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of my time learning new things and I am attempting to share what I learn with you but this information will go out of date so you should be flexible and not take this tutorial to be the ultimate statement on the subject.

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

LAB Magic

secrets of the x-treme color space

Most Photoshop users have seen LAB as one of the choices offered under the Image->Mode menu. Many know that LAB is the "connection space" used in ICC profile conversions. Most are at least aware that LAB is a device-independent color space. What is LAB good for?... Most people couldn't begin to imagine. Even the published "experts" say that LAB is not an intuitive editing space (as if RGB or CMYK were particularly "intuitive"). LAB is there, fifth choice down in the list for conversion choices from the typical RGB image (Grayscale, Indexed Color, RGB, CMYK... LAB) - but what do you use it for?

LAB is unique in that it is the only color space choice available to us in Photoshop that separates luminance or lightness/darkness from chrominance or hue/saturation. "L" represents lightness where "A & B" represent hue & saturation. This feature is one reason that Dan Margulis calls LAB the patron saint of lost causes. If there is a serious defect in an image - a major color cast, saturation or strange color-crossover issues the solution often lies in LAB color manipulations. LAB is often a good space to do sharpening in. Frequently, LAB is great for solving vexing retouching issues. However, LAB is lousy for subtle, detailed color moves - its more like a large sledge hammer that can smash several tiny nails at once but if you're not careful it can damage the wood!

We will begin our exploration of LAB with some basic observations of curve edits in LAB. We will proceed to some common uses and finally, end up with a fairly sophisticated correction that simulates the use of flash fill in a contrasty lighting situation. You will see why I call LAB the X-steme color space...

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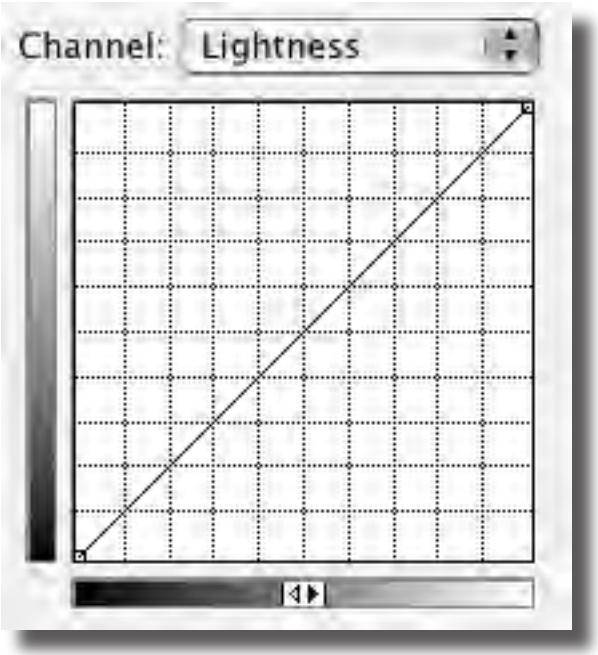
These files are compressed in a Binhex archive. To use these files you must first extract them from the archive using a file compression utility. You can download the excellent free “Stuffit Expander” utility from Aladin Software by clicking below:

Stuffit Expander

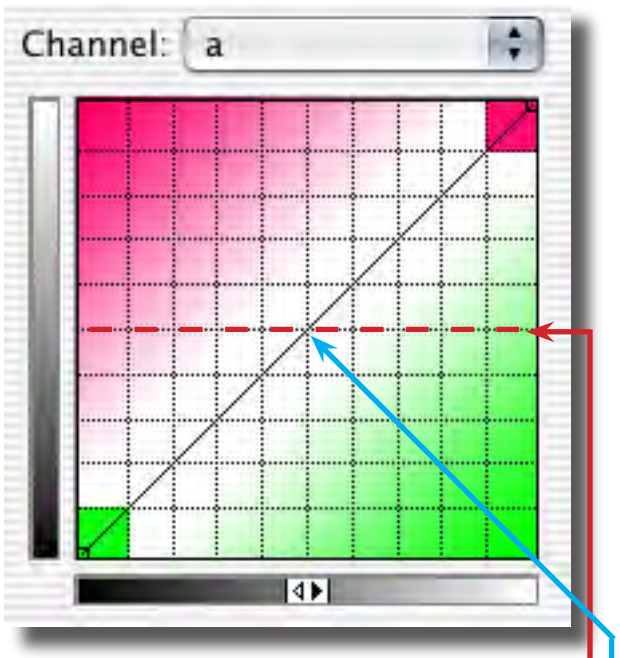
Choose your platform from the buttons at the top of the web page - Mac, Windows and Unix

LAB Color Basics

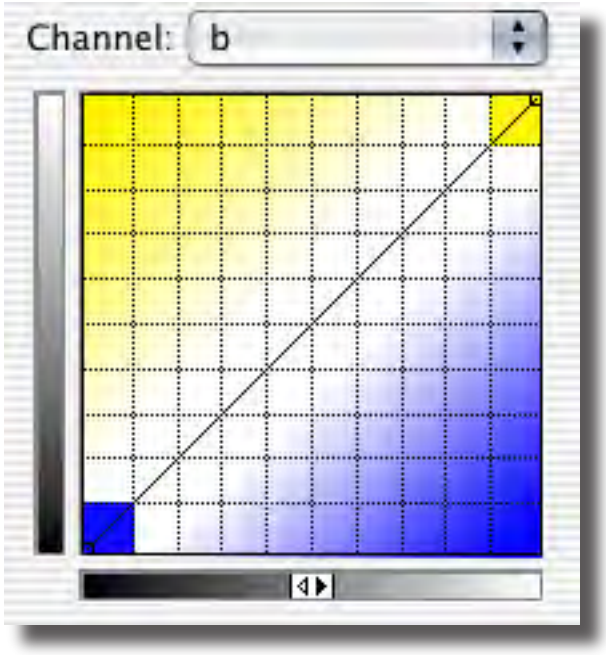
the anatomy of LAB curve corrections



The "L" of LAB is easy to understand because it behaves pretty much the same way as a regular grayscale channel. The only difference is the way the numbers are represented. Values go from "0" (black) to 100 (white) - basically there are only 100 positions available for a point on the curve even though there are 256 steps in an 8 bit grayscale channel. This also makes LAB a bit coarse for detailed edits in luminosity, though it still has its uses, as we shall see later, in blending calculations.



The "A" channel represents the magenta-green color of the image. When the curves is set up as shown - with the black point to the lower left - moving a point up makes it more magenta, moving it down, more green. In both A & B channels the point at which the curve crosses the horizontal mid-point line represents neutrality in that channel. In the "A" channel the image would be neither magenta nor green at this point.

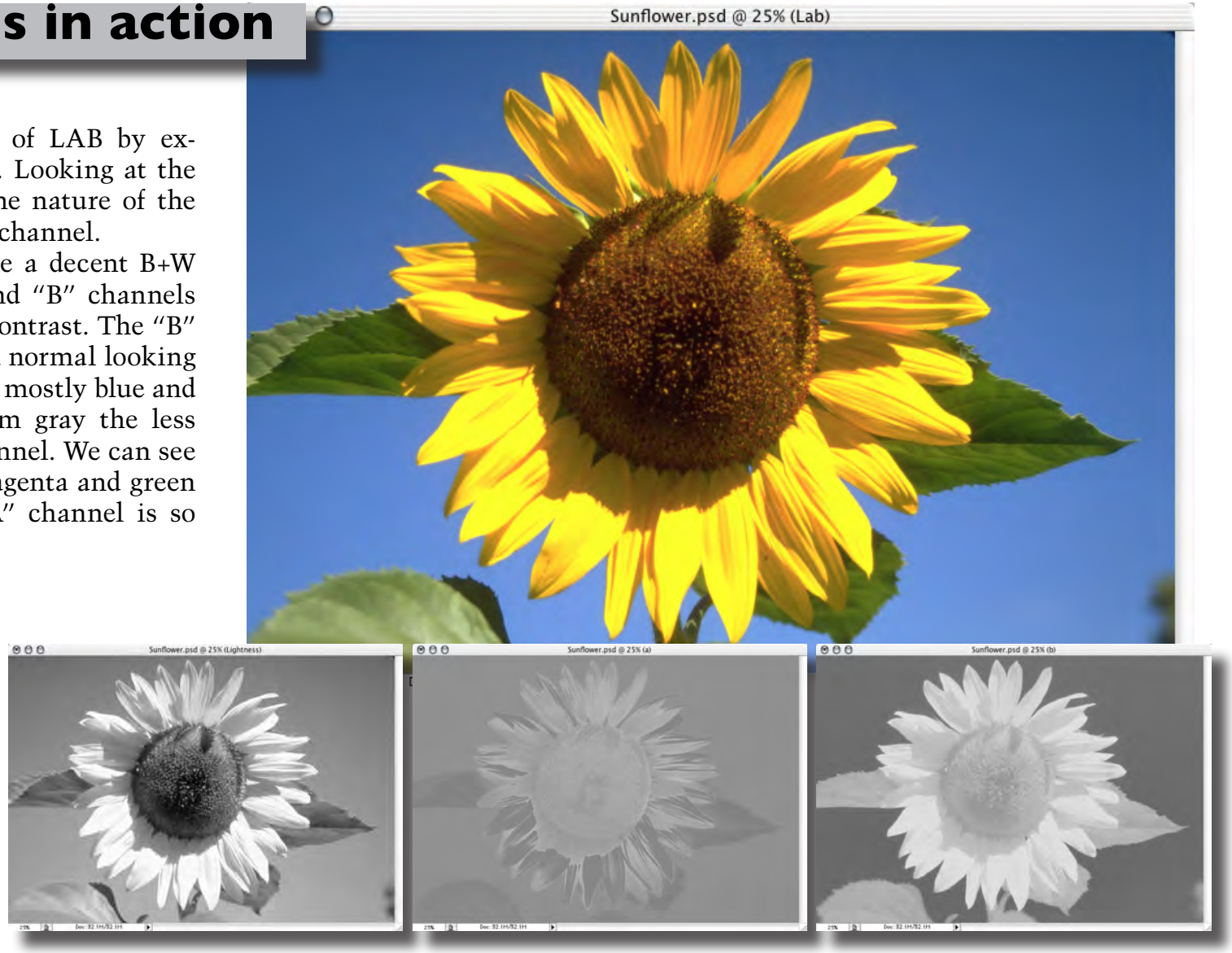


The "B" channel represents the yellow-blue color of the image. Moving up = more yellow. Moving down= more blue. The end points in both channels represent absolute (x-treme) and unprintable values. Black starts at -128, green (A) or blue (B). White ends up at +127, magenta (A) or yellow (B). Values more extreme than -60 or +70 are out of gamut for most CMYK color spaces. This really leaves only about 1/3 of the curve in the middle as useful editing space.

LAB channels in action

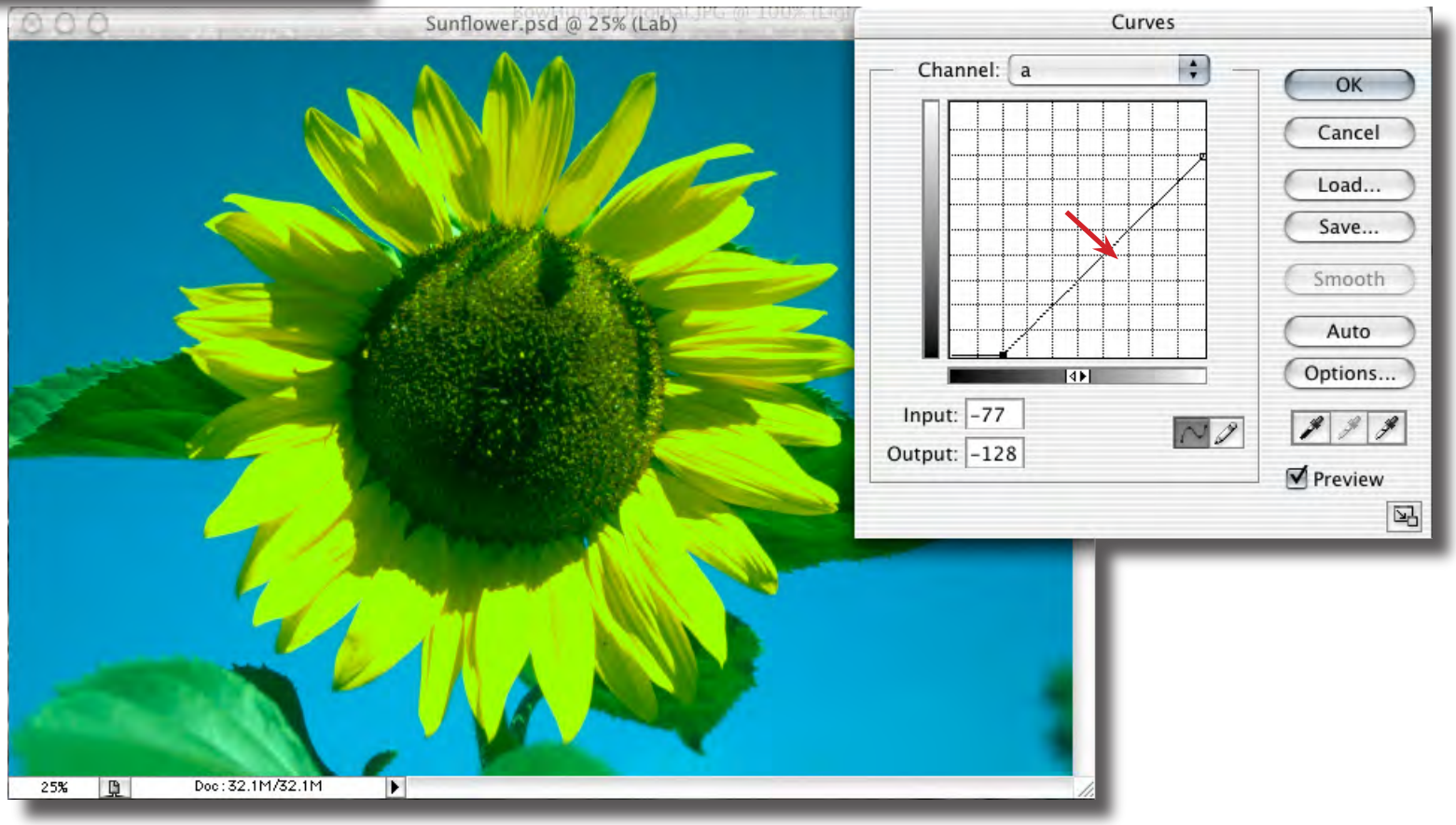
Lets start our exploration of LAB by examining this familiar subject. Looking at the individual channels reveals the nature of the grayscale information in each channel.

The "L" channel looks like a decent B+W representation and the "A" and "B" channels look a bit strange, lacking in contrast. The "B" channel comes the closest to a normal looking grayscale because the image is mostly blue and yellow - the closer to medium gray the less color saturation in a given channel. We can see that there is very little red/magenta and green in this image because the "A" channel is so gray.



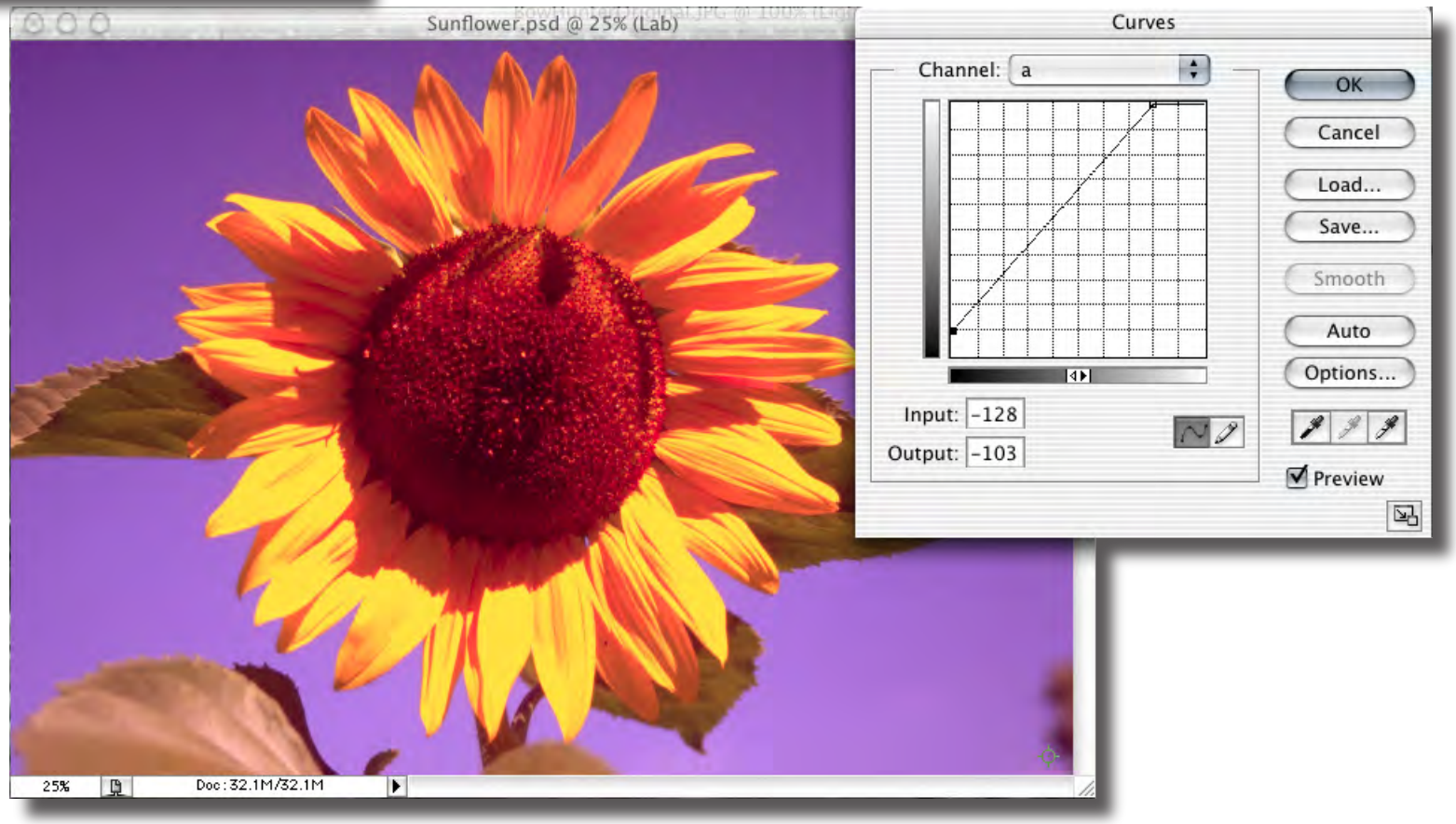
Normal color saturation is fairly gray in the A & B channels - anything close to white or black would be way out-of-gamut for most color spaces. Subtle shifts in gray value will therefore have profound effects on hue & saturation. This is both the strength and weakness of LAB as an editing space. Huge color moves can be made easily without "breaking" the image. A Hue/Saturation in RGB, if pushed too far, can result in posterization. Not so with LAB... subtle moves, however, are much more difficult...

A channel - green



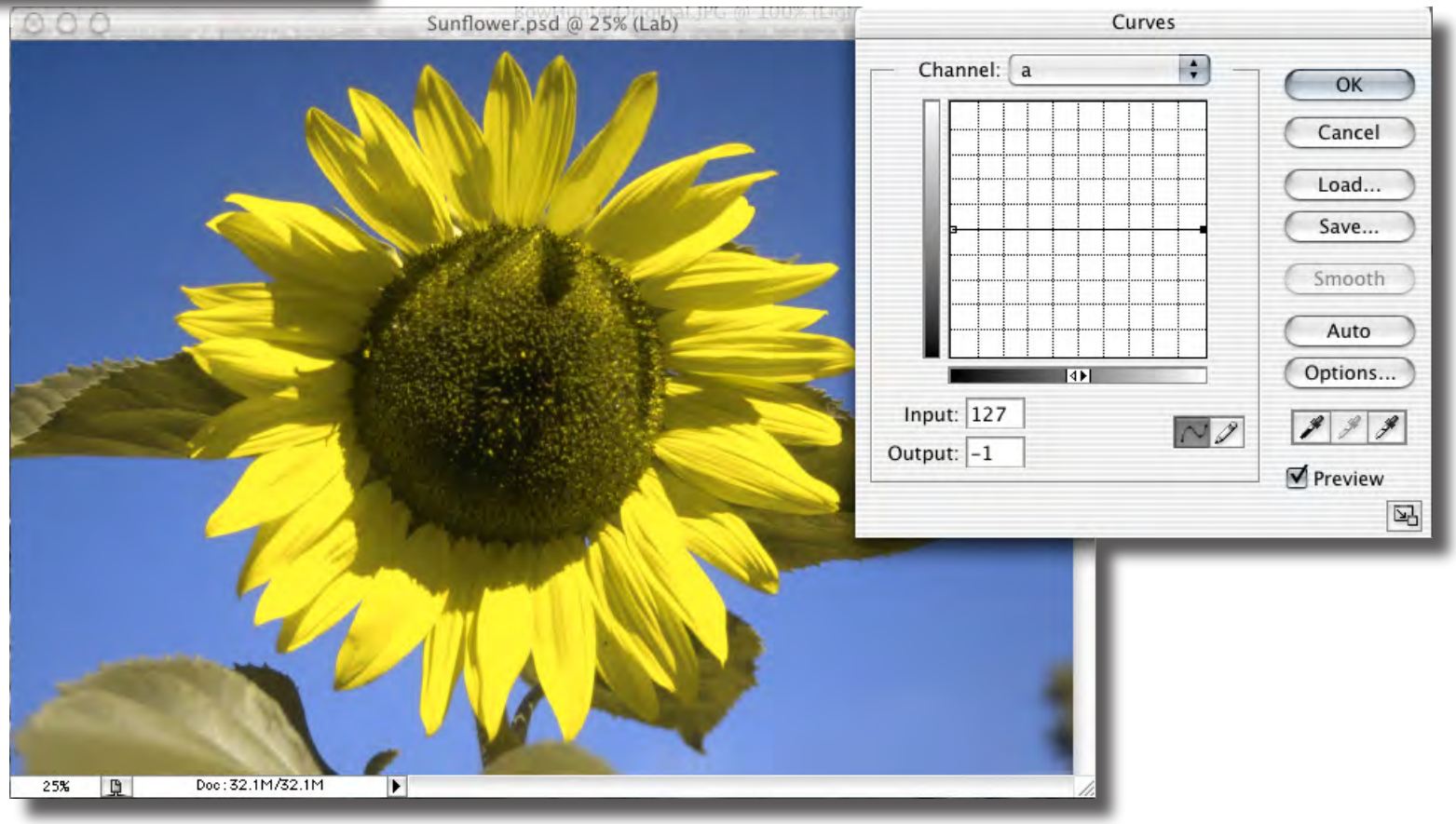
If we move the whole curve, straight towards the lower right corner in the "A" channel the whole image will move uniformly towards green - much like placing a green filter over the lens...

A channel - magenta



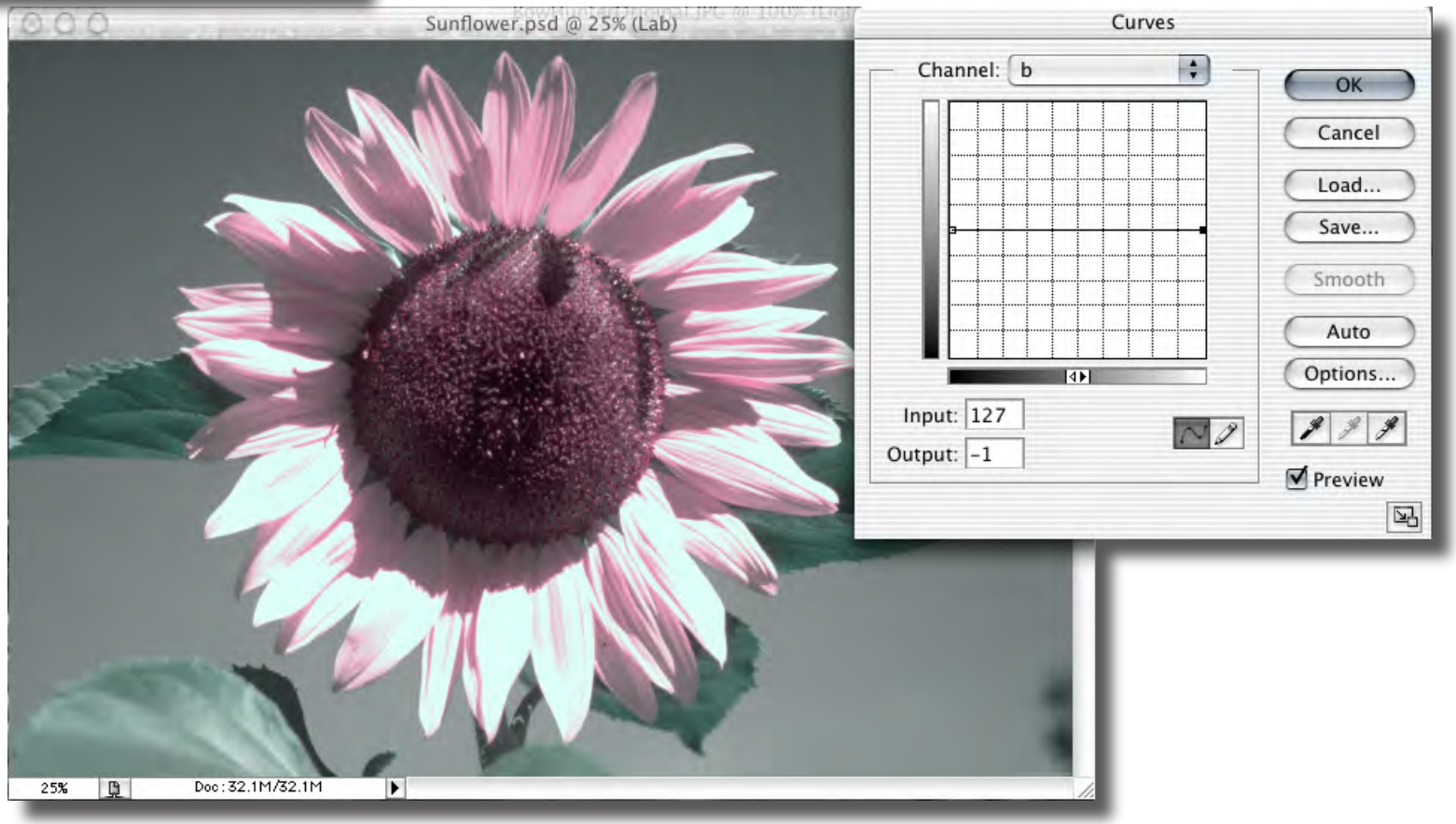
Conversely, if we move the other way, towards the upper left corner, the image turns towards magenta. You can see the tone that was originally green in the leaves has now become quite red. This is really a fairly small move on the curve to produce such a huge shift in color.

A channel - gray



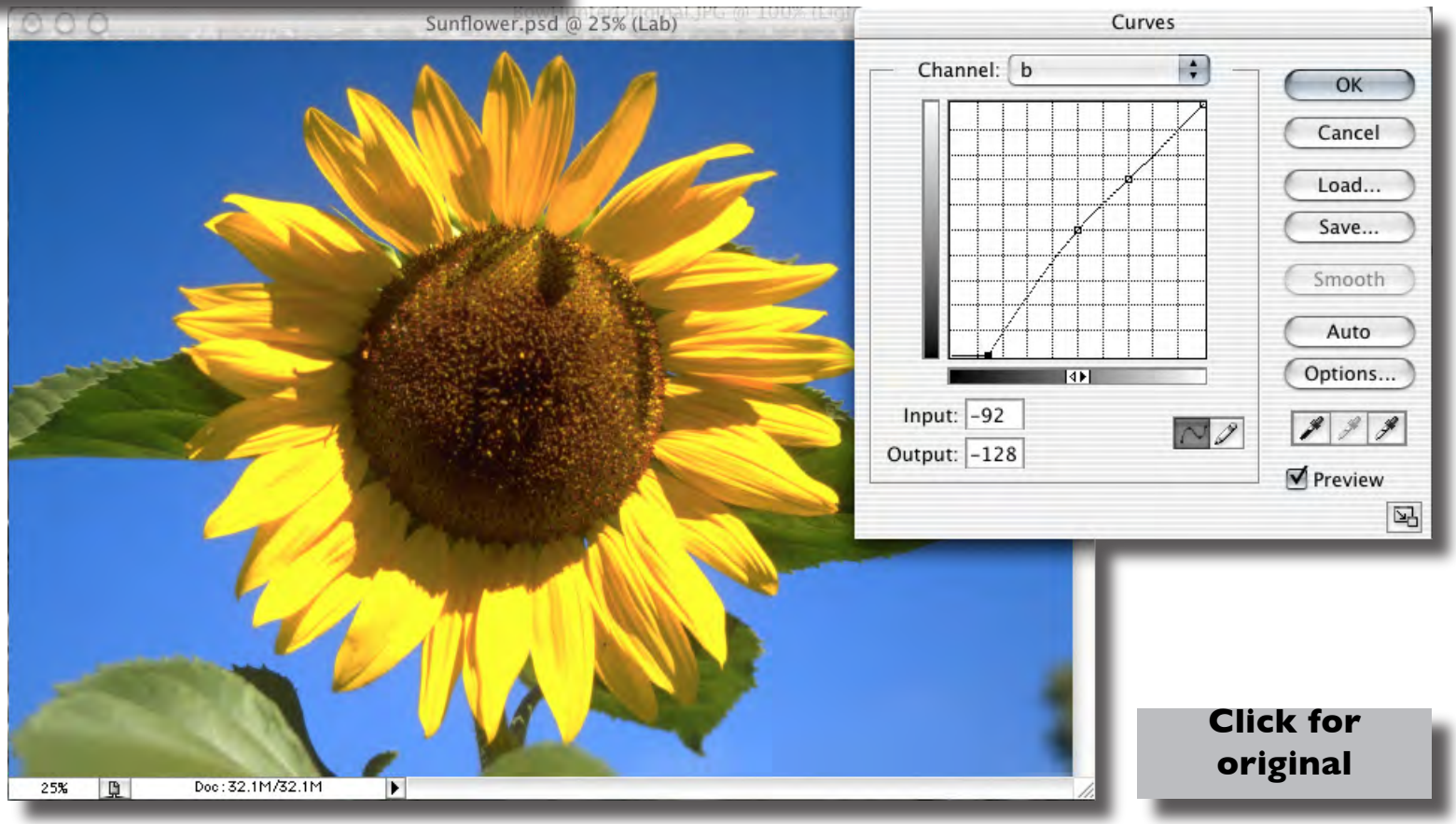
If we level the curve to a straight horizontal at the mid point the whole channel will turn gray and we'll have no magenta or green in the image at all. The result is an image that is only varying saturations of yellow and blue.

B channel - gray



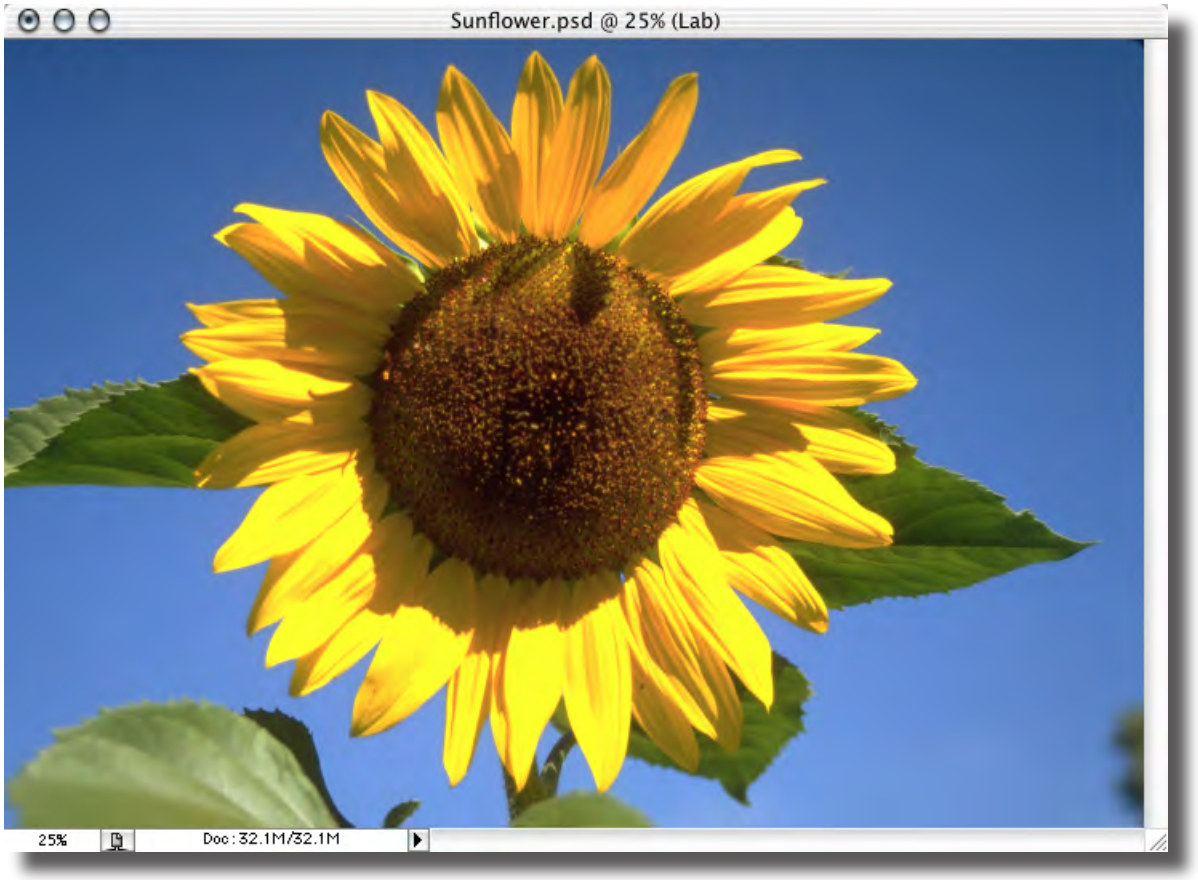
If we instead do this with the "B" channel, all the blue and yellow disappears and we are left with only the muted pink and green from the original color. Making the curve more vertical would increase the saturation and color intensity of yellow and blue. This image was fairly saturated in yellow and blue originally but we might still be able to correct for more color saturation in the blue sky...

B channel - Blue Saturation



Click for original

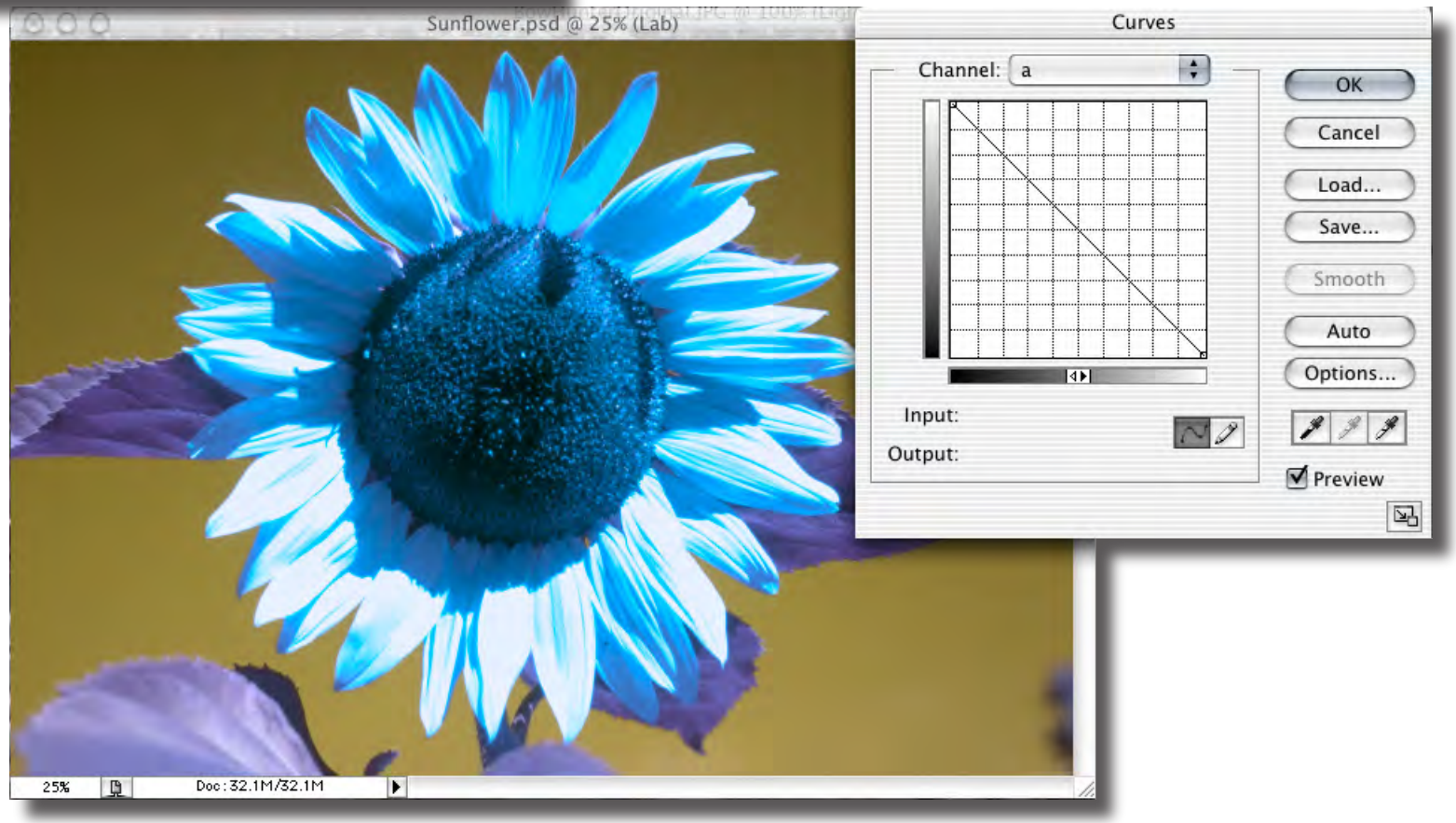
In the original image the blue sky lives in the bottom half of the curve. By moving that part of the curve to the right we can increase the saturation of the blue sky without affecting the other colors of the image. We don't have to worry about "clipping" black because there is nothing in the image that is that saturated. In general, we tend to edit in LAB using simple shapes for our curves like we have done here. Compare this version with the original...



Click back

While it may be tempting to increase the saturation in images by simple curve edits in LAB, its also very easy to over do it! LAB can hold colors that are out-of-gamut for normal human vision. Over-amp your colors and you could end up clipping color variation out of the picture and end up with flat Peter Max candy colored images.

Reversing A&B Channels



If we reverse the direction of the curve in both the A & B channels we can invert the colors without affecting the luminosity of the image. This is similar to, but much cleaner than, rotating the hue 180° in a Hue/Saturation adjustment layer and changing the apply mode to "Color" in an RGB image. Working the channels individually this way can get you some very effective color swapping effects.

LAB - what is it good for?

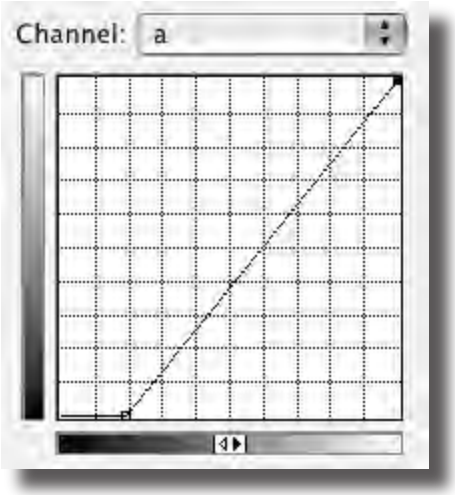
You may be thinking to yourself at this point that all this discussion of the LAB color space is well and good but... "what the heck do I use this for?"

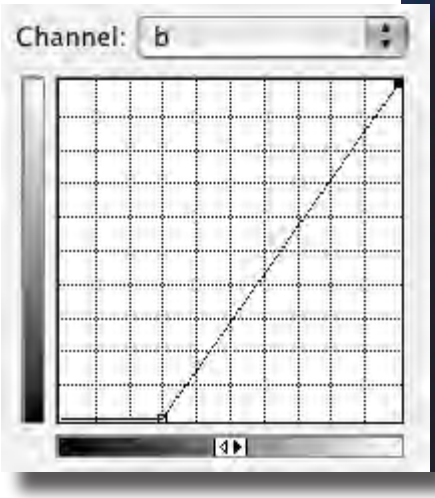
Well my brothers... LAB comes to the rescue quite often with severe color casts such as the one encountered here. The red/yellow dim tungsten lighting has sucked the color out of this daylight balanced shot. In RGB there is very little we can do to modify the overall color. There is a severe red cast – the green channel is very dark and the blue channel is almost nonexistent! When faced with this kind of challenge we start by converting into LAB: Image-> Mode-> Lab Color.

LAB - putting the color back

Pushing the black point in the A & B channels to the right has dramatically altered our color temperature. This simple move has revealed the blue in the woman's dress as well as the moonlit back yard beyond the tent canopy. This is not a simple color balance shift however because the color of the skin has remained as well as the wood parquet floor.

This may not be the best we can do with this image but its a good start – a return trip into RGB or CMYK followed by some more subtle curves can take us just about anywhere that we care to go. I encourage you to experiment with hopeless images this way to see just how far you can push them into shape.





Special Problems

LAB solutions for tricky situations

Here is a special problem that, at first, may not seem like a candidate for LAB corrections. I took this grab shot with a point & shoot digital camera on full-auto, jpeg mode. If I had been thinking I might have been able to get a better shot by activating the built-in flash. The lighting is terrible... the subject is in spotty shade and the colors are muted, the background distracting. This image is a challenge and normal techniques are just not going to give us much...

Click to first correction

Click to final version

LAB in 16 bits

Normally I'm not a big advocate of editing in 16 bit color space. For most images (99%) there just doesn't seem to be a particular benefit to pushing around 4x the amount of data. LAB edits , however, can be a bit coarse in that the grayscale steps can be pushed outside of normal limits very easily and changes can happen abruptly. Also simply converting into LAB causes you to loose 10-20 levels of info in each channel. If your image is weak to begin with (and if it isn't, you shouldn't be considering LAB edits) it can be a good idea to preserve as much info as possible.

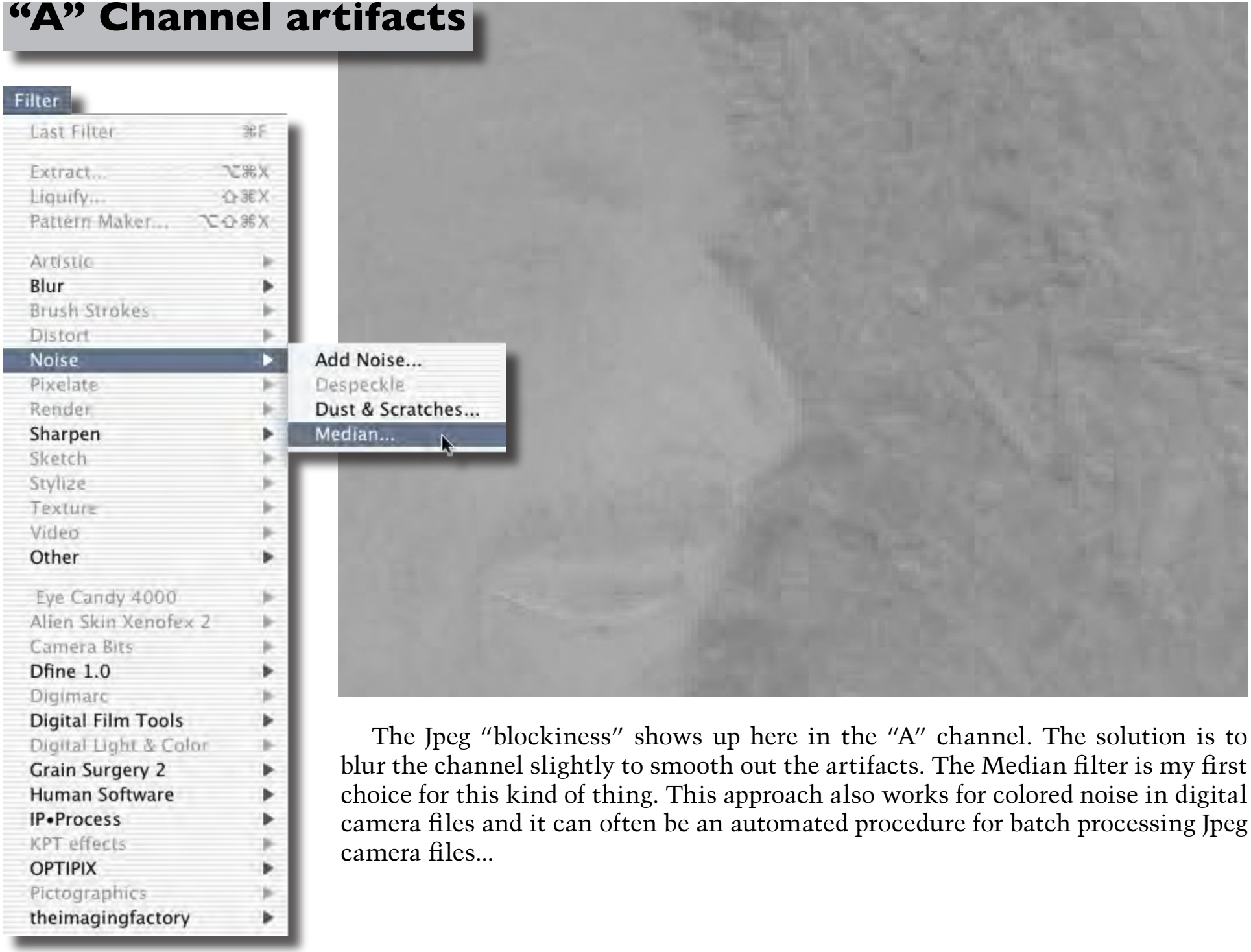
The Bow Hunter image has Jpeg artifacts throughout that can get amplified through some of the edits we are going to make - we have to minimize them. We're also going to be darkening and then lightening the image a considerable amount in part of our correction. These compound edits can cause some problems later so I think it could be wise to go into 16 bits for some of these moves.

Before converting to LAB, select: Image-> Mode -> 16 Bits/Channel. Then select: Image-> Mode-> Lab Color

Killing Jpeg artifacts

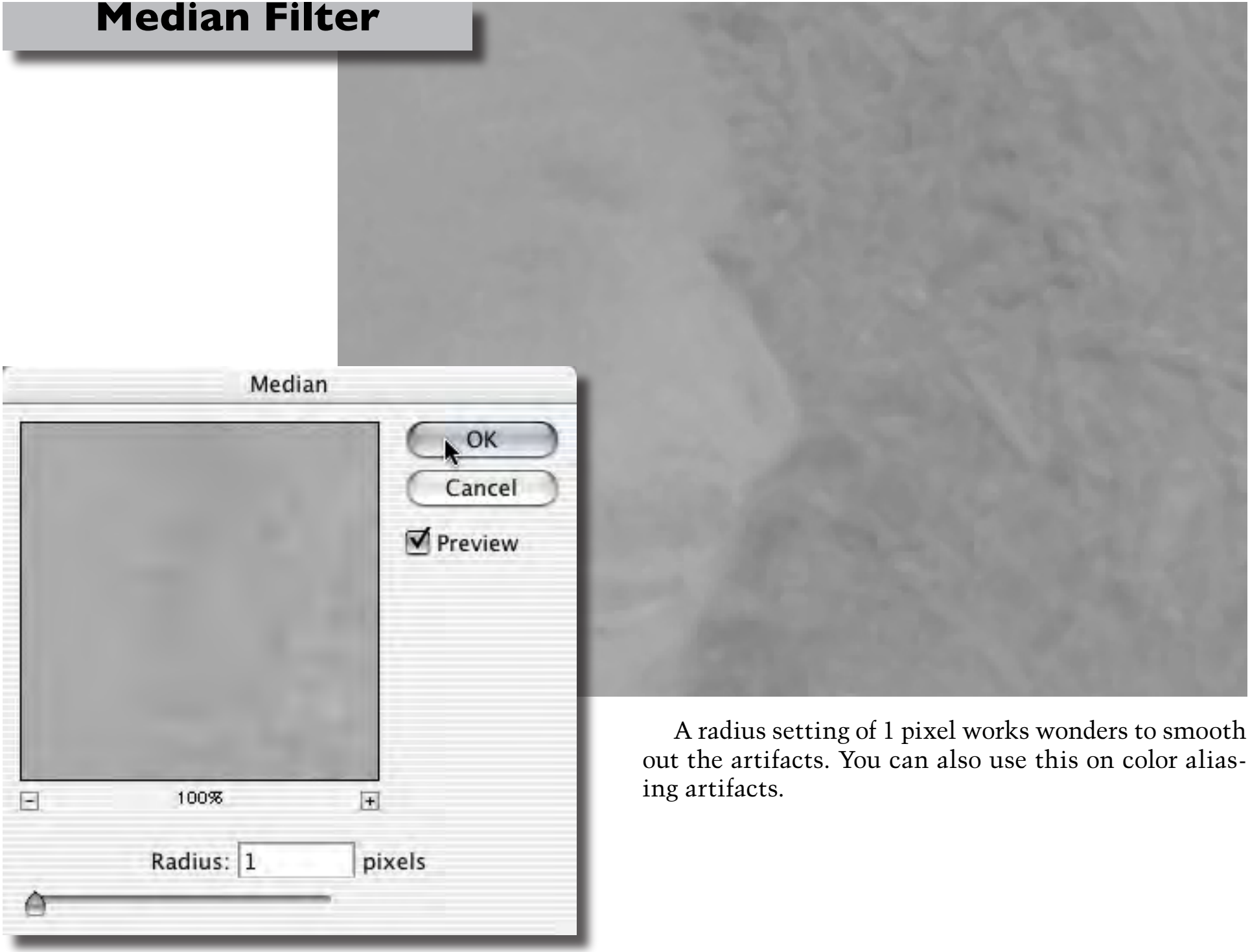
One of the curious features of LAB is that Jpeg artifacts are often not visible in the L channel but will show up in both the A and B channels. We cannot see any evidence of Jpeg blockiness here in the "L" channel...

“A” Channel artifacts



The Jpeg “blockiness” shows up here in the “A” channel. The solution is to blur the channel slightly to smooth out the artifacts. The Median filter is my first choice for this kind of thing. This approach also works for colored noise in digital camera files and it can often be an automated procedure for batch processing Jpeg camera files...

Median Filter

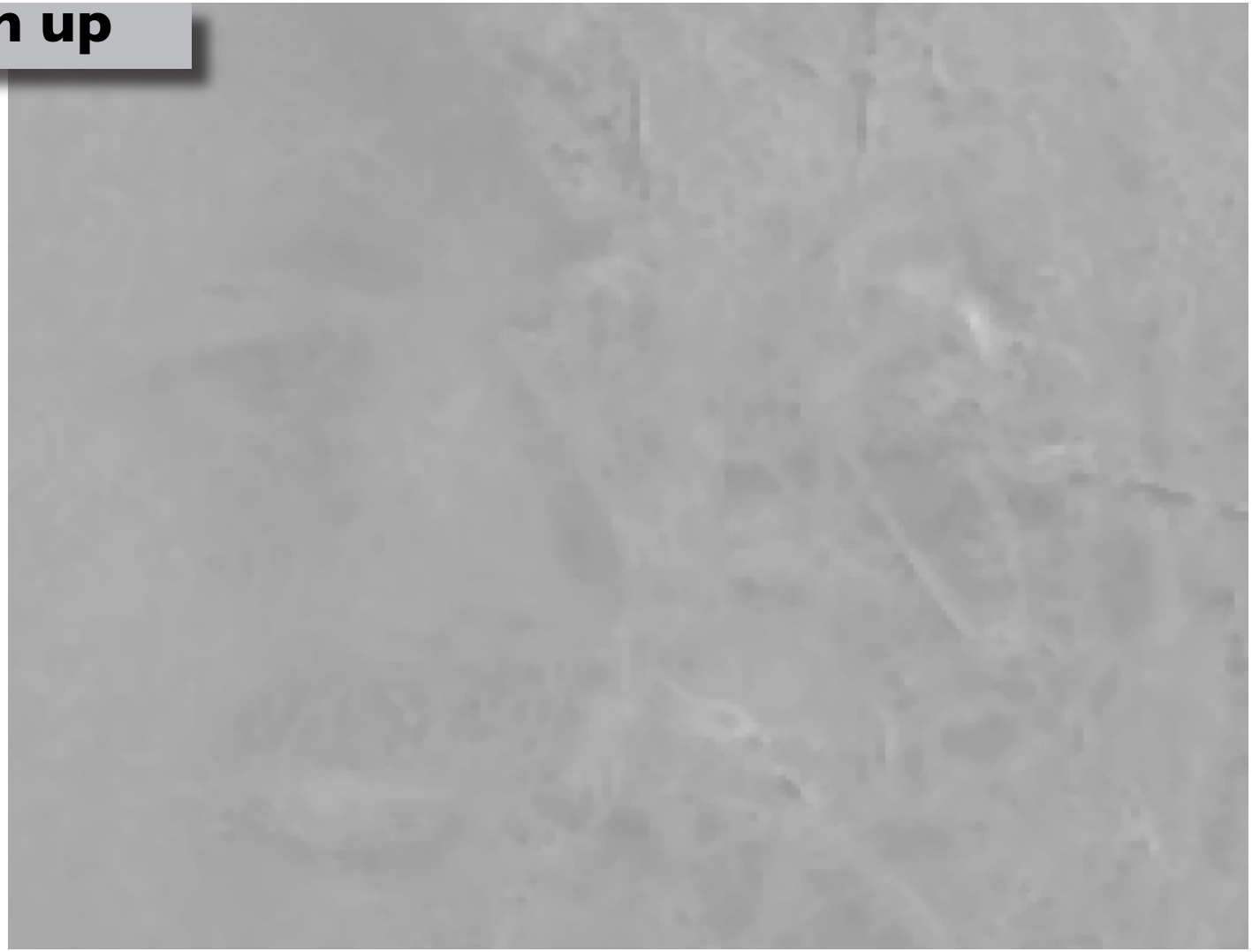


A radius setting of 1 pixel works wonders to smooth out the artifacts. You can also use this on color aliasing artifacts.

“B” Channel artifacts

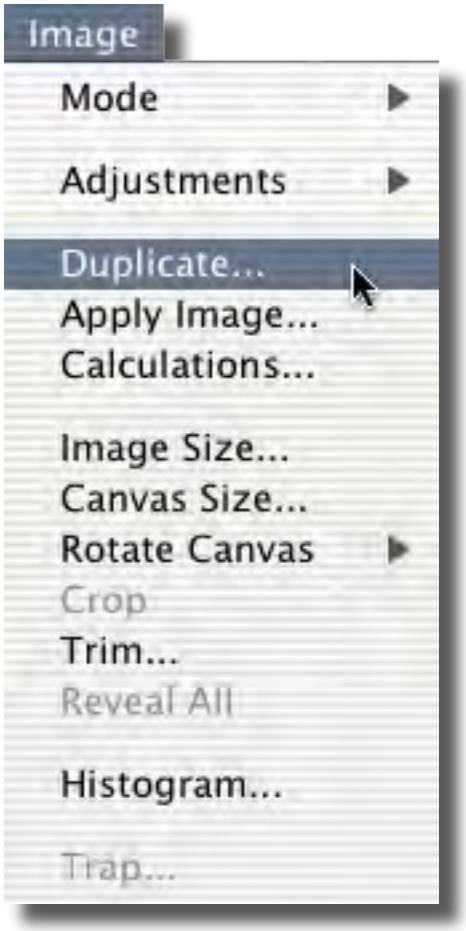
Again here in the “B” channel - nasty Jpeg artifacts.

Median Clean up



After blurring, they are not visible. There is another reason for minimizing these artifacts in the A & B channels besides simple cosmetic obsessiveness. Later on we are going to do some blending operations with this image utilizing these channels and it will be desirable to have them as smooth as possible.

Image Correction Strategy



OK... now that we've gotten some preliminary things out of the way, it is time to develop a correction strategy for our problem image. Start by stating the problem: This is a picture of a Bow Hunter wearing camouflage sitting in front of a forest background - he is blending in with the background! This may be exactly what he wants but it does not work for our picture. Our challenge is to try to separate him from the background, ideally, without having to do extensive masking. If I was to take this picture over I would use flash fill to over power the spotty lighting on his face and darken the leaves in the background.

I've told you that the key to this correction lies in LAB - let's look at the LAB channels and see if we can find a clue. Our salvation is in the "A" channel (seen above right). This channel has the face and arms of our hunter lighter than everything else in the image. Now if we could somehow apply that lightness in a way that separates him from the background we'd have a head start on our correction.

This is exactly what we are going to do. Our first step is to duplicate the image! We'll work on a duplicate, holding the original in reserve just in case we need to use something from the original in a layer in our correction. This is a good habit to get into especially when dealing with unusual corrections that may take far afield.

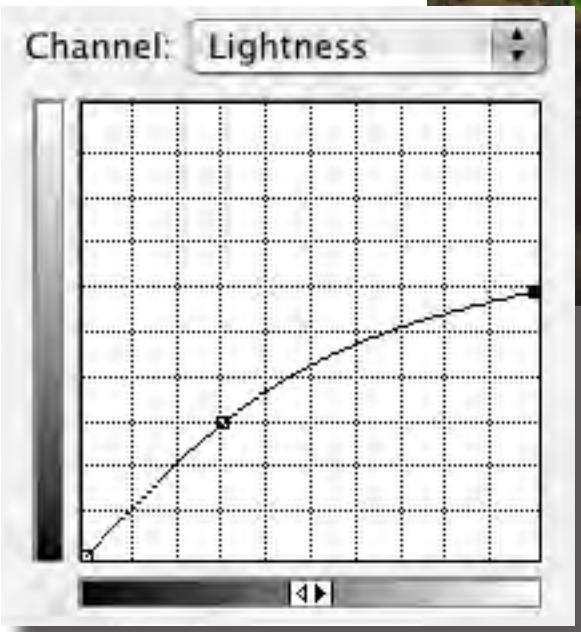
Select: Image-> Duplicate... and set the original aside...

Step One:

Make everything darker & flatter

Click to next correction

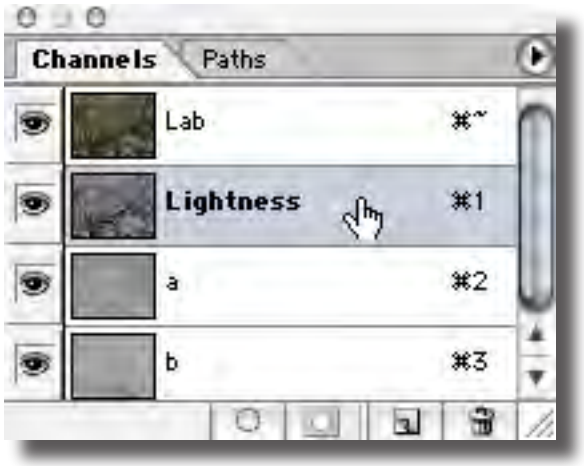
Click to original version



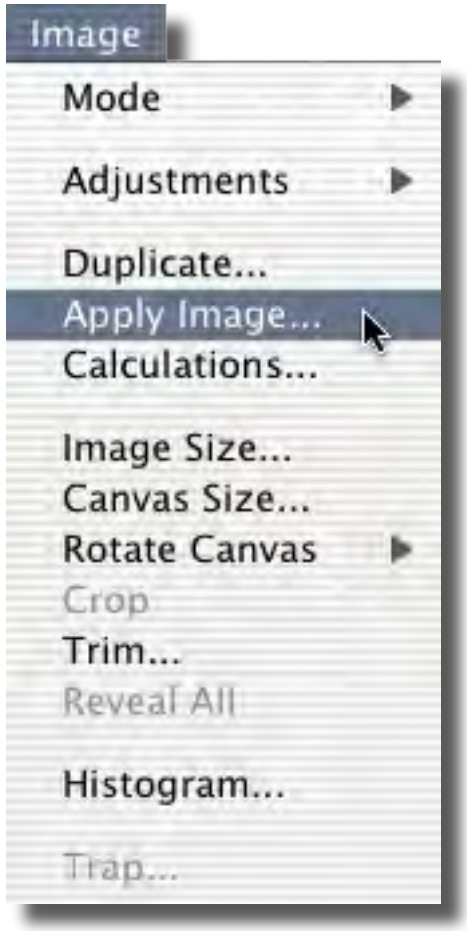
I want the background to get darker and more subdued so, for the first step, pull the white point in the "L" channel down and shape the curve for reduced contrast. The image seems very gray so, at this point, we'll increase saturation just a little by pushing the white point to the left and the black point to the right in the A & B channels by just a few points... The next steps require moves that are not available in 16 bits so we have to convert to 8 bits now.

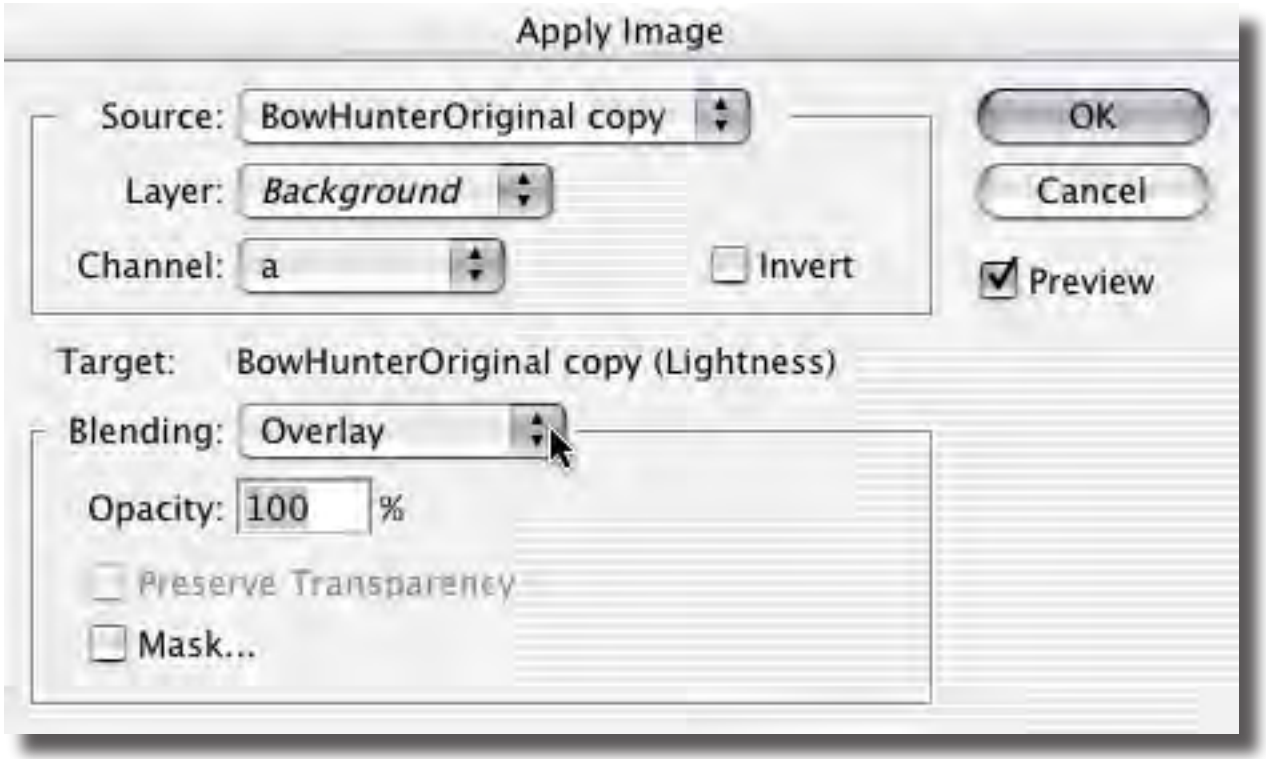
Select: Image-> Mode-> 8 Bits/Channel

Step Two:
Apply Image: A to Lightness



This next step is easier to do than explain! We are going to take advantage of one of Photoshop's little known but most powerful calculations. Select the "Lightness" channel in the Channels palette then select: Image-> Apply Image... The resulting dialog allows us to apply one channel against another using one of several apply modes. What interests us here is that the "A" channel has a face that is lighter and a background that is darker than medium gray. By using Overlay we can make the face lighter and the background darker in one step.





Apply Image has many uses. One of its advantages is that image calculations made this way are often better, cleaner and less prone to posterization than cranking curves on a channel directly. We are using image information to affect the image rather than artificially re-calculating pixels in some arbitrary way.

Apply A to Lightness

Click to next correction

Click to original version

The result after two applications of the "A" channel to the "L" channel in Overlay mode. The image could use a little more color variation/saturation so we will next apply the "A" channel to itself in Overlay mode this will increase the contrast in the "A" channel thus increasing saturation and color variation. Next we will do the same for the "B" channel - Apply Image: B to B in Overlay – increasing saturation in yellows and blues.

Step Three:

Apply Image: A to A & B to B

Click to next correction

Click to original version

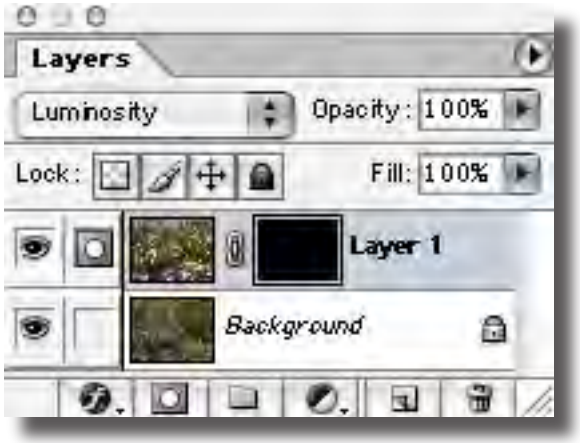
Before entering Apply Image again make sure that you target the A channel by selecting it in the Channels palette. Here is the image after applying A to A in Overlay mode at 25% and B to B in Overlay at 25%

Step Four:

Restore luminosity details

At this point some of the highlights in the face and elsewhere have lost their sparkle. Now is the time to retrieve these luminosity details from our original version. You could paint these in from an earlier history state but I feel its better to keep your options open for later on by using a layer here. Simply take your original copy and drag it into the new version while holding the shift key.

Make a black layer mask by clicking on the layer mask icon while holding the option/Alt key. Change the layer apply mode to Luminosity and selectively paint back highlight details in the nose, mouth, hands and some of the highlights on the leaves and pants. These little details make all the difference.



We can do a little more fine tuning with the dodge and burn tools will we're at this point in our project.

Step Five:

Dodge & Burn in the Lightness Channel

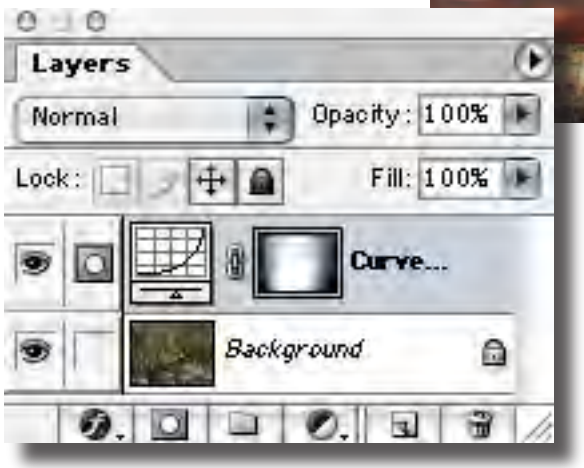
This step is not strictly necessary – I'm just including it here to illustrate an additional LAB technique. If you flatten the image now you can add a few subtle highlight and shadow details by using the Dodge and Burn Tools in the "Lightness" channel. Target the "L" channel by selecting it in the Channels palette. You can then use the Dodge and Burn tools to add a little more contrast into areas of interest. In this example I've added some shape to the hair at his temples and chin.

Step Six:

Convert to RGB and final curves

Click to next correction

Click to original version



After doing all this it is finally time to return to RGB. Select: Image-> Mode-> RGB. Now place a Curves Adjustment layer to brighten things up just a little and hit target white point-black point values. OK... Almost done! Look at this image a bit and try to imagine what would make it even better...

Step Seven:

Sharpen subject and Blur Background

While its easy to get excited about how far we've come, once we look at this image carefully, we can see that the actual focus of the camera seems to be towards the back. We have to admit that it would really help if the subject was sharper than the background!

We've scrupulously avoided using selections or masks in our corrections so far but now there's just no avoiding it. We have to make a selection around the figure in order to apply sharpening selectively. In addition we will need to additional tricks to get a blur to happen correctly on the background.

The rest of this tutorial is fairly straightforward, we no longer need LAB tricks and we are on familiar ground with RGB. This last finishing touch however, can separate the men and women from the girls and boys!

Click to see final effect

Make Selection

Cmd/option click

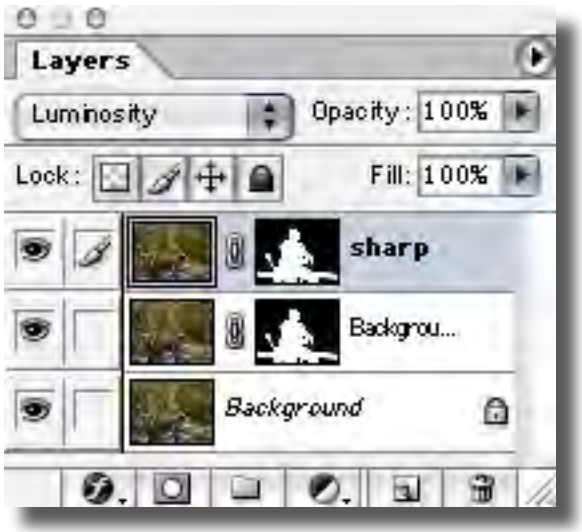
There are a couple of different ways to make this selection – I choose to use a path drawn with the Pen Tool. I've supplied this path on the sample along with a finished alpha channel that you can use if you'd rather skip the practice. At any rate, activate the selection by Cmd/option clicking the alpha channel - now copy the background into a new layer and...

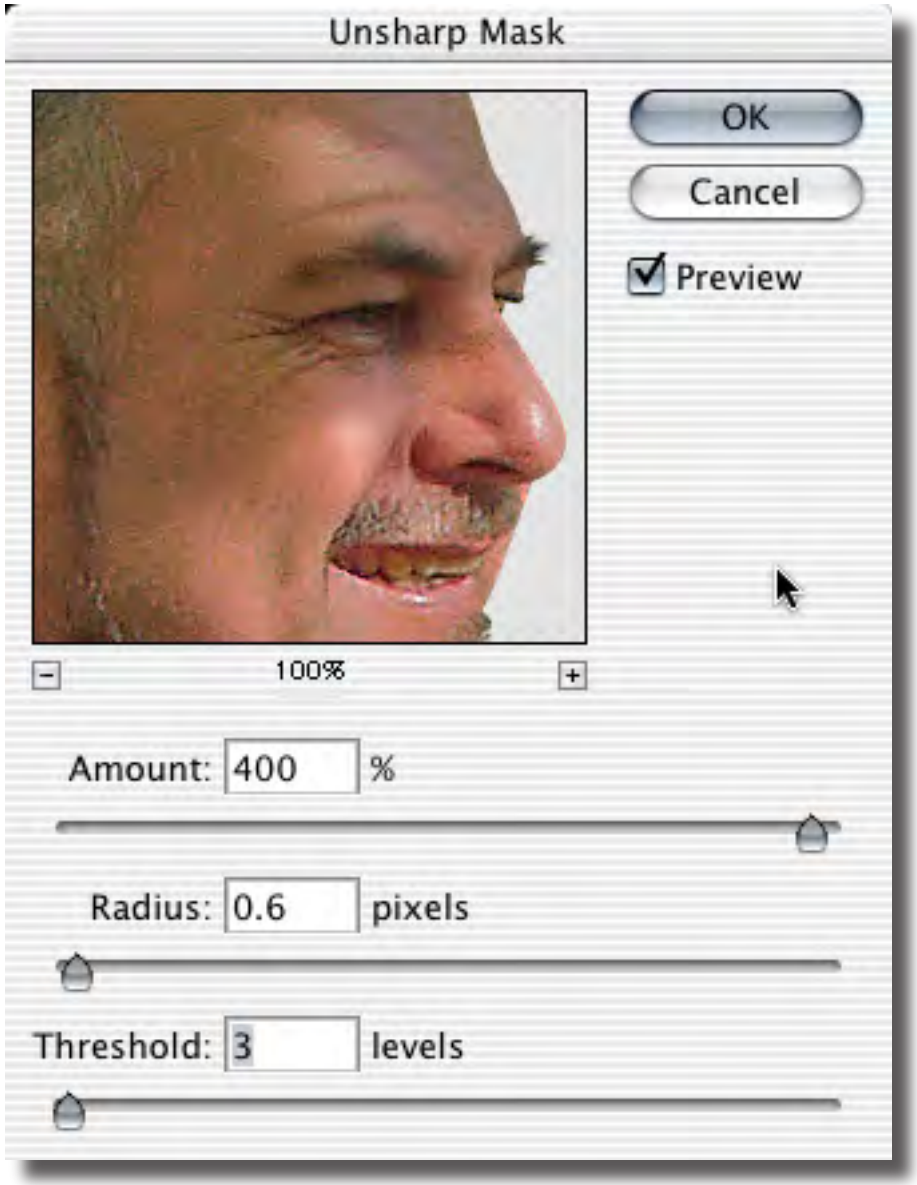
Make Layers & Sharpen

...click on the Layer Mask icon to save the selection into the layer mask. Now copy this layer to make a 2nd duplicate – change the apply mode to Luminosity. You are now ready to apply unsharp mask.

I used the settings shown here you can modify this to suit your output conditions. The idea here is that the luminosity apply layer eliminates the possibility of colored halos that would make the sharpening look more artificial.

The next step will to blur the background but before we run the Gaussian Blur filter there is one more trick to insure a realistic effect...



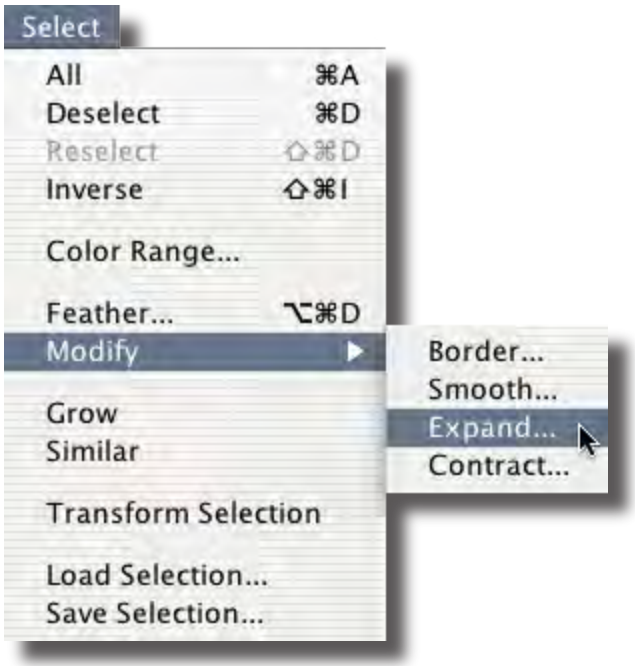


Clone into Edge

If we simply run the Blur now the edge of the figure will blur out behind the sharp figure giving a sort of blur halo that could ruin the effect we're after.

To make this work better, target the background by clicking on its thumbnail in the Layers palette. Then load the selection from the alpha channel again – Cmd/option click on the Alpha thumbnail in the channels palette. Select: Select-> Modify-> Expand... and expand the selection by 2 pixels.

Now Clone background into the edge of the selected area – its easier if you turn off the visibility of the upper layers. We want to get the background underneath the subject edge so that when we blur the background there won't be that telltale blur halo to give away the trick!



Proper Focus Restored

Run the Gaussian Blur filter over the background until you get the desired depth of field effect. Now the Bow Hunter really separates from the background.

Click to see previous

Final Version

Click to previous version

Click to original version

Here is the final version. I added a slight skylight rim at his shoulder by painting a light blue into an overlay layer – you can see my final layers to the left. To finish off, I add an Overlay noise layer that gives a consistent surface for the blurred and sharp areas.

A number of techniques combined to make a silk purse out of a sows ear! As they say, there are no bad originals only bad Photoshop users...

Conclusion

Congratulations... if you managed to follow along you've learned some very sophisticated Photoshop techniques for resurrecting dead-on-arrival originals including:

- Adding saturation with steeper A & B curves in LAB
- De-saturating by flattening A & B curves
- Minimizing Jpeg artifacts by blurring A & B channels
- Fixing radical color casts with simple LAB curves
- Using Apply Image to adjust image contrast and color
- Dodging and Burning in the Lightness channel
- Separating subject and background through sharpening/blurring

You've also gained an understanding of the nature of LAB color space and perhaps seen how some of these techniques can apply to your own work. The real work begins now as you start to apply these techniques and hopefully invent some of your own. If this seems way too complicated be patient – return to this tutorial later and work through it again. Many things require more than one exposure before they sink in.

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/main.html

http://www.ledet.com/margulis/articles.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:

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best regards, Lee Varis 2003