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## Police Science Technical Abstracts and Notes

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## POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

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**Explosive Hearing Aid Batteries**—R. M. Hewitt, *Journal of American Medical Association*, 156: 1010 (November 6, 1954). Article discussed the hearing aid batteries known as Mercury Cells. These particular batteries contain mercury as one of the elements in the chemical action of the cell. Batteries are provided with vents that allow release of gasses formed by chemical action during normal use. However, accelerated action, due to sudden heat, of burning these batteries in a fire or incinerator, apparently causes an undue increase in the gas pressure, which results in explosion of the batteries. Several cases reported wherein such explosion contributed to minor injury.

There is still an appreciable amount of mercury in these batteries, even after the battery has run down. It is pointed out that the batteries of all hearing aid manufacturers are made by relatively few battery concerns. To the best of knowledge, all the hearing aid companies have used these mercury batteries, so that the situation described is common to all—W.E.K.

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**Inaugural Course, Canadian Fire Investigation School**—The Fire Underwriters Investigation Bureau of Canada, Inc., and the Canadian Association of Fire Chiefs, sponsored the First

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**Canadian Fire Investigation School**. The School was conducted by the Association of Canadian Fire Marshals, and was held at the Royal Canadian Mounted Police Barracks, N Division, Rockcliffe, Ontario, Canada, on October 25–29, 1954, inclusive. The course was attended by 36 persons representing Provincial Fire Commissioners Office, Royal Canadian Mounted Police, Royal Air Force, Municipal Police, and State Police agencies. It is planned, in the near future, to hold a similar course of instruction at Regina, Saskatchewan.—W.E.K.

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**Bertillon's "Portrait Parle" and Plastic Surgery**—M. deAndres, *International Criminal Police Review*, No. 81: 226–31 (Oct., 1954). The possibilities of plastic surgery have imposed some limitations on facial features, birthmarks, tattoos, and so forth as means of identifying criminals. It is suggested that greater care must be taken to observe the movements and mannerisms of the individual as well as an over-all collection of facial and body features. Rooms equipped with one-way windows are recommended to enable the detectives to study the criminal.—J.D.N.

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**Chromatographic Microanalysis of Dried Ink**—E. Martin, *International Criminal Police Review*, No. 81: 232–8 (Oct., 1954). Inks are chromatographed on paper cylinders using S & S No. 2043 paper. The solvent is prepared by mixing 100 cc of isobutyl alcohol, 40 cc. of 20% acetic acid, 5 cc of sodium sulfite solution, and 5 cc of a 10% oxalic acid solution. The water layer is separated and discarded, and 10 cc. of glycol are added to 90 cc of the remainder.

Four to six hours are needed to develop the chromatogram.—J.D.N.

**Legal Photography**—James M. Caulfield, *The Professional Photographer*, 81: 54-5 (December, 1954). The author discusses problems of yesteryear in proving photographs for courtroom use. He tells in particular his experiences in 1916 in a case in using enlargements of a portion and of the whole negative. He contrasts these problems with the present-day court acceptance of photographs.—O.H.

**Police and the Public**—L. L. Solms, *The Nongqai*, 1143-6, 1166 (November, 1954). The author discusses the relationship between the police forces and the public, referring particularly to police of the Union of South Africa. He makes, however, several general observations that are worthy of consideration by all police officials. One is that "the more police are feared and disliked . . . the more force has to be used to control crowds." He observes that crowds can be more readily controlled by police forces that are liked and respected than by those which have the reputation "of being despotic and high-handed." He contrasts the problems of a patrolman with those of a private in a military organization, pointing out that a private acts almost continuously in a group under the direct supervision of officers, but a patrolman or constable "mostly works alone as an independent agent, and on him to a large extent depends the reputation of the force as a whole." Police officers often must make split second decisions as to their actions, and it may sometimes require long deliberation by lawyers and magistrates to determine whether or not the decision was entirely in keeping with the law. Finally, he cautions that the individual officer must maintain respect in his community, and that his private life must be above reproach. While he must personally act in this manner, he cannot judge the action of any other member of the community so long as the other member does not break the law.—O.H.

**Examination of Documents**—Ordway Hilton, *Western Reserve Law Review*, 6: 45-8 (Fall

1954). This article discusses ways and means by which the document examiner can assist a trial attorney by discovering the facts contained in a questioned document. A discussion of denied signatures and the determination of whether or not they are authentic, together with examples of how the document examiner may assist in verifying the testimony of a person who describes the preparation of a document or in preparing cross examination to destroy erroneous testimony by such a witness is presented. Cases applying these techniques are described.—O.H.

**Exposure to Toxic Substances**—Irving Sunshine, *Western Reserve Law Review*, 6: 26-44 (Fall 1954). The author discusses toxic substances with special emphasis on those that may be encountered through exposure in various occupations. He describes the various factors governing drug action, different types of exposures, and classifications of poisons. Noxious agents encountered in daily life and industry are considered. Statistics are quoted on chemical agents found in fatalities in Cuyahoga County over a ten-year period. The article has legal annotations prepared by Oliver Schroeder, Jr.—O.H.

**Can Two Identical Ridge Patterns Actually Occur—Either on Different Persons or on the Same Person**—G. Tyler Mairs, *Fingerprint and Identification Magazine*, 36: 3-6, 20, 31 (September, 1954). The original assumption that two identical ridge patterns could occur on either the same individual or different persons is refuted, the proof of this contention being that nature has never made duplicates in any matter. There has always been some differentiation either in physical appearance or in microscopic detail. 50 years ago the mathematicians called upon the laws of chance to prove that prints could not be duplicated. Much less was known then about the biological factors involved in the formation of friction ridges in the embryo than is known today. The mathematical possibility of duplication of ridge formations was astronomical. During the past fifty years, it is almost inconceivable that of

the many million of prints compared, at least one case of exact duplication should have been discovered, if duplication is possible. The burden of proof has been shifted. It falls upon the shoulders of those who contend that two fingerprints can be identical.

The conclusion is drawn that the contention that "there can be no duplication of fingerprints" rests on sound biological evidences.—T.W.B.

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X-Ray Diffraction, Its Nature and Use in Forensic Chemistry—Leo Levi, *The Royal Canadian Mounted Police Quarterly*, 20 (2): 122 (October 1954). A brief discussion of the history and principles of X-ray diffraction and their application to identification of compounds important to the forensic chemist.—J.F.W.

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A Survey of the Identification Characteristics of Horse Hair—E. E. James, *The Royal Canadian Mounted Police Quarterly*, 20 (1): 35 (July 1954). Variations in characteristics of hair from different parts of the horse are discussed along with photomicrographs of several typical specimens.—J.F.W.

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The Use of Aniline Dyes and Anthracene in the Detection of Petty Theft—T. J. Clogger, *The Police Journal*, 27 (1): 51 (January–March, 1954). Superintendent Clogger describes the use of synthetic dyes for marking such things as notes, coins, and petty cash to detect a person who steals them. He also describes the use of anthracene in conjunction with ultraviolet light. He lists the precautions to be taken while applying these chemicals including the important factor of not contaminating the clothing or hands of the officer who might make the arrest, since the suspect would then claim he had gotten the dye or fluorescent powder from the arresting officer.—J.F.W.

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A Substitute for a Prism in Fingerprint Photography—T. J. Barret, *The Police Journal*, 27 (2): 138 (April–June, 1954). The author describes the use of a first surface mirror in

photographing latent fingerprints directly on a bromide paper. This is particularly useful where a white or aluminum developing powder has been used.—J.F.W.

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New Breath Test Method—George Larsen, Jr., *Traffic Digest & Review*, 2 (11): 2 (November, 1954). Mr. Larsen described the "Breathalyzer" as designed by Lieutenant Robert F. Borkenstein of the Indiana State Police Laboratory. This new instrument for automatic analysis of breath for alcohol content uses a potassium dichromate-sulfuric acid reagent. A measured quantity of alveolar air is passed through a measured quantity of the reagent. The resulting color change is read by balancing the light transmittance through the reduced reagent and through a standard solution. The per cent alcohol is read directly from a scale connected to the light balancing mechanism. The reagent can be provided in sealed ampoules and is quite stable. Electric heaters insure complete oxidization and prevent condensation. Good accuracy has been claimed in the tests made to date. Subsequent reports will be made after further data has been accumulated. There is no information at present as to when or where the apparatus will be produced commercially.—J.F.W.

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Reaction of Morphine With Potassium-Mercuric Iodide—Leo Levi and Charles G. Farmilo, *Analytical Chemistry*, 26 (6): 1040 (June 1954). A study of the morphine-mercuric iodide complex is described. Ultraviolet absorption spectra, X-ray diffraction patterns, infrared absorption spectra, optical rotation, and typical crystal structures are shown. With the proper technique the authors detect approximately 25  $\gamma$  and as little as 1  $\gamma$  when the test is carefully carried out in a capillary tube.—J.F.W.

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Isolation and Purification of Semi-micro Quantities of Morphine—Leonard B. Acher and E. M. K. Geiling, *Analytical Chemistry*, 26 (6): 1061 (June 1954). The method of isolating morphine in quantities of the order of 1 to

10 milligrams is described. The authors developed this process for isolating carbon-14-labeled morphine from the opium poppy. However, the method appears adaptable to quantitative determination of morphine in pharmaceutical preparations, animal tissues, and plant material. The method involves an extraction, a purification using ion exchange resins and crystallization. Details of the method are too lengthy to be repeated here.—J.F.W.

**The Isolation and Identification of Barbiturates**—Felix J. Sabatino, *Journal of the Association of Agricultural Chemists*, 37 (4): 1001 (November 1954). Procedures are described for the paper chromatographic separation of five barbiturates commonly encountered in sedative mixtures and for the quantitative isolation of phenobarbital from other barbiturates by column partition chromatography. A tank for 8 x 8 inch paper chromatograms is described by

Lloyd C. Mitchell in the same Journal, 36 (4): 1187 (November 1953).—J.F.W.

**Science in Law Enforcement**—The Law-Medicine Center of Western Reserve University, in cooperation with the Cuyahoga County Coroner's Office, announces its Second Institute on Science in Law Enforcement to be held June 20-25. A very comprehensive program dealing with various phases of criminal investigation and laboratory techniques that can assist in these problems is to be presented. Members of the Coroner's Laboratory and the Cleveland Police Department will present a major portion of these discussions. Commander George H. Hatherill, Head of the Criminal Investigation Department of the London Metropolitan Police, is to join the faculty as a special lecturer. Information concerning registration can be obtained from Oliver Schroeder, Jr., Director, Law-Medicine Center.