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Police Science Technical Abstracts and Notes

POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

Edited by

Joseph D. Nicol*

Abstractors

John F. Williams† William E. Kirwan‡ C. W. Muelhberger, Ph.D.§

Spectrophotometric Determination of Heroin and Quinine Maynard J. Pro, William P. Butler and Alex P. Mathers, *J. Assoc. Offic. Agr. Chemists, 38* (4): 849 (November, 1955). The authors describe a method of determining heroin and quinine from absorbance values at 297.5 mμ and 330 mμ. 0.1N sodium hydroxide in methanol (20%) is used as a solvent. Since heroin hydrolyses in 0.1N sodium hydroxide and absorption values read are actually those of morphine. Samples of unknown drugs in the order of 100 mg are dissolved and washed with anhydrous methanol to remove diluents and the most common interfering substances (milk, sugar, mannitol, and starch). Most other common diluents gave little or no absorbance at the wavelengths used. (J. F. W.)

Miniature Fluorescent X-ray Spectrograph—L. S. Birks and E. J. Brooks, *Analytical Chemistry, 27* (7): 1147 (July, 1955). A simple inexpensive X-ray spectrograph with no moving parts and with provisions for recording the spectra from two specimens simultaneously, side by side, on photographic film is described. The instrument is used on ordinary diffraction equipment and is designed for analyses which do not require the ultimate sensitivity or greater accuracy of a Geiger-counter spectrometer. (J. F. W.)

Rapid Microprocedure for Determination of Mercury in Biological and Mineral Materials—Dorothy Polley and V. L. Miller, *Analytical Chemistry, 27* (7): 1162 (July, 1955). The authors outline a method which requires only standard laboratory equipment, is specific and relatively rapid. An accuracy within 1γ or 5% in the 1γ to 100γ level is claimed. Common metallic ions do not interfere, and the procedure may be used to determine mercury in small amounts in soil, plant, and animal materials and in air. A sulfuric acid-hydrogen peroxide digestion is used and must be modified for different types of materials since very rapid reactions result in loss of mercury. Dithizone is used in the colorimetric determination, and the unreacted dithizone is measured with a photoelectric colorimeter. (J. F. W.)

Organic Spot Test Analysis—Fritz Feigl (translated by Ralph E. Oesper), *Analytical Chemistry, 27* (8): 1315 (August, 1955). The feasibility of using organic preparation procedures as the basis of microanalytical tests for organic compounds or functional groups is discussed and explored. Procedures for the detection of phenols, acyl derivatives of aromatic amines, arylurethanes and monoarylureas, and sulfonic acid have been developed. A sensitive test for organically bound iodine is also outlined.(J. F. W.)

Microreflectivity Analysis of Coal—J. T. McCartney and L. J. E. Hofer, *Analytical Chemistry, 27* (8): 1320 (August, 1955). The use of a photomultiplier photometer and a recording microammeter to record reflectance

* Technician, Dade County C.B.I. Laboratory, Miami, Florida.

† Technical Laboratory, Missouri State Highway Patrol.

‡ Director, New York State Police Scientific Laboratory, Albany.

§ Director, Crime Detection Laboratory, Michigan Dept. of Health, Lansing.

from polished blocks or briquets is proposed. Specimens are viewed through a microscope with a vertical illuminator and reflectance readings are taken through the same instrument. A side observation tube is provided so that the microscope may be focused without disconnecting the photometer. A 1/4 inch oil immersion objective is used, and a fine resolving pinhole at the level of the image in the ocular produces an effective diameter of 1.85 microns at the specimen. The slide with the specimen is moved past the objective at a fixed rate with a mechanical drive. Specimens are mounted in a thermoplastic resin before polishing. Nigrosine dye is added to the resin to cut down reflectance from particles beneath the surface of the plastic binder. While this paper deals with analysis of coal the technique might be adaptable to reflectance of other small specimens. (J. F. W.)

A New Spot Test for Formaldehyde—Philip W. West and Buddhadev Sen, *Analytical Chemistry, 27* (9): 1460 (September, 1955). The authors describe a method of detecting formaldehyde by means of a spot test reagent paper. Filter paper impregnated with an equilibrium mixture of potassium tetracyanonickelate and dimethylgloxime can be used to detect as little as 0.5 of formaldehyde. The intensity of the red color developed is a function of the formaldehyde present and can be measured to provide a semiquantitative method. (J. F. W.)

Criminal Detection Devices Employing Photography—Kodak Pamphlet M8, Eastman Kodak Company, Rochester 4, N. Y. This interesting pamphlet has recently been released, wherein various kinds of criminal detection systems, particularly suitable for use with photographic equipment, are described in detail. All of the ideas have been used in police activities and have proven themselves under a broad variety of conditions. The pamphlet, which is distributed free to law enforcement agencies, should be obtained, as the ideas presented are sound and practical and will be of value when the need arises. (W. E. K.)

Criminalistic Importance of the Blood Group Determination of Saliva Traces.—Karl Thoma, *Die Neue Polizei, 7:* 104–5 (July, 1953). The determination of blood groups on postage stamps and the flaps of envelopes is described. The absorption method is used. As a preliminary test for method of moistening, the adhesive is tested for enzymatic conversion of starch. (J. D. N.)

A New Iodine Sublimator—Fritz Kindervater. *Kriminalistik, 9: 392* (October, 1955). An all-glass iodine sublimator for fingerprint detection is described. The apparatus consists of a spiral glass tubing of such a diameter as to surround an elongated electric lamp bulb. The helix terminates in a chamber for iodine sublimation situated at the upper end of the light bulb. A glass jacket surrounds the bulb and helix, and the helix passes through seals in the outer jacket at the upper and lower ends. The outer jacket is open at the lower end to accommodate a rubber stopper through which the electric wires pass. In operation the iodine chamber is filled, the lamp heated and, after sublimation takes place, preheated air is blown through the chamber, driving the iodine vapors out. (J. D. N.)

Police and Emergency Births—Anon., *Spring 3100, 26:* 18–20 (December, 1955). Instructions by the Obstetrics Division of Bellevue Hospital, on the handling of emergency births (J. D. N.)

Photomicrography—J. M. Martina, *Fingerprint and Identification Magazine, 37:* 6–8 (December, 1955). A discussion in support of liberal use of photomicrographs in the courtroom to support expert testimony. (J. D. N.)

Equipment Needed by the Scientific Crime Scene Investigator—M. S. Grabowski, *Fingerprint and Identification Magazine, 37:* 16–20 (December, 1955). A description of the Mobile Laboratory of the Cleveland Police Department. (J. D. N.)

Load 'em with Wax—J. F. Brady, *The*

American Rifleman, 103: 48–9 (September, 1955). For "practical" shooting, practice wax loads are recommended. The flash hole is enlarged with a No. 31 drill, and the unprimed case is pressed through a block of paraffin. No powder is used. The wax-loaded cartridge is then primed. Acceptable accuracy from 10 to 20 feet is attained. (J. D. N.)

Further Developments in the Chromatographic Analysis of Dried Ink—E. Martin, *International Criminal Police Review*, Number 91: 257–8 (October, 1955). An extension of the method discussed in the October, 1954 issue of the Review. Reagents used are: 1, distilled water; 2, sodium fluoride; 3, oxalic acid (crystals and 10% solution); 4, α-butanol. The specimen of writing to be analyzed is placed in 1 cc of a solution prepared as follows: .250 gr. sodium fluoride, .100 gr. oxalic acid, and 200 cc H_2O. When dissolved, a small crystal of oxalic acid is added. The solution is concentrated and transferred to chromatographic paper, Whatman No. 1. A solution of 200 cc of α-butanol and 50 cc of oxalic acid solution (10%) is used to develop the chromatogram. (J. D. N.)

Machine Gun Deactivation Program—Anon., *The American Rifleman, 103:* 46 (December, 1955). The procedure for deactivating machine guns, submachine guns, and fully-automatic weapons to take them outside of the National Firearms Act, is given. A firearm is considered deactivated when the chamber has been steel welded shut, and the barrel has been welded solidly to the frame or receiver. (J. D. N.)

Catching Thieves by Telephone—J. O. Cowley, *The Police Journal* (London), *28:* 280–2 (October–December, 1955). By means of string and staples, the opening of a door will lift a telephone hand set and record this in the telephone exchange. Such a system is only feasible in areas having switchboards. (J. D. N.)

A Study of Firing Pin Impressions and Extractor Markings in .22 Caliber Rifles—S. O. Berg, *Identification News, 5* (No. 10): 4–5 (November, 1955). Classification of firing pin shape and position and angular relation of extractor and ejector marks for fifteen .22 caliber rifles. (J. D. N.)

Watch Those Numbers—Anon., *American Rifleman, 103:* 36–7 (December, 1955). A study of counterfeit F. N. Browning Model 1900 pistols bearing serial numbers 126063 or portions thereof. Another example of the inherent risk of using serial number only as a means of identifying an evidence weapon. (J. D. N.)

Petty Thieving—J. K. McLellon, *The Police Journal* (London), *28:* 283–90 (October–December, 1955) A discussion of theft detection methods based upon fluorescing powders. Successful and unsuccessful traps are analyzed (J. D. N.)

Electronics and Traffic Control—P. W. Rice, *Traffic Digest and Review, 3* (No. 11): 7–9 (November, 1955). The new traffic signal control system installed at Evansville, Indiana, is described. "When a change in the timing of signals in the system is required because of a change in traffic load, a master controller at police headquarters sends out its signal. Instead of power going over a wire to operate relays in the intersection controllers, the power goes into electronic equipment. The radio transmitter goes on the air, transmits the tone of a certain frequency assigned to that particular function and goes off the air, all automatically. At the intersection, a radio receiver picks up the signal, actuates the neccessary relays, and makes the changes in signal timing." The equipment is manufactured by the General Electric Company. (J. D. N.)

Oklahoma City School for Handling Emergency Victims—Anon., *Traffic Digest and Review, 3* (No. 11): 11 (November, 1955). Eight doctors presented topics in the fields of Emergency Transportation of the Seriously Ill; Bleeding and Respiratory Emergencies;

Fractures; Shock, Burns, and Gunshot Wounds; Heart Cases, Stroke, Epilepsy, and Heart Strokes; Convulsions, Poisons, Noxious Gases, Drug Intoxication, and Asphyxiation; Obstetrical Cases, and Mental Patients. (J. D. N.)

A Modified Absorption Technique of Determining the ABO Group of Bloodstains—S. S. Kind, *Vox Sanguinis, 5:* 15–9 (January, 1955). A modified absorption technique for the ABO grouping of bloodstains is described. A method for preventing haemolysis of the red blood cells by washing powder is considered and the non-specific inhibition of agglutination in very dilute (in saline) antisera, by fibers, is noted. (J. D. N.)

Camera Prints—Identification of Stolen Cameras—H. B. Tuttle, *Identification News, 5* (No. 10): 1, 3, 6, 7 (November, 1955). Movie cameras can be identified as to make and model by marks in the aperture plate which are recorded on the frame of the picture. The position of the frame line above or below the center of the perforation, the width of the frame line are some of the irregularities which identify the individual camera. These features are studied by enlarging to 11 x 14 or 16 x 20 prints and comparing standard pictures with those in question. Stolen cameras may be identified or the cameras used to produce illicit pictures might be apprehended. (J. D. N.)

About Color—Direct Color Separation Negatives—Paul Outerbridge, *U. S. Camera, 18:* (No. 9) 36 (September, 1955). Color separation negatives can be made using a camera loaded with Super-XX cut film and using the following filters: Wratten A-25, B-58, and C-5 or 47-B. Perfect registry of film requires the use of sheets of Micro Glass in front of the film. Exposure and development is regulated by practice. Since three separate photographs are made, this technique can only be used with stationary subjects. (J. D. N.)

Chemistry of Fire—G. W. Shorter, *News Letter, International Association of Arson Investigation, 5:* 48–57 (April–May–June, 1955). A survey of the chemistry of fire including spontaneous ignition, smouldering, flash point, ignition temperature, explosive or flammable limits, explosive range, and flammable dusts. (J. D. N.)

Types of Papillary Ridges—Israel Castellanos, *Fingerprint and Identification Magazine, 37:* 16–7 (November, 1955). Four types of papillary ridges are described; (a) straight edged ridge, (b) rough, serrated edge, (c) broken ridges with straight borders, and (d) papilla presenting appearance of suspension points. (J. D. N.)

Some Aspects Relative to the Identification of Synthetic Fibers—A. K. Bergh, *International Criminal Police Review*, Number 91: 246–56 (October, 1955). Microscopic appearance and reaction to Fibrotint G. L. and Texchrome are discussed for seven purely synthetic, three regenerated protein, and three rayon fibers. (J. D. N.)

New Method for Blood Alcohol Determination—Karl Thoma, *Die Neue Polizei, 7:* 8–9 (January, 1953). The nonspecific nature of the Widmark method is discussed. As a more suitable procedure, the enzyme method of Bucher and Reditzki is proposed. Four solutions are made as follows:

I. 10 gms. Sodiumpyrophosphate ($Na_4P_2O_7$ + 10 H_2O)
   2.5 gms. Semicarbazide hydrochloride
   0.5 gms. Glycochol in about 250 ml. H_2O, with 10 ml 2 N NaOH added and made up to 300 ml.
II. 26 mg. 100% Diphosphopyridinnucleotid in 2 ml. of water.
III. 25 mg. protein of alcohol dehydrase suspended in ammonium sulfate-pyrophosphate (45.5 gms. $(NH_4)_2SO_4$ and 3 grams. $Na_4P_2O_7$ + 10 H_2O in H_2O made up to 100 ml., pH adjusted to 7.3).
IV. 3.4% Perchloric acid (2.9 ml. 70% perchloric acid made up to 100 ml. with H_2O).

The method is as follows:

0.5 ml. of blood or serum is centrifuged

with 2 ml. of perchloric acid in a stoppered tube. 0.1 ml. of the clear liquid and 4.5 ml. of solution I are mixed. Next 0.1 ml. of solution II and 0.02 ml. of solution III are added, and mixture made up to 5.0 ml. with solution I, mixed and incubated at 19°–26° C for 70 minutes. A blank is made in the same way with the omission of the serum. The density at 366 mμ is read in 70 to 100 minutes. (J. D. N.)

The Identification of Marihuana—A Modified Duquenois Reagent—Occasionally, the police laboratory is called upon to identify small fragments of marihuana such as might be found loose in a pocket or purse, or remaining in a crushed cigarette butt. In such instances, microscopic identification (with results recorded, where necessary, by photomicrographs) should be confirmed by testing the specimen for the presence of tetrahydrocannabinol ($C_{21}H_{30}O_2$), the active ingredient. For this purpose the vanillin-acetaldehyde-hydrochloric acid test developed by Duquenois and Negm (*Jour. Egypt. Med. Assn., 21:* 224 (1938)) is both specific and sensitive.

The original formulation of Duquenois and Negm calls for 0.4 gram of vanillin dissolved in 20 ml. of 95% ethyl alcohol and the addition of .06 gram of acetaldehyde. Of these components, vanillin is stable and readily obtainable (Eastman Kodak Co. #273); 95% ethyl alcohol is also available in most laboratories. Acetaldehyde, however, is highly volatile and boils at ordinary room temperature. It also has a tendency to polymerize if kept for any length of time in a refrigerator. The securing of acetaldehyde of reasonable purity, therefore, is usually the most difficult part of the preparation of Duquenois Reagent. In this laboratory we have found that replacing acetaldehyde by its more stable tri-mer, paraldehyde, did not alter either the sensitivity or the specificity of the reagent.

MODIFIED DUQUENOIS REAGENT

To 0.8 gram of pure vanillin (E. K. #273) dissolved in 40 ml. of pure 95% ethyl alcohol, add 1. ml of paraldehyde (U.S.P.) If stored in a glass stoppered bottle in a cold dark place (refrigerator) the preparation will remain colorless and will retain its sensitivity for months. If kept at room temperature and in daylight for any length of time, the reagent becomes straw-colored and loses its sensitivity. In making the test, a few small particles (approximately 1 to 5 milligrams) of suspected marihuana are placed in a deep depression of a porcelain spot plate, moistened with 0.2 ml. of Duquenois Reagent, covered with a microscope slide (to prevent excessive evaporation of alcohol) and allowed to stand for a few minutes in order to permit the alcohol of the reagent to extract any resin from the specimen. Then add 0.2 ml. of concentrated hydrochloric acid (C.P. Reagent grade 1.19 sp. g.) and observe any color changes which occur during the ensuing 5–10 minutes. If there is much activity (tetrahydrocannabinol) in the specimen, a fleeting grey color will be quickly supplanted by a lavender changing to violet and finally to blue. If the resin is present only in traces, or if the preparation is old and the active ingredient has become oxidized or altered, the development of these colors will be slower and less intense. If no lavender or violet coloration is discernible in 5–10 minutes, no tetrahydrocannabinol is present. Where the specimen is available in larger quantity (as where an entire cigarette is at hand), the quantities of specimen and reagents may be increased 5 to 10 fold.

In their original report, Duquenois and Negm recommended the extraction of the specimen with petrolic ether, the low-temperature evaporation of the solvent, and the testing of the extract so obtained. We have found that for qualitative tests, the extraction may be dispensed with, and the reagents applied directly to the sample. (C. W. M.)

Journal of Forensic Sciences—Official publication of the American Academy of Forensic Sciences. Volume 1, No. 1, January, 1956 issue is the first issue of the official publication of the A. A. F. S. This publication contains scientific articles of the highest caliber and will continue to do so. The articles in this first issue are:

The Historical Development of Toxicology, by A. O. Gettler

The Traumatic Neuroses: Medico-legal Puzzle, by M. I. Tuchler, et al.

Forensic Pathology Slide Seminar, by A. F. Strauss

Narco Interrogation, by C. B. Hanscom

Trauma and Tumours, by T. J. Curphey

The Unexpected in Firearm Identification, by C. Goddard (W. E. K.)

Physical Evidence—in Cases of Breaking and Entering—H. Ward Smith, Ph.D., *Police News: 9* (4th Quarter 1955). This is the sixth of a series of articles on the use of laboratory evidence in law enforcement, written by Dr. Smith, Director of the Attorney General's Laboratory, Province of Ontario, Toronto, Canada. The current article deals with the collection and submission of evidence relative to burglaries. The article is illustrated by case histories, and emphasizes the importance of spectrographic analysis in such investigations. (W. E. K.)

The Police Camera—Irvine A. Brace, *Police News:* 137, (4th Quarter 1955) (Official publication of the Police Association of Ontario). A brief discussion of the use of filters in police photography. (W. E. K.)

Fingerprint Fact and Fiction—*The Outpost* (Magazine of the British South African Police), 23 (November, 1955). A brief review of the history of fingerprint identification, in which proof is offered to authenticate the pioneer work of Dr. Henry Faulds, who mentioned fingerprint identification as early as October, 1880. Brief, but interesting. (W. E. K.)

ARSON INVESTIGATION SEMINAR

The Public Safety Institute of Purdue University with the support of the International Association of Arson Investigators and many other national and state agencies interested in the recognition, investigation, prosecution and prevention of the crime of arson will hold a five day intensive training program from April 23 to 27, 1956. The seminar will be held in the Memorial Union Building on the Purdue campus in Lafayette, Indiana.

The 12th Annual Seminar with international recognition will provide the nation's most outstanding lecturers on the subject of arson. There will be training for the new enrollee, advanced investigative techniques, review of latest laboratory aids and specific training that will lead to more effective detection, apprehension, prosecution and conviction of the arsonist.

For additional information concerning the seminar please address: Professor Shelby Gallien, Seminar Director, Public Safety Institute, Purdue University, Lafayette, Indiana.

FOREIGN LANGUAGE PERIODICALS AND ARTICLES OF INTEREST IN THE FIELD OF POLICE SCIENCE*

Compiled by Kurt Schwerin†

INTERNATIONAL CRIMINAL POLICE REVIEW. Paris. Vol. 10, no. 89, June/July; no. 90, Aug./Sept.; nos. 91–92, Oct.–Nov., 1955. English edition.

J. F. Kristensen and Ch. Vesterbirk, *Police in Greenland* [2d part] (no. 89, p. 158–65).—J. Nepote, *The "magic eye" or Inspectoscope* (p. 166–71).—J. W. Allen, *Making plaster casts in snow* (p. 171–75).—W. R. Harrison, *The preliminary examination of documents* (p. 175–78).—The whole no. 90 deals with the single topic of *Police Youth Clubs: Definitions; existing clubs; conclusions. Appendices: Rules and constitutions.*—Nos. 91–92 include the following articles: A. K. Bergh, *Some aspects relative to the identification of synthetic fibers* (no. 91, p. 246–56).—

* All periodicals listed are available in the Elbert H. Gary Library, Northwestern University, School of Law, 357 East Chicago Ave., Chicago.

† Assistant Librarian, Elbert H. Gary Library, Northwestern University, School of Law.

E. Martin, *Further developments in the chromatographic analysis of dried ink* (p. 257–58).—J. Pinel, *The episcope in police science* (no. 92, p. 266–67).—Tore Sjoegren, *Handwriting comparison and probability* (p. 274–83).

INTERNATIONAL REVIEW OF CRIMINAL POLICY. United Nations (N. Y.) no. 6, 1954; nos. 7–8, January–July, 1955.

No. 6: Part I (*Articles*). James Riby-Williams, *The treatment of juvenile delinquency in the Gold Coast of West Africa.* (With summaries in French and Spanish) (p. 1–17).—Enrique R. Aftalión, *Manifestaciones predominantes de criminalidad en Argentina* (Main forms of delinquency in Argentina) (With summaries in English and French) (p. 18–24).—Karen Berntsen and Karl O. Christiansen, *The resocialization of short-term offenders, with special reference to the Danish prison system* (With summaries in French and Spanish) (p. 25–41).—Pierre Cannat, & others, *Quelques aspects de l'administration pénitentiaire en France* (Some aspects of the penitentiary administration in France) (With summaries in English and Spanish) (p. 42–72).—No. 6, Part II, deals with *United Nations activities in the field of the prevention of crime and the treatment of offenders* (English section, p. 74–86, followed by translations in French and Spanish).—No. 6, Part III (p. 117–57) is an extensive topical bibliography of current technical literature. Nos. 7–8, a double issue, is devoted to the report prepared by the Secretariat on "The prevention of juvenile delinquency" which was the basic document on this subject for the first *U. N. Congress on the Prevention of Crime and the Treatment of Offenders* (Geneva, August 22–September 3, 1955). The report consists of four parts: 1. United Nations activities in the field of juvenile delinquency.—2. Fundamental considerations for the formulation of a policy for the prevention of juvenile delinquency,—3. The prevention of juvenile delinquency.—4. The role of courts and treatment measures in the prevention of juvenile delinquency. The English text of the report (p. 1–82) is followed by translations in French and Spanish.

KRIMINALISTIK. Hamburg. Ninth year, no. 7, July; nos. 9–10, Sept.-October, 1955.

Neue möglichkeiten zur sicherung von latenten daktyloskopischen spuren auf papier? Mitteilung des Bundes-Kriminalamts. (New possibilities of securing latent dactyloscopic traces on paper? Memorandum of the German Federal Office of Criminology. (no. 7, p. 257–63).—M. Frei, *Beitrag zur spurenkunde des suicids durch erhängen und erdrosseln* (A note on traces in the case of suicide by hanging and strangling) (no. 9, p. 345–47).—Herbert Peter, *Die bedeutung der rechtschreibfehler in der forensischen schriftexpertise* (The significance of orthographic mistakes in the expert opinion on handwriting) (pt. 1, no. 9, p. 348–51; pt. 2, no. 10, p. 384–88) — W. Jach, *Lehren aus fehlermittlungen bei brandfällen* (Faulty arson investigations and what they teach) (no. 9, p. 342–45; no. 10, p. 388–90).

REVUE INTERNATIONALE DE DROIT PÉNAL. Paris. Vol. 26, 1955, nos. 1–2.

This double number contains on pp. 1–220 seven articles on various aspects of the recidivist and recidivism in French and comparative law, with an introduction by Paul Cornil. The authors are: Marc Ancel, P. R. Bize, Charles Sannié, Paul Villetorte, H. van Helmont, Charles Germain, and Thomas Würtenberger.