary – only you can decide what is good or not. We might have stopped two layers back and the beauty of this approach is that we can always go back and re-work the image.
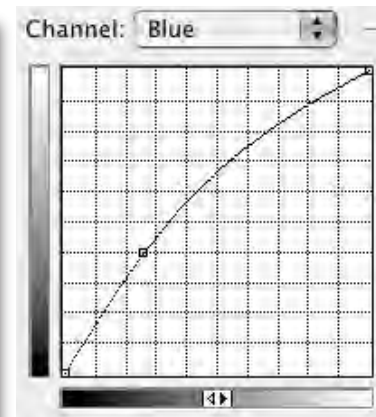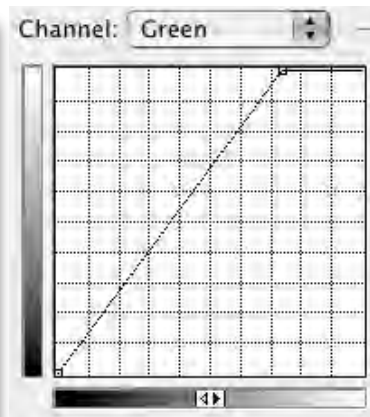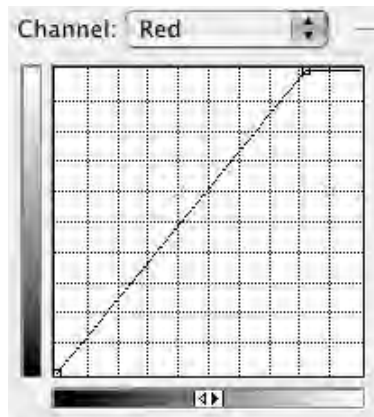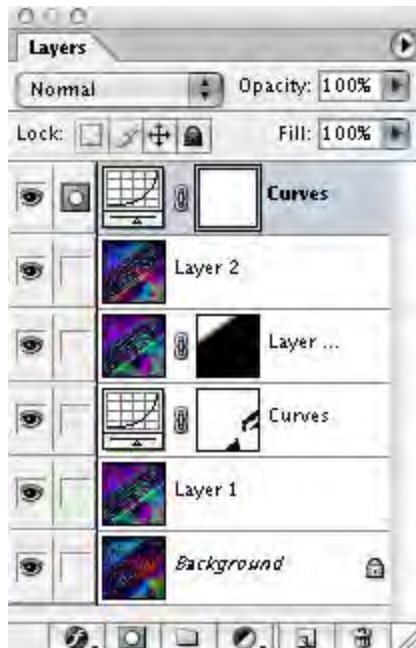
Alternative Technique
Blending multiple Screen layers to build color

The biggest problem with the RGB False Color technique is that it favors red green and blue primary colors. The results can be very interesting and colored subjects are rendered with more subtly than monochromatic ones but the final colors are more "happy accidents" than controlled choices.

An alternate technique allows for precise control over actual color and it lends itself to low key images that immerge from dark surroundings. The following pages demonstrate the "Screened Layer" technique for colorizing and building a more subtle color rendering of our first subject.

The idea is to start with a black background and screen subsequent layers on top to build up controlled lighting and introduce color layer by layer...

Duplicate Background
Then delete background to black

We start with overall soft fill. We place this "fill" layer over a black background in order to maintain control over the level of fill light in the image by using layer opacity.

The easiest way to achieve this and maintain the exact pixel dimensions to register the subsequent layers is to start off by duplicating the background – drag the *Background* layer thumbnail to the new layer icon at the bottom of the "Layers" palette.

The select the Background layer – click on it in the Layers palette and hit Cmd/Ctrl–A – then delete to black (make sure black is you background color first. You should end up with the original background image on top of a black *Background* layer...
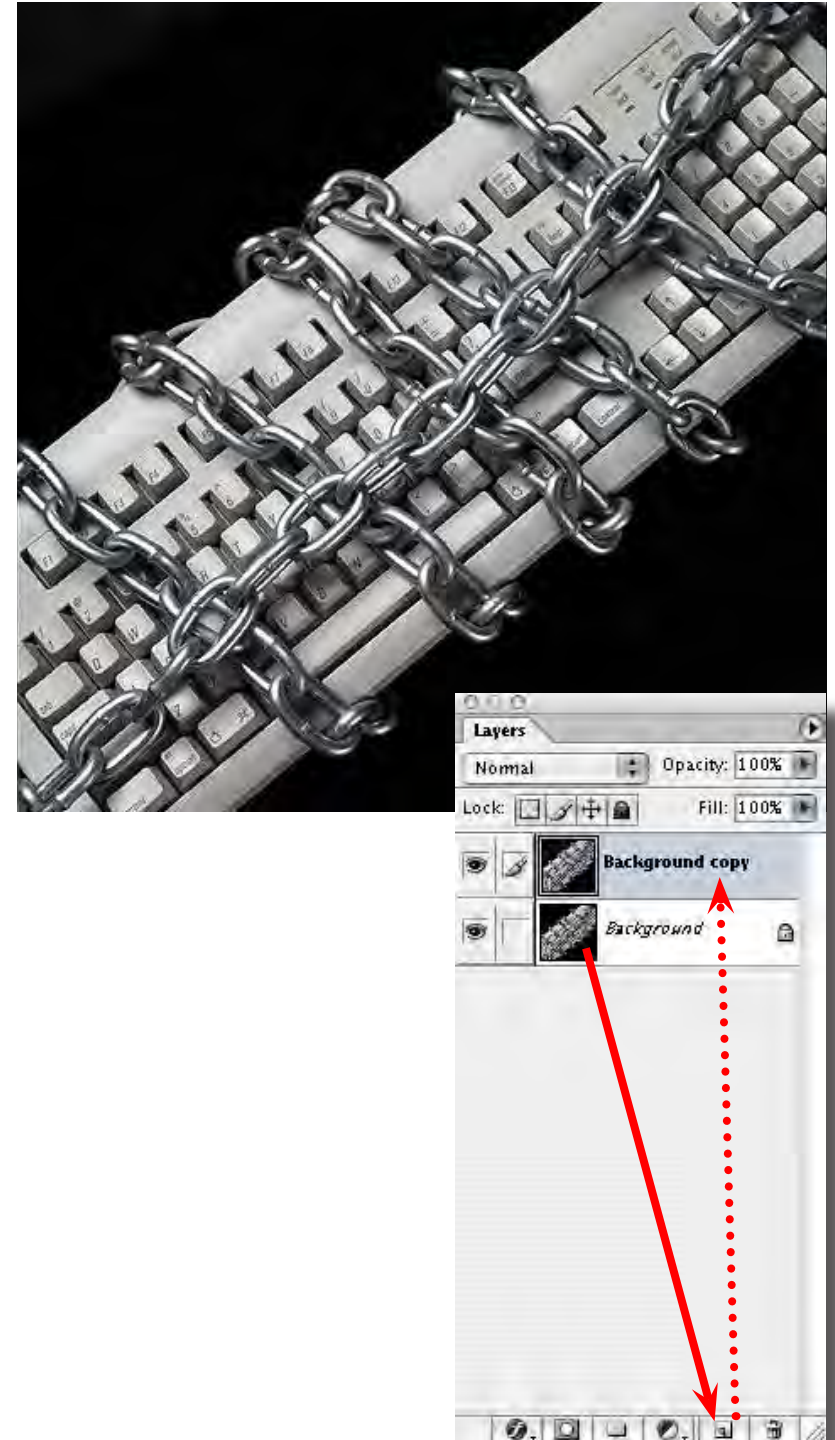
Reduce Opacity
Create ambient fill light

This is our fill light layer – we can reduce its intensity by reducing the layer opacity. We'll set this fairly low at the moment so that it doesn't compete too much with the other colored light layers...
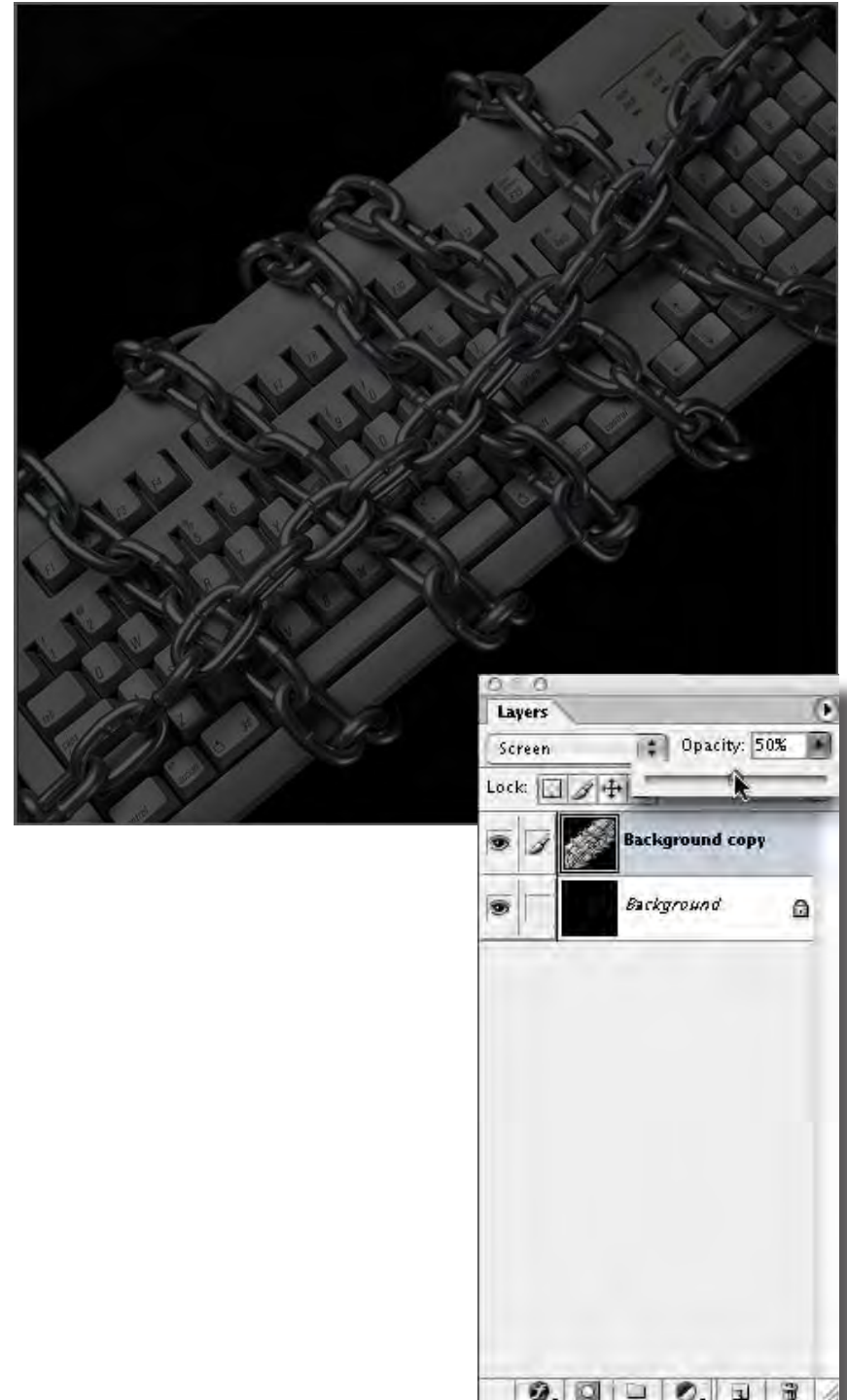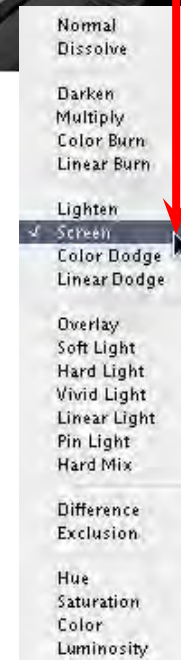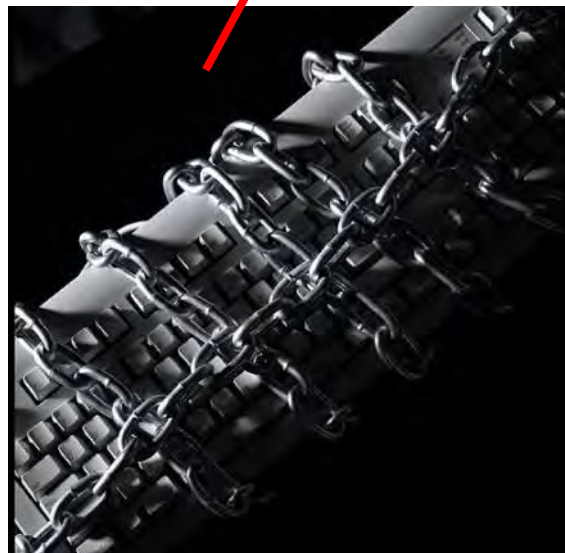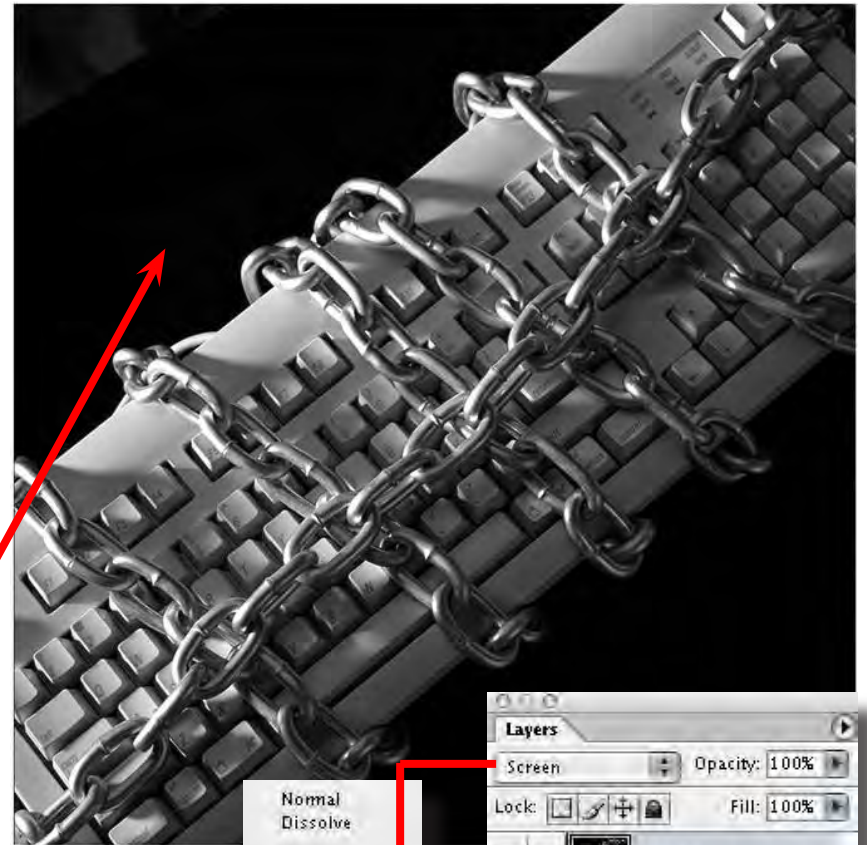
Shift-Drag in Layer
Register 2nd layer & set mode to Screen

Hold down the shift key and drag the first lighting layer (the "Red" document) into the new image. This automatically registers the two images because they are exactly the same pixel dimensions.

Change the layer apply mode to "Screen" by selecting it from the drop down menu just beneath the layers "tab". The light from this layer is now added to the overall fill light. You can use this technique to build up complex lighting in layers rather than trying to get everything right at once with multiple lights.

We will introduce color in the next step...

Normal
Dissolve

Darken
Multiply
Color Burn
Linear Burn

Lighten
✓ Screen
Color Dodge
Linear Dodge

Overlay
Soft Light
Hard Light
Vivid Light
Linear Light
Pin Light
Hard Mix

Difference
Exclusion

Hue
Saturation
Color
Luminosity

Layers

Screen   Opacity: 100%

Lock: 🔲 ✏ ✛ 🔒   Fill: 100%

👁 🖊 Layer 1

👁 Background copy

👁 *Background* 🔒

Hue/Sat Adjustment
Use Previous Layer for Clipping Mask

Now we will add an adjustment layer to colorize the first lighting layer. While you are on Layer 1, hold down the Option/Alt key and click on the adjustment layer icon at the bottom of the Layers palette – select: "Hue/Saturation..." from the resulting fly away menu. By holding down the Option/Alt key you get the New Layer dialog where you can select options – we'll check "Use Previous Layer to Create Clipping Mask". This causes the new Adjustment Layer to be controlled by the opacity of the previous layer – we can use this Hue/Saturation layer to color the previous layer and the result will be screened over the underlying layers.

Check: "Colorize" in the Hue/Saturation dialog and adjust the hue and saturation for a cyan-green – reducing the lightness will force a richer color into the image.
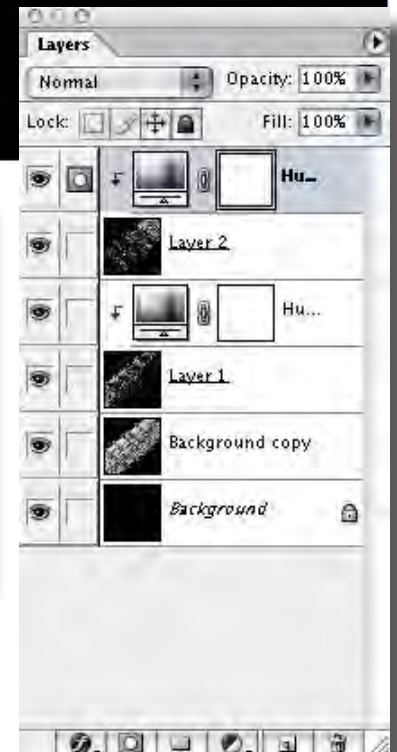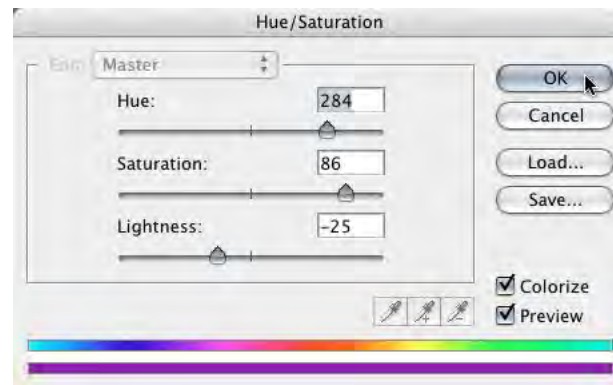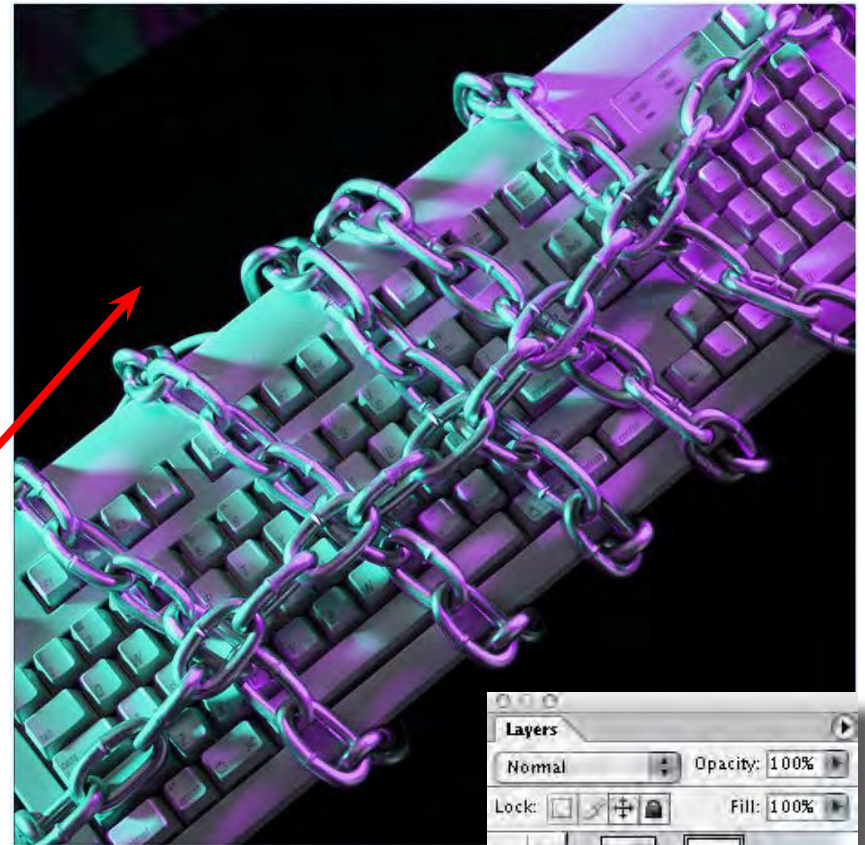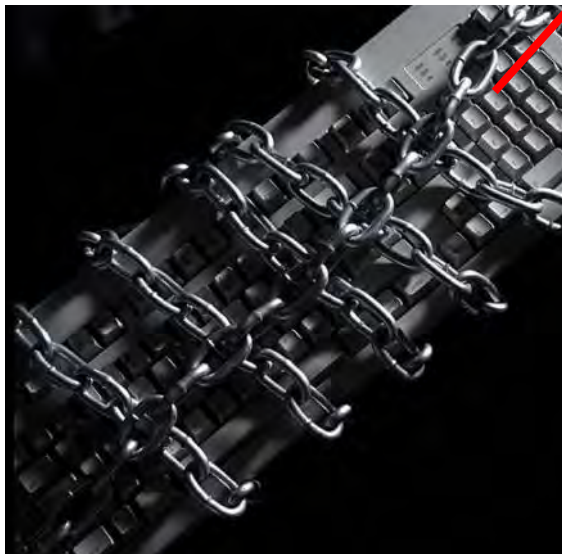
We repeat these last few steps for the two other lighting layers next...
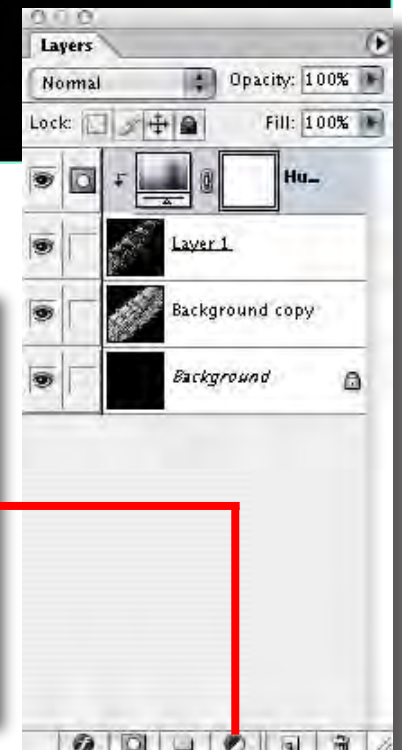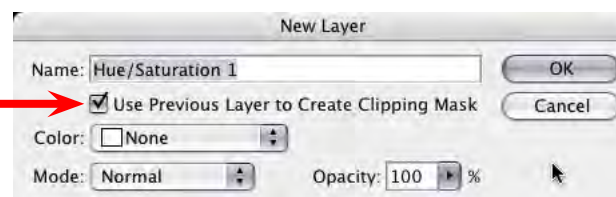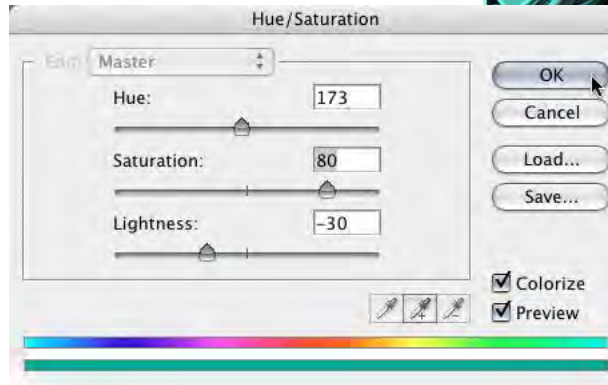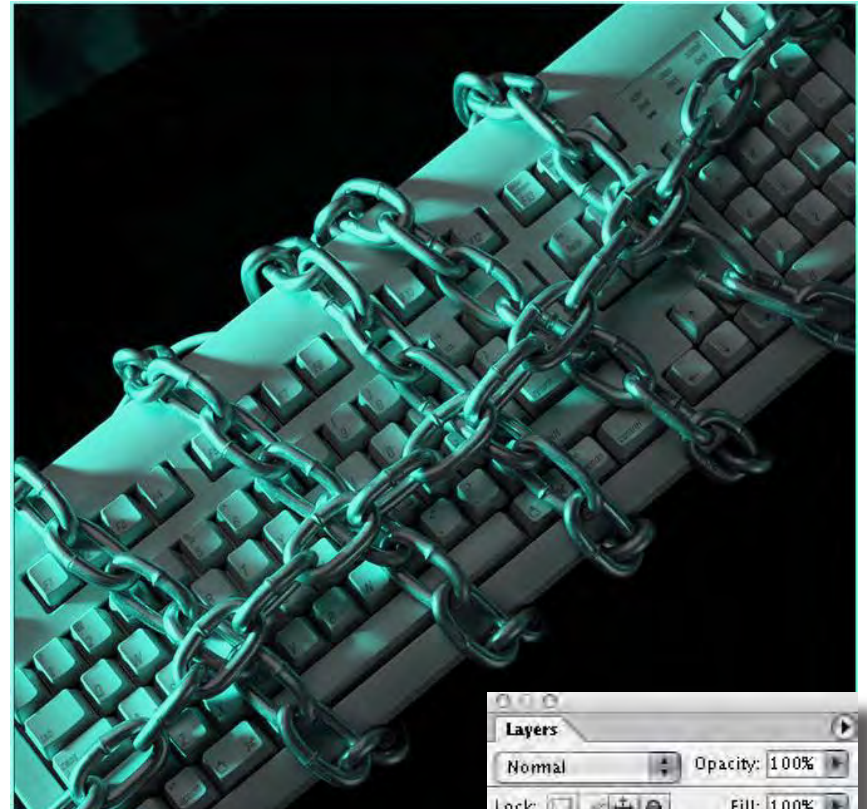
3rd Layer
Continue Screen and adjust Hue

- Shift-drag the next lighting layer

- change the apply mode to "Screen"

- option/alt select Hue/Saturation adjust layer

- check "Use Previous Layer for Clipping Mask"

- adjust hue and saturation for a lavender color

Hue/Saturation

Edit: Master

Hue:	284
Saturation:	86
Lightness:	-25

OK
Cancel
Load...
Save...

☑ Colorize
☑ Preview

Layers

Normal | Opacity: 100%
Lock: ☐ 🖋 ✛ 🔒 | Fill: 100%

- Hu...
- Layer 2
- Hu...
- Layer 1
- Background copy
- Background

Final Layer
Blend multiple Screen layers to build color

Repeat the steps for the next layer – this time we aim for a cyan-blue.
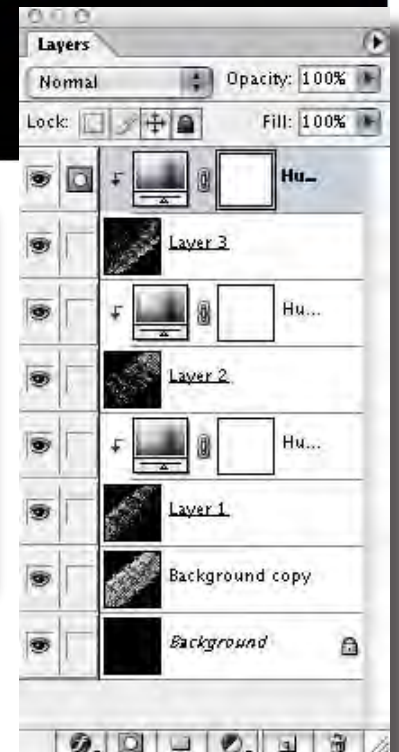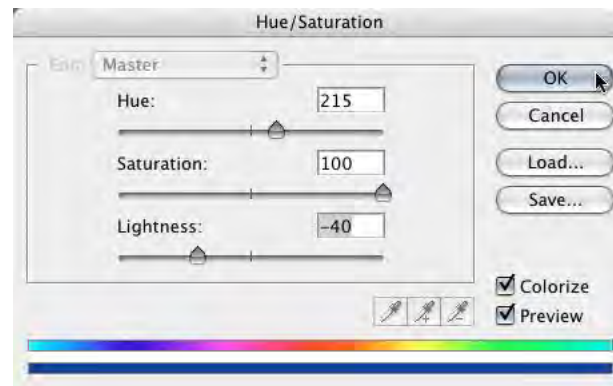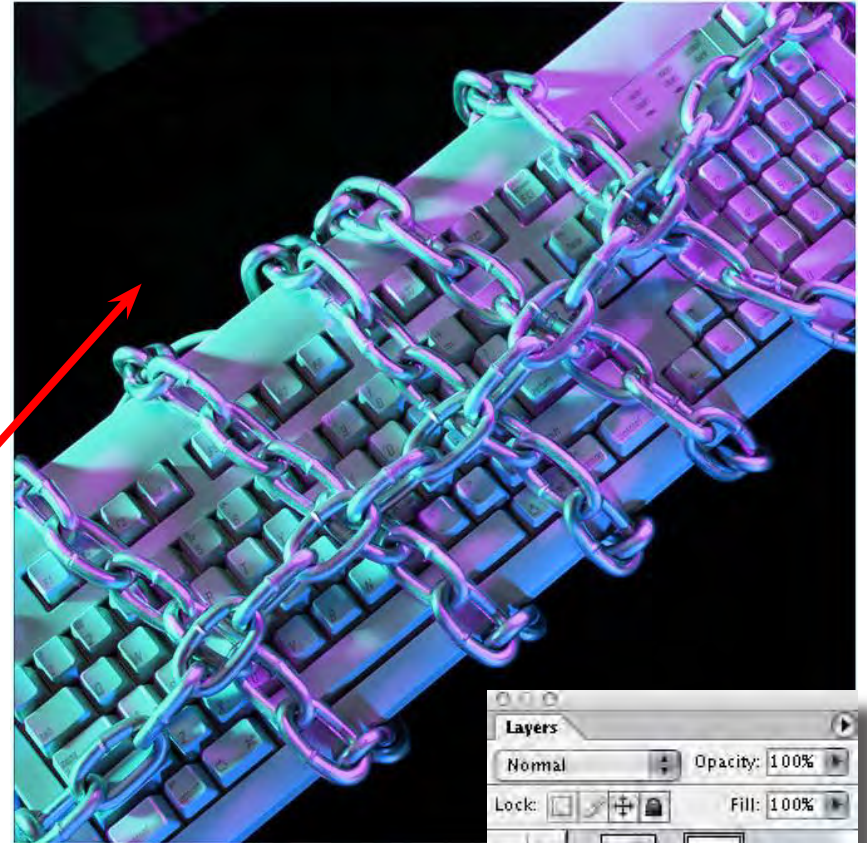
Adjust Fill Layer
Control contrast with opacity of fill light layer

The first layer (the Background copy layer) is currently being used to reduce the contrast and soften the color. We can turn it off by clicking the eye icon to the left of the layer thumbnail in the Layers palette. We may decide to use it or not – or change the layer opacity!

At this point, with our layer structure in place, we can start to experiment and refine the image. All the Hue/Saturation adjustment layers are available to change colors. We can change the layer opacity for any given layer. The beauty of this approach is the complete flexibility and control.
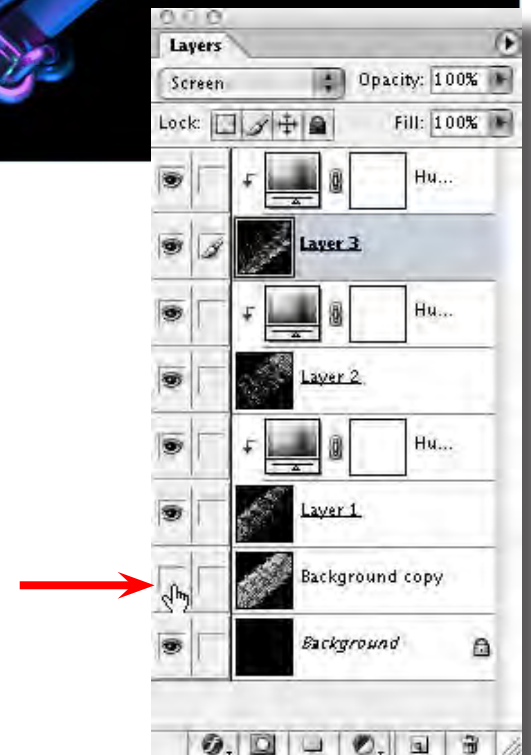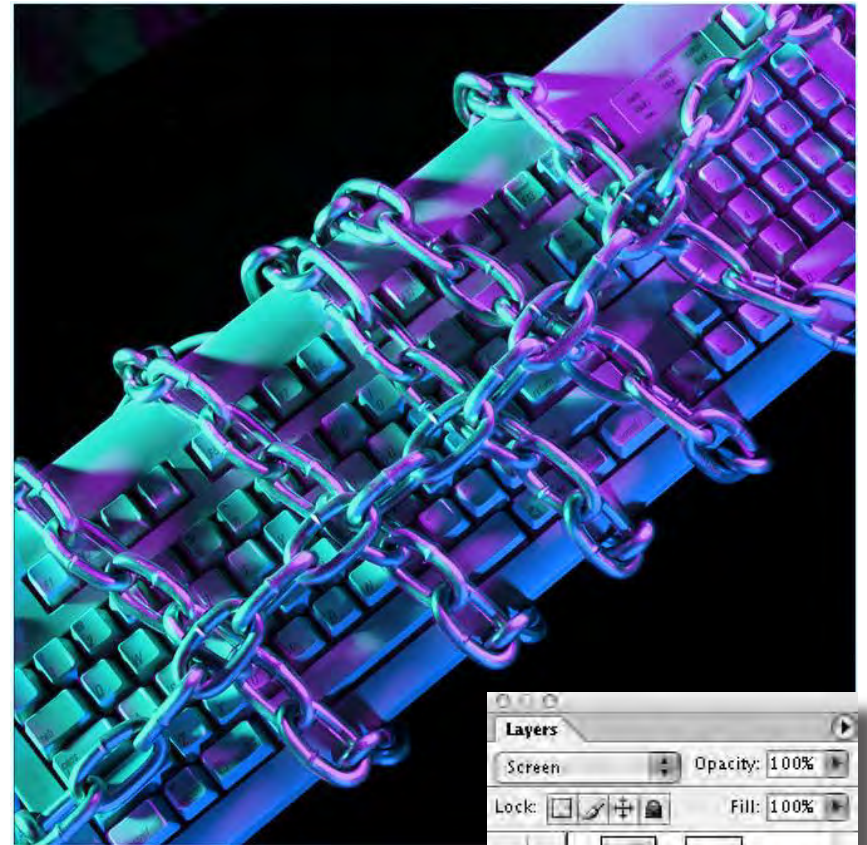
Difference Apply Mode
More color variations

Here we change the layer apply mode for Layer 3 to "Difference". This results in an interesting anodized look in the lower half of the keyboard. Once we do this however, the color scheme gets skewed. No problem, we can re-adjust the colors quite easily...
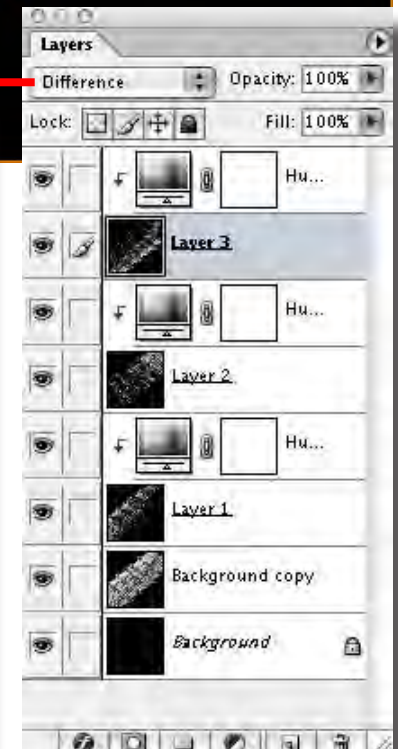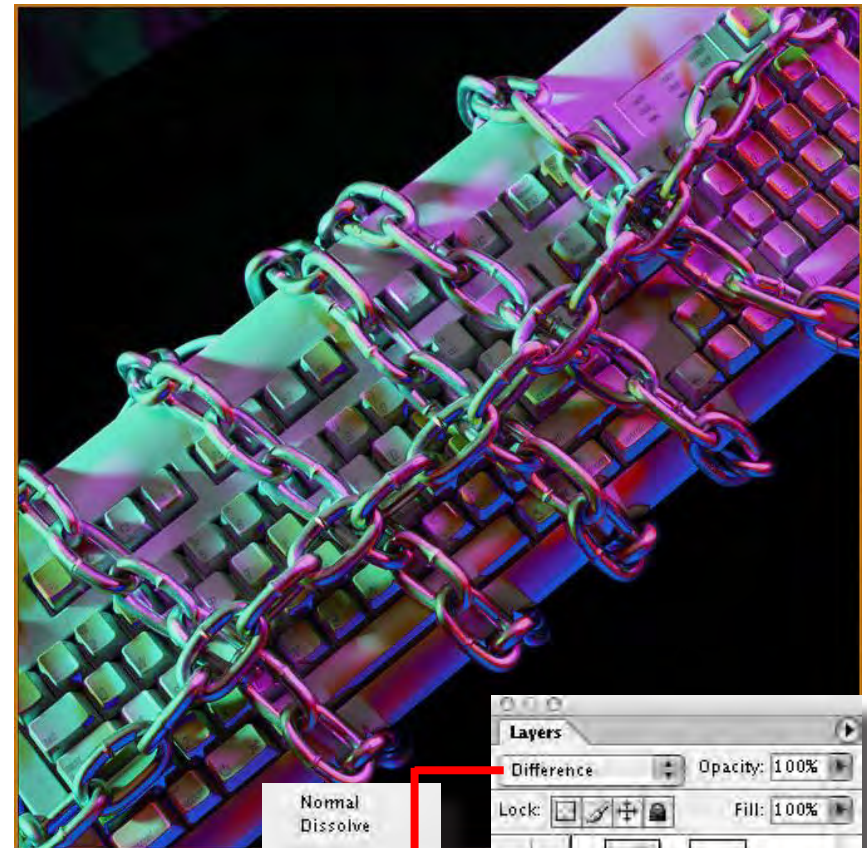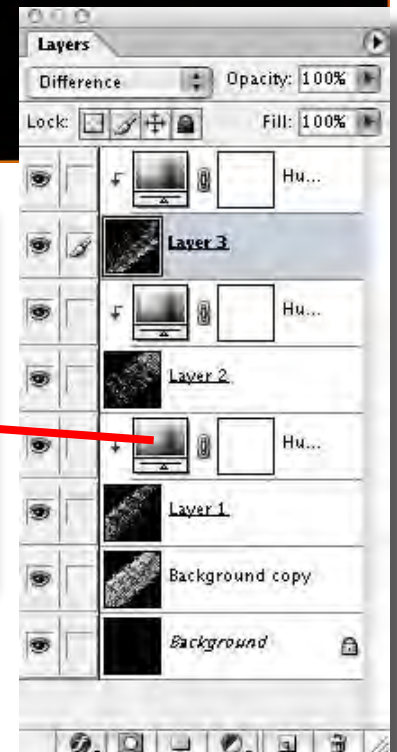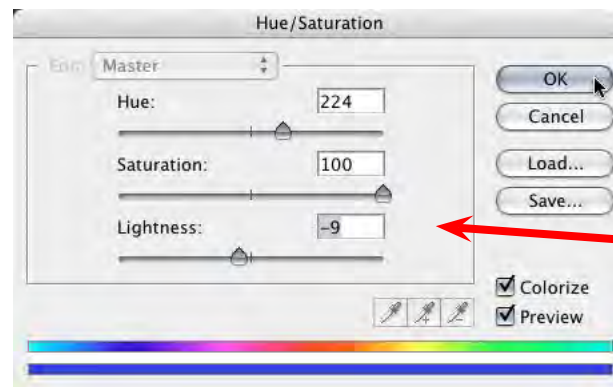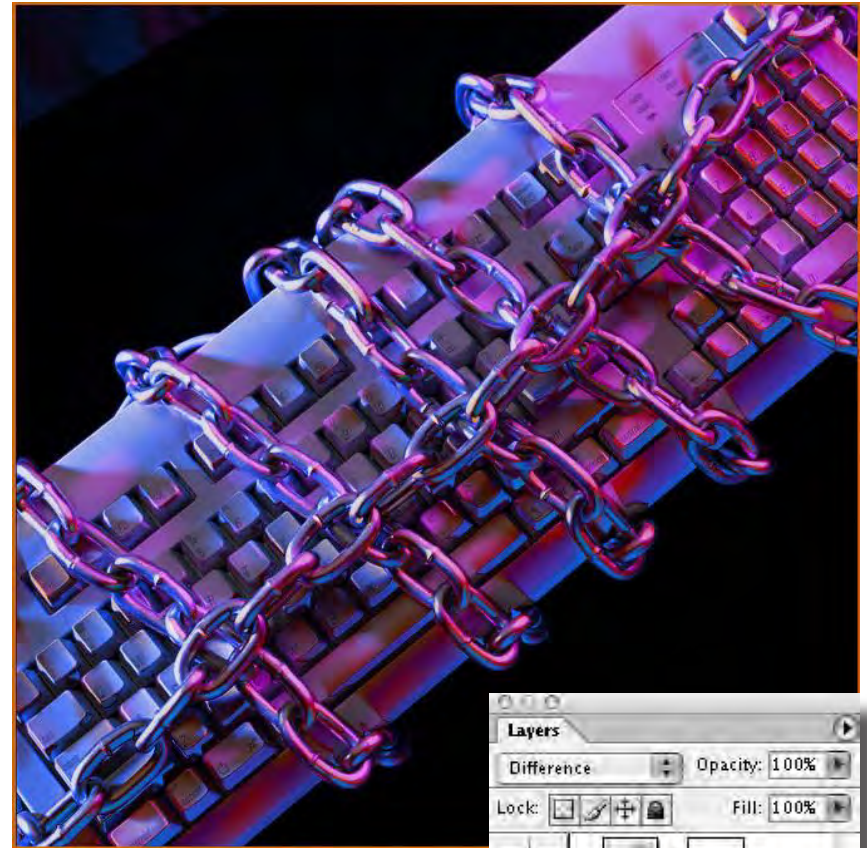
Re-Adjust Hue/Sat
Revise color after all layers are in place for final effect

Double click on Layer 1 's Hue/Saturation adjustment and we can re-jigger the color to give a lavender-magenta rendering. With so many options the only problem is making up your mind what to do next...

The pages that follow show a gallery of images that utilize various combinations of these "False Color" techniques. All of the images were captured digitally with Megavision camera backs used on medium format roll film cameras but just about any digital camera can be used effectively with these techniques. Digital capture allows you to bring images into Photoshop, immediately work them up and then take more pictures. This kind of interaction sparks tremendous creativity in your shooting sessions.
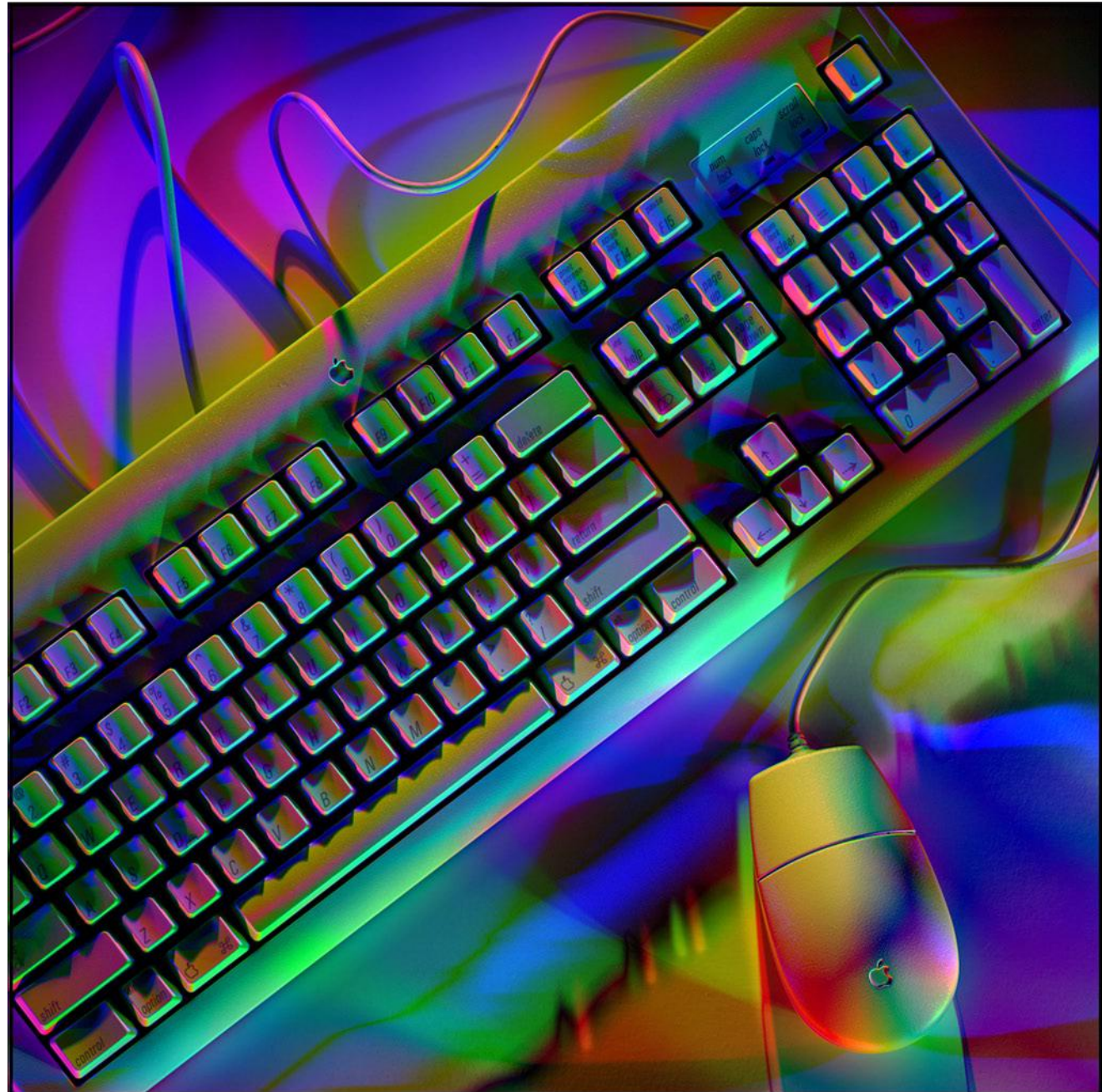
The following examples are just a very small sampling of what you can do with the "False Color" technique...

This final version of the Keyboard and Mouse image utilizes the same layers we worked up before with just a few more layer mask tweaks to enrich the colors in the lower right. There is an amazing amount of color detail and texture in the hi-res image.
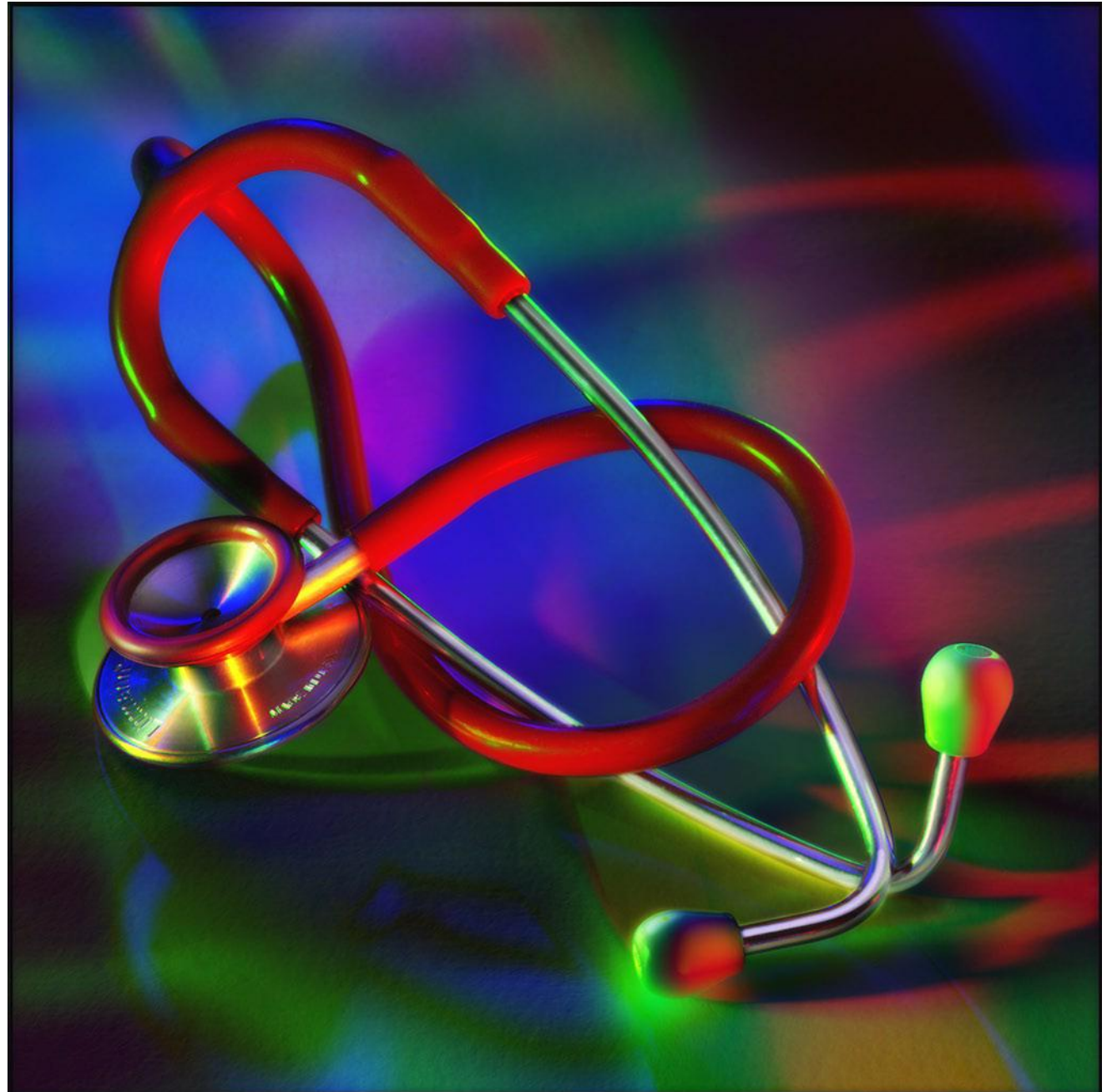
The subtle colors in this image were the result of a fairly complex layer structure of multiple RGB Tri-colored layers, Difference apply modes and an embossed "Overlay" layer.

Three different RGB Tri-colored layers were blended together with layer masks to create this image.

This ghostly apparition was created completely photographically using a basic RGB Tri-color blend of three exposes of a black satin cloth billowing from a wind machine. The colorized composite version was duplicated in a layer flipped horizontally and a Difference apply mode generated the kaleidoscopic symmetry.

Only white light was used to photograph this skull – the subtle red and cool hues were created by colorizing and blending separate lighting layers.
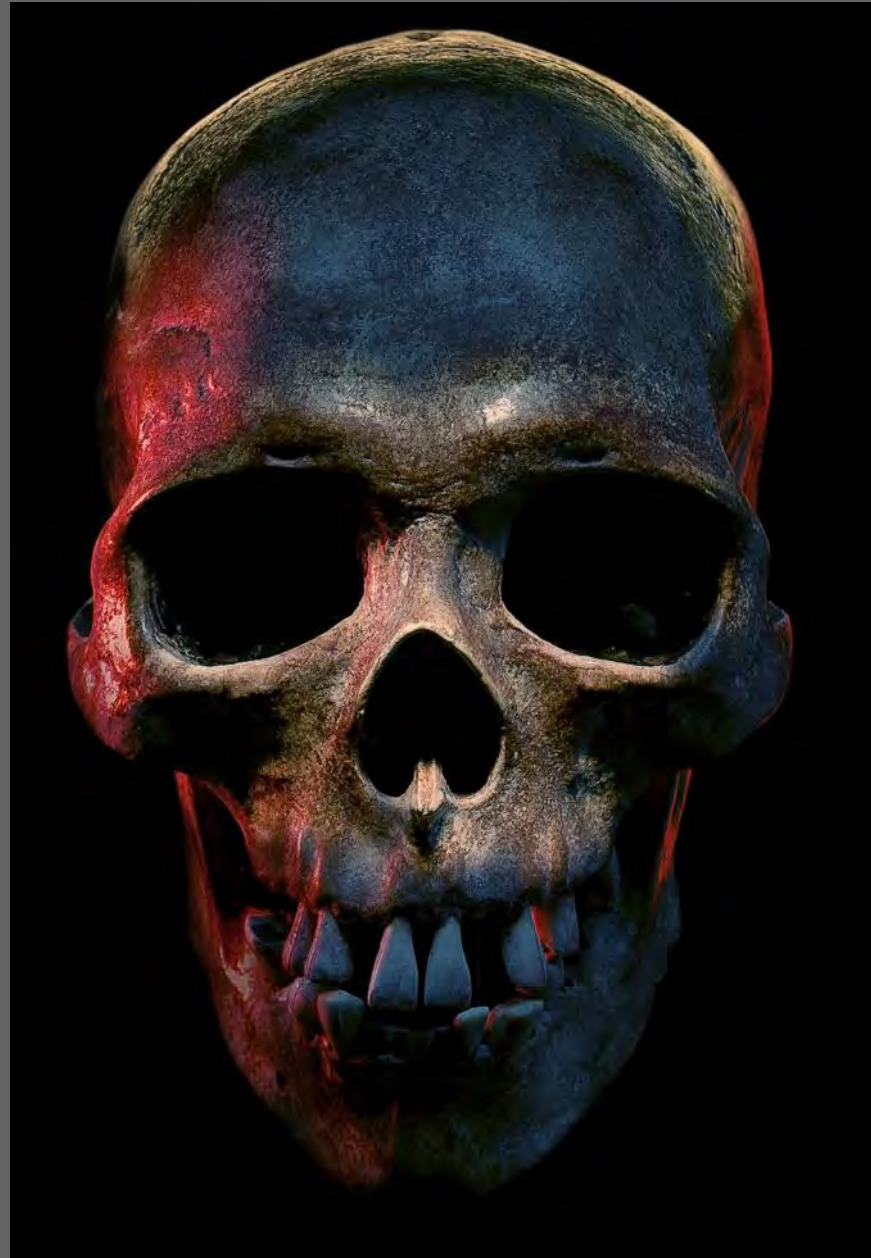
Conclusion
Creative control of color

Color is one of the most expressive elements in a photographic image. Often it is treated as an unalterable consequence of the subject that is photographed – the roll of the photographer defined as one of technical accuracy. Sometimes it is useful to break out of the confines of a fully color managed workflow and radically alter our perception of color. Stir the paint and fling it about – see what kind of trouble you can cause

The techniques outlined here are just the tip of the iceberg and hopefully they can stimulate some experiments that will take you into uncharted territory. For, who is the master – the photograph or the photographer? Why stay close to the shore? Point your ship at the horizon and boldly go where no photographer has gone before...

Varis PhotoMedia Tutorials

Thank you

I hope you enjoyed this tutorial. The techniques outlined here represent just the tip of the iceberg. Photoshop is a very deep application - a person could spend years studying it and there will always be more to learn. If all this seems a little overwhelming, take a break, do what you feel comfortable doing in Photoshop and return to this tutorial again later on. Often, it takes several weeks for a particular technique to sink in so give it time.

I have other tutorials available online (navigate to the methods section), some are free and some are available for a modest charge. See tutorials and some examples of my work at:

http://www.varis.com

There are many learning resourses available on the web - here are a few other sites with good information:

http://www.russellbrown.com   http://www.creativepro.com

http://luminous-landscape.com/   http://www.imaging-resource.com/HOWTO.HTM

http://www.photoworkshop.com/   http://www.adobe.com/misc/training.html

http://studio.adobe.com/expertcenter/photoshop/   http://www.ledet.com/margulis/articles.html
main.html

http://www.steves-digicams.com/   http://www.photoshopuser.com/

http://www.handson.nu/   http://photoshopgurus.info/

These last two links are typical of the majority of Photoshop tutorial sites - they are focused on cool graphics effects not photography. You might want to look over this material anyway - sometimes you can learn a lot about basic functions in Photoshop.

I'm always trying to improve these materials and I'm always open to your feedback. You may contatct me via email at:

varis@varis.com

best regards, Lee Varis 2003