Light, Texture, Quality, Direction

The texture of an illuminated surface will change our impression of the color quality of surface color. Surfaces with a smooth texture will appear more saturated. In addition, the specular light reflected will be of the same color as the light source.

The quality of light, be it soft or hard, influences our impression of color saturation. Hard light sources create colors brighter and more saturated due to the greater contrast. The direction of the light source relative to the viewer has an influence on brightness and color saturation. Color saturation is greater when light strikes an object or subject from the front.

Judgement of both color and contrast are readily influenced by the size of the picture we are viewing and prevailing lighting conditions. This includes such variables as ambient light levels, the color of the foreground with respect to the background colors and the color and brightness of nearby objects.

Color and Depth

Careful observance over time of the nature of light and how it affects what it illuminates has led to some conclusions. Artists discovered that "warm" colors tend to move towards the viewer and "cool" colors to recede. From this observation came the realization each color has a relative distance when viewed in relation to other colors within a picture. This is known as chromatic stereoscopy.

Simply stated, chromatic stereoscopy aids in creation of the illusion of solidity and depth within a two-dimensional medium. Warm colors within a frame tend to appear smaller than their cool colored counterparts, which appear larger and more distant. This principle is fundamental to creating pictures which appear to have three dimensions where there are only two. Well-crafted pictures make use of this technique to draw your eyes into the picture where they will then explore the frame. Your centre of focus will go from near to far and then your eyes will travel around the frame, eventually landing at the main centre of interest.

Careful framing is an adjunct that further enhances the effect of color used effectively to create depth. It is possible, with the careful use of color, to create the impression that some planes in a picture are more distant than others. This can be accomplished without other visual clues that would be typically used, such as lines of perspective.

There is another basic principle called the Law of Thirds. It also makes use of stereoscopic vision, and is the same regardless of the medium used to record a picture.

If you take a frame and divide it into nine equal parts you will end up with nine squares; each will have a point where it intersects with its neighbour. If you place a point of interest you want the viewer's eye drawn to on any of those intersections, the eye will be immediately drawn to it. If you carefully combine several elements like color, brightness and tone together you can effectively draw the viewers attention to exactly where you want it, and away from areas where you don't want their interest diverted.

Color Detail and its Relation to Distance

As pointed out earlier, the eye has a limited ability to detect fine color detail because of the shortcoming of the rods. The rods are blind to color except for the blue portion of the spectrum. Visual acuity, or the ability to resolve fine detail, varies as a function of hue or color. We have greater visual acuity in the orange-cyan region than in the green-magenta portion of the spectrum. In addition to this, the eye is plagued by chromatic aberrations which prevent the simultaneous focusing of red and blue detail.

During the genesis of color television — when engineers were designing the addition of color to the black and white signal — they used this fact to their advantage and were able to make the addition of a color signal more economical by limiting the bandwidth, and thus the resolution of the color. This was possible because large areas of color could be reproduced reasonably accurately by themselves, with fine detail being introduced into a picture by the luminance or black and white signal. This luminance signal produced the resolution of fine detail by variances in the luminance portion of the combined signal.

Technically speaking, fine detail from the luminance channel was being superimposed on an out-of-focus colored background. It is well-known that as the size of the detail in an object decreases we are less able to detect colors. They become pale and one color can become indistinguishable from a tone of grey. This too, like other phenomenon discussed, is affected by prevailing viewing conditions. Fog, haze or atmospheric mist can cause cool colors to become desaturated, bluer or even warmer in appearance.

The resolution of fine color detail is influenced by an effect called spreading.

When spreading occurs "a fine blue pattern tends to have a darker, more saturated appearance against black than against white" contrary to what we would expect for normal simultaneous color contrast effects. By assimilation, the color of both the background and the pattern upon it become modified when small areas roughly equate.*(2)*

Color Harmony

As long as there has been color, people have been trying to find combinations that are harmonious with each other. Thus the theory of triads, or near complimenters, was developed. This theory supposes that the hues in the color wheel being equidistant from each other will, when viewed together in a scene, appear to be harmonious. Some time ago, in an article on lighting for rock-and-roll, I explained the use of a combination of colors (yellow, blue and magenta) to create pictures that were visually interesting, harmonious and had depth. The use of those three colors was merely a textbook example of this theory.

This theory isn't flawless, nor can it be randomly applied to every situation. Color harmony is dependent on several criteria, things such as relative saturation, background color, shape, texture and the proportions of the various elements in the picture to one another.

Yet it still remains true that the most visually pleasing pictures derive their effectiveness from a restricted palette of colors.

Footnotes:

1.) Page 102, Sylvania GTE 7th. Edition *Lighting Handbook for Television, Theatre and Professional Photography*. GTE Products Corporation 1984.

2.) Page 59, *The Technique of Lighting for Television and Motion Pictures*. Gerald Millerson Focal Press 1972 New York, London. BT

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