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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 Catalytic Process for Restoration of Serial Numbers on Aluminum—W. Jerry Chisum, *Journal of the Forensic Science Society*, 6(2): 89 (April 1966). This method for restoration of numbers on aluminum and aluminum alloys uses an acidic solution of mercuric chloride and a twenty minute application time. (GDM)

Identification of Seeds of *Ipomoea Purpurea* (Morning Glory Family Reported to Have Psychotomimetic Properties) by Paper Chromatography—James W. Brackett, Jr., William A. Carter, Don M. Harding, and Paul M. Dougherty, *Journal of the Forensic Science Society*, 6(2): 90-96 (April 1966). Using an alcoholic extract, a separation is carried out in a butanol:acetic acid:water system. Development is made with p-dimethylaminobenzaldehyde and ninhydrin. The method requires 1 gram of seed and will detect milligram quantities of *Ipomoea Purpurea*. (GDM)

Problems and Advantages of Test Firing Weapons into Water—Lowell W. Bradford, *Journal of the Forensic Science Society*, 6(2): 97-98 (April 1966). Experimentation shows that breakdown and mushrooming of lead and soft nose bullets can be minimized by using a powder load which will not exceed a velocity of 1800 ft./min. A 12 ft. × 2 ft. vertical water tank was used. (GDM)

Identifications by Means of Pyrolysis Products—Paul L. Kirk, *Journal of Gas Chromatography*,

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5(1): 11-14 (January 1967). The theory and design of pyrolyzers as well as a listing of its use in criminalistics is discussed. Included in the uses are drugs, plastics, paint, wood, plant material, bacteria, and hair. (GDM)

Quantitative Resolution of Protein Pyrolyzates by Gas Chromatography—Maurice V. Stack, *Journal of Gas Chromatography*, 5(1): 22-24 (January 1967). The analysis of proteins including protein fibers by pyrolysis is done on a 15% carbowax 1500 column using temperature programming. Dental enamel was also analyzed by this method and seems to have applications in the field of criminalistics. (GDM)

The Use of Nutmeg as a Psychotropic Agent—Andrew T. Weil, *Bulletin on Narcotics*, 18(4): 15-23 (October-December 1966). Nutmeg (*Myristica*) has been shown to have narcotic properties. The effect is compared to that of marihuana. The author covers the history of its use as a narcotic and as a legal medicine, the pharmacology and psychopharmacology of nutmeg. (GDM)

Unusual Bullet 'Fingerprints'—D. Q. Burd and A. E. Gilmore, *The American Rifleman*, 115(3): 24 (March 1967). Where shots are fired with either an excessively lubricated barrel or projectile, the land widths on the rifling impressions may be wider than normal. This discrepancy is particularly prominent with barrels having shallow rifling or worn rifling. These conditions could effect evidence bullets or test bullets. (JDN)

Influence of Drugs on Handwriting—(Zum Einfluß von Drogen auf die Handschrift)—E. Goetschel, *Kriminalistik*, 21(1): 7-10 (January 1967). The effects of Valium (benzodiazepin derivative), Psilocybin and LSD on handwriting was studied. Valium shows an effect after pro-

longed medication, while the other two drugs show an effect after only twenty minutes. The author urges document experts to work with medical experts in evaluating the effect of new drugs on handwriting. (JDN)

An Aid to Paint Flake Preparation—A. F. Humphrys, *International Criminal Police Review*, 208: 146-7 (May 1967). A method for preparing paint flakes for microscopic examination is described. (PJC)

Forgeries in Fingerprints—Sia Rani Gupta, *International Criminal Police Review*, 208: 133-9 (May 1967). The article discusses techniques used to forge fingerprints and methods of detecting forged fingerprints. (PJC)

Identification from a Bite Mark in Cheese—J. J. Layton, *Journal of the Forensic Science Society*, 6(2): 76-80 (April 1966). Photographs are shown of bite marks in cheese on which were found 20 points of comparison with the suspect. The identification was done using plaster casts of the evidence cheese and a known piece of cheese which the suspect took a bite of. (GDM)

The Identification of Wood Fragments—J. L. Fish, *Journal of the Forensic Science Society*, 6(2): 67-75 (April 1966). A case is described in which wood used in safe insulation was found in the suspect's truck and led to a conviction. The article lists a method for the microscopic identification of wood. This method includes sectioning and staining. Also discussed is a set of multiple entry punched card keys which are used in the microscopic identification of woods. (GDM)

Comparison of Adhesive Tapes by Neutron Activation Analysis—J. E. Scott, C. M. Hoffman, M. J. Pro, and H. L. Schlesinger, *Journal of the AOAC*, 50(2): 371-376 (April 1967). Activation analysis of adhesive tapes shows differentiation is possible through elemental composition. Differences between brands, batch to batch and in batch variations were detected. Irradiation time was 1 hour at a flux of 7.4×10^{12} n/cm²/sec. (GDM)

Identification of Bullet Holes by Residue Transfer—H. L. Schlesinger, C. M. Hoffman, and M. J. Pro, *Journal of the AOAC*, 50(2): 376-380 (April 1967). Using activation analysis, bullet holes can be identified through the transfer of antimony

and copper as the bullet passes through its target. A correlation was found between the residue and the jacket composition, caliber, and configuration. (GDM)

Pyrolysis—Gas Chromatography in the Differentiation and Characterization of Antibiotics—Thomas F. Brodasky, *Journal of Gas Chromatography*, 5(6): 311-318 (June 1967). Both high and low temperature pyrolysis are used by the author to assist in the identification of antibiotic drugs. Columns used include 5% FFAP on Diaport S, 2% QF1 on Anakrom, 15% Carbowax 1500 on Haloport F, 2% Carbowax 20M on Chromasorb W and 5% Halcomid-Quadrol on Haloport F. The method used is suitable for quantitation in some instances. (GDM)

Studies on Differentiation of Microorganisms by Pyrolysis—Gas-Liquid Chromatography—E. Reiner, *Journal of Gas Chromatography*, 5(2): 65-67 (February 1967). Using a 10% Carbowax 20M on Anakrom ABS column, a method is suggested for use in the identification of many microorganisms. The method allows the differentiation of various strains of the same microorganisms. (GDM)

Restoration of Photographs by Neutron Activation—E. Ostroff, *Science*, 154(3745): 119-23 (October 7, 1966). Occasionally a photograph too faded for use defies all attempts at restoration by normal methods. Where even micro traces of the original silver image remain, neutron activation and autoradiography may restore the picture provided the item is relatively free of halogens and other silver. (JDN)

Explosively Produced Fractures and Fragments in Forensic Investigations—H. P. Tardif and T. S. Sterling, *Journal of Forensic Sciences*, 12(3): 247-72 (July 1967). A series of tests have been described by which the general explosion characteristics of fragments were determined on both the "macro" and the "micro" scale. Although all features of the tests have not been described in detail here due to lack of space, the following conclusions based partly on the general results of these tests and partly on the results of the examination of all the small fragments produced in these tests have been made:

1. The small fragments produced by the shattering effect of an explosion have identifiable char-

acteristics which are not produced during damage from other causes.

2. The large and medium size fragments from a structure can be reassembled and in general will tell if the disruption was caused by an explosion because of the preferred direction in which the fragments are found to be curved or oriented.

3. With an increase in stand-off distance, the central zone of fine fragmentation decreased proportionately in area, and the fragments outside the central zone decreased in number but increased in size. The morphology of the fragments also changed. Since the shattering power is higher at shorter stand-offs, the fragments are smaller and more equiaxed while they increase in length at the longer stand-offs.

4. A decrease in the amount of the charge produces effects similar to an increase in stand-off distance. Large charges produced large zones of fine fragmentation and large equiaxed fragments, while the smaller charges produced long fragments originating at the centre.

5. An increase in sheet thickness causes a decrease in size of the central zone, but the general fragmentation was not much affected except for the very thin and the very thick sheets.

6. When a small charge such as a dynamite rod was placed perpendicular to the metal sheet, the effect was much less than when the charge was placed in a parallel direction.

7. The general pitting effect was prevented when a 2-inch thick layer of fibre glass insulation batts was placed in contact with the aluminum sheet. When the same material was placed around the charge, the effect was slightly enhanced.

8. A similar layer of fibre glass insulation batts in contact with the sheet between it and the explosive will reduce the shattering effect and produce longer fractures and larger overall fragments.

9. The placing of a very thick layer (16 inches) of fibre glass insulation batts behind the metal sheet results in a completely different behaviour with very little fragmentation being produced.

10. The more brittle materials, such as magnesium alloys, fragment to a considerably greater extent than some aluminum alloys, mild steel, and stainless steel.

11. No fragmentation at all was produced when the explosive was replaced by a 10-lb. unconfined gunpowder charge under conditions for which a much smaller dynamite charge gave very severe fracture and fragmentation.

12. The high velocity impact of small fragments

with part of the structure leaves telltale evidence of an explosion in the form of oriented indentations and perforations.

13. The "macro" and "micro" characteristics of metallic fragments produced by the detonation of a high explosive charge, can be used to ascertain the explosive nature of an accident even after other evidence of the explosion may have been destroyed by a subsequent fire or aircraft crash. (WEK)

The Significance of Chronic Heart Disease, Fatty Liver, and Consumption of Barbiturate and Librium on the Tolerance to Ethyl Alcohol, as Judged in a Postmortem Series—Tom Saldeen and Orien Johansson, *Journal of Forensic Sciences*, 12(3): 273-94 (July 1967). In a series of 5,100 medico-legal cases, death was believed to be caused by intoxication with alcohol in 82 cases. The concentration of alcohol in blood seldom reached high values (0.35%–0.45%), and deaths from intoxication with alcohol alone therefore appeared to be rare. In most cases the concentration of alcohol in the blood was low (0.15%–0.30%). These patients often showed chronic heart disease, fatty degeneration of the liver (chronic alcoholism), or alcohol had been consumed in combination with barbiturate. A few cases in which the combined consumption of Librium and alcohol was assumed to have caused death are also reported.

The fatal course of intoxication with alcohol combined with barbiturate may be so rapid that death in such cases can easily be confused with sudden deaths from natural causes.

The risk of placing large amounts of barbiturate (or Librium) in the hands of alcoholics is stressed, as is the importance of continuous observations of alcohol-barbiturate intoxication.

Even though death caused by combined consumption of alcohol and barbiturate is most often to be regarded as suicide or accident, the possibility of murder in such cases must be considered. (WEK)

Chloral Hydrate and Alcohol Metabolism in Human Subjects—H. L. Kaplan, R. B. Forney, F. W. Hughes, and N. C. Jain, *Journal of Forensic Sciences*, 12(3): 295-304 (July 1967). Chloral hydrate, ethanol, and chloral hydrate plus ethanol were administered, on separate occasions, to each of five human subjects. Ethanol metabolism was not appreciably altered by the concurrent ad-

ministration chloral hydrate. In contrast, consistent and marked alterations of chloral hydrate metabolism were evident when chloral hydrate and ethanol were given together. Blood trichloroethanol concentrations reached earlier and higher peak levels and remained elevated during the remainder of the six-hour period.

The cardiovascular responses of the subjects to the three treatment conditions were not significantly different. The number of symptoms, and their severity, recorded by the observer and the subjects were greater after the combination than after either compound alone. In no case did a subject show evidence of what might be considered as "knock-out" effect. (WEK)

Psychiatric Responsibility and Tort Liability—

Howard Newcomb Morse, *Journal of Forensic Sciences*, 12(3): 305-58 (July 1967). A psychiatrist has an obligation to disclose to his patients the risks inherent in proposed therapy. In order for the patient's consent to protect the psychiatrist from a charge of professional negligence, it must be an informed consent.

In respect to electroshock therapy, the most recent innovation is to administer, firstly, a sedative drug and, secondly, a depressant, paralyzing drug, both intravenously, immediately prior to the administration of the electroshock therapy. The combined effects of appropriate quantities of these two agents are the prevention of convulsion and the reduction of muscular contraction, accomplishing the almost complete elimination of the contingency of fractures resulting from the electroshock therapy. However, it is the present opinion that the use of electroshock therapy will be gradually supplanted by the use of new so-called "anti-anxiety" drugs.

Psychiatrists, both as individual therapists and as owners or managers of sanatoria and hospitals, have been held liable for injury or death resulting from failure to restrain or control patients to whom they owed a duty of care and vigilance. This duty, owed by the psychiatrist to his patient, is to exercise personally, or by means of orders and instructions to hospital personnel, reasonable restraint and observation. Proper medical procedure dictates that a psychiatrist never, under any circumstances whatsoever, sign a physician's certificate for hospitalization (commitment form) without first—immediately prior thereto—personally conducting an examination of the patient.

Law cannot much longer resist the scientific inroads of modern psychiatry. Law has already felt the need of relying heavily, if not entirely, upon psychiatry in making enlightened determinations of such important issues as legal insanity, criminal mental incompetency, and criminal sexual psychopathy. The impact of psychiatry upon law has, on the whole, been salutary. Law cannot much longer accept the benefits of psychiatry without making an accommodation to fit the needs of the interaction of the two disciplines. (WEK)

Asphyxial Deaths by Hanging in New York City, 1964-1965—James L. Luke, *Journal of Forensic Sciences*, 12(3): 359-69 (July 1967). Description of the circumstances and the pathologic changes found in 106 asphyxial deaths by hanging over a two-year period in New York City have been presented. Most of the victims were foreign-born elderly males. Only two cases were accidents, the rest being suicidal. The backgrounds of these victims as well as the circumstances of these deaths are described in detail and discussed. (WEK)

"Optical Contrastors." A New Instrumental Aid in Deciphering Faint Writings and Other Low-Contrast Evidence—Linton Godown, *Journal of Forensic Sciences*, 12(3): 370-75 (July 1967). Semi-transparent plates can be effective as "optical contrastors" to appreciably increase contrast of low relative contrast areas of documents or thin underexposed films. They can be used visually or with photography without regard to color of writing or background and, if desired, together with color absorption filters. Optimum contrast enhancement requires selection of plates with appropriate custom-made multilayer, interference type, beam splitter coatings. Practical contrast gains can be expected from use of one or more standard, chromium-film, semireflecting "one-way-mirror" plates. Intense lighting is required to overcome light losses by reflection and absorption. Slight degradation of detail may accompany the contrast gains.

The "optical contrastor" offers a new instrument for the decipherment of documents or other faint, low contrast forensic evidence. It can be anticipated that its use will make some otherwise impossible decipherments possible, render some indefinite interpretations definite, and make some difficult tasks appreciably easier, even though it