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## Police Science Technical Abstracts and Notes

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## POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

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Edited by

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Abstractor

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**Physical Activity until Collapse Following Fatal Injury by Firearms and Sharp Pointed Weapons**—Werner U. Spitz, Charles S. Petty, and Russell S. Fisher, *Journal of Forensic Sciences*, 6 (3): 290-300 (July 1961). Questions often asked of the forensic pathologist are: "How long could a man have lived after his wounding, and what activities might he have undertaken until he collapsed?" There are no ready answers to these questions. A review of 111 homicides involving firearms and sharp pointed instruments with regard to the time taken to reach complete disability and blood loss of the victim has been reported. Disability of victims of fatal gunshot injuries appears to be more rapid than in those fatally wounded by sharp pointed instruments. (WEK)

**Fatal Underwater Breath Holding in Trained Swimmers**—Joseph H. Davis, *Journal of Forensic Sciences*, 6 (3): 301-6 (July, 1961). Two cases of fatal underwater breath holding in trained swimmers are presented. The role of carbon dioxide retention as the fatal factor is discussed. Competitive contests which feature underwater breath holding to excess are a most dangerous practice and should be discouraged. The dangers of this practice should be emphasized in the initial phases of swimming instruction. (WEK)

**Interesting Applications of Tool Mark Identification**—Charles R. Meyers and Edgar W. Kivela, *Journal of Forensic Sciences*, 6 (3): 316-20 (July 1961). Four cases are mentioned which illustrate the investigator's recognition of the wide application of tool mark evidence. An imaginative search for this evidence coupled with the laboratory

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identification by the criminalist often provides the necessary conclusive link for successful prosecution. (WEK)

**Was this Document Written with the Left Hand?**—Mary S. Beacom, *Journal of Forensic Sciences*, 6 (3): 321-30 (July 1961). Questionnaires were completed by a group of 115 persons ranging from 11 to 67 years of age. Due to this limited number of questionnaires, which were used as a basis for this study, the results aforementioned can not be considered scientifically conclusive. Rather this paper is offered as a suggested procedure for further investigations which may follow, with the acquisition of a larger quantity of selected writings by the left-handed. A study of these findings may help document examiners to feel more justified in hesitating to state an opinion as to the hand used in a given writing. There are so many factors involved. (WEK)

**Quantitative Determination of Arsenic in Toxicological Analysis**—R. C. Gupta, *Journal of Forensic Sciences*, 6 (3): 331-6 (July 1961). A simple and accurate method of determining milligram quantities of arsenic in tissues, urine, and other substances has been presented. After wet digestion the arsenic is converted to arsine with nascent hydrogen, and the latter is bubbled through a buffered solution of iodine. The excess iodine is titrated against standard thiosulfate solution. (WEK)

**An Evaluation of a Technique for the Examination of Lipstick Stains**—D. M. Lucas and G. Eijgelaar, *Journal of Forensic Sciences*, 6 (3): 354-62 (July 1961). A method for extracting the Bromo Acids dyes from transfer lipstick stains was developed using 5 per cent ammonia in

methanol by percolation after pre-treating the stain with petroleum ether. Results from visible absorption spectro - photometry and paper chromatography for 32 lipstick samples were determined and the significance of the results has been discussed. This technique allows for greater differentiation than does visual comparison under white or ultraviolet light or color reactions with strong acids. (WEK)

Use of Inverted Microscope in Becke Line Method of Determination of Refractive Index of Solids—S. N. Garg and M. V. Badwe, *Journal of Forensic Sciences*, 6 (3): 286-9 (July 1961). Use of an inverted microscope with a thin bottom cell and only two liquids is described for determining the refractive index of small solids by Becke line method. The refractive index of the immersion liquid can be quickly and continuously adjusted and on that account alone the method is much less laborious than the conventional method. (WEK)

Lead Poisoning Resulting from Illicit Alcohol Consumption—Anne E. Eskew, James C. Crutcher, S. L. Zimmerman, George W. Johnston, and William C. Butz, *Journal of Forensic Sciences*, 6 (3): 337-50 (July 1961). Five clinical cases of chronic lead intoxication are reported in patients who have consumed large quantities of illicit whiskey. In two of the cases the lead content of autopsy tissues is recorded. Chronic alcoholism, combined with lead poisoning, is regarded as a significant factor in leading to the demise of these patients. Correlated with this finding is the existence of large quantities of lead in distillates of seized illicit liquor stills in which automobile radiators were used as a means of condensation. The fact that the radiators are not the only source of lead is illustrated by elevated readings in other samples; lead ions will be released whenever the acid distillate comes in contact with solder. (WEK)

The Use of Paper Chromatography in Systematic Toxicological Analysis—Alan S. Curry, *Journal of Forensic Sciences*, 6 (4): 373-99 (Oct. 1961). A review of the use of paper chromatography in toxicological analysis. General discussion of the 3 methods of producing paper chromatograms, solvent systems and visualisation of the spots. Also presented is a procedure of systematic toxicology which includes volatile compounds,

metallic poisons, toxic anions, organic solvents—soluble poisons, strongly acidic and weakly acidic solvents—soluble compounds, alkaloids, quarternary ammonium compounds and glycosides. The author concludes by stating, "Paper chromatography as it is used by the forensic toxicologist has three functions:

- (a) The separation of normal body constituents from traces of poison with consequent purification of the latter.
- (b) Identification of abnormal constituents from a consideration of Rf values and specific chemical sprays.
- (c) Semi-quantitative assay of abnormal and normal constituents." (WEK)

Paint Examination Techniques Utilized in FBI Laboratory—*FBI Law Enforcement Bulletin*, 30 (9): (Sept. 1961). A review of the many scientific examinations and technical processes available at the FBI Laboratory for use in the examination of paint particles submitted as evidence in the investigation of crime. Also, suggestions as to proper packaging and submission of such evidential material to the laboratory. (WEK)

Identification of Blood Stains by Paper Chromatography—Angelo Fiori, *Journal of Forensic Sciences*, 6 (4): 459-64 (Oct. 1961). A rapid paper chromatographic method for identification of blood stains is presented. This method is a modification of that carried out by the author in 1957. (WEK)

Forensic Neuropathology—Cyril B. Courcille, *Journal of Forensic Sciences*, 6 (4): 445-58 (Oct. 1961). Lack of fundamental knowledge as to nature and sequences of pathological processes taking place in the central nervous system not infrequently leads the medical examiner to reach erroneous conclusions, especially when he attempts to establish an actual cause of death. When such findings are misinterpreted in civil medicolegal cases injustice is often done; in criminal cases, an even greater tragedy occurs when innocent individuals are often punished more or less severely for alleged felonies.

In the writer's experience such miscarriage of justice not infrequently occurs in the smaller urban centers. It is the purpose of this and subsequent studies to review the basic aspects of forensic neuropathology in an effort to avoid such tragedies.

This introductory study is concerned with some simple technical methods which make possible accurate, adequate and appropriate conclusions in medicolegal autopsies. (WEK)

**Barbiturate Analysis: Method and Statistical Survey**—Roger Bonnichsen, Andreas C. Maehly, and Adrian Frank, *Journal of Forensic Sciences*, 6 (4): 411-43 (Oct. 1961). A method for the qualitative and quantitative determination of barbituric acid derivatives in toxicological analysis is described. The procedure includes the use of paper chromatography, spectrophotometry, and melting point determination. Only a few grams of tissue are required. The overall yield of each individual barbiturate is about 80%, even when several derivatives are present simultaneously.

More than 600 cases of lethal barbiturate intoxication have been analyzed, and the extensive data obtained are statistically evaluated. The results give reliable information about the concentrations of barbiturates in lethal poisoning cases. The synergetic action of ethanol in barbiturate poisoning is discussed. (WEK)

**The Identification of Pistols by Serial Numbers and Other Markings**—V. Krcma, *Journal of Forensic Sciences*, 6 (4): 479-500 (Oct. 1961). The people responsible for the identification, registration, and control of firearms must have available as much data as possible on the serial numbers and other identification markings of these weapons. In addition, firearms examiners attempting to restore obliterated serial numbers should be aware of the size, form, and location of the serial numbers on the weapon they are examining. Sometimes knowledge of a hidden serial number or a partial number saves a lot of work or is valuable for checking the results of the restoration. Hidden duplicate numbers may be found in various places depending on the type and make of the weapon.

The author presents detailed information on the following firearms:

Colt Frontier Scout .22 Cal. Revolver

FN Pistols

Iver Johnson Revolvers

Inglis Pistols

P.B. Pistols

P-38 Pistols

Smith & Wesson's Pistols and Revolvers

SIG Pistols

Walther-Manurhim Pistols

In addition, there are nine pages of tables setting

forth pertinent data on the common location of serial numbers and other identification markings. This article is a summary of information that should be of value to all firearms examiners. (WEK)

**Unusual Handguns, Unlawfully Possessed or Used in Crimes**—Leslie L. Smith, *Journal of Forensic Sciences*, 6 (4): 501-6 (Oct. 1961). This paper presents a description of the characteristics and features of examples of altered factory-made rifles, an individually made pistol and two types of "Zip" guns. Case histories involving the use of these guns are related, and the possibility of identifying bullets and cartridge cases fired from these guns are discussed. (WEK)

**Identification of Fiber Blends by Infrared Spectroscopy**—M. Kathryn Wharton and Florence H. Forziati, *American Dyestuff Reporter*, 50 (14): 33-6 (July 10, 1961). A powered specimen of blend is separated in a density gradient of ethanol: carbon tetrachloride. Components are collected with a hypodermic syringe, dried and pelleted with KBV. Fibers are identified by comparing their I.R. spectra with known spectra. (JDN)

**How Far Will a Gun Shoot?**—Anonymous, *The American Rifleman*, 109 (9): (Sept. 1961). Maximum ranges are given for common cartridges for rifles and hand guns. The maximum range of shot is also discussed. (JDN)

**20 mm Recovery**—John L. Boyd, *The American Rifleman*, 109 (9): 84-5 (Sept. 1961). Test shots fired from suspected 20 mm cannons were recovered in a stack of 20, 4" mattresses. These tests were successfully compared with a stray projectile which struck a home. (JDN)

**Hypnosis: A New Tool in Police Work**—Harry Arons, *Police*, 6 (1): 68- (Sept.-Oct. 1961). A discussion of the pros and cons of hypnotism in connection with criminal interrogations. (JDN)

**A System for Identification of Barbiturates in Blood**—George W. Stevenson, *Analytical Chemistry*, 33 (13): 1903-6 (Dec. 1961). The barbituric acid derivative is dissolved in butyl ether and extracted with a borax (pH 9) solution twice. This removes the polar compounds. Further extract with 1N Na OH removes the nonpolar compounds. The polar fraction is treated with strong alkali

while observing absorbance at 260  $\mu$ . This step separates the barbiturates into resistant and labile. The nonpolar barbiturates are separated into saturated and unsaturated compounds by  $\text{KMnO}_4$  oxidation. The final identification is based upon the rate of decrease of the barbiturate under alkaline hydrolysis as measured spectrophotometrically. (JDN)

**Pyrolysis Techniques**—D. A. Vassallo, *Analytical Chemistry*, 33 (13): 1823-4 (Dec. 1961). Describes a hot wire unit for pyrolysis of polymers. The pyrolyzates can be introduced into a gas chromatography by a hypodermic needle. "Hot filament pyrolysis facilitates identification of pyrolysis products. Pyrolytic analysis is most useful for detecting minor differences in similar polymers." (JDN)

**Out of Sight**—R. E. O'Reilly, *The American Rifleman*, 109 (12): 96 (Dec. 1961). A shot fired from a 9 mm Luger pistol, penetrated a telephone pole, ricocheted off of water and fatally injured a boy  $\frac{3}{8}$  of a mile away. (JDN)

**Separation of Components of Marijuana by Gas-Liquid Chromatography**—Charles R. Kingston and Paul L. Kirk, *Analytical Chemistry*, 33 (12): 1794 (Nov. 1961). Separation of components of a resin, extracted from *Cannabis Sativa* by petroleum ether, by gas liquid chromatography is described. Each fraction was tested by Duquenois and Moustapha reagents, some giving the characteristic color of the parent resin. The authors suggest that color tests lack the specificity of gas-liquid chromatography for positive identification of marijuana. (JDN)

**Erased Numbers on Metal**—T. J. Clogger, *The Australian Police Journal*, 15 (2): 149 (April 1961). Solutions for cast iron, steel aluminum and copper alloys are discussed. Ferrous and aluminum articles should be heated to 300°C and cooled before etching.

Cast iron— $\text{H}_2\text{SO}_4$  (10%) +  $\text{K}_2\text{Cr}_2\text{O}_7$

Steel— $\text{HCl}$  (80ml),  $\text{H}_2\text{O}$  (60 ml),  $\text{CuCl}_2$  (12.1 gms) Alcohol (50ml)

(Alternate with  $\text{HNO}_3$  15%)

Aluminum—(A) Glycerine (30ml),  $\text{HF}$  (20ml)  
 $\text{HNO}_3$  (10 ml)

(B)  $\text{CuCl}_2$  (200 gms),  $\text{HCl}$  (5ml)  
 $\text{H}_2\text{O}$  (100 ml)

(Alternate A & B, scrubbing to remove copper deposit)

Copper and copper alloys— $\text{FeCl}_3$  (19 gms),  
 $\text{HCl}$  (6 ml)  $\text{H}_2\text{O}$  (100 ml). (JDN)

**Infrared Techniques in the Identification and Measurement of Minerals**—W. M. Tuddenham and P. J. P. Lyon, *Analytical Chemistry*, 32 (12): 1630 (Nov. 1960). Studied effects of a grinding matrix, and concentration in I.R. spectra of quartz and  $\text{CO}_2$  in samples of carbonate-apatite samples. Quantitative results suggest that this method might be applied to dust, fine clay, pigments, etc. (JDN)

**A Water Tank System of Bullet Recovery**—E. G. Bigler, *Police*, 6 (1): 72 (Sept. & Oct. 1961). A water recovery tank, used by the Metropolitan Dade County Crime Laboratory, is described. The tank measures twelve feet, six inches in length and twenty inches in diameter. Shock mounting and sound proofing minimize transmission of the shock to other parts of the building. A perforated basket permits the recovery of the test bullets. (JDN)

**Circumstantial Evidence**—S. Swaine, *The Australian Police Journal*, 15 (2): 117 (April 1961). The author relates four cases in which evidence of a circumstantial nature (sufficient in many of our courts as far as suggesting guilt), was proven false by laboratory examinations. In one case, circumstances were present; which might have called for a rash use of firearms resulting in possible harm to a completely innocent man. (JDN)

**"Truth" Drugs**—Lawrence Zelic Freedman, *Scientific American*, 202 (3): 145 (March 1960). Drugs effect higher brain centers and then, with larger doses, the next lower centers. Effect on person depends upon "personality structure of the subject, his physiological tolerance for the drug, and the environmental stimuli acting upon him at the time."

Points out the value of drugs for psychiatric interview, but warns against its use to obtain a reliable confession. (JDN)

**Alcohol as a Factor in Victorian Road Collisions**—J. H. W. Bissell, *The Australian Police Journal*, 15 (4): 332 (Oct. 1961). A study of road accidents in Victoria and Melbourne showed 64 to 70% of