

## ULTRAVIOLET LIGHT EXAMINATION

The production of radiation beyond the range visible to the human eye occurs in nature. The sun emits wave lengths shorter than those which can be seen. Various chemical elements, when acted on electrically also emit short radiations. The most usual of these are carbon and mercury. Largely, the mercury arc has been the source of ultraviolet light for the examination of pictures. It is probably more efficient in a quartz tube than in glass, for the transmission of ultraviolet light by glass is very slight.

An efficiency in this means of examination, however, depends not upon illumination but on the fluorescence. Many materials, when acted upon by short waves, are stirred into a secondary activity of their own and emit a weak light, known as fluorescence. This weak light is visible when the source is filtered. Some of the materials used in painting as well as many materials used in restoration or effects of damage will fluoresce when exposed to ultraviolet light.

Always remember that observations made under a ultraviolet light are indications, not necessarily proofs.

Note the following:

### PAINTINGS

- Some surface coatings have a yellowish fluorescence which can increase in time.
- Overpaint tends to fluoresce mainly because it lies above the first level of the surface coating.
- Orange/natural/unbleached shellac has a bright orange-colored fluorescence.
- Without a covering layer, a few pigments have a strong fluorescence:
  - Zinc-white fluoresces a bright lemon yellow
  - Madder fluoresces a salmon pink
- Bluish-white spots indicate the presence of lining compound
- Dark bluish-violet indicates picture repair putty
- Very small blue dots are dust
- Chartreuse haze indicates old varnish (this is good - it shows no recent restoration)
- Be aware that there is a masking varnish that is used to hide restoration - has the ability to absorb the UV frequency but the surface has a greasy quality. The masking varnish is noticeable because of the density of the color and the overall perfect coating of the varnish layer

### WORKS ON PAPER

- Watercolor/gouache can vary in color from pale blue to dark purple, orange, etc.
- Oil-based stains on paper appear brighter than a waterstain under an ultraviolet light
- Mold and foxed spots appear stronger under an ultra violet light
- Bright areas show new patches of paper
- Tissue and silk repairs are clearly visible
- Smudged areas indicate erasures
- Very faint writing indicates erased signatures
- New touch-up on watercolors and gouache has the same indications as on oil paintings
- Old paper fluoresces faintly whitish, yellowish or grayish
- Modern paper glows bright bluish white
- Mildew (foxing) appears yellowish
- Old vellum appears yellowish white or ivory

- Modern vellum appears bluish white

#### PORCELAIN AND GLASS

- In porcelain and ceramics, repairs and cracks fluoresce bright white
- Lead glass (with as little as 1% lead) fluoresces an ice-blue
- Flint glass appears white
- Uranium-colored glass fluoresces a very bright green or yellow
- Clear glass repairs are easily seen with the naked eye but not so in colored glass
- Beware of judging the age of glass by color, because short-wave radiation turns some clear glass to amber or purple in a matter of weeks rather than many years if aged naturally by sunlight.

#### TEXTILES

- Thread colors may match, but the dyes of new threads will fluoresce white

#### MARBLE

- Fresh cut marble will appear as a strong purple
- Old marble will be a mottled white

#### JADE

- Fresh carved jade will appear as an intense color
- Old jade will be mottled in color

#### IVORY

- Newly carved ivory will appear purple
- Old ivory will be a yellow tone

#### CLOCKS

- New clock faced will appear bright white