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Compilation of Papers
and PowerPoint Presentations
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Determining the Sequence of Non-Intersecting Media on Documents:
Ballpoint Pen Written and Laser Printed Entries
Valery N. Aginsky, Ph.D.

ABSTRACT: This paper describes a technique for establishing the relative chronology of making ballpoint ink entries (signatures, marks) and laser printed entries in case when these entries do not intersect. The results of both blind and real case examinations are discussed. The technique is also effective to determine the sequence of intersecting ballpoint pen lines and laser printed marks.

Abstract: Automated Characterization of Handwriting – Lessons Learned
CR Batishko, RC Hanlen

Early in 1998, scientists at the Department of Energy’s Pacific Northwest National Laboratory (PNNL) began a three year project aimed at establishing a scientific basis for forensic handwriting examination as practiced by the community of forensic document examiners (FDEs). The project began with the statistical analysis of a set of manual measurements of size from a limited number of exemplars. Promising results motivated expansion of the number of parameters and the number of exemplars to be measured. The volume of measurements to be extracted made automating the measurement process a high priority.

Measurements to be automated were identified jointly by the PNNL researchers and a group of FDEs at the United States Postal Inspection Service (USPIS) over the several year life of the project. These ultimately included slant, pressure variation, style, rhythm, skill, speed and tremor. By summer 2001, a slant measurement algorithm had been developed and tested, and several others of the measurements were under development. However, as always, moving from a fully manual, subjective method to a computer-based, objective, automated measurement method is always fraught with difficulties – most due to the high tolerance and adaptability of the human eye-brain system and the relatively low tolerance of computer vision-based systems for variability and background clutter.

This presentation proposes to identify and address those issues whose solutions are most critical to successfully automating the handwriting characterization process, and to respectfully suggest some modest practices which would greatly enhance the ability to provide FDEs with a suite of computer-based aides to handwriting examination.

How Old Is Too Old For Exemplars?
Michael P. Bertocchi

ABSTRACT: The use of exemplar writing for comparison purposes is essential in most handwriting or signature comparisons. This case involves the use of exemplars that are almost twenty years old. The exemplars were followed-up with new, requested writing that traced the writer's habits through the years to the present. The use of new requested exemplars were used to show, in this author's writing that if time didn't stand still, it moved very slowly.
The Differentiation of Color Laser Printers
Chi-Keung LI, Wai-Chung CHAN, Yau-Sang CHENG & Sze-Chung LEUNG
ABSTRACT: A survey of laser printers from different manufacturers (Canon, Ricoh, Epson, Minolta, Hewlett-Packard & Tektronix) resulted in the observation of dotted motifs of different patterns on the printouts from Canon, Epson and Ricoh laser printers. Studies so far showed that for Canon printers, the dotted motifs found on the same model with different serial numbers were also different. We have come to the opinion that the patterns with the distinctive arrangements of the dots are probably related to the serial numbers of the machines and could be used for identifying the laser printers. A feasibility study on the use of Raman Spectroscopy for the differentiation of toners of different manufacturers of laser printers has also been conducted.

The Effects of Paper on Line Quality
Mary Ann Czermak
ABSTRACT: The study explores the visual ink line characteristics of seven pens on three paper surfaces. Included are the well-known appearance of the ball point writing line, as well as a fountain pen and the newer gel ink rollers. The selected papers are a lightweight glossy surface, a regular all-purpose bond and tablet paper. Direct light, sidelight and transmitted light enhance different aspects of the writing lines.

How Often Do Document Examiners and Graphologists Agree?
Marvin H. Dawson
Abstract: This presentation is to revisit a study surveying four populations in an effort to prove or disprove a direct correlation between training and one’s ability to accurately reach certain decisions associated with the work product of a forensic document examiner. Another study objective was to determine if there was a correlation between the method of training a forensic document examiner vs. the study method of graphologists; and accuracy of opinions. Four handwriting problems were provided each person in the survey. The attitudes and responses of the participants were as unique to each population as the accuracy of opinion.

Evidential Value from Ink-jet Printers
Steven P. Day
ABSTRACT: The widespread use of inkjet printers has made it necessary for document examiners to find a method of linking a questioned document to an individual inkjet printer. The identification and characterization of defects produced by inkjet cartridges provides a means of achieving this.

This study was primarily to investigate the physical nature of defects in inkjet printers and show how printer outputs and printers can be linked. Thus it was hoped to establish whether or not inkjet printers can be linked to their printouts through their physical appearance on the paper and if so to estimate the evidential value of any defects or other physical features. By identifying such
features it was hoped that a protocol for the examination of this type of printer could be developed.

Defects can be easily introduced into printouts by blocking the electrical contacts that control a particular print head. The behavior of the defects thus produced is different for different types of inkjet print cartridges. By studying the behavior of such defects it is possible to devise a strategy for the examination to distinguish between different printers. Not all nozzles get blocked with the same frequency so if a particularly rare nozzle gets blocked then the evidential value in linking that particular printer to the printout will increase.

**Case Assessment and Interpretation For Handwriting Comparison, Or Handwriting, Bayes and Science**

Steve P. Day and Anthony Stockton

**ABSTRACT:** The Rev. Bayes was a Victorian Preacher who formulated a theorem that is one of the central pillars of probability theory. The Bayesian paradigm is based on the idea that probability provides the only coherent basis for reasoning in the face of uncertainty. Life is all about making decisions and updating uncertainties in the light of changing patterns of information: Bayesian inference provides a logical framework for this process. There is evidence that the first application of Bayesian thinking in forensic science is attributable to Poincare in his review of the notorious Dreyfuss case.

Recently the Forensic Science Service in the UK has developed a Case Assessment and Interpretation model based on the Bayes theory. This is designed to help Reporting Officers develop a consistent approach to casework and aid the Police in the investigation of their cases. In applying this model to Handwriting comparison it was found that the approach that most scientific examiners have always taken is essentially a Bayesian one and that the new model could be used to underpin the scientific approach to the subject. In addition, the model can help the examiner to ensure that they are addressing the most relevant questions on behalf of the investigator and that their interpretation is balanced and supported by scientific principles. The theory suggests a way of forming a conclusion that is based on the likelihood of the findings given that a person did, or did not, write a particular document rather than the likelihood that the person is guilty or not, which is viewed as the province of the court.

This presentation will be in two halves. Tony Stockton will explain how this approach can help the Investigator to ask the right questions and understand what the Handwriting examiner can do. In the second talk Steve Day will work through a case to show how the model is applied in practice in our country, and reveal its strengths and weaknesses. It is hoped to demonstrate that it provides a logical, balanced and transparent approach to handwriting comparison and that, while this may require some changes in the way we approach casework, those changes are more like changing a President than the War of Independence!
Forensic Application of UN-DU Adhesive Remover
Meredith DeKalb and Gabriel Watts

ABSTRACT: Finding a cost effective and a reliable means for the removal of self-adhesive stamps, stickers and tapes from various documentary evidence, without causing damage to this evidence is an ongoing challenge for document examiners.

Heptane, an organic compound also used as a solvent in fuels, and commercially available in products such as “UN-DU®” has shown great capabilities to be an effective tool for document examiners. Limited testing of this product was completed to determine it’s success in consistently removing self-adhesive stamps, stickers and tapes without damage to underlying substrates and/or writing fluids.

Techniques for self-adhesive stamps will be demonstrated.

Ink Differentiation for the Fiscally Challenged
Steven G. Drexler, B.S.

ABSTRACT: Being asked to distinguish between two or more inks that may have been used to alter a questioned document is a common problem posed to the Forensic Document Examiner. In today’s modern laboratory, sophisticated instruments have been made available, such as the VSC 4 and VSC 2000, Foster & Freeman, Worcestershire, England, that are specifically designed to aid in the differentiation of inks. However, the considerable expense may make these instruments unavailable to many government and private laboratories. The present study introduces a low cost ink differentiation system, comprised of simple commercially available components, and test its ability to distinguish between various black inks.

Forensic Handwriting Examination in Support of War Crimes Prosecutions
Gideon Epstein

ABSTRACT: The investigation and prosecution of War Crimes or "Crimes Against Humanity", is of great concern to many countries in the world today including the United States. International courts have been established to hear such cases and bring the individuals, organizations, or leaders to justice. This paper draws on more than 20 years of experience in the examination of documents used to support charges of "crimes against humanity". What kinds of documents can be important? How does a forensic document examiner go about putting a case together for prosecution and court presentation? This paper discusses the three main categories of war crimes. (1) Crimes by an individual, (2) an organization (3) or a leader of a government. Documents and the verification of information on them, is an important tool to successful prosecution of this type of crime.
Examination of Digital Signature Cases Involving the UPS DAID Devise
Robert G. Foley
ABSTRACT: Special problems presented in cases utilizing the UPS DAID digital signature devise. Emphasis will be on the DIAD system, acquiring digital signatures for comparison, exemplar collection and results.

Millennium Handwriting Trends
James Hayes
ABSTRACT: Handwriting instruction has gone through a number of changes since the golden ages of the 50's when the Palmer Method dominated the educational scene. Since the advent of the computer, educators have had to squeeze in more subjects each day. One of the losers in this bid for classroom time has been handwriting instruction. What are the methods that are currently being employed, and what handwriting systems are being used by teachers? The demographics of our society has also changed and this change may effect the handwriting we will examine in years to come. This paper will provide information regarding the current state of handwriting instruction in a number of public and private schools in the Midwest.

The Greatest Handwriting Mystery of the Century
A. Frank Hicks
ABSTRACT: For three years, a series of letters appeared in a prominent London newspaper attacking the British Government, the King and many of the governmental ministers. Most of these letters were signed "Junius". But who was Junius? No one ever came forward with a legitimate claim to being the author of these letters. This presentation will look at the atmosphere in Britain that led to the letters and discuss one handwriting expert's examination of the handwriting several decades after the letters were written. This expert claims to have identified the author. The comparison process and the comments of the examiner and the attorney who hired him reveal an understanding of the Forensic Document Examination profession that would be a credit to any examiner today.

Impression By Traced Forgery
Robert D. Kullman, Leonard Speckin, Erich Speckin and Michael Sinke
ABSTRACT: Can you determine if Electro Static Detection Apparatus (ESDA) developed indented written impressions are the result of original writing or a traced forgery? After developing ESDA impressions of a critical entry in a medical chart on a laboratory report generated months after the date of the critical entry, the defendant's attorney raised the question of forgery. He theorized the forgery occurred by someone making a machine copy of the page containing the original critical entry, then placed this machine copy on top of the laboratory report and traced the critical entry henceforth creating the developed ESDA impressions.
Using this theory, we developed a form consisting of short phrases, symbols and numbers commonly found in medical charts to determine if this type of traced forgery could be detected. The form consisted of a top page, transmitter page, with photocopied entries and two blank pages, receiver pages 1 and 2, of unlined white “Hewlett Packard 8 ½ by 11 inch Office Paper” stapled to the top page to prevent shifting.

The participants in this study were 39 faculty and staff of a school district in the central Michigan area ranging in age from 24 to 73. Twenty four of the participants were male and fourteen were female with one form undesignated. Thirty-three were right handed and four left handed with two forms undesignated. Participants were directed: “Use a ball point pen and carefully trace over the following writings. After you complete project, please fill out information at bottom of page and return in enclosed envelope.” When the completed Test Packets were received they were kept in a file for over three months prior to conducting any ESDA examinations.

After reviewing the transmitting page of all the Test Packets for accuracy of the tracings, we conducted ESDA examinations on the two receiving pages of Test Packets 3, 17, 18, 37, 40 & 41. Each ESDA was developed as completely as possible.

Evaluations of the ESDA developed impressions were conducted with the original form and a first generation machine copy of the original. Our evaluations found that the impressions developed on all six of the first receiver pages were easily detectable as not being the product of the original writing, except for the single number 1 on all first receiver pages except test 3. The findings did not differ between using the original form or the first generation machine copy for comparisons with the ESDA developed impressions.

The conclusions drawn from this study are that strong well developed “forged” ESDA impressions which consist of more than a short single stroke are readily differentiated from well developed ESDA impressions from original writing from a transmitter page. Additionally, that weak ESDA impressions of limited writings leave open the possibility of “forged” impressions.

Patricia Manzolillo, M.S.F.S.
ABSTRACT: This presentation is intended as a review of the new course offered at RIT in June 2001. The course was designed specifically to assist Forensic Document Examiners in the examination of printing processes and technologies. Topics covered in the course include conventional printing processes and image structure, non-impact printing and image structure, paper, inks, image analysis, and available software. The review will contain a short overview of the instructors, format, materials, and information presented during the course. The presentation will conclude with an evaluation of the course and its usefulness to Forensic Document Examiners.
Demonstrating Evidence With Multi-Media Technology
Linton Mohammed

ABSTRACT: Advances in multi-media technology combined with the lowered costs of computer hardware have given Document Examiners powerful tools with which to demonstrate their findings and the reasons for their conclusions. This paper reviews the literature on demonstrative evidence, discusses the principles involved and suggests ways and means by which different types of evidence can be demonstrated in a 'clear and convincing fashion' using multi-media technology.

An Instance of Inkjet Printer Identification
Joseph L. Parker

ABSTRACT: Examination of a series of anonymous documents generated by inkjet printer technology, revealed the presence of several printing flaws. A suspect inkjet printer was received for examination. Test printing with the suspect printer reproduced the same flaws observed on the questioned documents. Examination of the suspect machine and its test prints, resulted in isolation of "class" flaws and a previously unobserved "individual" printing flaw. The accumulative presence of these features enabled an association between the anonymous documents and the suspect inkjet printer.

Diné Bizaad: The Navajo Alphabet
Sandra Ramsey Lines, B.A.

ABSTRACT: In an effort to preserve Native American cultures and languages, there is a resurgence in teaching Native Americans to read and write their tribal language. One such effort that appears to be making great strides in that of the Navajos. Forensic document examiners are expected to have a working knowledge of various systems of writing; therefore, it is important for them to recognize the various systems being taught. This paper explores the development of the Navajo alphabet (also known as the Diné Bizaad) and its current place in the history of writing.

An Evaluation of Sampling Methods for Microspectrometer Analysis of Document Evidence
Thomas P. Riley, B.S.

ABSTRACT: Microspectrometer analysis in document cases can provide valuable information. Microspectrometer examinations provide analysis of a specimen in Ultraviolet (UV reflected and transmitted), Visible (reflected and transmitted), and fluorescence (365nm [NU] and 405 nm [NV]).

In most instances, this type of examination can be conducted through non-destructive techniques, by merely placing the document to be examined upon the microscope stage. However, in some
instances, semi-destructive techniques may be of use, and may provide substantially more valuable evidence.

This research will be into the various means of examining document evidence utilizing a microspectrometer and to compare methods for preparing items for analysis.

Recent Absentee Ballot Voter Fraud Cases in Alabama
Richard A. Roper, Steven G. Drexler

ABSTRACT: For many years wholesale absentee ballot voter fraud was believed to be standard operating procedure in certain counties in Alabama. In spite of diligent investigative efforts, supported by findings from document examinations, past efforts to resolve absentee ballot voter fraud met with frustrating results. Factors such as sudden memory lapses on the part of formerly cooperative critical witnesses doomed the process. However, after the elections of November 1994, citizens’ groups lobbied the Attorney General of Alabama and the United States Attorney for the Northern district of Alabama to new voter fraud investigations. This paper presents an overview of the investigations and results of document examinations major investigations in three counties. Observations on the readiness of the investigative units and on the critical cooperative functions of the various agencies involved are addressed. Also discussed is the influence of input from the document examiners to the field investigators in order to lay out a coherent plan to investigate the ballot process. From the investigation we could: 1) demonstrate the forgeries, 2) identify patterns of common authorship, and 3) attempt to identify the individuals involved.

Feasibility Study for the Removal of Tape From Paper Products: Via Un-Du® Adhesive Remover
Robin Russell

ABSTRACT: A case was submitted to the Missouri State Highway Patrol Crime Laboratory which solicited the help from a questioned document examiner to perform a physical match on a typed document. This document had been taped together using tape similar to Scotch™ tape. It was purported that the taped document was two separate documents segmented together to produce one document. The pieces of paper overlapped each other, making a physical match impossible without the removal of the tape. This author previously conducted validation studies using such tools as heat guns, irons, liquid nitrogen, and freezing temperatures to remove tape. However, it has been the experience of this examiner that while some of these methods were useful, none adequately separated the tape from the paper item without some drawback. Consequently, a search for another method was undertaken, that could better accomplish this objective. Un-Du® adhesive remover was the catalyst used to conduct this method. The adhesive remover was applied to various paper products bearing writing from several writing media, as well as typing. Subsequently tape was place on each of the paper items and adhesive remover applied. The results of the experiment proved successful with the tape being easily removed. However, there are some drawbacks in that when the tape is removed, pencil markings
and typing have a slight transfer from the paper onto the tape. Therefore, consideration must be given on a case-by-case basis as to whether slight pencil or typing transfer would hinder additional examinations.

What’s The Difference?
Farrell C. Shiver
ABSTRACT: Document examiners differ in their attitudes concerning the subject of handwriting eliminations. This paper will examine those differences.

Expressions of Conclusions on Handwriting Comparisons
Steven J. Strach, Ph.D.
ABSTRACT: Scales of conclusions on the results of handwriting comparative examinations are critically discussed. The scales are either in use or are being developed or proposed in various parts of the world. The aim is to discuss advantages and disadvantages present in all of these scales and to compare and contrast the scales, but not necessarily to endorse one particular system.

It is hoped that a philosophical approach will allow some convergence of thought on what is often a contentious subject. It is the author’s view that the sometimes fundamentally divergent ways of thinking in the legal and scientific arenas are the fundamental cause of the arguments.

Haas Typewriter Atlas.pdf – Electronic Document Presentation
Andrew T. Szymanski
ABSTRACT: This technical presentation will demonstrate a newly created Portable Document Format (PDF) of the Haas Typewriter Atlas. All of the typewriter specimens and catalog pages compiled by Josef and Bernhard Haas were scanned and converted to electronic documents for easy access and review by the Questioned Document Examiner. This presentation will demonstrate the convenience of the electronic version of the Haas typewriter collection for the classification of typewritten evidence.

Updating Document Examination: The Inclusion of Computer Disk Analysis
Charlotte Ware
Abstract: As more and more computers are used to commit crimes, there is an increasing need for disk analysis and evidence recovery of data stored on the hard drive of a suspect’s computer. The Forensic Document Section of the TXDPS Crime Laboratory includes an area specifically dedicated to computer disk analysis. The equipment needed, training opportunities, and types of casework encountered will be discussed, as well as the applicability to traditional questioned document casework.
WORKSHOPS

Electronic Court Exhibits for the Questioned Document Examiner
William J. Flynn

Development and Testing of Habit Area Templates
R.C. Hanlen, P.A. Manzolillo, R.J. Muehlberger, G.R. Sperry

Signature and Handwriting Workshop
Howard C. Rile

Deposition and Evidence Admissibility/Panel Discussion
Thomas W. Vastrick

POSTERS

Check...The Bottom Line
M. Katherine Voelker

Obsured Writing Revealed Using ESDA
Steven J. Strach, Ph.D.
WORKSHOPS

Electronic Court Exhibits for the Questioned Document Examiner
William J. Flynn
ABSTRACT: This workshop will demonstrate the use of active digital technology to illustrate a document case (such as how a printing machine or copy machine works) to a judge or jury.

Development and Testing of Habit Area Templates
R.C. Hanlen, P.A. Manzolillo, R.J. Muehlberger, G.R. Sperry
ABSTRACT: This workshop will focus on the development and preliminary validation of a set of templates for handwriting habit areas commonly examined by forensic document examiners. These templates contain handwriting samples that span a range of conditions within a specific habit area. The findings and conclusions expressed by document examiners can often involve inconsistent descriptions of a writing sample. This is probably due to the fact that the descriptions are based upon the subjective and individual nature of an examiner’s training and experience. It is postulated that document examiners have the ability to consistently describe a writing sample when conducting a comparison to a template. This workshop will test this postulate by having numerous forensic document examiners compare a series of writing samples against templates for seven habit areas.

Signature and Handwriting Workshop
Howard C. Rile
ABSTRACT: This workshop includes some interesting cases, and some cases where examiners have come to different conclusions. Perhaps the different conclusions were reached for defensible reasons, such as not having been provided with the same information and materials for examinations, and how were these different conclusions resolved in a positive manner?

Deposition and Evidence Admissibility/Panel Discussion
Thomas W. Vastrick
ABSTRACT: This workshop and panel discussion includes Professor of Law and Honorary Member of the ASQDE, Andre A. Moenssens, and Attorney Stephanie Domitrovich, Erie County, PA judge and instructor at the National Judicial College at which she teaches the admissibility of scientific evidence.
POSTERS

Check...The Bottom Line
M. Katherine Voelker
ABSTRACT: There are several printing methods used to produce check routing numbers, which are also known as Magnetic Ink Character Recognition (NICR) lines. This poster presentation will show the printing characteristics that distinguish MICR encoders that use dot matrix printing, magnetic thermal transfer ribbons (MTTR) and the traditional letterpress impact printing. The two dot matrix encoders that are produced for the United States are easily differentiated from each other. The ability to identify the type of a machine that could have produced the MICR line is important to the investigation process.

Obsured Writing Revealed Using ESDA
Steven J. Strach, Ph.D.
In a recent case, it was requested that we try to reveal an obscured diary entry. It is normal practice in such cases to try various optical techniques to reveal or enhance traces of the obscured writing. Illumination with filtered light or infrared and detection of reflection or luminescence, along with microscopic observations, are the usual methods of choice. In this case, although such methods did reveal some details of the original entry, decipherment was still difficult. Surprising results were obtained using the Electrostatic Detection Apparatus (ESDA), particularly on an ESDA image of the second page below the obscured entry. Much more detail of the original entry was revealed using ESDA despite the obscuration clearly having left its own detectable impression on this page. One important entry (a monetary amount) was revealed with ESDA and not with the other techniques. The whole entry was deciphered using a combination of results from all of the techniques used. Possible reasons why ESDA was successful in this case will be presented. It is recommended that ESDA should be attempted in such cases where feasible and when other techniques are less than fully successful.