J5 The Examination of Suspected Artificially Aged Paper

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After attending this presentation, attendees will be able to provide information regarding the application of commonly used methods to artificially age paper and apply physical, optical, and chemical techniques that may be used to distinguish the differences.

This presentation will impact the forensic science community by informing examiners of some of the characteristics that indicate that paper has been artificially aged. This kind of examination may be infrequent for some laboratories; therefore, this presentation will provide visual examples, methods to apply in an examination, and suggested conclusions.

The artificial aging of paper is a popular activity among hobbyists and specialty paper-makers who seek to reproduce the appearance of genuinely antiqued paper, and the plethora of craft books and websites that provide methods that can be easily applied at home attest to its popularity. These same, easy-to-use methods; however, are also employed by those who seek to create fraudulent documents that appear to have been produced from another time.

Determining the purported age of a questioned document is among the myriad examinations that can be conducted by a forensic document examiner. These examinations include establishing the introduction dates of various writing inks and machine printing processes, such as ball point pen, typewriting and inkjet printing that may be present on the document in question, and whether the introduction dates comport with the alleged date of the document's production. Other dating determinations can be made by examining the actual paper for coded watermarks or whether the constituents of the paper's composition were available on its purported date. Numerous forensic texts and published articles have described many of these kinds of examinations for decades. Understanding the natural causes of paper aging and deterioration, and how to better preserve paper and books, has been an ongoing topic of study by conservationists for years. The focus of this study; however, is on a less-studied, specific aspect of dating determination - the appearance of the paper itself and the more common, widely-available methods that are used to artificially age paper for fraudulent purposes.

The natural paper aging process tends to produce observable, readily identifiable characteristics that significantly differ from the effects created through artificial paper aging. The current study employed some of the most common methods used to artificially age paper, such as soaking paper in coffee or tea, or applying lemon juice or milk prior to baking the paper in an oven. Other methods used may include intentional burn marks or man-made holes added to paper to simulate other artifacts of natural paper aging. Naturally-aged paper that is at least 60-years-old was compared to paper that has been artificially aged for purposes of this study, as well as paper that was suspected of artificial aging for fraudulent purposes from actual cases. Appropriate physical, optical, and chemical techniques that may be used to distinguish the differences between genuine and artificial aging features, such as paper texture, discoloration patterns, and ultraviolet properties will be described.

Following a comparison of the paper properties of genuine and artificial aging, recommendations will be provided regarding which physical properties a forensic document examiner can recognize or identify that would lead to definitive conclusions versus which features can be combined, or may be less reliable for aging purposes, but may nevertheless indicate that artificial aging has been attempted. The possibility for making errors in conclusions, and misinterpreting observations will also be discussed.

The findings of other research projects that address the long-term natural paper aging and accelerated paper aging studies, such as the American Standards and Testing Materials (ASTM) Paper Aging Research Program, as well as studies conducted by the Library of Congress will also be included.

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