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## Police Science Technical Abstracts and Notes

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## POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

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Use of the Electron Microprobe for the Identification of Paint Chips (Anwendung der Elektronenstrahl—Microsonde zum Identifizierung von Lacksplitttern)—A Schöntag, *Archiv für Kriminologi*, 138 (5 & 6): 125-30 (Nov., Dec., 1966). Although the electron microprobe possesses interesting and useful capabilities, Schöntag reports that a sample of 3 mm x 3 mm is necessary to show proper representation. This size is likewise necessary for spectrographic trace analysis. Since specimens of this size are rarely encountered in criminalistics, the author feels that an improved technic must be sought. (JDN)

Experimental Investigation of Radioactive Diatoms in Drowning (Experimentelle Untersuchungen mittels im Kern-Reaktor bestrahlter Diatomeen über das Ertrinken)—S. Merli and U. Ronshi. *Archiv für Kriminologie*. 138 (5 & 6): 131-6 (Nov.-Dec., 1966). Blood samples taken from the left side of the drowned dogs show an elevation of Mn<sup>56</sup> after 70 sec. when the animals were drowned in water containing radioactive diatoms. Microscopic examination of the whole organs (lungs, liver, kidney) after 40 minutes showed only 9 diatoms. The authors caution against a conclusion of non-drowning based upon negative findings of diatoms, particularly where whole organs are not examined. (JDN)

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Measurement of Serum Diphenylhydantoin by Gas-Liquid Chromatography—D. H. Sandberg, G. L. Resnick, and C. Z. Bacallao, *Analytical Chemistry*, 40(4): 736-738 (April 1968). In the described procedure diphenylhydantoin is extracted from acidified serum with chloroform. The methoxy derivative of diphenylhydantoin is then formed and separation is accomplished by g.c. using a flame ionization detector. G.C. operating conditions:

1. Stationary phase—2% (w/v) XE-60
2. Column Temp. 230-240°C
3. Detector Temp. 250°C
4. Inlet Temp. 250°C
5. Helium Flow 90/ml/min. (PJC)

X-Ray Techniques in Forensic Science—Daniel Graham, *The Criminologist*, (9)105-119, (August 1968). An x-ray technique called electronography is described in detail. This technique has been used to record watermarks on stamps affixed to documents, fingerprints on difficult backgrounds, indented writing on a printed page and fingerprints on skin. Briefly, the method employs the characteristic radiation given off by metallic elements under the influence of a high kilovoltage monochromatic primary beam. The procedure in the case of indented writing and fingerprints involves dusting with metallic powder and placing a film over the area being studied. Suitable filters are employed to assure that only the radiation from the powder will be recorded on the film. This technique eliminates all of the difficulties encountered in normal photography and allows prints to be found and recorded which previously would have been impossible to record. (PLC)

A Fatal Case Involving Trichloromonofluoromethane and Dichlorodifluoromethane—R. C. Baselt, and R. H. Cravey, *Journal of Forensic*

*Sciences*, 13(3): 407-410, (July 1968). The case history, autopsy findings, and toxicologic studies following a fatal exposure to trichloromonofluoromethane and dichlorodifluoromethane are discussed. (PJC)

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**Separation of Penicillins by Paper and Thin-Layer Chromatography**—Hans Hellberg, *Journal of the A. O. A. C.*, 51(3): 552-556, (March 1968). The development of a paper and a thin-layer chromatographic method for separating many of the most common penicillins is described. (PJC)

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**Determination of Trace Component Distribution in Illicit Spirits by Neutron Activation Analysis (NAA), Atomic Absorption (AA), and Gas-Liquid Chromatography (GLC)**—C. M. Hoffman, R. L. Brunelle, M. J. Pro, and G. E. Martin, *Journal of the A. O. A. C.*, 51(3): 580-586, (March 1968). Trace inorganic and organic components found in illicit spirits were evaluated statistically. The inorganic components were measured by neutron activation analysis and atomic absorption. The organic components were determined by GLC. Results show that the use of multiple techniques increased the probability of matching two or more samples in determining a common source. (PJC)

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**Rapid Near-Infrared Spectrophotometric Method for Determination of Meprobamate in Meprobamate Tablets**—Stephen Sherken, *Journal of the A. O. A. C.*, 51(3): 616-618, (March 1968). A rapid method is presented for the analysis of meprobamate in meprobamate tablets in which the meprobamate is quantitatively dissolved in alcohol-free chloroform and the solution scanned on a spectrometer in the near-IR region. Meprobamate gives rise to two bands in the near-IR region which can be used for the determination of dilute solutions of meprobamate in chloroform. These bands are at 2.820 and 2.914 microns. (PJC)

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**Gas Chromatographic Separation and Quantitative Estimation of Barbiturate Mixtures in Solid Dosage Forms**—John L. Allen, *Journal of the A. O. A. C.*, 51(3): 619-621, (March 1968). A GLC method for the analysis of mixed barbiturates in solid dosage forms is presented. Equipment used: Pacard Model 7621 G.C. equipped with a hydrogen flame ionization detector. Column—6' x 4 mm. v.d. glass column. Packing—10% SE 30 on 100-120 mesh Gas Chrom Q using silanized glass

wool end plugs and preconditioned for 18 hr at 250°C with N<sub>2</sub> flow of 100 ml/min. and carrier gas flow rate 80 ml/min. and the following temp. °C were maintained: column 180, injector 218, detector 220. Operating conditions—detector 125 v; hydrogen flow 40 ml/min.; air flow 400 ml/min.; electrometer setting  $3 \times 10^{-9}$  amp. The hydrogen and air flow rates were adjusted so that 2.0 µg mephobarbital gave ca 40% full scale conditions. Sample preparation and procedure is included in the article. (PJC)

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**Collaborative Study of the Separation and Spectrophotometric Determination of Acetyl-Carbromal and Bromisovalum**—James M. Look, *Journal of A. O. A. C.*, 51(3): 621-623, (March 1968). A celite column separation and infrared spectrophotometric determination of acetyl-carbromal and bromisovalum is described and the results of a collaborative study of the method presented. (PJC)

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**Collaborative Study of a Method for the Determination of Antipyrine and Benzocaine in Glycerol and Propylene Glycol Bases**—Richard T. Krause, *Journal of A. O. A. C.*, 51(3): 624-626, (March 1968). A column partition chromatographic separation, U.V. quantitative determination, and infrared spectrophotometric identification method for antipyrine and benzocaine is presented. The results of a collaborative study of the described method are presented. (PJC)

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**Chlorinated Hydrocarbons in Drugs: Chloral Hydrate**—Arthur W. Davidson, *Journal of A. O. A. C.*, 51(3): 626-630, (March 1968). A specific colorimetric method for chloral hydrate is described. The method is based upon the reaction of chloral hydrate with quinaldine ethyl iodide to produce a stable blue cyanine dye. The dye is determined spectrophotometrically at 605 millimicrons. (PJC)

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**Ethyl Alcohol in Cadaver Organs and Fluids**—R. Luvani and E. Marozzi, *Journal of Forensic Medicine*, 15(2): 67-71, (April-June 1968). The authors examined 59 cadavers with alcoholaemia using the gas chromatographic method to determine alcohol concentrations in blood, spinal fluid, urine, brain, lung, myocardium, skeletal muscle, liver, and kidney. The conclusion reached is that the calculation of blood alcohol concentration in blood by means of that in organs or body fluids

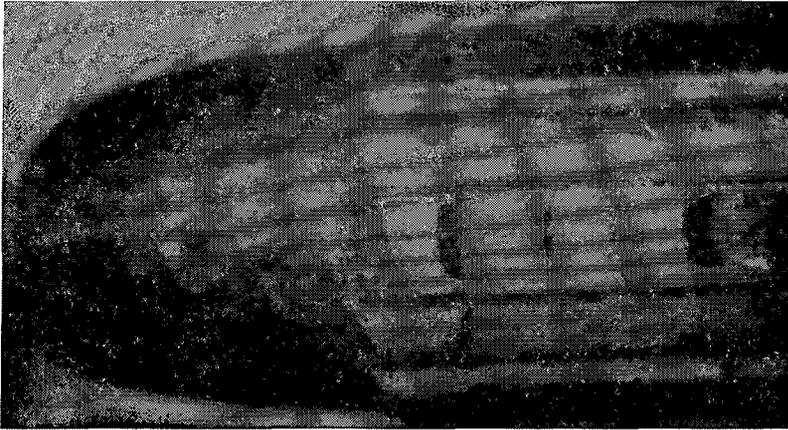


FIGURE 1

Resulting rifling marks on bullet.

can only be done if one knows whether the subject was in the absorption or past-absorption phase at the time of death. (PLC)

**The Unusual in Rifling**—Stanton O. Berg, LL.B., Firearms Examiner, 6025 Gardena Lane, N.E., Minneapolis, Minn. 55421.

Recently in connection with a firearms case in civil litigation, I had the occasion to test fire a Noble Model 275J Lever action .22 caliber rifle. In examining the recovered test bullets, I noted that the land markings on the bullets had a very pronounced semi-circular or raised half moon shape at the bottom of the markings (fig. 1). I have observed evidence of this phenomenon before in rifling marks but only to a slight or very modest

degree. In this case the semi-circular shape was very marked.

The reason for this peculiarity became apparent upon examination of the guns rifling. Each of the lands had a very apparent half moon shape or trough on the top of the land (fig. 2). Coarse tool markings were amply evident on the bottoms of the troughs. It appeared almost as if the edges of the tops of the lands had been lifted or forced up in the rifling process leaving the marks on the top surfaces intact. Whether this was produced intentionally by the factory or resulted from a defective rifling cutter or broach is unknown. An inquiry made to the factory has gone unanswered.

Firearms Information Service, a small arms and

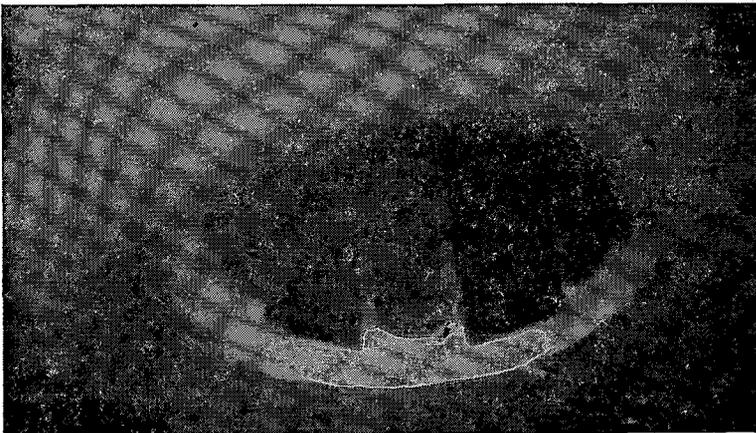


FIGURE 2

Rifling at the end of the gun barrel.

ammunition intelligence service—sometimes referred to as Firearms Identification Service—which was inaugurated by the H. P. White Laboratory, Bel Air, Maryland, in 1957, has resumed publication by the Firearms Information Service Division, Weapons Technology Laboratory, P.O. Box 199, Winchester, N.H.

The service which engages in original research also collects, analyses and disseminates useful small arms and ammunition technical intelligence from throughout the world. Information thus secured is published monthly on 4 x 6-inch file cards. Early in 1968 the number of cards will be increased to 50 monthly at no additional charge.

Cards include data on rifling specification and specification changes, firing pin impressions, cartridge and bullet component analysis; headstamp, primer and bullet code marking identification, breech block markings, information of manufacturers and trade marks, proof marks, serial numbers, technical description of contemporary and obsolete weapons, bullet color codes and book reviews.

The cards are coded so that the subscriber can readily file them for quick reference. A series of basic index cards are supplied with the original subscription and additional cards are supplied as the need arises. Fine quality scale photographs are supplied of each weapon described in the service.

"We have gathered over the years technical data which it would take an individual subscriber many years to secure by himself even if the manufacturers were willing to provide it. In some instances we have information which has since been lost by fire, flood, carelessly by manufacturers. This carded and coded information will eventually provide a subscriber a fund of material he could not get elsewhere," stated F.I.S. Technical Director Ray Bearse.

Bearse, author of *Centerfire American Rifle Cartridges (1892-1963)* and co-author with H. P.

White and B. D. Munhall of *Centerfire Pistol and Revolver Cartridges* is currently working with H. P. White, chief engineer of the H. P. White Laboratory on a series of volumes covering the entire range of small arms ammunition. (JDN)

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Demonstration of Spermatozoa in Stains on Wood by a Histochemical Technique—P. L. Baima-Bollone, *Journal of Forensic Medicine*, 15(2): 84-87, (April-June 1968). The technique used for the demonstration of spermatozoa on wood is based on the histochemical DNA—specific reaction of Feulger-Rossemuck. The method described is simple, gives no false positives, and may be used on cloth stains and on wood impregnated stains. (PLC)

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Close-Range Wounds Caused by a New Type of Small Shot Ammunition with Special Consideration of the Shot Distribution—W. Janssen and D. Kistner, *Archiv fur Kriminologie*, (141): 1-13, (January-February 1968). Unusual shot patterns and entrance wounds can be caused by the new style plastic shot cup ammunition. The various shapes of the entrance wounds produced by the spreading of this plastic cup are illustrated. The results of experimental research of the shot distribution after penetration of different materials are also discussed. (SMK)

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5th International Meeting of Forensic Sciences—The 5th International Meeting in Forensic Sciences will be held in Toronto, Ontario, Canada June 5th to June 11th, 1969. Papers will be presented in the fields of Forensic Medicine, Pathology, Toxicology, Psychiatry, Criminalistics and Document Examination. The language of the meeting will be English. Individuals interested in attending the meetings should contact the Secretariat, 8 Jarvis Street, Toronto 2, Ontario, Canada. (OH)