# Colorizing the Prokudin-Gorsky photo collection

Erik G. Learned-Miller

January 24, 2011

In this assignment you need to use MATLAB to colorize the digitized Prokudin-Gorsky images with as few visual artifacts as possible. A few of the Prokudin-Gorsky images can be found at this web site:
http://www.cs.umass.edu/ elm/Teaching/Images/Prokudin/.

Each image looks something like the one shown in Figure 1.
The process contains the following parts:

1. Use MATLAB to cut each "triple" in three images, each of which contains a color channel (red/blue/green, although not necessarily in that order),

2. You will be combining these images in various orders to form a color image in Matlab. Matlab will interpret whichever image is first in the triple to be the red channel. The second image will be assumed to be the green channel. The third is the blue. Thus, you may need to try different orderings of the image to get it right.

3. You will need to shift the second and third images relative to the first. This can be done using the circshift function. If you look carefully at the composite images after each shift, you can predict which shifts will be necessary to make the images look good.

In this assignment we will assume that a simple x,y translation model is sufficient for proper alignment. The resulting color images will inevitably exhibit some artifacts due to color fading, blemishes on the glass plates, noise, etc. In later assignments, we will explore ways of aligning the images automatically.
You will need to turn in two things.

1. For a SINGLE IMAGE, turn in the sequence of MATLAB commands used to make the composite for this image. This sequence of commands should work assuming the original images are in the same directory as the code, and that the image has the same name that it had on the original web page.

2. I want you to send the TA (or me, if there is no TA) the final composites for any two of the images in the data directory. Email the final images and the sequence of matlab commands (in a text file) with a subject line of "CS370 Assignment 2". Check the course web page for the due date.

Figure 1: **Prokudin-Gorsky "triple".** This image shows an example of a triple of images taken by photographer Prokudin-Gorsky. Each image was taken with a different filter, one with red, one with blue, and one with green, although not necessarily in that order.