

## Topic 040

### Qualities of lighting

Any study of lighting design must include a thorough understanding of both the PHYSICAL and the PSYCHOLOGICAL properties of light.

Knowledge of the behavior and properties of light can help explain vision and human perception. *The lighting designer is especially interested in how the properties of light affect the eye/brain process and cause feelings and emotions.*

An understanding of the physical properties of light can also help explain optics, lenses, color theory, lighting and projection equipment and much more.

The laws and applications of reflection, refraction and absorption are encountered and used every day by the stage lighting designer and these concepts must be thoroughly understood both in theory and in practice.

These basic qualities of light are; **INTENSITY, FORM, COLOR, DIRECTION** and **MOVEMENT**. These are the lighting designer's tools.

Almost all visual images can be described, discussed and analyzed in these terms - both physically and psychologically. There is an excellent classroom exercise that usually starts with an analysis of reproduction paintings from the 'Old Masters'. Student learn to discuss the qualities of light, using such terms as intensity, brightness, direction, color, form, and distribution.

These terms are used to discuss the painting in detail from one small area to another. In addition the painting as a whole is discussed in respect to overall lighting impact, style, mood, composition, emotional content and other qualities

The experienced lighting designer also frequently relies on the qualities of light to help communicate his lighting concept to others.

**Example:** The stage was brightly bathed in a deep blue wash. Slowly, the amber sun softly rose above the horizon gently illuminating the stage in a golden glow. Cool, textured and uncertain light slowly starts to grow and creep throughout every corner of the stage. Soon a low dominating warmth from stage right becomes evident, balanced by a diminishing and cooling of other general light. As darkness falls, the entire stage grows shadowy and covered with sharp defined leaf projections. The blue wash unnoticeably reappears as a shaft of sharp silvery moonlight slips across the stage. (Organize in studio by Producer)

### Brightness (Intensity)

INTENSITY typically refers to the 'strength' of a light source. Intensity of a source exists independent of its distance. Intensity is measured in candela (The old term was candlepower).

ILLUMINATION refers to amount of light falling on a surface. The old term for illuminance was 'illumination'. Illuminance is measured by a light meter (corrected for the curve of the

human eye) in foot-candles or lux (metric). Typical stage lighting illuminance levels may range from 25 to 200 foot-candles or more. The eye has an incredible power of accommodation and can comfortably adjust to illuminance levels in nature from 1 to 10,000 foot-candles, or more.

**BRIGHTNESS** refers to the visual sensation caused by a light source when it interacts with an object and then the eye. Brightness depends on the intensity of the source, on the distance to the object and on the reflective properties of the object. The foot-lambert is the unit of brightness.

Example: In theatre when we change the dimmer setting of a lighting fixture, we are changing the output **INTENSITY** of the source. This results in a change of **ILLUMINANCE** (light falling on the stage) that is perceived by the eye as a change in **BRIGHTNESS**.

**VISIBILITY** depends on many factors, not just the intensity of a source or the brightness of an object. Color, contrast, distance, movement and the conditions of the eye and visual system all play an important role towards visibility.

The stage lighting designer is more concerned with the brightness of an object than the intensity of its light source. He soon learns that objects of higher brightness generally draw attention on stage. Light attracts! Conversely, darkness conceals - but may also put the audience to sleep. One of the prime jobs of the lighting designer is to actually keep the audience awake. This is not as funny as you may think when you consider what we do to an average audience member. Usually late, after dinner and a few drinks we seat the audience in comfortable chairs - and then turn off all the lights! The lighting designer must use the power of light to keep the audience awake and direct their attention to the stage by providing proper visibility, interest and selective focus.