

## Fun with Photoshop

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Image editing software is making it possible for us as microscopists to digitally prepare our micrographs for output as working prints, figures for journals, slides, inclusion in reports, or as files for transmission via the Internet or World Wide Web. In the course of becoming familiar with various software applications, I decided to have some fun colorizing and recombining some scanning electron micrographs. While this kind of frivolity has no place in the presentation of scientific data, learning to manipulate images in this silly way serves two purposes; both to bring humor into the steep learning curve, and to highlight the sobering fact that you can no longer believe what you see in print. Although we would all hate to admit it, there may be unscrupulous scientists in our midst, tempted to alter visual data to suit their needs. Having said that, let me now show you one way it can be done...!

First, open Photoshop 3.0 or 4.0. I am presuming that you know your way around Photoshop, somewhat. **Open** each of the image files you will use for the composite picture (i.e., Figure 1).

Prepare the image by **cropping, rotating, or flipping**, as necessary. Adjust the **levels** and **contrast and brightness** as needed (covered in next month's article). Paint your images as your imagination dictates. Experiment; different tools give different results. Be creative (i.e., Figure 2)! Save your images with new names along the way (**Save As...**) so that you can go back to previous versions, if desired.

Now you need to select the portion of one image that you want to move onto the other. Selections can be made in several ways; with the **magic wand** or with **Select → Color Range**, both of which are selected by color; by tracing with the **lasso tool**; or by using the **paths tool** which can give smoother curves if you are already familiar with it from Adobe Illustrator. Remember to double-click on the tool to show the **options palette** to help refine your tool.

After you have made your selection, click on the **Move Tool** and drag the selection to the destination image. Another option is to copy the selection to the clipboard with **Edit → Copy**, then click on the destination image to activate it and use **Edit → Paste** to bring over the selection from the clipboard. This is now a **floating selection**, and can be dragged around with the **Move tool**. Position it where you want it, then either paste it down (if you are sure) by deselecting it, or keep it as its own layer by dragging the floating selection to the little folded paper icon at the bottom of the **Layers** palette in 3.0. It should remain as its own layer in 4.0. As a layer it can be further moved and manipulated. Be sure the **Preserve Transparency** box remains checked in the **Layers** palette. Each layer or the background can be turned off by clicking on the eyeball next to it in the palette, or layers can be thrown away by dragging to the trash can at the bottom of the **Layers** palette.

Was it the wrong size? Resize the selection with **Image → Image Size** (i.e., Figure 3). Experiment with **Image → Flip**, **Image → Rotate**, and **Image → Effects → Scale, Skew, Perspective, or Distort**. You can further refine the illusion by adding shadows and adjusting lighting angles. Photoshop 4.0 comes with quite a few special effects, which are also available as plug-ins for Photoshop 3.0.

When the image is as you like it, **save** it, either in the **.psd** Photoshop format, which preserves the layers, or **Flatten** it by clicking on the right-pointing arrow in the **Layers** palette and selecting **Flatten** from the popout menu, then **Save as a TIFF or JPEG** file.

Here is an example of an image on which I spent a little more time (i.e., Figure 4). In the original image there were two girls sitting in front of my Hitachi S-800 FESEM, with an insect on the CRTs. For the final image I had to completely remove one child, move her chair, clone parts of the SEM stage (giving it more knobs and meters than it really has), add the pseudocolored insect (a native Hawaiian bug), give him a shadow, and put an image of my daughter on the screens of the SEM. The whole effort took far more time than I'd like to admit, and a lot of RAM.

In future articles I will address techniques of legitimate

interest to microscopists. I have prepared a step-by-step tutorial designed to get you through the very basics of opening an image file, making corrections to it, adding arrows, labels, and a magnification bar, followed by page layout, all with Photoshop. In an effort to provide more detail, I am working on a manuscript for a handbook tentatively titled "Photoshop Distilled: Tips on Black and White Image Adjustment and Layout for Scientists". I would appreciate any comments, criticisms, or contributions! I can be reached by e-mail at: [tina@pbrc.hawaii.edu](mailto:tina@pbrc.hawaii.edu).

For more examples of pseudocolored SEMs, visit my web site at <http://www.pbrc.hawaii.edu/bemf/microangela>.

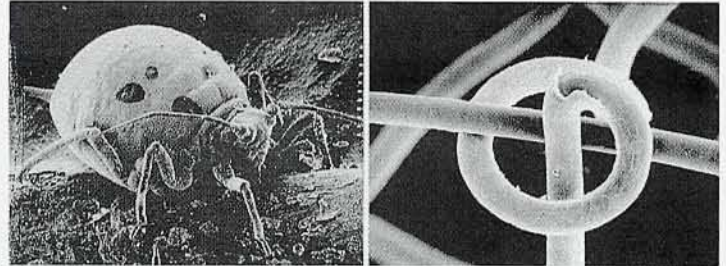


Figure 1



Figure 2



Figure 3



Figure 4

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