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Police Science Technical Abstracts and Notes

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POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

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Infrared Microspectroscopy, II—The application of Infrared Microspectroscopy to the products of paper chromatography should find use in police laboratories. A recent article by E. R. Blout and G. R. Bird in the *Journal of the Optical Society of America*, 41:547-51 (August, 1951) describes an infrared microspectrometer capable of a resolving power of $\lambda/\Delta\lambda = 400$ on samples of 5 to 10 γ . Even less sample can be used with proper manipulative technic.

Photography in Arson Cases—The lecture presented at the Seventh Annual Arson Investigators' Seminar and Training Course on the subject of Photography in Arson Cases is published by the author, Quentin Dean, in *International Association of Arson Investigators' News Letter*, 2:2-16 (January, 1952). Dean relates the legal requirements of photography, and equipment useful in arson photography.

Spark Analysis of Semi-Microsamples—Sample preparation in the spectrographic analysis of specimens of limited quantity can be the controlling factor in many applications. W. J. Wark shows how this can be done by briquetting the sample on the end of a one-centimeter piece of graphite rod. As described in the *Journal of the Optical Society of America*, 41:465-7 (July, 1951) the method produces a favorable sample to carbon ratio, reproducible background, lower sample loss, and greater accuracy. Its adaptability to samples ranging from fractions of a milligram to tens of milligrams makes it a valuable contribution to Police Spectrographers.

Metallurgical Microspectroscopy Using Microdrills—By means of a microdrilling machine, where drills as small as .001 inch in diameter are used, areas as small as individual grains in a metal can be sampled. The chips are collected by flowing on collodion and transferring to a graphite electrode. F. R. Bryan, *Journal of the Optical Society of America*, 41:1061 (December, 1951) points out the advantages of this method in the precise sampling, sensitivity by use of arc, and the utilization of standard equipment.

Cyanogen Rarefaction Using Solid CO₂—W. J. Wark constructed a chamber of three walls of brass, floor and roof made with Bakelite, and a sliding wall of glass for the fourth side. An opening in one wall is covered with a quartz plate. A fume stack and graphite electrode bushing penetrate the roof of the cell and a graphite bushing in the floor holds the lower electrode. Dry ice is introduced into the chamber via the sliding glass window. Many advantages other than reduction of cyanogen bands accompany this method; such as, reduction of self-absorption and a reduction of carbon continuum. The details of construction are contained in an article in the *Journal of the American Optical Society*, 41:482 (July, 1951).

Whorl Patterns in Fingerprint Classification—The double loop is treated in

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the discussion of Whorl Patterns in the *F. B. I. Law Enforcement Bulletin*, 21:7-9 (February, 1952).

Watermarks and the Investigator in Document Cases—The assistance afforded by watermarks in the tracing of paper to its origin is pointed out in the *F. B. I. Law Enforcement Bulletin*, 21:10-11 (Feb., 1952). The manner of production of the various types of watermarks is discussed.

Estimation of Age of Wounds and Disease Processes—A review of the age of wounds and disease, as it relates to forensic medicine, is given by W. O. Russell in the *Annals of Western Medicine and Surgery*, 5:950-3 (November, 1951). The mechanisms of body reactions to injury with their relation to Ante- or Post-Mortem injuries are discussed. Certain diseases and pregnancy are treated as related to establishing time of death.

A Systematic Approach to the Identification of Toxic Organic Compounds Isolated from Tissues and Fluids, Part I-Determination of Acidity and Basicity—The first of four papers on this subject is presented in the *Annals of Western Medicine and Surgery*, 5:945-9 (November, 1951). C. J. Umberger and A. Stolman separate drugs of the acid-ether residue into strong acids, weak acids, and nonacidic compounds. These are then diagnosed by indicators; congo red test paper and Davidson indicators. The alkaline-ether fraction is tested by sodium alizarin-sulfonate. Davidson indicators are also used on the basic-group drugs.

Revolver vs. Automatic Pistol—Some of the features represented in revolvers and automatic pistols are discussed by G. L. Hutton in *The American Rifleman*, 99:40-1 (October, 1951). It is Hutton's opinion that automatics, such as the Walther PP32, as used by the German police, is very dependable.

A Rapid Estimation of Alcohol in Body Fluids Using the Test-tube Still—A rapid method for the determination of alcohol in blood and urine is of interest to police technicians. This method described by F. R. Weedon, J. H. Gustafson, and J. D. Rolfe in the *New York State Journal of Medicine*, 51:(23):2744-5 (December 1, 1951) will merit trial because of the simplicity and reproducibility. No mention is made of the specificity of the method. An 8 mm. tube, 13 cm. long is closed at one end and 0.2 ml. of sample introduced; a 10 x 2.5 cm. piece of filter paper is rolled and inserted to within 4 mm. of bottom of the tube. This assembly is placed, open end down in a colorimeter tube containing 1 ml. of 0.6393 per cent potassium dichromate reagent in 50 per cent, by volume, H₂SO₄. An infra-red lamp is placed 11.5 cm. from tube for ten minutes after which the tube is rotated and the opposite side heated for another ten minutes. After cooling, the inner tube is removed with washing, and the washings and dichromate made up to 10 ml. After mixing, a reading is made at 400 to 465 m μ . against a blank. The readings are referred to a standard curve.

Overhead Photography in Confined Spaces—An ingenious piece of equipment for taking photographs vertically from the ceiling of small rooms is described by Detective Constable L. F. Clausen in the January-March issue of *The Police Journal*, 25:29-30 (January-March, 1952) (Submitted by John F. Williams, Missouri State Highway Patrol Technical Laboratory.)

The Protection of Articles Which Bear Fingerprints—The use of parts from a "Meccano" set (Mechanical Construction Sets available at top departments) to construct rigid carriers for objects of various shapes, which will protect any latent prints from disfiguration is described. Illustrations of bottles, knives, guns, and glass are included. Reported in *The Police Journal*, 25:31-3 (January-March, 1952). (Submitted by John F. Williams.)

Two Technics in Paper Chromatography—Forensic chemists who have a spectrophotometer in their laboratory will be interested in this method. David M. Tennent, John B. Whitla, and Klaus Florey describe an adapter for a Beckman DU instrument, for the direct reading of paper strip chromatograms. It is simple in construction and fits the absorption cell compartment. A similar device might be constructed for other make instruments. The paper strips are developed by means of lengths of glass tubing by an ascending flow principle. The inside diameter of the tube is equal to the width of the strip. Although the authors applied this method to the determination of ketosteroids, it might well be extended to include substances more familiar to a forensic chemist. *Analytical Chemistry*, 23:1748-1749 (December, 1951). (Submitted by Clemens R. Maise, St. Louis Police Laboratory.)

On the Use of X-ray Powder Patterns for Identification of Barbiturates in Forensic Chemistry. Iso-Yueh Huang and Bodil Jerslev. *Acta Pharmacologica et Toxicologica*, 7:227-230, (1951).—Isolation and identification of barbiturates from tissues is often difficult, and when crystals of more than one barbiturate are isolated the problems of identification are greatly complicated. The use of x-ray diffraction in identification of a barbiturate is described, and this method appears to offer great promise in the analysis of tissues for derivatives of barbituric acid. (Submitted by Frank R. Dutra, M.D., College of Medicine, University of Cincinnati.)

Blood and Urine Alcohol Tests in Cases of "Driving Under the Influence." I. M. Barclay, E. J. Miller, L. C. Nickolls. *Medico-Legal Journal*. Vol. XIX, Part III:98-105, (1951).—The results of chemical tests of blood, urine, or exhaled air for alcohol are becoming more widely used in the prosecution of persons accused of driving under the influence of alcohol. Urine has certain advantages over blood: 1) it is not always possible to secure blood samples, and to obtain them requires an "assault," while urine samples are usually readily obtained; 2) urine samples are often large enough to permit cross-checking of analyses by several analysts working independently, an important procedure where the liberty of the accused person may hang on the analytical result; 3) urine samples are usually large enough to permit analysis for other volatile reducing substances (such as acetone or paraldehyde), when required; 4) blood samples sometimes "unaccountably deteriorate" very quickly, while urine samples are preserved well for weeks by refrigeration.

Even though a chemical analysis does not reveal a concentration of alcohol that is *prima facie* evidence of intoxication, it may support clinical evidence of that condition and sometimes can be used to discredit an alibi that no alcohol or only a minute quantity had been consumed. In other cases, chemical tests have proved the absence of alcohol when other circumstances indicated that the individual was probably intoxicated. (Submitted by Frank R. Dutra, M.D.)