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## Police Science Technical Abstracts and Notes

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## POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

Edited by

Gary D. McAlvey<sup>1</sup>

Abstractors

William E. Kirwan<sup>2</sup>  
Theodore R. Elzerman<sup>3</sup>  
Artur Solarz<sup>4</sup>

Paula J. Cardosi<sup>5</sup>  
Sally I. Dillon<sup>5</sup>

Gloria H. Kraatz<sup>5</sup>  
Michael J. Kreiser<sup>5</sup>  
Edgars Rudzitis<sup>5</sup>

Explosive Compounds and Ballistic Powders for Use in Firearms—Eugenio Lagagesse, *International Criminal Review*, 238: 158-165 (May 1970). A technical discussion of explosive materials encountered in the crime laboratory is presented. The author presents the thermodynamics of explosive reactions in considerable detail. First of a series. (GDM)

Mannequins in Court—Peter J. Pitchess, *F.B.I. Law Enforcement Bulletin*, 39(12): 14-15 (December 1970). Sheriff Pitchess describes the various ways mannequins have been used in court to illustrate wounds in homicide victims. (GDM)

Identifying Disaster Victims—*F.B.I. Law Enforcement Bulletin*, 39(12): 10-13 (December 1970). The services of the F.B.I. Disaster Squad are outlined. Also included are several suggestions concerning the processing of disaster scenes and victims. (GDM)

The Forensic Dental Examination—Elmer E. Kellin and Gerald L. Vale, *The Forensic Gazette* 1(5): 7-8 (December 1970). Sometimes dental examination is the only means for identification. Dental evidence in these cases is an ideal source for the law enforcement agents to make identification. It is suggested that a standardized examination with identifying code be developed which could be computer programmed. Possibly an identification

<sup>1</sup> Superintendent, Illinois Bureau of Identification, Joliet, Illinois.

<sup>2</sup> Superintendent, New York State Police, Albany 1, New York.

<sup>3</sup> Assistant Superintendent, Illinois Bureau of Identification, Joliet, Illinois.

<sup>4</sup> Åkerbyvägen 90/IV, 183 35 Täby, Sweden.

<sup>5</sup> Crime Laboratory Analyst, Illinois Bureau of Identification, Joliet, Illinois.

number or Social Security number should be etched on the inside of larger inlays, crowns, bridges, etc. The saving of casts, etc., plus accurate records and radiographs is important. A procedure is described that a forensic odontologist may use at oral autopsy at either a catastrophe or decomposed type situation. Findings at autopsy should be published in a national dental journal, etc., such that a dentist may recognize the records of a former patient. (TRE)

Forensic Examination by the Dentist—A. Ortiz and A. G. Racey, *The Forensic Science Gazette*, 1(5): 5-7 (December 1970). Forensic Odontology can be used for human identification, living or dead. The examination can reveal information about age, sex, race, occupation, social status and habits of a victim. The study of the teeth alone cannot determine race and sex. Age determination can be accurate during the first twenty years of life. A suspect may be identified from bite marks. The availability of accurate dental records are of importance for comparison between ante-mortem and post-mortem for identification purposes. (TRE)

Stereochemical Composition of d- and l- Amphetamine Mixtures by Thermal Analysis of the Benzoyl Derivatives—William E. Ment and Victor S. Marino, *Journal of the A.O.A.C.*, 53(5): 1097-1099 (September 1970). A procedure for the thermal analysis of the benzoyl derivative of amphetamine is presented. This procedure enables rapid determination of the stereochemical composition of d- and l-amphetamine mixtures with  $\pm 5\%$  accuracy and requires as little as 5 mg. amphetamine salt. (PJC)

Separation of Trisulfapyrimidines by Partition

Column Chromatography—Harvey M. Miller, *Journal of the A.O.A.C.*, 53(5): 1100-1102 (September 1970). A column partition method for the separation of sulfamethazine, sulfamerazine, and sulfadiazine is described. The sulfas were separated on a 0.1NKHCO<sub>3</sub> column and eluted with various organic solvents. (PJC)

GLD Determination of Nikethamide in Injections—John M. Newton, *Journal of the A.O.A.C.*, 53(5): 1103-1105 (September 1970). A GLC method for the direct determination of nikethamide in injection using a KCl thermionic detection is described. (PJC)

Colorimetric Analysis of Norethindrone, Norethindrone Acetate, and Norgestrel in Oral Contraceptives—Robert V. Smith, et al, *Journal of the A.O.A.C.*, 53(5): 1089-1092 (September 1970). A colorimetric method, based on reaction with blue tetrazolium, is described for the analysis of norethindrone, norethindrone acetate, and norgestrel. (PJC)

Electron Capture Detection and Measurement of Fluothane (Halothane) in Blood—A. Brachet-Liermain, L. Ferrus, and J. Caroff, *Journal of Chromatographic Science*, 9: 49-53 (January 1971). A procedure for the determination of fluothane (halothane) in blood is described. The anesthetic was extracted from 30-50  $\mu$ l sample of blood with benzene and subsequently detected and measured by means of an electron capture detection. (PJC)

Characterization of Steroidal Drug Metabolites by Combined Gas Chromatography-Mass Spectrometry—C. J. Brooks, et al, *Journal of Chromatographic Science*, 9: 35-37 (January 1971). Preliminary studies of human urinary metabolites of orally administered 17 $\alpha$  ethyl-17b-hydroxyestr-4-en-3-one (Nilevac) are reported in this paper. Combined G.C.-M.S. techniques were used in the study. The conditions used for the G.C.-M.S. were as follows: 6 ft. (OV-17 or 10 ft. (OV-1) x - in., o.d., silanized glass columns packed with 1% of the appropriate stationary phase coated on Gas Chrom Q (100/120 mesh); carrier gas, helium (30 ml/min); molecular separator, 250°, ion source, 270° electron energy, 70 ev; accelerating voltage, 3.5 kv; scan times approximately 5 sec (m/e 10-500). Spectra were calibrated by an LKCB 90/0 mass marker. (PJC)

The Examination of Handwriting—Cecil L. Wilson, *The Criminologist*, 5(36/77): 7-18 (May/August 1970). Mr. Wilson states the requirements necessary to become a "handwriting expert": study and a scientific approach. He cites some of the problems of a document examiner and refers to a few of the cases he has worked. His recommendations include studying as many handwritings as possible, noting minor characteristics as well as the general nature of the handwriting, and making preliminary examination of documents. (GHK)

Modified Chemical and Physical Methods for the Detection of Latent Fingerprints—William D. Green, *The Criminologist*, 5(16/17): 54-62 (May/August 1970). The author discusses the chemistry, technique, and advantages of an improved silver salt method for detecting latent fingerprints and of silver salt, iodine-starch, and ninhydrin transfer films for lifting prints. (GHK)

Stud Gun Injuries—Werner U. Spitz, M.D., and Russell M. Wilhelm, *The Criminologist*, 5(16/17): 85-91 (May/August 1970). The authors cite cases of stud gun injuries and includes pictures and descriptions of stud guns and stud gun injuries. (GHK)

Characterization of Heroin: A Preliminary Study—M. J. Pro and R. L. Brunelle, *Journal of A.O.A.C.*, 53(6): 1137-1139 (November 1970). Since heroin is illicitly produced, the final product ready for street sales can contain a wide variety of elements. As a result, the qualitative result is very significant. However, a quantitative determination of each element can add much information for establishing common origin of questioned and known specimens. It is essential to employ microscopy and chemical analysis of the organic components. Further examination by NAA and AA can be used to detect and quantify as many as 22 elements. (ER)

A Method for the Determination of Short-Range (05 to 5 cm) Firing Distance—A. Schontag and F. Suchenwirth, *Arch. F. Kriminalogie*, 146(3, 6): 62-68 (September-October 1970). The method is limited to instances where the bullet penetrates more than one layer of fabric. The second layer of fabric or lining is examined for powder residue, the extent of which decreases with increasing distance within the range specified. (ER)

**An Improvement to the Mixed Agglutination Method**—E. Schultz, *Arch. f. Kriminalogie*, 146(3, 4) 95–98 (September, October 1970). A modification in the technique resulted in higher sensitivity and shorter analysis time. The erythrocytes used for agglutination are treated with diluted (below the level of agglutination) nomologue of anti-serum (e.g. A-Erythrocyte with Anti-A) instead of usually used saline. The method can be used also on saliva, sperm, perspiration, and hair. (ER)

**Computerized Dactyloscopy and Personal Description**—E. Angst and A. Leibacher, *Kriminalistik*, 24(10) 495–502 (August 1970). The county police of Zurich (Switzerland) has been developing since 1968 a system for storage and evaluation of fingerprint information utilizing IBM 360/40. While direct computerized identification is not yet possible, the combination of the dactyloscopy program with other information utilizing electronic data processing has increased the effectiveness of police work. The article describes and illustrates the organization of the project. (ER)

**Locksmith and Police—Public Security**—Arthur R. Paholke, *The Locksmith Ledger*, 32(2): 9–15 (February 1971). The author indicates the importance of locksmiths being aware of the different methods of forced entry and what the crime laboratory can do in its investigation of the physical evidence. The article contains several excellent photographs indicating various examples. (MJK)

**Gunshot Residue Solves Armed Crimes**—C. Michael Hoffman and Roland L. Wilder, *The American Rifleman*, 119(2): 26–27 February 1971). The authors discuss the paraffin cast method, Dr. Harrison's method, and neutron activation analysis with respect to gunshot residues deposited on the suspects' hands and on the victim at close range. The emphasis of the article is on neutron activation analysis. (MJK)

**Separation and Identification of Some Organophosphorus Pesticides from Liver by Two-Dimensional TLC**—A. C. Koutselinis, G. D. Dimopoulos, and Z. I. Smirnakis, *Medicine, Science and the Law*, 10(3): 178–179 (July 1970). Describes the experimental work in finding a chromatography system to simplify the up to now lengthy process of extraction, but at the same time to make possible the distinct separation of various pesticides. (SID)

**Vital Reaction in the Epithelial Connective Tissue Ground Substance**—A. B. Nevelos and D. J. Gee, *Medicine, Science and the Law*, 10(3): 175–177 (July 1970). In this study, acidic mucopolysaccharide reactions were used to detect vital reactions in the epithelial connective tissue and substance. As a result, it was found that acidic mucopolysaccharides disappear from the vital wounds in an approximately 200–500 micron wide area surrounding the wound surfaces, corresponding to previous observations, and that they also disappear from vital bruises, abrasions, and electrocutions, while in vital hanging and strangulation marks they remain present. (SID)

**Autopsy Findings Following Death by Intramuscular Hydrogen Cyanide: An Experimental Study**—Bryan Ballantyne, *Medicine, Science and the Law*, 10(3): 171–174 (July 1970). Compares post-mortem appearances in pigs killed by captive bolt or by an intramuscular injection of hydrogen cyanide. (SID)

**When Is Cannabis Resin?**—E. G. C. Clarke and Ann E. Robinson, *Medicine, Science and the Law*, 10(3): 139–148 (July 1970). The authors explain that there are wide variations in the thin-layer and gas chromatograms from different samples of cannabis resin. They suggest that the identification of cannabis and cannabis resin be based on thin-layer, gas chromatography, and microscopic examination. (SID)

**Medico-Legalism**—R. Nagle, *Medicine, Science and the Law*, 10(3): 158–159 (July 1970). The article presents a new concept of forensic study and practia-traditional terms are more strictly defined and the contribution of this philosophy in the assessment of the academic status of medico-legal studies is discussed. (SID)

**A Glass Density Method Using Marker Dyes and Stains**—J. E. Davis, *Journal of the Forensic Science Society*, 10(2): 113–114 (April 1970). Describe a procedure for the preparation of density gradient columns for the comparison of glass fragments using dye-staining. (SID)

**A Case of Poisoning by Epsom Salt**—P. O. Rees, *Journal of the Forensic Science Society*, 10(2): 91–94 (April 1970). Abnormally high concentrations

of magnesium were found in the post-mortem blood of a female subsequent to an attempt to produce abortion by the injection of Epsom salt into the uterus. (SID)

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**Intravenous Amphetamine Poisoning, Report of Three Cases**—R. H. Cravey and Dwight Reed, *Journal of the Forensic Science Society*, 10(2): 109-112 (April 1970). A review is presented of reported instance of fatal amphetamine poisoning, together with blood and tissue levels of amphetamine in three cases submitted to the author's laboratory. A brief case history is reported for each of the three cases (SID).

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**The Restoration of Desiccated Cadaveric Fingers for the Purpose of Identification**—H. E. McKeehan *Journal of the Forensic Science Society*, 10(2): 115 (April 1970). Gives a procedure for the restoration of desiccated cadaveric fingers using a solution of Eastman Kodak Photo-Flo 200 to render the epidermis quite pliable and soft. (SID)

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**Comparison of PVC Coated Samples of Copper Cable by Neutron Activation Analysis**—R. J. Caldwell, *Journal of the Forensic Science Society*, 10(2): 69-72 (April 1970). Two lengths of PVC coated copper electrical cable were compared to establish if they had a common origin. Non-destructive analysis of the copper cable revealed the same four trace elements, silver, gold, cobalt, and antimony in similar concentrations in each exhibit. These results were compared with the results of the analyses of 13 other samples of copper wire and cable from various origins. The insulating plastics which sheathed the cables were also analyzed and compared. Qualitative matching of the plastic coatings was made on the basis of eight trace elements (SID)

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**The Identification of Motor Body Fillers**—B. C. Cleverley, *The Journal of the Forensic Science Society*, 10(2): 73-76 (April 1970). Examination of a number of motor body fillers shows that it is possible to identify the brand of a filler from its color and infrared spectrum. The colors of different batches of each filter were the same and the spectra of uncured fillers and of hardeners showed that the composition of batches was similar. The spectra of different mixes of a filler sometimes showed difference between the absorbance ratios of some absorption brands. (SID)

**The Investigation of Methaemoglobinemic and Carcinogenic Poisons as  $\pi$  Complexes with 2, 4, 6 Trinitroanisole and Picramide**—D. B. Parihar, S. P. Sharma, and K. K. Verma, *Journal of the Forensic Science Society*, 10(2): 77-82 (April 1970). Aromatic amines and their metabolites are potential methemoglobinizing poisons in industry. B-naphthylamine and Benzidine are chiefly responsible for the appearance of bladder tumors. The identification of these amines when present in the air of factories or on the shoes or clothing of the workers is described. The compounds can be easily detected up to 1 to 4 mg. as their charge transfer complexes with aromatic nitro compounds. (SID)

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**The Examination of Bloodstains by Laurell Electrophoresis**—P. H. Whitehead, S. S. Kind, P. A. Morris, M. Davies, and R. M. Cleevely, *Journal of the Forensic Science Society*, 10(2): 83-90 (April 1970). The recently described technique of crossed antigen/antibody electrophoresis has been adapted for studying experimentally prepared bloodstains. Full practical details are given and a discussion of the technique and its potential use in forensic science is presented. Attention is drawn to gross differences in serum protein patterns that may occur in bloodstain extracts and also to clear differences observed between the major haptoglobin variants by this technique. (SID)

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**Instrumentation in Criminalistics**—P. L. Krik, *Journal of the Forensic Science Society*, 10(2): 97-107 (April 1970). A review is presented of instrumentation applicable to the field of criminalistics. Neutron activation analysis, the scanning electron microscope, the electron microprobe, atomic absorption spectroscopy, x-ray fluorescence spectroscopy, mass spectrometry, pyrolysis gas chromatography and a number of other instrumental approaches are considered in the context of their possible contributions and application to the examination of physical evidence (SID).

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**X-Ray Densitometric Investigations of the Human Mastoid Process**—K. Saternus and H. P. Schmitt, *Zeitschrift für Rechtsmedizin (Journal of Legal Medicine)*, 67(3): 115-183 (1970). As a result of x-ray densitometry examination of 91 adult mastoid processes the authors carried out, that age and sex determination is impossible using unknown

single specimens, but the specific structure of the mastoid process, especially the specific structure of its air spaces is suitable for individual identification. (AS)

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The Radiographical Method of Determining the Range from Which a Shot Was Fired?—E. Bohm, H. P. Schreiber, and H. Suchenwirth, *Disch. Z. ges. gericht. Med.*, 65: 109-111 (1969). A radiographical control method of determining the range from which a shot was fired is described. For effecting the representation of residual smoke particle distribution, a table top radiation inspection unit at 25 kV and 3 min. exposure, was used. The x-ray negative obtained was projected on a rotating film strip. A compensating filter is necessary for photometric evaluation of the rotation pictures. (AS)

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Expert's Practice Problem—J. Cholewinski and S. Kowalski, *Archiwum Medycyny Sadowej I Kryminologii*, 20(1): (1970). An identification case of multilayer isolating tape of a main cable is described. A detailed comparative examination of cable remaining with a fragment belonging to the suspected person was performed. (AS)

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Detection of ABO Antigens in Blood Strains Using a Modification of the Elution Test—J. S. Kobiela, B. Turowska, B. Opolska, *Archiwum Medycyny Sadowej I Kryminologii*, 20(1): (1970). The authors detected in 112 blood stains, from criminal cases, the ABO system by using the method described by Nickolls and Pereira and the classical inhibition method (Holzer). The modification of the absorption-elution method according to Nickolls and Pereira has proved to be a very simple sensitive method and very useful to introduce to forensic practice. (AS)

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Two Cases of Criminal Dismemberment of Bodies—J. S. Kobiela, Z. Marek, E. Baran, A. Jastrzebski, and B. Prochnicka, *Archiwum Medycyny Sadowej I Kryminologii*, 20(2): (1970). The cases of criminal dismemberment of the bodies of two young women is described. In one case the murderer boiled the pieces of the body and burnt the head in a stove. The genital organs have been found. In the second case the murderer had packed the body and threw it into a river, from where it was recovered after a few months. In these cases it was impossible to give a detailed opinion about

causes of death, mainly because of the lack of heads. In spite of this, it was possible to estimate the sex and age of the victims. The authors describe and discuss the methods and the results of serological, toxicological, histological, and sex chromatin investigations in which x-ray examination of bone-age was made as well. (AS)

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The Investigation of Inks in Judicial Trial—J. Cholewinski and J. Dumanski, *Z Zagadnien Kryminalistyki*, 4: (1969). The authors describe investigations of ink and paper to reveal the mutual interaction between the ink components. During several experiments it was stated that the pigments which can be separated chromatographically are strongly adsorbed on the cellulose fibres. The spots of documentary inks differ from those left by dye inks as a result of an outer boundary zone, which hinders the components of any other ink introduced on the paper near the first to diffuse into the first spot. The results obtained have made it possible to develop a rapid and sure method for determining which of two ink lines crossing each other on paper were drawn first. (AS)

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Electronic-Ray Investigations of Electrical Injuries—E. Bohm, *Z. Rechtsmedizin (J. Legal Med.)*, 67: 293-308 (1970). Cutaneous injuries produced in human cadavers by 220 volt alternating current were examined using a scanning electron microscope and a microprobe analyzer. The author describes changes of the skin surface and of the hair, in particular the structure of metallic particles at points of contact. It was possible to determine the elements of the alloys and their protective covers on the skin surface and to correlate these with points of contact of the electrodes used. It was possible to show a complex electrical metallization, which cannot be carried out with the use of fluorescent x-ray or spectrum analysis. The development of the instruments used and their applicability in forensic trace analysis are also discussed. (AS)

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Toxicological Data on Phenothiazine Drugs in Autopsy Cases—R. Bonnicksen, P. Geertinger, and A. C. Maehly, *Z. Rechtsmedizin (J. Legal Med.)*, 67: 158-169 (1970). The concentration and distribution of phenothiazine drugs in the body fluids and tissues of 66 autopsy cases are reported. The cases are presented in three groups. From the data presented it seems that the level of this kind