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Tip: Enhancing Watermark Images: A Photoshop Method

BUILDING THE DATABASE

A recent research project at the Library of Congress focused on building a watermark database using a part of the Tissandier Collection, which contains approximately 8,000 items including letters, documents, maps, drawings and watercolors.[1] The material was collected by the French brothers Albert and Gaston Tissandier, noted balloonists and writers. The collection documents the early history of aeronautics with an emphasis on balloon flight in France and other European countries, with the majority of items spanning the years 1780–1910.

The aim of the research project was to provide a comprehensive and complete database of watermarks identified in the collection of handmade and early machine-made papers using a simple, cost effective, and reproducible method of recording the designs legibly (fig. 1). Ultimately, these enhanced images enable identification of provenance and/or dating of historic papers.

DIGITAL PROCESSING WITH PHOTOSHOP

The method uses transmitted light photography (fig. 2) followed by manipulations in Adobe Photoshop to record the watermarks. The process is efficient, quick, and does not require expensive equipment. Moreover, it directly generates digital data and allows future additional manipulations.

The challenge of producing a clearly legible image is the high contrast between the dark areas of the writing ink and the transparency of the watermark that appears weak in comparison. Reducing the contrast makes the watermark appear more legible. By manipulating a digital transmitted light image using Photoshop, the media that frequently obscures a watermark can be diminished and the legibility of the watermark image can significantly improve. Subsequently, the contrast within the watermark image alone can be maximized, enhancing contours and legibility. The method consists of two processing steps in Photoshop.

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STEP ONE: MEDIA REDUCTION

First, create a copy of the background. On this copy, select the darkest pixels in the image, which are typically the writing or printing media, using the Color Range tool under the Select tab (fig. 3). In most cases, select the Shadows settings from the first drop-down menu. Sometimes, other selections like Sampled Colors, Skin Tones, or specific colors may be a more suitable match for the media. Determining which selection is appropriate is made by trial and error and, eventually, with practice. Next, erase the selected media. Finally, create a new layer below and fill it with a midtone selected from the image. The midtone will blend in with the erased areas to "retouch" the loss.

STEP TWO: WATERMARK ENHANCEMENT

The second step is increasing the contrast to the maximum (fig. 4). Adjust the contrast in the image by selecting Adjustments > Levels under the Image tab. Select the lightest pixel, (typically inside the watermark) and the darkest pixel in the image (usually located on a fold or edge).

ADVANTAGES AND DRAWBACKS

The method described is simple and reproducible (fig. 5). It is easily accessible to a wide variety of users and can be adapted for other types of collections. Furthermore, this systematic approach allows reproducibility and fast recording.

The method follows typical conservation practices with regard to reversibility of the process and application of a custom-made approach. The principle of reversibility is respected by always creating copies of original images and multiple layers so the original image is never lost through subsequent manipulations. Also, as in retouching a real artefact, finding a midtone that can unify the color of the paper is challenging, especially after the second step. Nearly all of the parameters can be easily tailored to suit a specific watermark image, including the level of retouching by changing the midtone color, as well as adapting the hardness of the edge and size of the filling tools in specific areas in the lower layer.

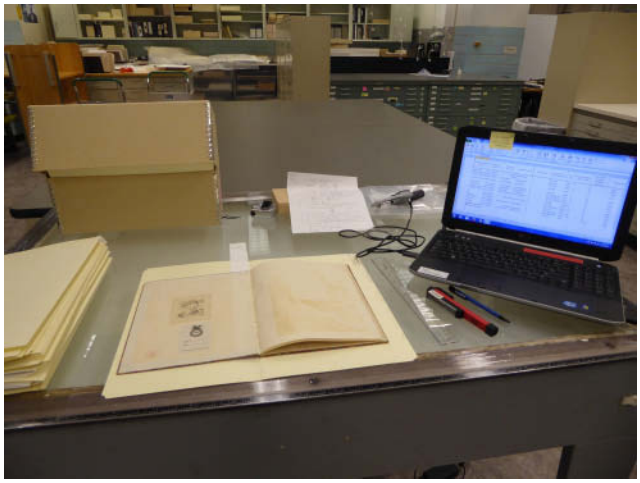

Fig. 1. Recording data on the light table.

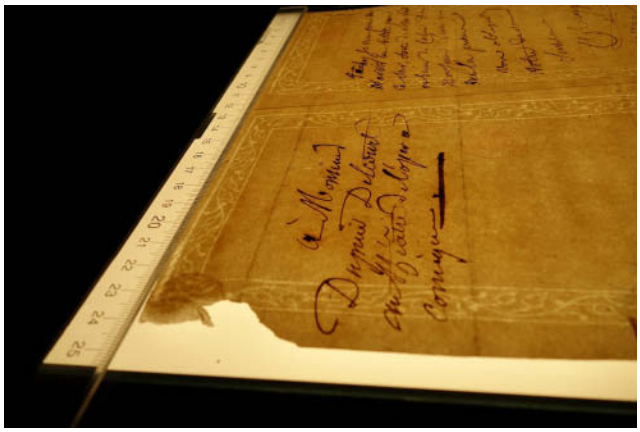

Fig. 2. Transmitted light photography.

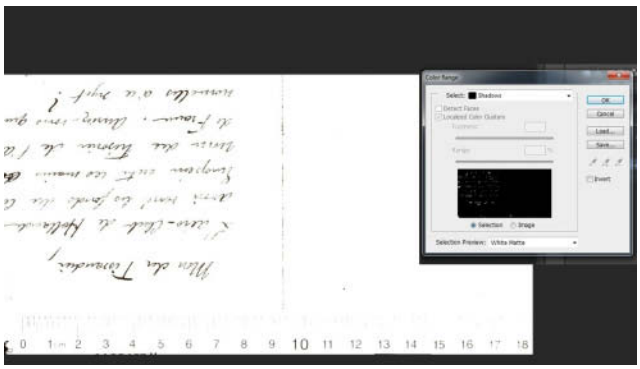

Fig. 3. Step 1 of the digital processing—selecting the media area.

Nevertheless, this method does not come without drawbacks. Enhancing the contrast by broadly selecting the darkest and lightest areas can become a problem when applying the method to a heavyweight paper, a large surface area covered by media such as engraving or watercolor, or if the original image is very dark from the beginning. In these cases, the selection will be harder to make and details can be lost during the digital manipulations. Moreover, the enhancement operation for one watermark may take around 5–10 minutes but digital processing of a large collection with low quality photographs or complex media can be very time-consuming.

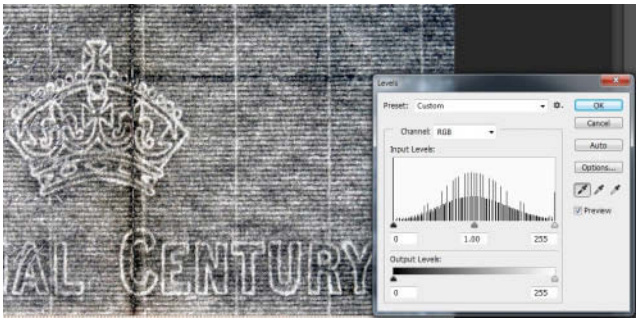

Fig. 4. Step 2 of the digital processing—enhancing the level of the contrast.

Fig. 5. Example of watermark enhancement.

This Photoshop method provides the first step to a new way of recording and deciphering watermarks. More information can be found on the Library of Congress website (Valero and Oey 2018) and detailed instructions are available on the Book and Paper Group Wiki (Valero 2018). It is hoped that, with widespread use, the method can be improved and perfected.

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NOTE

1. The Tissandier Collection on the history of aeronautics was purchased in 1930 and resides in the Manuscript Division at the Library of

Congress (MSS42994). The Tissandier collection also contains original documents from the Montgolfier brothers, Joseph and Etienne, pioneer developers of hot air balloon and heirs of a French family well-known for their prosperous papermaking business in the south-east of France.

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