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Police Science Technical Abstracts and Notes

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POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

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Multiple Thickness Cell Assemblies—Application to Ultraviolet Spectrophotometry—D. D. Tunnicliff, *Analytical Chemistry*, 28 (11): 1657 (November, 1956). To take advantage of varying cell length rather than concentrations in ultraviolet absorption spectrophotometry, the author has devised multiple cell assemblies with cells of varying thicknesses. A gas cell assembly for the Beckman DU and liquid or gas assemblies for the Cary and the Beckman DU are described. Methods of measuring cell thickness and cell blanks are included. (JFW)

Plastic Vessel for pH Measurements of Small Samples—Kenneth M. Richter, *Analytical Chemistry*, 28 (12): 2036 (December, 1956). Dimensions and sketches of an adapter shaped to the Beckman standard electrodes for samples as small as 0.25 ml are furnished. A shoulder in one well of the adapter serves to prevent damage to the calomel electrode. (JFW)

Control of Fine Chemicals and Pharmaceuticals—Report for Analysts—W. B. Fortune, *Analytical Chemistry*, 29 (1): 17A (January, 1957). A paper, presented at the Symposium on Analysis of Fine Chemicals and Pharmaceuticals at the American Chemical Society meeting in Atlantic City in September, 1956, points out the increasingly difficult problems of

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identification and analysis of the many new drugs and chemicals being produced today. Classical methods are inadequate, and new methods are hardly keeping pace with development and production of new products. Of particular interest to the Forensic Chemist or Criminalist are the comments about the need of applying confirmatory tests and not relying on single or inadequate identification tests. (JFW)

Detection and Estimation of Nerve Gases by Fluorescence Reaction—Bernard Gehauf and Jerome Goldenson, *Analytical Chemistry*, 29 (2): 276 (February, 1957). Reaction of indole and perborate with nerve gases such as sarin produces as an intermediate product indoxyl which is highly fluorescent. Sensitivity at least 50 times greater than the best colorimetric method is claimed. (JFW)

Reaction for Colorimetric Estimations of Some Phosphorous Compounds—Bernard Gehauf, Joseph Epstein, G. B. Wilson, Benjamin Witten, Samuel Sass, V. E. Bauer, and W. H. C. Rueggeberg, *Analytical Chemistry*, 29 (2): 278 (February, 1957). The acceleration of the rate of oxidation of such bases as benzidine by various organophosphorous compounds has been made the basis of a sensitive method for quantitative estimation of the phosphorous compounds. The mechanism of the test reaction and the relevant chemistry to enable the reaction to be applied to other compounds are discussed. (JFW)

Determination of Mercury in Urine—V. L. Miller and Frank Swanberg, Jr., *Analytical*

Chemistry, 29 (3): 391 (March, 1957). Catalytic oxidation of the specimen with 50% hydrogen peroxide is followed by the mercury micro-procedure of Polly and Miller using dithiozone and reading in a spectrophotometer. (JFW)

Sensitive Photometric Technique for Determination of Organophosphorus Compounds—F. T. Eggersten and F. T. Weiss, *Analytical Chemistry*, 29 (3): 453 (March, 1957). A method of determining small amounts of organophosphorus materials, involving an initial reduction to a phosphine with a solution of lithium aluminum hydride is discussed. Organocompounds could be detected in microgram amounts while inorganic materials produced but small response. (JFW)

The Morphine-Marme Complex—Leo Levi, *Analytical Chemistry*, 29 (4): 470 (April, 1957). The author studies the chemistry and mechanics of the morphine hydrochloride reaction with cadmium iodide-potassium iodide solutions. Sensitivity depends on the potassium iodide concentration and the reagent-reactant ratio. As little as 0.1 γ of the narcotic can be readily detected with a carefully adjusted reagent. Ultraviolet and infrared absorption spectrum, X-ray diffraction pattern, optical rotation, and solubility behavior of the derivative are reported. (JFW)

Analytical Reviews—*Analytical Chemistry*, 29 (4): 589-734 (April, 1957). The annual review issue of *Analytical Chemistry* includes reviews of articles of interest to the Forensic Chemist or Criminalist. Sections on Clinical Chemistry, including toxicology, pesticides, and pharmaceuticals will be of particular interest. (JFW)

The Use of Breath Tests by Law Enforcement Officers—H. Ward Smith, *The Police News* (4th Quarter, 1956). The author, Director of the Attorney-General's Laboratory for the Province of Ontario, thoroughly discusses the use of breath tests in the Province of Ontario. He concentrates his article on an explanation and description of the *Breathalyzer* instrument

and briefly describes the training program which has been developed for the officers making the breath test and presenting their evidence in court. (WEK)

Fluorescence Pictures Identify Diamonds.—Robert Webster, *Industrial Photography* (February, 1957). By photography of the differential fluorescent effects shown by diamonds under ultraviolet light, a comparatively rapid and relatively foolproof method has been developed for positive re-identification of jewelry.

The procedure adopted is first to take a straight photograph of the jewel and make a positive print showing subject's actual size. This photograph and description of the number and nature of the stones, the metal setting, and the gross weight of the piece, form the first part of identification. Next, the jewel is placed in a beam of ultraviolet light, which should be between 4,000 and 3,000 Angstroms. Emission at 2537 Angstroms is not at all satisfactory for fluorescence photography of this nature. This ultraviolet photograph shows the glow of the diamonds. The presence of pearls, rubies, emeralds, or sapphires, which usually give a uniform glow or none at all, will not invalidate the use of this method. The fluorescence pictures provide the second and final part of the identification. Once the photographic identification has been prepared, any fluorescent picture of the jewel taken at a later date will show a similar pattern of intensities. (WEK)

The Emotional Stress Meter—Homer J. Dana and Claude C. Barnett, *Police* (January-February, 1957). The author briefly discusses the limitations of the Polygraph in detection of emotional stresses. They point out that no really significant basic improvements have been made in Polygraphs throughout the years.

The authors advance the use of a new instrument, "The Emotional Stress Meter." The new instrument consists of the Oxyhemograph and Pulse Wave Velocity Measurement. It is claimed that this combination is very sensitive to very small physiological changes induced by mild emotional stress. A proposed exhaustive evaluation study is being directed toward

determining the limitations of this new combination. (WEK)

Criminal Detection Devices Employing Photography—Harris B. Tuttle, *Police* (January-February, 1957). This article describes several kinds of detection systems particularly suitable for employment with photographic equipment. A list of some of the most effective ways in which photography can be put to work, all of which are based upon actual police activities, and all of which have proven themselves under a broad variety of conditions, is submitted.

For the ultimate in simplicity, only four components are necessary; an alarm unit, a locking device to keep the alarm activated, a power source, and some kind of triggering mechanism. The alarm may be anything from a signal light to a gong, horn, or old-fashioned doorbell. The locking device may consist of a low voltage relay with built-in locking feature. The power source may consist of four No. 6 dry cells or a single "hot-shot" unit providing the 6-volt power supply. As for triggering devices, the author suggests photo-electric system, radiation transmitter-detector units, photographic traps, using flash equipment, or the Kodak Ektron Detector.

The article contains illustrations showing basic wiring circuits that can be used for installation of such criminal detection devices. (WEK)

Blood Grouping Tests in Disputed Parentage—Alexander S. Wiener, *Journal of Forensic Medicine*, 1 (4) (October-December, 1956). The author, Dr. Wiener, is perhaps one of the foremost serologists in the United States today. This very interesting article is a discussion of three cases in which serious errors in blood grouping were made in medicolegal cases of disputed paternity. The experiences related demonstrate how important it is that the person charged with the responsibility of carrying out such grouping tests must be fully qualified. Such experts must not merely be accurate technicians, but must also be thoroughly

versed in the basic principles of blood group serology and genetics. (WEK)

Is Hair a Means of Identification?—E. Martin, *International Criminal Police Review*, No. 99: 176-9 (June-July, 1956). A discussion of the possibilities of human hair as a means of identification of suspects. Transmitted and fluorescent lighting and studies of scale shapes are used. An appeal is expressed for receipts of letters discussing this problem. E. Martin's address is Staatsanwaltschaft Basel-Stadt, Kriminaltechnische Abteilung Basel/Lohnhof, Switzerland. A synopsis of all documents received will be published at a later date. (JDN)

Brake Shoe Identification—*RCMP Gazette*, 19 (4): 9 (April 15, 1957). Test impressions of a brake drum made on lead foil were matched with a brake shoe. Striations on drum replica compared favorably with striations on the brake shoe. (JDN)

Unusual Firearms Cigarette Lighter Gun—*Bulletin of Bureau of Criminal Investigation*, New York State Police, 22 (3): 2, 1957. Plans for conversion of cigarette lighters into guns were sold several years ago. These plans are reproduced in the *Bulletin*. A lighter of the push-down variety is used, taking out the wick and cotton and substituting a tube of .22 caliber I.D. Lead is then poured into the case for weight. A simple spring arrangement serves as trigger, hammer, and firing pin. .22 Shorts or Longs can be fired. (JDN)

A New Burglary Tool and Proof by the Metal Chips—F. Enklaar, *Kriminalistik*, 10 (12): 452-4 (Dec., 1956). A "Wolf Hole Cutter" saw was used in an attempt on the door of a safe. Due to the hardness of the metal, this was unsuccessful. The tool was traced to two suspects and metal chips were recovered from their clothing. No tool was recovered. Holding the metal chips by means of a small magnet comparisons were made with marks on chips from clothing against chips from the scene. Although the chip measured only 1.76 mm by .93 mm, a match of numerous lines are shown

in the accompanying comparison photomicrograph. (JDN)

Effects of Alcohol on Handwriting—Albert Rabin and Harry Blair, *Journal of Clinical Psychology*, 9 (3): 284-287 (July, 1953). Forty "normal" male subjects between the ages of twenty and forty served as subjects for the experiment. All with the exception of two were "social drinkers." All of the subjects ingested between 9 and 15 ounces of 100 proof bourbon over a four and one half hour period.

Prior to consumption, the subjects were asked to copy a reading selection from a standard intelligence test at the ten year level. The writing equipment was uniform, and the instruction was "copy this as well as you can." After consumption, the same task was repeated.

Measurements through the medium of the Alcometer indicated a range in concentration in the blood from 0.54 mg to 1.75 mg per cc. Before and after samples were evaluated on the basis of 15 graphological signs. Significant differences were found to exist between the two specimens. More time and space were used, and they were less accurate. The study clearly shows a deterioration in motor coordination in a well habituated activity, and the results are even more significant in the light of expectation of practice effect.

The important question is whether lesser amounts of alcohol will produce such clear cut differences. (CAS)

Report on the Department of Chemistry and Inspectorate of Dangerous and Hazardous Materials. Singapore, 1955—The Department of Chemistry handles forensic problems in arson, blood and seminal stains, narcotics, documents, drugs and poisons, firearms, and vehicular accidents for Singapore and the Malayan police. In addition, certain private inquires are undertaken on a fee basis. (OH)

An Evaluation of Chemical Methods for Restoring Erased Ink Writing—Ordway Hilton, *The Police Journal* (London), 29 (4): 264-672 (October-December, 1956). Inks with iron may be restored with sulfocyanic acid, potassium ferro- or ferri-cyanide, ammonium sulfide, or Tiron (disodium 1,2-dihydroxybenzene-3,5-disulfonate).

Synthetic dye inks may be restored with iodine fuming, fluorescent dyes, or an iodine staining solution.

Ballpoint pen writing presents some problems of restoration since it is more resistant to erasing. Applying iodine staining solution to front or back may be useful. The above methods should be used with photography, ultraviolet and infrared examination. (JDN)

The Fate of Blood Alcohol During Putrefaction—M. Djavad Atabakhch. *Ann. Pharm. Franc.*, 12: 717-723 (1954) (in French). This paper covers a blood alcohol study conducted with special emphasis upon rate of alcohol loss versus storage factors, and on the possible formation of alcohol with putrefaction. Defibrinated beef blood was stored outside the building but protected from the sun in 100- and 300-ml. glass-stoppered flasks after treating the various samples with glucose, alcohol, and a representative pulped sample of human viscera. Controls were established and sampling conducted the first of each month from January through July. Cordebard's nitrochromic method for blood alcohol analysis was used.

The author points out prior misleading information which failed to distinguish between alcohol and other volatile reducing substances. The results of this study indicate that no alcohol is generated in blood samples *in vitro* even though glucose and viscera are added, and that low temperature and complete filling of the container, preservatives action notwithstanding, are the primary factors governing loss of alcohol. (EW)