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## Police Science Technical Abstracts and Notes

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## POLICE SCIENCE TECHNICAL ABSTRACTS AND NOTES

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A Punchcard System for Identification of Typescript—J. H. Hodgins, *Journal of Forensic Sciences*, 8 (1): 68–81 (Jan., 1963). This system does not claim perfection and has not yet had to withstand the test of time. It does seem, however, that the use of punchcards as used in this system, or as one may choose to use them in a system tailored to their own particular needs, is one way to keep abreast of the host of type styles our modern type foundries seem capable of producing. (WEK)

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Narcotics Analysis—A Simple Approach—Melvin Lerner, Albert L. Mills, and Sally F. Mount, *Journal of Forensic Sciences*, 8 (1): 126–31 (Jan., 1963). The use of a combination gas chromatographic and infrared technique in narcotics analysis has been described. The technique is simple and positive and is applicable to samples containing 20 micrograms or more of narcotics. Applications to the fields of narcotic origin and illicit trade have been indicated. (WEK)

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Traumatic Subarachnoid Hemorrhage in Alcohol Intoxication—J. Simonsen, *Journal of Forensic Sciences*, 8 (1): 97–116 (Jan., 1963). In a retrospective analysis of a 20-year material of persons meeting with sudden death from subarachnoid hemorrhage from the medicolegal institutes in Denmark, traumatic cases were compared with a control series of spontaneous cases.

The study concerned only cases caused by minor head injuries, taken to mean injuries not violent enough to cause fracture of the skull or

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contusion of the brain. Particular interest was displayed in those traumatic cases of sudden death following subarachnoid hemorrhage in which the person had been intoxicated at the time of the hemorrhage.

During the 20-year period 1941–1960 there had been 15 cases of sudden death due to subarachnoid hemorrhage following upon minor head injuries in intoxicated persons. In only 20% had the hemorrhage originated in vascular abnormalities. In one case (6.7%) the bleeding was due to rupture of a normal artery and in 73.3% of the cases the origin of the bleeding could not be demonstrated.

Among the control series, consisting of 108 cases of sudden death due to spontaneous subarachnoid hemorrhage, an abnormal vessel or process was responsible in 70%, while it proved impossible to demonstrate the origin of the hemorrhage in only 30%.

This marked difference must be taken to mean that minor head injuries sustained by intoxicated persons occupy an exceptional position as a provoking factor, and it must be assumed that in the majority of the traumatic cases in which the origin of the hemorrhage was nondemonstrable, it has arisen in a normal artery or arterial branch. Lastly, head injuries involving sites on a level with the base of the skull appear to be particularly liable to induce these hemorrhages. (WEK)

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Changes in the Brain Incident to Extreme Variations in Temperature, Barometric Pressure, Electrical Current, and X-Radiation—Cyril B. Courville, *Journal of Forensic Sciences*, 8 (1): 82–96 (Jan., 1963). There is little to report concerning the effects of physical agents such as heat, cold, and altered barometric pressure. Elevated barometric pressure does sometimes cause gas embolism of the brain, and lowered barometric pressure may cause cerebral anoxia, but otherwise changes in the brain after exposure

to these elements usually consists of congestion and focal hemorrhage.

X-rays and ionizing radiation, however, produce alterations in the brain. Depending upon the amount of exposure to x-radiation, the changes vary in degree, mechanism, and location. Exposure of an embryo to radiation results in retardation of the morphogenesis of the brain. If an overdosage of radiation is directed at the mature brain, extensive demyelination or necrosis results, which appears to be secondary to thickening of the walls of the blood vessels. If the radiation is sharply focused, damage to the overlying cortex may also occur. Central gliosis with regional demyelination may follow radiotherapy directed to the brain for intracranial, cranial, or pericranial neoplasms.

There is much uncertainty as to the effect on the brain of electrical currents especially those of high voltage. No characteristic pattern has been demonstrated in the central nervous system of man, even in cases of electrocution or in instances of severe electric burns associated with peripheral nerve injury. Severe electrical injuries, especially those of the peripheral nerves, should be studied more critically until this information becomes established. (WEK)

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**Detection of Toxic Compounds in Humans and Animals by Rapid Infrared Techniques**—Richard D. Stewart and Duncan S. Erley, *Journal of Forensic Sciences*, 8 (1): 31-45 (Jan., 1963). Infrared analysis can be a powerful tool for the detection and identification of toxic materials in body fluids and tissues. Exhaled air may be analyzed directly in a long path gas cell for gases and most volatile organic compounds including halogenated hydrocarbons, alcohols, ketones, and ethers.

The solvent extraction method may be used for the analysis of volatile materials or nonvolatile compounds such as the barbiturates or dicumarol. A specific identification of the material extracted is usually possible by obtaining a solid state spectrum of the extract.

The high specificity of the infrared spectrum allows a single technique to be used for many different compounds. Sampling methods are simple and rapid, most analyses being performed on the sample itself (e.g., exhaled air) or following a simple extraction. (WEK)

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**The Meaning of "Cause of Death"**—Milton G. Bohrod, *Journal of Forensic Sciences*, 8 (1): 15-21 (Jan., 1963). 1. No definition of "Cause of Death"

has been found to be acceptable except possibly this one: "Cause of Death is a statement made by a pathologist to a clinician or a law enforcement agent which makes the latter say 'Well, I am not surprised the patient died.'"

2. The meaning of "cause of death" has been relative to time and status of medical knowledge and will always be. It is also relative to the purpose for which it is asked. The three main purposes are (1) scientific, (2) statistical, and (3) legal.

3. The concept is made difficult for all purposes by the fact that single causes of death are the exception. Most deaths are due to multiple causes or causal chains of events.

4. It is probably that, for scientific purposes, the concept "cause of death" can be dispensed with entirely and in the author's opinion it should be.

5. For statistical and legal purposes the concept should be altered to allow for assigning multiple causes. (WEK)

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**Identification of Glass Fragments by Measurement of Refractive Index and Dispersion**—Donald G. Grabar and Andrew H. Principe, *Journal of Forensic Sciences*, 8 (1): 54-67 (Jan., 1963). Refractive index measurements have been described by a number of workers as an aid in the identification and comparison of glass fragments, and Kirk has pointed out that dispersion measurements would be of value but that a simple, sensitive method for measuring dispersion on small samples is not available. It is the purpose of this paper to describe a simple microscopic method of measuring dispersion, and to show how by a simple modification of the microscope's optical system visual exhibits demonstrating refractive index and dispersion relationships between two glass fragments can be obtained. (WEK)

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**Simple Power Sources for Electrophoresis**—David A. Crown, *Journal of Forensic Sciences*, 8 (1): 117-25 (Jan., 1963). The electrophoretic separation of ink dyestuff constituents is dependent upon (1) a source of direct current, and (2) an apparatus for maintaining an electrical field so that dyestuffs can migrate to the positive or negative poles. The author discusses circuits that are intended only as a guide for those wishing an inexpensive apparatus for routine electrophoresis. He discusses sources of DC voltage, using radios as a DC source, locating high voltage in radios, building power sources using components, tanks

and electrodes, electrolytes and current flow, and safety precautions. (WEK)

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**Sudden Death in the Hyper-Reactor State**—Milton G. Bohrod, *Journal of Forensic Sciences*, 8 (1): 22-30 (Jan., 1963). Sudden death in the hyper-reactor state—a new name for a medical condition. The author discusses 6 cases, each of which illustrate an important phase of the problem as to why deaths of this kind occur almost exclusively in childhood or very young adulthood. Every pathologist remembers instances of hyperacute death in middle-aged or older people in which after careful search at necropsy he was able to point victoriously to a raised patch in a coronary artery or a few silvery streaks in the myocardium and say "See, here it is, the Cause of Death". The author is sure that most of us have had misgivings as to whether it was really so. The fact is that older people have developed the scars of living and, in cases of sudden death, it is all too easy to point to one of them and so satisfy clinicians, family, and legal agencies. With the different viewpoint toward sudden death implied by the recognition of a hyper-reactor state we may find such cases at all ages. (WEK)

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**Identification Guide for Solid Dosage Forms With Description of the Identification Guide**—John J. Hefferren, *Journal of the American Medical Association*, 182 (12): (December 22, 1962). The need to identify an unknown tablet or capsule may occur in many situations, varying from the emergency treatment of a poisoning in a hospital receiving room to the detailed study of the cause of death in a coroner's laboratory. In the emergency situation, the time factor, together with limited quantities of the unknown drug product, make identification difficult and often impossible. Even when the quantity of drug sample and the time factor are favorable, the identification can be a long and difficult task for a laboratory staff skilled in drug identification and possessing extensive physical and chemical information on available drugs.

The identification guide for solid dosage forms consisting of 158 pages is based on physical characteristics such as size, shape, color, and markings of tablets and capsules. The guide includes three main categories: tablets, soft gelatin capsules, and hard gelatin capsules. In order to tabulate the data on the physical characteristics of a given product, each term under each category was as-

signed a number in accordance with the specific coding card for each of these main categories.

To use the guide, the investigator should consult the appropriate coding card and determine the code number which described the physical characteristics of the unknown drug. He then should consult a list of tables arranged in accordance to code numbers which are assigned to the more than 5,000 solid dosage forms. Once he has found the part of the list identified by this code number, he should narrow his search further by use of such additional criteria as specific dimensions, reference color, and imprint.

When the characteristics of the unknown drug are matched to characteristics in the guide, the field will be narrowed to one, or at most, a relatively few drugs. Tentative identification is thus established.

Effort should be made to obtain copies of the full issue of the *Journal* rather than the specific article as there are many specific advertisements which supplement the information included in the drug identification guide. (WEK)

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**Delinquency Control Institute**—University of Southern California announces the 37th and 38th classes in delinquency control beginning respectively September 9, 1963 and February 10, 1964. Courses are open to law enforcement officers. Information regarding enrollment and possible scholarships should be directed to the Delinquency Control Institute.

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**Accent on Photography**, *Law and Order*, 11 (4): 6-26 (April 1963). A section of this publication devoted to various aspects of photography. The five papers presented are: "Photography Plays Major Role in Arson Investigation" by Harris B. Tuttle, "Photography at Night" by Edward F. Brewer, "Tips on Simplified Darkroom Procedures" by Phillip M. Mikoda, "Electronic Flash in Law Enforcement Photography" by Ralph "Skipper" Miller, "Color Photography at Low Cost" by Rusty Russell. This series of photography papers covers a wide area of law enforcement photography including lighting problems, film type, film loading, and negative processing. Also discussed is methods of focusing at night without a range finder. (JDC)

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**X-Ray Spectrometry in the Clinical Laboratory. Bromide Normally Present in Human Serum**—Samuel Natelson, Bertrum Sheid, and Donald R.

Leighton, *Clinical Chemistry*, 8 (6): 630-639 (December 1962). A procedure is described for estimating the bromide content of human serum from individuals not receiving bromide medication. In the procedure, the serum is ashed and dissolved in hydrochloric acid. The solution is dehydrated with the calculated amount of acetic anhydride, and the precipitated sodium chloride is washed with additional glacial acetic acid to remove the bromides. The sodium chloride is removed by centrifugation and the bromides recovered by evaporation of the acetic acid. The residue is dissolved in methanol and transferred to filter paper for assay in the X-ray spectrometer. The procedure, with the omission of ashing, is applicable to sea water. When it was applied to sea water, strontium as well as bromide could be visualized on the recorder of the instrument and assayed. (JDC)

Determination of Snakebite as Dangerous or Harmless—H. M. Smith and Floyd Boys, *Police*, 7 (4): 6-13 (March-April 1963). Discussion of identification of dangerous reptiles and recognition of the bite of dangerous snakes. (JDN)

A Device for the Introduction of Submicrogram Quantities of Solids into a Gas Chromatograph—D. B. McComas and A. Goldfien, *Analytical Chemistry*, 35 (2): 263-4 (Feb. 1963). A device made from a 24-gage hypodermic needle and a stainless steel wire permits micro quantities of solids to be introduced quantitatively into the injection port of a gas chromatograph. The steel wire is ground square and then twisted to form spirals. The wire is coated with solution, solvent evaporated, and the wire withdrawn into the needle. Upon injection into the port, the wire is extended, permitting the sample to evaporate. This method eliminates masking by a broad solvent band. (JDN)

Spray Technique for the Preparation of Thin Layer Chromatography Plates—Ihor Bekersky, *Analytical Chemistry*, 35 (2): 261-2 (Feb., 1963). An air spray bottle is used to spray slurry of aluminum oxide-G, calcium sulfate, and water on to glass plates. The thickness of the layer is determined by the number of passes and the spray technique. Layers are permitted to dry 2 minutes between coats. Plates are activated at 130° C for 1½ hours. (JDN)

Prevention of Peak Tailing in the Direct Gas Chromatographic Analysis of Barbiturates—E. W.

Cieplinski, *Analytical Chemistry*, 35 (2): 256-7 (Feb. 1963). Peak tailing of barbiturates is prevented by neutralizing acid absorbing sites on support. Hexamethyldisilazene treated support material is further treated with Empol 1018 dimer acid and then coated with SE-30 or neopentyl glycol adipate. The packing and operating conditions are standard. (JDN)

A Scientific Scene of Crime Kit—R. D. Ostler, *The Police Journal*, 36 (5): 222-5 (May, 1963). The Crime Scene Kit developed by the Portsmouth City Police is described. It is the author's opinion that crime scene kits should not include tools, fingerprint equipment, or plaster. By keeping the kits compact and light, they are more likely to be used. (JDN)

Seattle Twists for Traffic Safety—Ellis Lind, *Traffic Safety*, 62 (4): 20-1, 44 (April, 1963). By placing traffic cones in a zig-zag pattern, motorists could be observed for peculiarities of driving ability. Non-sober drivers could be detected. One lane was left unaffected in order to make the test non-mandatory. Sufficient publicity was given to the test to discourage drinking and driving. (JDN)

Unusual Breaking Implements—Anon., *The Australian Police Journal*, 17 (1): 72 (Jan., 1963). A fork shaped tool was used to open Yale locks by inserting tool through transoms over the door and controlling its movement with a string. (JDN)

The Lie Box Lies—John P. Coghlan, *Illinois Police Association Journal*, 16 (2): 11-15, 63-4 (March-April, 1963). A criticism of the use of lie detection examinations in police or employment investigations. (JDN)

Photography Plays Major Role in Arson Investigation—H. B. Tuttle, *Law and Order*, 11 (4): 6-9, 57 (April, 1963). Photographs of all evidence recovered as well as over-all record photographs are an aid to the investigation and prosecution of arson cases. Particular use should be made of multiple flash and high speed color films. (JDN)

Present Status of the Ninhydrin Process for Developing Latent Fingerprints—W. L. Choate, G. R. Stanghor, and A. W. Somerford, *Identification News*, 13 (3): 9-10, 14 (March, 1963). Comparative tests using various concentrations, various solvents, and a range of temperature conditions show that the best results are obtained at concen-