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Police Science Technical Abstracts and Notes

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POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

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Determination of Diphenhydramine and Certain Related Compounds by Ultraviolet Spectrophotometry—Jack E. Wallace, John D. Biggs, Elmer V. Dahl, *Analytical Chemistry*, 38 (7): 831-834 (June 1966). This report proposes a spectrophotometric method of analysis for diphenhydramine (Benadryl), [2-(benzohydroxy)-N, N-dimethylethylamine hydrochloride], bromodiphenylhydramine (Ambodryl), and diphenylpyraline (Diafen) in biological materials. It says that the method is specific for a group of compounds having a diphenyl methyl ether functional group and are extractable as bases. (PJC)

Comparative Ethanol Concentrations in Blood and Urine During Social Drinking—P. J. Stevens, J. K. Mason, and C. H. Bowden. *Medicine, Science & the Law*, 6 (2): 96-102 (April 1966). The authors using a control group of 69 male subjects investigated the estimation of blood-ethanol levels from urine-ethanol levels. Their work shows that a reliable conversion cannot be made due to the many variables which surround the collection of ethanol in the bladder as well as many other variables which must also be considered. (GDM)

Our Mobile Crime Unit—R. J. Cotron, *Law and Order*, 14 (2): 75 (February 1966). A description of the crime scene unit developed by the Eau Gallie, Florida, Police Department. In addition to the normal evidence kits, fingerprint kits, etc., the unit is equipped with a portable generator for strong on-scene lighting. (JDN)

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Obtaining Finger Prints from Mummified Fingers — J. T. Mercer, *Finger Print and Identification Magazine*, 47 (8): 3-5, 23 (February 1966). After amputation, the mummified finger is pressed into soft clay. The impression is stretched, coated several times with latex, removed and printed on the technician's finger. (JDN)

Detection of Blood with Thin Layer Chromatography—B. Rengei, *Archiv für Kriminologie*, 136 (1 & 2): 10-11 (July-August 1965). Blood in high dilution can be concentrated by thin layer chromatography using methanol, acetic acid (99:1) for development. Peroxydase from plants is deactivated by heating the plate in an oven at 100°C. Benzidene is used to detect the location of blood. (JDN)

Mistakes in Homicide Investigation—W. E. Kirwan, *Finger Print and Identification Magazine*, 47 (7): 3-9, 14-22 (January 1966). A good discussion of errors in homicide investigations with suggestions for correction. (JDN)

Fluortec—A New Fluorescent Polymeric Finger Print Powder—D. Patterson, *Finger Print and Identification Magazine*, 48 (1): 3-5, 23 (July 1966). Fluortec is a finely powdered polymeric substance in which a fluorescent coloring material is dispersed. This powder presents a bright contrast against most backgrounds and can be used with or without ultraviolet light. (JDN)

The Use of Dentistry by Law Enforcement Agencies—L. L. Luntz, *Finger Print and Identification Magazine*, 48 (1): 6-7, 11-16 (July 1966). Teeth are often available when all other means of personal identification are destroyed. The author suggests the proper procedure for comparing ante-mortem and post-mortem dental charts. (JDN)

A Spectrochemical Method for the Determination of Trace Impurities in Metallurgical Materials—B. E. Balfour, D. Jukes, and K. Thornton, *Applied Spectroscopy*, 20 (3): 168-71 (May-June 1966). A method is described in which trace impurities can be quantitatively determined via standards which are co-precipitated with the sample. Thus the problem of obtaining standard alloys of the same materials and physical form is obviated. The over-all co-efficient of variation in repeat runs is between 5% and 10%. Elements can be detected as low as .5 ppm depending upon the element and what other elements are present. (EMB)

Digital Computer Calculations and Correction of Matrix Effects in X-ray Spectroscopy—Betty J. Mitchell and F. Noel Hopper, *Applied Spectroscopy*, 20 (3): 172-80, (May-June 1966). A multiple regression technique has been developed to calculate equations correlating X-ray fluorescent intensities with composition for complex sample matrices. The technique has been applied to a variety of materials containing major and minor components with a wide range of atomic numbers. Equations are developed to calculate concentrations without the need for calibration curves. The equations themselves are programmed for computer calculation. (EMB)

Spectrographic Determination of Trace Amounts of Rare Earths. Determination of All Rare Earth Elements by the Carrier Distillation Method—B. Strzyzewska, Z. Radwan, and J. Minczewski, *Applied Spectroscopy*, 20 (4): 236-9 (July-August 1966). The sample, dissolved in HCl, is poured on to a graphite powder, after drying, a carrier (2% CsF) is added after which the sample is distilled and excited in a DC arc. The detection limit for these rare earths in graphite matrix was between .02 and .16 μg per sample. (EMB)

Preparation and Use of Powdered Silver Chloride as Infrared Matrix—Tim Spittler and Bruno Iaselskis, *Applied Spectroscopy*, 20 (4): 251 (July-August 1966). A method for preparing silver chloride pellets for infrared analysis is explained. The silver chloride is not so water sensitive as the usual KBr. A flat infrared trace from 2 to 40 μ can be obtained with this pellet if a compensating pellet is used. The preparation of the silver chloride powder is fairly elaborate, requiring special drying apparatus and liquid nitrogen. The pellets

may be handled with no special precautions except protection from direct sunlight. (EMB)

Motorcycle Headlight: On or Off at Time of Accident?—A. Schoentag, *Archiv fuer Kriminologie*, 137 (1-2): 1-5 (January-February 1966). In traffic accidents occurring during darkness it sometimes becomes critical to determine whether the vehicle lights were on or off. Previous articles by the author have dealt with the examination of lamps and filaments when the lamps were shattered by the collision impact. In this article he discusses the conclusions that can be made on the basis of the lamp and filament condition of intact bulbs.

A motorcycle struck an automobile while both were traveling at fairly high speed. The driver of the car claimed that the cyclist did not have his headlight on. Examination of the lamp filament showed evidence of melting and re-fusing of the coiled portion as well as a clean break in a straight part of the wire.

Considering these facts and the condition of the inside of the bulb—deposits were absent—the author concluded that the light was on at the time of impact and that a secondary break in the filament occurred immediately thereafter. But he cautions against potential misinterpretation of such evidence, since a prior faulty condition must also be considered. (JB)

Markings on the Hit And Run Victim's Shoes—A. Schoentag, *Archiv fuer Kriminologie*, 137 (5-6): 135-138 (May-June 1966). Dead or injured persons found by a roadside do not always show clear external evidence of having been struck by an automobile. Despite severe internal injuries there may not be definite indications of hit and run in the form of paint swipes, tears in fabric, or tire marks. This is likely to occur when the victim is struck from behind and is thrown directly upward and to the right. In such cases an examination of the soles of the shoes may reveal clear evidence of the impact.

When the victim is struck, the sole of the shoe bearing the body weight (rarely both shoes) will show characteristic, deep abrasions. The appearance and distribution of these abrasions may even show the direction from which the vehicle struck. In an impact from the rear, the scrape marks will indicate that the victim's toes were first forced downward against the pavement, momentarily before the body was lifted. A microscopic exam-

ination of the individual grooves may confirm the gross evidence in the abrasions: particles of street dirt imbedded in the leather will be seen as smeared toward the rear of the sole. The reverse may be observed if the victim was struck while facing the vehicle: the abrasions increase gradually toward the tip of the sole. (JB)

"Chance Photographs" As an Aid to Crime Investigators—M. Frei-Sulzer, *Kriminalistik*, 20 (5): 232-235 (May 1966). All possible evidence and sources of information should be brought to bear on the investigation of crimes and accidents. One such source might be photographs of persons, places, or things taken by amateurs or press photographers or even by the criminal himself. A classic case is provided by the assassination of President John F. Kennedy where amateur movies showed the actual events and press photos showed the subsequent murder of Lee Harvey Oswald.

It may even happen that the criminal takes pictures of his work. In one such case, a fanatic opponent of trade with Communist countries vandalized a number of Czech-made automobiles and kept a diary, with photographs, of the destruction he had wrought.

In the author's experience amateur photos have also been helpful in a variety of other problems: (1) showing the condition of a fire scene at various stages of a fire; (2) locating a witness to a traffic accident through his license number which showed up in a snapshot taken at the scene; (3) demonstrating that a suspect has associated with certain other individuals as revealed by a group picture or, conversely, in disproving an alibi when a suspect claims to have been at a different place at the time of the crime and produces snapshot to support his story; (4) describing stolen property by means of available photos of jewelry being worn by its owner, for example; such photos could also assist in restoring stolen property to the rightful owners. (JB)

The Medical Practitioner, Alcoholism and the Law—Max Hayman, *Journal of Forensic Sciences*, 11 (2): 111-23 (April, 1966). The concept has been gaining favor that alcoholism is a disease and the alcoholic a sick person. But if the alcoholic is a sick person, why do we arrest him? The medical practitioner defines the alcoholic as an ill person, whose illness is associated with unhappiness. The law cannot "cure" the disease. Short jail sentences

do allow a sobering-up and recuperation period from a physical point of view and have therefore relieved some of the deleterious effects of prolonged drinking. In any event, alcoholism is medically a disease because the American Medical Association says it is, and legally, drunkenness is a crime because the lawmakers say it is. In one way or another, alcoholism affects all the institutions in our society. Law and medicine are particularly involved, since alcoholism has been variously designated as a crime and as a disease. The law needs whatever aid it can get from the helping professions, and a workable program as a guide. Screening centers are needed to select proper care for each alcoholic. Considerable experimentation has been going on in our law courts, which includes the use of probation to honor camps, alcohol-prevention classes, alcoholism clinics, and Alcoholics Anonymous.

The Medical practitioner is involved in a frustrating situation compounded of ignorance and obligations. As the law more and more recognizes alcoholism as a disease, his responsibilities commensurately increase. Research and experimentation in the medicolegal management of the alcoholic has become mandatory. (WEK)

The Use of X-Ray Electronography and Auto-electronograph in Forensic Investigations—Daniel Graham, and Hugh C. Gray, *Journal of Forensic Sciences*, 11 (2): 124-143 (April 1966). (1) The forensic applications of two related radiographic techniques are described. Both utilize the characteristic radiation of lead. (2) Lead in the form of foil is used in the demonstration of watermarks on stamps affixed to documents. (3) Lead dust of carefully chosen particle size will delineate fingerprints on difficult surfaces such as hammer shafts, and recording of indented impressions on printed paper. (WEK)

Single Motor Vehicle Accidents in Cuyahoga County (Ohio): 1958-1963—S. R. Gerber, Paul V. Joliet, and John R. Feegel, *Journal of Forensic Sciences*, 11 (2): 144-51 (April, 1966). Two hundred and twenty-five single motor vehicle fatal accidents were studied from 1958 through 1963 in Cuyahoga County, Ohio. In those cases which survived no more than 12 hours, blood alcohol determinations were performed. Of the 225 drivers, death was considered due to trauma in 168 and due to natural causes in 57. The blood alcohol was found to be above 0.10% in nearly three-fifths of

the 124 drivers dying of traumatic injuries who were tested while only four persons dying of natural causes exhibited positive blood alcohols. Road conditions, available daylight, and weather were also analyzed for each group. The natural deaths tended to occur in daylight under generally favorable conditions. Those dying of accidental trauma tended to occur on clear, dark nights and with higher alcohol levels. (WEK)

Urine Screening Techniques Employed in the Detection of Users of Narcotics and Their Correlation with the Nalorphine Test—Kenneth D. Parker, C. H. Hine, N. Nomof, and H. W. Elliott, *Journal of Forensic Sciences*, 11 (2): 152-66 (April, 1966). (1) In a comparison of the nalorphine pupillary test and chemical analysis of the urine for their relative abilities to predict morphine and codeine administration to volunteers in a double-blind study, the chemical test was shown to be more accurate and to remain positive for a greater time after administration of the narcotic. (2) Among 1,004 cases of addicts administered the nalorphine test where the pupil test gave a positive or equivocal result, confirmation of narcotic use by chemical analysis was 46.8% and 20.5% respectively. (3) Both chemical tests and the nalorphine tests are useful methods of screening for narcotic use. There are benefits and drawbacks pertaining to each. (WEK)

The Occurrence of Cyanide in the Blood of Fire Victims—H. R. Wetherell, *Journal of Forensic Sciences*, 11 (2): 167-73 (April, 1966). Routine toxicological procedures followed include a check for the presence of cyanide, because of its extreme lethality and the relative simplicity of the screening test. It would be particularly embarrassing to overlook such a potent cause of death. The presence of sublethal concentrations of cyanide in the blood of fire victims is reported. The source of the cyanide is considered. (WEK)

Traumatic Rupture of Papillary Muscles with Unrecognized Cardiac Tamponade—Antal Szakacs, *Journal of Forensic Sciences*, 11 (2): 174-8 (April, 1966). A case of traumatic rupture of the papillary muscles of the left ventricle is presented. The patient lived only nine hours after the injury. A diagnosis of serious heart injury should be suspected after nonpenetrating trauma to the chest wall, especially if the patient has sustained a blow in the precordial region, and if his blood pressure or pulse, or both, cannot be elicited.

Since the prognosis is grave, prompt surgical exploration is imperative. (WEK)

The Medical Examiner System in the Territory of Guam—Charles J. Stahl, *Journal of Forensic Sciences*, 11 (2): 179-85 (April, 1966). The island of Guam is an unincorporated, remote territory of the United States. Guam has been a possession of the United States since 1898, except for Japanese occupation during World War II. Naval administration terminated in 1950 following passage of the Organic Act, which granted citizenship to the residents of Guam and established civil government.

The Government Code of Guam enacted by the First Guam Legislature in 1952 provided the territory with a law for a medical examiner system. The close liaison between civil and military agencies concerned with law enforcement, medicine, and law has afforded an opportunity for integrated approach in the investigation of suspicious, violent, and unexpected deaths. The existent law and medicolegal facilities provide the basis for a modern, effective medical examiner system. (WEK)

Poisoning by Volatile Compounds, I. Aromatic Hydrocarbons—R. Bonnicksen, A. C. Maehly, and M. Moeller, *Journal of Forensic Sciences*, 11 (2): 186-204 (April, 1966). (1) The application of chemical procedures, and gas chromatography to analyses of biological materials for benzene and aromatic hydrocarbons with aliphatic side chains has been discussed. (2) A sensitive chemical procedure for determination of benzene, toluene, and xylenes, based on the Janovsky reaction between nitrated hydrocarbons, alkali, and ketone has been described. (3) A number of case reports involving poisoning by aromatic hydrocarbons and the subsequent toxicological findings have been presented. (WEK)

The Determination of Ethanol in Blood or Tissue by Gas Chromatography—R. A. Davis, *Journal of Forensic Sciences*, 11 (2): 205-13 (April, 1966). A gas chromatographic method for the quantitative determination of ethanol in blood and tissue is described. The sample was homogenized with dioxane and after separation of the precipitated protein by centrifugation, the ethanol was determined in the clear supernatant layer of solution by gas chromatography. Ethoxyethanol was used as internal standard. Ethanol was satisfactorily quantitated in blood. The amounts re-

covered from liver and brain tissue were considerably less than the corresponding amounts found by a modified Widmark procedure. (WEK)

Preservation of Blood Samples Containing Alcohol—Lowell W. Bradford, *Journal of Forensic Sciences*, 11 (2): 214-6 (April, 1966). Discussion at recent scientific and professional meetings indicates that other workers have experienced difficulty with various preservatives and containers for the preservation of blood samples containing alcohol. The author recommends using (a) a screw cap vial with a resilient liner faced with Teflon or polyethylene, and (b) the use of mercuric chloride as a preservative in a formulation of 5 milligrams of sodium citrate and 0.1 milligram of mercuric chloride per milliliter of blood. For convenience in vial preparation, a solution of 40 grams of sodium citrate plus 0.8 grams of mercuric chloride per liter of water is made up. If one uses 8 milliliter screw cap vials, one milliliter of the solution is measured into each of the vials and they are baked dry in an oven. Preservative does not interfere with tests for drugs, narcotics and poisons other than heavy metals. (WEK)

"Nondestructive" Neutron Activation Analysis of Hair—Albert W. Forslev, *Journal of Forensic Sciences*, 11 (2): 217-32 (April, 1966). A review of recent work on neutron activation analysis of hair is presented with an evaluation of its applications to forensic science.

Washing techniques and trace element variations are discussed.

Radiation damage to hair resulting from neutron intensities of 10^{12} and 10^{13} n cm⁻² sec⁻¹ for three day periods is described and the limits of nondestructive analysis discussed. Some of the questions which exist and precautions that should be observed by the forensic scientist are outlined. (WEK)

Hommage à Edmond Locard (1877-1966)—*Sàretè National*, no. 63, 6-12 (June-July, 1966). Four tributes to the world famous French criminalist, Edmond Locard are published. "Edmond Locard and the Police Laboratory at Lyon", by Professor R. Moret, Director of the Laboratory deals with Locard's contribution to this laboratory. "Edmond Locard and Legal Medicine", by Professor Louis Roche of the Institute of Legal Medicine of Lyon deals with Dr. Locard's contribution to this field. "The Contribution of Ed-

mond Locard to the National Police School", by Henri Baudry, Director of the School, deals with Dr. Locard in connection with the Police training program. Jean Mercier, attorney, speaks finally under the caption of "Farewell to Lyon." Dr. Locard's death occurred on May 4, 1966. (OH)

Detection and Identification of Micrograms of Neutral Drugs in Biological Samples—Leo R. Goldbaum and Thaddeus J. Domanski, *Journal of Forensic Sciences*, 11 (2): 233-42 (April, 1966). A procedure for extraction of microgram quantities of neutral drugs from biological materials has been described. After partial purification of residue from an ether extraction by partition between hexane and alcohol, the residue from evaporation of the alcohol phase is dissolved in acetonitrile and 1 to 3 μ l portions are used for gas chromatographic identification of neutral drug extractives.

The relative retention times, minimum detection limits, and further gas chromatographic manipulations to confirm identity of various neutral drugs are given and discussed. (WEK)

Analytical Features of Chlorphentermine (= Pre-Sate® R)—M. F. Mason, E. Foerster, W. Patterson, and W. Drummond, *Journal of Forensic Sciences*, 11 (2): 243-55 (April, 1966).

1. Data on chlorphentermine-HCl ("Pre-Sate® R") in respect to its solvent partitions, absorption coefficients, X-ray diffraction pattern, thin-layer, paper and gas chromatographic behaviours, have been obtained and presented.
2. Studies of various primary separational procedures for recovery of chlorphentermine from tissues showed steam distillation from alkaline solution to be most effective.
3. Difficulties with UV measurement of chlorphentermine extracted from tissues have been illustrated and discussed.
4. Recoveries of chlorphentermine-HCl added to liver, brain, and blood and obtained by steam distillation and gas chromatography have been presented. It may be expected that such analyses will provide values between 90 and 110% of the drug present.
5. The drug appears to be quite stable in tissues and has been recovered quantitatively and unchanged from tissue allowed to putrefy.
6. The detection and quantitation limits have been indicated and the detection of chlorphentermine in "screening" procedures has been discussed. (WEK)