

## 16th–17th Century Italian Chiaroscuro Woodcuts: Instrumental Analysis, Degradation, and Conservation

### ABSTRACT

Italian chiaroscuro woodcuts are among the most technically innovative of Renaissance prints for being printed in color. A woodcut is made from a wooden plank that is carved in relief, inked, and impressed on paper. Chiaroscuro woodcut prints—named from the Italian term for contrasting light and dark tones—involve printing an image from two or more woodblocks, with each block printed in a different color, to create transitional passages of shading. With two to five superimposed layers of colored, oil-based inks printed onto a paper support, the chiaroscuro woodcut is an object of complex stratigraphy. Several centuries of aging and deterioration of both the inks and paper can cause visual changes that affect a print's legibility, thereby distorting the historical and aesthetic interpretation of the work. Sometimes inappropriate restoration or conservation treatment can also obscure or obliterate information imparted by the chiaroscuro woodcut printing process. A correct assessment of the physical characteristics of the printing process, the visual qualities of the colored inks, as well as the condition of the individual impressions, is therefore fundamental not only to the art historical evaluation of prints, but equally to the application of appropriate preservation and conservation measures. It is the characterization of the printing ink pigments, ink degradation, and associated damage to the print paper support that form the object of this study.

A technical survey of over 2000 Italian chiaroscuro woodcuts of the 16th and 17th centuries conducted in international collections revealed trends in deterioration of colored inks such as discoloration, fading, blanching and micro-fissures. Seventy-two prints from the Library of Congress, Los Angeles County Museum of Art, and Grunwald Center for the Graphic Arts were examined further using instrumental analysis. The

seventy-two prints analyzed were selected according to the following criteria. First, to the extent that the holdings of the three collections allowed, the prints selected represent six major practitioners of the Italian chiaroscuro woodcut and provide a chronological overview of the period in which the technique flourished. Second, although the majority of prints selected are early impressions, some later or posthumous impressions also were analyzed. Moreover, while many of the prints chosen are in an excellent state of preservation, others exhibit a range of aforementioned condition problems.

The results of this joint study demonstrate the use of unstable colorants such as lead white, verdigris, vermilion, orpiment and organic pigments. Based on the documented behavior of unstable colorants in oil paint, it is possible to infer how the visual appearance of prints containing such colorants is likely to have changed. The combined evidence is here analyzed in order to establish recommendations for conservation treatment, storage and parameters for display and equally to inform art historical interpretation.

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Presented at the Book and Paper Group Session, AIC's 43rd Annual Meeting, May 13–16, 2015, Miami, Florida. The paper has since been published in the *Journal of the American Institute for Conservation*, Vol. 54, No. 4, in November 2015