SHADOW AND LIGHT
working with photographs in pyrography projects

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derringer pattern included
INTRODUCTION

As pyrographers we often use photographs as the bases for our wood burning projects. Home photos of family and friends, a landscape photo of an old hip roof barn, and pets playing with their favorite toy are all possibilities for a realistic, finely shaded pyro burn.

Today’s digital cameras makes using photographs even easier as your image can quickly be uploaded to your home computer for instant printing.

Although a photograph accurately captures the scene or still life our eye does not necessary see what that photo truly caught.

During this tutorial we will look at how the human eye sees, how the brain interrupts the information from the eye, how color and gray scale effect visual impact, and how you can learn to use this knowledge to create strong, bold, realistic pyrography images.

First Impressions

In the photo, top right, the brightly colored silk daisies grab the attention in the photo and are complimented by the ruby red base to the antique oil lamp. Shades of golden yellow are found in the dried leaves, left, the golden orange background daisy, and in the oak basket. Mossy green flows through the central elements of the dried leaves, upper oil lamp base, and in the silk leaves in the basket. Overall this still life has a nice triangular layout with bold dark shadows along the floor of the elements.

It seems a perfect photo for the bases of a pyro project until you gray scale the image. Suddenly those bright orange and yellow flowers seem to disappear into the background area, What appeared to be a bright highlighted area on the oak basket is a dull mid-tone value. There are almost no white highlights.

The flowers on the floor of the still life have little definition between one flower and another as all have taken one the same tonal value. This is also occurs in the basket flowers.

As you work through this tutorial you will discover why this bright, colorful still life is not suitable as a sepia toned pyrography painting.
A VERY SIMPLE DRAWING

As you look at the photo and colored pencil drawing to the left you may see a common tomato, unremarkable, and not something that you might chose as the bases for your next pyro project. Yet, this simple tomato holds a fast amount of information on how your eye sees an object, how light effects the tonal value of that object, and how color and shadow interact to create an image.

As we work through this tutorial you will explore the differences between color and tonal value; direct and reflected light, cast and reflected shadows; and how to put those aspects to use in your wood burning.

This tutorial will focus on the colors, gray scale tones, and sepia tones found in photographs and colors.

TERMINOLOGY

Cast shadow - a shadow created because an object blocks the area from the light source

Contour - the curvature of a shape

Gray scale - a tonal value scale worked from white to black

Highlight - an area of direct sunlight

Hue - pure color, as red or blue

Primary color - red, blue, and yellow; colors that can not be created by mixing other colors

Profile - the outline of a shape

Reflected light - a highlight created from light that has bounced off on another surface onto the main object

Reflected shadow - a shadow that has bounced off one surface onto the main object

Secondary colors - colors created by mixing two equal parts of two primary colors

Sepia scale - a tonal value scale worked in shades of brown

Tertiary colors - colors created by mixing three parts of two primary colors

Tonal value - the amount of white, black, or gray contained in a color tone

Tones - a color with white, black, or gray added
VARIATIONS OF AN IMAGE

In pyrography we often work with colored photographs or images. Yet we burn in shades of brown to black. By gray scaling your photo you can remove all of the color information, creating a working image that matches your pyro palette. In this sample I have converted the original color drawing into a gray scale and sepia image.

COLOR GROUPS

Pure colors are called hues and contain neither black nor white. Hues are defined by three categories - primary colors, secondary colors, and tertiary colors.

Primary colors are those colors that can not be created by mixing other colors; they are the base colors of cadmium red medium, ultramarine blue, and cadmium yellow medium.

Secondary colors are created by mixing equal amounts of two primary colors and are cadmium orange, verde green, and dioxide purple. To further increase your color range you can create tertiary colors by mixing two parts of one primary with one part of another which results in yellow oranges, blue greens, and violet reds.

Mixing all three primary colors create our shading colors of brown and brown gray.

TONAL VALUE SCALES

Removing the color from an image converts the image to a gray tonal value scale. Tonal values are the amount of white or black that any area of your photo has. For pyrography the value range from white to black translates into highlights and shadows the establish the contour of an element, the shadow it casts, and its distance from other elements in the pattern.

Most computer graphics or photo editing programs will allow you to gray scale an image. Many also feature a sepia or vintage command that will create a brown toned photo.

In pyrography the amount of white or black in a color is created through tonal value burns. After the burn is complete pure color can be applied over the pyro tonal value work to create pale toned pastels to dark jewel tone colors.

The number of tonal values that you will use in creating a tonal value scale is usually limited to 6 to 12. This range allows for white, black, and middle gray will a few values on either side of the mid-tone.
HIGHLIGHTS - WHITE TONED VALUES

Highlights are created when the light source directly strikes the element, creating a pure white area or spot. This tomato has three strong highlights - one on the left side of the tomato body, one on the upper middle of the tomato, and one along the left side of the stem.

In all three of these areas the light overpowers the color of the element. In pyrography highlights are created by leaving that area of the design un-burned, allowing the color of the burning media to show.

REFLECTED HIGHLIGHTS

Where the highlights fall in your photo establishes where your light source lies. In our sample note that all three highlights are on the upper left side of the tomato. This places the light source coming from the upper left corner of the image.

A reflected highlight is created when the light bounces off a surface to fall upon your element. There are two examples of reflected highlights in the tomato drawing.

The highlight on the middle left of the tomato body is created when the light hits the table surface and bounces onto the tomato body.

A second reflected highlight lies on the shadow side of the tomato where the light again bounces off the table onto the tomato. Note that this second highlight rings the dark area on lower right of the tomato. The light has struck the table beyond the cast shadow of the tomato then bounced back onto the tomato, creating a highlight halo.

Reflected highlights are not as strong or pure white as direct highlights.
CAST SHADOWS

Shadows are created when one element or one area of an element blocks the light source from reaching another area or element in the design. In this drawing the stem of the tomato blocks the light from reaching the lobe of the tomato directly to the right of the stem.

The body of the tomato blocks the light from reaching the table surface on the right side of the tomato.

REFLECTED SHADOWS

Shadows can bounce off the surrounding surfaces onto another area or element just as highlights can. For our tomato the dark cast shadow that the tomato creates on the table has bounced back from the table’s glossy surface onto the lower right section of the tomato body.

CONTOUR TONAL VALUES

Light emanates from its source as a cone, not as a straight line. This creates a graduated tonal value across the surface of your element, with lighter tones closer to the direct highlight point and darker tones as the light moves away from that highlight point. The contour tones of an element only become black when the element has curved completely out of the reach of the light source.
REPEATED TONAL VALUES

A shade of tonal value will be repeated several times throughout any image or photograph. In the tomato drawing three areas that been marked that all share the same tonal value. Each of these areas would receive the same pyrography burning to keep the tones equal.

BLACK AND WHITE CONTRAST

Placing one or two areas of the extreme tonal values next to each other gives the eye a place to compare the darkest and palest tones.

The brightest highlight on this tomato lies in the upper left and is adjacent to the blackest tone of the drawing, found in the background area. These two tonal value areas set the whitest and darkest tones of your tonal value scale.

ADJACENT MID-TONE VALUES

In any gray scaled photo you will discover adjacent areas in two different elements that have the same tonal value. In these areas the defining line between the two elements seems to disappear. In our sample there are three areas where the body of the tomato and either the table surface or background share the same tonal value.
HOW THE BRAIN SEES AN IMAGE

Notice that I did not say how the eye sees an image. The eye receives information about an image or photo in two distinct manners, it is only when those two pieces of information are combined by the brain do we see an image. So where the eye gathers information it is the brain that interrupts that information into one image.

Inside of the eye are two receptors - the cones and rods. The cones of the eye gather information about color, it determines if an objects is red, yellow, or blue. The rods, the second eye receptor, evaluates the amount of light each area is receiving; the rods create the gray scale tonal values that we use in pyrography.

Our sample photo for this section is a wooden hill just after sunrise.

COLOR RECEPTORS - CONES

The sample photo has been altered to remove as much shading as possible while emphasizing the color hue of each area. The gray green leaves of the forest are now broken into areas of yellow, yellow green, deep green, and blue. The tree trunks show greens, reds, and yellows.

You can see the colors contained in light when you view a rainbow created through a prism, called a spectrum. Each color in the spectrum has its own specific wave length. When light strikes an object most of those color waves are absorbed by the object. Those that are not absorbed bounce off the object to be received by our eye.

So the color of any object and therefore the color that our eye cones receive are the light wave lengths that the object rejects. We don’t see green leaves, we see the green light waves that have bounced off of the leaves.

SEPIA OR GRAY SCALE RECEPTORS - RODS

What the tonal value receptors, the rods, see is equivalent to a sepia or black and white photo. Rods record the amount of light an area is receiving - whether it is in pure highlight or the darkest shadows.
COMBINING THE CONES AND RODS IMAGES

The brain combines the information sent by the cones and rods to create one image that has color hues and tonal values.

In the photo sample, left, the color image has been superimposed over the sepia tonal value image, exactly as the brain compiles the information it receives. The resulting photo is an excellent copy of the original camera photograph.

The eye’s and brain’s two step process that creates one image is the very process that we use as pyrographers.

First the rod’s gray scale image is burned using a wide range of tonal values to establish contour, shape, and shadows.

When the pyro work is complete a transparent coloring agent as watercolors can be applied over the design.

The combined steps - tonal value work and color work - create one realistic, brightly colored image.
COLOR IMPACT VS TONAL VALUE STRENGTH

Let's look at this brightly colored still life photo and its gray scale image to explore how the hues and tonal values can deceive the eye.

As in the sample photo on page 2 the color photo appears to be a prime image for a pyro burning but once gray scaled loses its visual impact.

The vivid hues of orange and red in the flower petals is the only true hue or color in the photo and therefore has the strongest visual impact.

The flower petals contain a small amount of pure yellow, and an equal amount of pure orange and red hue. Pure hues have the same mid-tone value. So when the photo is gray scaled the petals lose their individuality that was dependent on color.

The background and glass bottle are pastel tones that have large amounts of white added to their colors - true hues as in the flowers are stronger than pastel toned colors as shown in the glass bottles.

The basket, leaves, flower centers, and cinnamon sticks are all neutral toned colors as each contain some amount of gray or brown. True hues are stronger in impact than neutral colored elements.

When that same photo is gray scaled and the orange and red hues removed those same flowers now become a mid-tone gray. They have no more strength than the pastel (pale tonal value) glass bottles or the neutral (mid-toned) basket or leaves.

The strong visual line created by the orange red hues in the flowers is lost when gray scaled. The mid-tones of the flower petals shares the same mid-tones as the shadows under the still life and the left side of the basket.

In fact the background elements of the two glass bottles becomes the strongest visual elements in the image. These bottles hold the three of the four pure white highlight areas in the entire image, bringing your eye to the back of the still life.
PLANNING FOR A WIDE VALUE RANGE

For our final photo sample I have laid my arrangement on the table with my focus on tonal value instead of hue. I chose silk flowers that had strong amount of wither black or white to add to the arrangement.

The addition of a few pure white flowers in both the foreground arrangement and in the basket adds highlight tonal value to the final photo.

A few dark red flowers were also added to the basket. Since dark red is created using pure red hue and black I know that these flowers will have a dark tonal value.

I have removed the pale pastel bottles in the background and placed the oil lamp with the colored base. The glass globe still places some transparent glass in the final image but as the base of the lamp is color toned so that this area in the arrangement will take on a mid-tone value.

The gray scale image has a nice balance of white, mid-grays, and black tonal values. The brightest areas of the gray scale photo are now in the white foreground petals instead of in the background glass elements. The black tones under the flowers and between the floor arrangement and basket are stronger because there are more strong areas of white with which to contrast.

In the original arrangement the strongest asset was the diagonal line of bright orange flowers. In the new arrangement color photo that line is not as strong with the addition of new flower colors - the dark burgundy and pure white flowers break the orange line.

Yet the gray scale photo has a strong diagonal line in the same position. This new line has extra strength because the flowers now create a gray scale - working from pale tones to the lower left, mid-tones at the center oil lamp, and dark tones in the basket.
PRACTICE PATTERN

The still life for this tutorial features a Philadelphia derringer, three vintage books, and a pipe stand with two long stem briar pipes.

The shadows and highlights are strong in this sepia toned photo as the still life was taken with one light source set to the upper right hand side of the arrangement.

A full range of tonal values are used within the image from pure white highlights through solid black tones.

The still life was created using objects that all had a neutral color hue - walnut brown in the gun stock, brown metal in the gun barrel, dark brown in the book covers, beige in the book pages, rose brown in the pipes.

CREATING YOUR OWN STILL LIFE ARRANGEMENTS

1. Select a neutral mid-toned background. A tablecloth, bed sheet, or roll of craft paper works excellently.

2. Set up one lamp with a fluorescent bulb as your light source. Turn off any other lights in the room and close the window curtains.

3. For your first still life arrangements chose elements that share the same color - all red elements or all blue elements. Working with just one color can guide you in recognizing the color tones as tonal values.

4. Place the arrangement away from the background cloth or paper to create air space for the cast shadows.

5. Take several photos of each arrangement from different angles. You may discover that one angle shows stronger shadows than another.
MAPPING YOUR PHOTO

Before you begin your pyro project print an extra copy of the image. Take time to carefully review the image, circling each area of tonal value interests.

1 Areas of bright white highlight
2 Cast shadows
3 Graduated tonal values that show contour
4 Repeated tonal values
5 Equal tonal values in adjacent elements
6 White and black contrast

The gray scale shown on the right of the photo was created by copying and pasting small areas directly from the photograph.
Philadelphia Derringer Pyrography Project from the Great Book of Wood Burning
by L. S. Irish, available at Amazon.com
PRACTICE PHOTO

This still life photograph can be used to explore tonal values, highlights, shadows and contour shading in a design. This particular still life contains neither reflected highlights or reflected shadows since the floor surface and background materials have a matte, non-glossy, finish.
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