

CASE REPORT

Arthur T. Anthony,¹ B.S.; Betty C. Gayton,² B.S.; and Brian C. McVicker,² B.S.

An Esoteric Technique Useful in the Identification of Unidentified Remains from the Examination of Faded, Illegible Hospital Identification Wristbands

ABSTRACT: A technique routinely used in the examination of questioned documents has been found to be of assistance when employed in the examination of faded and/or partially legible hospital identification wristbands found with unidentified remains (UIDs). A non-destructive test used predominately by forensic document examiners in the analysis of writing inks, handwritten alterations, and obliterations has proven useful throughout the years when confronted with this unusual type of documentary evidence. This discussion paper was prompted by the Tri-State Crematory disaster, Walker County, Georgia, from a request by investigators as to whether or not any information could be obtained from the examination of faded hospital identification wristbands where no information was readily discernable. Subsequent analysis by non-destructive infrared inspection, a standard technique used in the examination of questioned documents, proved useful in assisting with the identification of unidentified skeletal remains.

KEYWORDS: forensic science, questioned documents, non-destructive ink examination, infrared electronic conversion, ink comparison, medical examiner, pathology, anthropology

Wristbands submitted for analysis were examined by visual, infrared reflectance, and infrared luminescence techniques in attempts at raising faded and legible personal data that might assist in the identification of UIDs. The process involves the use of an instrument referred to as an infrared electronic converter. The technique is non-destructive and has replaced traditional infrared photography as the technique of choice. Initially, cathode-ray tube (CRT) cameras sensitive in the infrared region were used until the development of Charged Coupled Device cameras (CCD). A good general discussion concerning the development of infrared reflectance and luminescence techniques as they apply to questioned document examination has been reported by Kuhn (1,2) and Richards (3).

Currently, high-resolution CCD cameras sensitive in the infrared region of the electromagnetic spectrum are used in conjunction with band pass barrier filters, excitation filters, and a light source to inspect inks. The technique is predominately applied to the inspection of alterations and/or obliterations on documents in an attempt at raising the original entries. This technique has application in medical examiner investigations as well. The visualization of faded tattoos on heavily decomposed skin is a good example (Fig. 1). In addition to being non-destructive, the advantage of this technique is that the results can be viewed in real-time and saved as digital image files, permitting further enhancement. This technique

has been employed successfully over the last ten years in the examination of faded hospital identification wristbands found at crime scenes with UIDs that were submitted to the laboratory.

The purpose of the following discussion is to illustrate that even when it appears that nothing of evidential value can be visualized from faded identification wristbands, submission of the evidence to a forensic document examiner versed in the use of non-destructive infrared techniques should always be pursued.

Case 1

Approximately ten years ago an anthropologist on contract with the Georgia Bureau of Investigation's Crime Lab (Division of Forensic Sciences) inquired as to whether it might be possible to examine hospital patient identification wristbands and raise the original patient information on three separate wristbands (Fig. 2). The wristbands were submitted in two separate cases to the Medical Examiner's section of the laboratory along with skeletal remains for possible identification. A handwritten first name was decipherable on one of two orange plastic wristbands submitted in one of the cases, however, no additional information was visible. The third wristband did not contain any visible evidence of the original personal data. Prior to the involvement of the anthropologist, it was determined that nothing of evidential value could possibly be ascertained from the wristbands in their current condition and the remains were placed in storage. Ultimately, the entire name from both orange plastic wristbands from the first case were visualized by infrared luminescence (Fig. 3). Partial data were obtained through infrared reflectance on the third wristband and was sufficient to identify the individual (Fig. 4).

¹ Manager, Forensic Document and Imaging Section, Georgia Bureau of Investigation—Division of Forensic Sciences, Decatur, GA.

² Forensic Document Examiners, Georgia Bureau of Investigation—Division of Forensic Sciences, Decatur, GA.

Received 2 Nov. 2002; and in revised form 8 Mar. 2003; accepted 8 Mar. 2003; published 22 May 2003



FIG. 1—*Photograph of suspected UID (left). Infrared enhancement of tattoo on decomposed skin.*



FIG. 2—*Plastic hospital wristbands from two UIDs submitted for analysis.*

Case 2

The most recent application of the technique was during the Tri-State Crematory investigation that began in February 2002. Over 300 remains were recovered from the site in Walker County, Georgia. As of this writing over half of the remains have been successfully identified using various techniques such as fingerprint comparisons, DNA analysis as well as through the above-described technique. Early in the investigation, 16 hospital wristbands were submitted to the Questioned Documents section of the Georgia Bureau of Investigation's Division of Forensic Sciences for decipherment. Figure 5 is a natural copy image of a wristband showing the condition upon submission. It should be noted that mold began

to form on some of the wristbands because they were packaged in plastic evidence bags, hindering examination efforts. Three of sixteen wristbands did not reveal any recoverable information of value. The remaining wristbands yielded sufficient information from infrared inspection to assist with the identification process (Fig. 6).

Case 3

During another disaster that ironically also took place in Georgia, flooding in the southwest part of the state in 1994, the above technique was used to assist in the identification of remains. Due to the severity of the flood, caskets and vaults were unearthed resulting in over 400



FIG. 3—Enhanced infrared luminescence of original ink writing on two wristbands depicted in Fig. 2 clearly revealing the last name. Portions of which have been intentionally blurred.



FIG. 4—View of monitor from the third wristband depicted in Fig. 2 revealing sufficient information for identification.



FIG. 5—Wristband from Tri-State crematory disaster showing no visible information.



FIG. 6—Infrared luminescence enhancement of the wristband depicted in Fig. 5 revealing all of the original alphanumeric identification information. Portions of which have been intentionally blurred.

disinterred corpses. The above-described technique was used to raise names and personal data from hospital identification wristbands which was useful in the identification of several of the remains.

Discussion

There will be many discussions from a medico-legal standpoint about the Tri-State Crematory investigation. However, it is the desire of the authors to inform members of the forensic community faced with similar evidence, faded identification wristbands, that a technique is available which may prove useful as it did in the above-described matters, even if there appears to be no discernable data visible.

References

1. Kuhn RJ. Infrared examination with an electronic converter. *J Crim Law, Criminology and Police Sci* 1954;45(4):486–90.
2. Kuhn RJ. Recent developments in the use of infrared electronic converters. *J Forensic Sci* 1959;4(1):11–7.
3. Richards GB. Application of electronic video spectral techniques to infrared and ultraviolet examinations. *J Forensic Sci* 1977;22(1):53–60.

Additional information and reprint requests:
Brian C. McVicker, B.S.
Georgia Bureau of Investigation
3121 Panthersville Road
Decatur, Georgia 30034
E-mail: brian.mcvicker@gbi.state.ga.us