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Police Science Technical Abstracts and Notes

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POLICE SCIENCE TECHNICAL NOTES AND ABSTRACTS

Joseph D. Nicol*

The Separation of Crystals and "Gums" on a Micro or Semimicro Scale—The product of a micro organic synthesis is often a few crystals imbedded in a viscous liquid. A. L. Bacharach recommends the use of a Conway diffusion unit for such a separation. This consists of two dishes, one inside the other, the larger covered by a glass plate. A small porous plate containing the mixture is placed in the small dish and the annular ring filled with solvent. After standing for several hours, the gum will be contained in the porous plate, from which it can be extracted if needed, and the crystals now free can be removed from the top for further recrystallization. This is reported in *The Analyst* 72: 244-245 (June 1947).

Identification of Typewriting—(By George MacLean; *The Police Journal*, 19(3): July-Sept. 1946)—The purpose of this article is to familiarize police officers with the methods used in the comparison and identification of typewriting in the hope that they may find the information of assistance in such cases. The author describes in detail two cases where the identification of typewriting played a major part. In one case a suspect was cleared of all suspicion and in the other, the original ownership of a stolen typewriter was proven by means of typewriting comparison. A procedure for the comparison and identification of typewriting is described as follows: 1. Determine the make of the machine by the comparison of the design, dimensions, etc., of each character on the criminal document with the corresponding character on the standard. 2. A comparison should be made for vertical and horizontal alignment of each character to the adjacent character. 3. The perpendicularity of each character should be checked. 4. All sides of each character should be checked for any differences in impressions. 5. Each character should be carefully examined for any defects or divergencies. Some of the most common defects in the type faces are the shortening of the serifs in "P", "D", "B" and "H" and the diacritic in the letter "T". This article is illustrated with ten photographs. (Note submitted by D. J. Purtell of the Chicago Police Department Scientific Crime Detection Laboratory.)

Physical Evidence in Hit and Run Cases—A survey of the field of hit-and-run cases by Frank Stratton shows 25 per cent of the proof as derived from technical analysis. In an article in the *Boston University Law Review*, 26:249-263 (April, 1946), Stratton discusses the various clues such as blood stains, tissue, glass, etc. which have proven useful in this type of investigation. The material is nontechnical and intended for the guidance of investigators.

* Firearms Identification Technician, Chicago Police Scientific Crime Detection Laboratory.

The Use of Loaded Cartridge Cases in Firearms Identification—Frequently weapons and ammunition are recovered separately, and it is desirable to establish their connection. Auto-loading types of firearms leave numerous marks on the cartridge cases as a result of the loading operation. The clip, extractor, and ejector are the principal sources of identifiable marks. This is true whether the cartridge or shell is hand ejected or ejected after being fired. It is a common occurrence to find loaded cartridges with numerous extractor and ejector marks on the head of the case as a result of hand ejecting. This ammunition may be linked to the suspect weapon by these marks. For example, if a prisoner denies loading a weapon found unloaded in his possession or denies ownership of the gun although having the right ammunition elsewhere in his possession the answer may come from marks on the cartridges. Still another example can be taken from a case handled by the writer. During the course of a currency exchange robbery the proprietor was shot by the robber using a 9 m/m Luger automatic pistol. A fired cartridge case and fired projectile were recovered at the scene of the shooting. Later a suspect was apprehended who had nine loaded 9 m/m Luger cartridges in a drawer in his room. Several of the cartridge cases had marks of the ejector, but one in particular had a much deeper mark. A comparison between loaded and fired cartridge cases showed the similarity of ejector marks. Although the murder weapon was never recovered the match of ejector marks resulted in a conviction. The presence of firing pin indentations on misfired cartridges can also lead to valuable information regarding the weapon in question. It may be possible to establish that an assault with intent to kill was attempted or that shots were fired in a certain sequence in a revolver.

Identification of Explosives by X-Ray Diffraction—The powder diffraction patterns of eighteen explosives have been tabulated by A. M. Soldate and R. M. Noyes in the *Industrial and Engineering Chemistry, Analytical Edition*, 19:442-4 (July 1947). Hanawalt's method of classification has been used giving the d spacing and line intensities. The following explosives are listed: Pentaerythritol tetranitrate, 2,4-Dinitrotoluene, 2,4,6-Trinitrotoluene, Picric acid, Guanidine picrate, Ethylene dinitramine, Nitroguanidine, 2,2,5,5-Tetramethylol cyclopentanone tetranitrate, Dihydroxyethyl nitramine dinitrate, Hexogen, Octahydro-1,3,5,7-tetranitro-S-tetrazine, Octrahydro-1-acetyl-3,5,7-trinitro-S-tetrazine, β -Diethylcarbanilide, Diphenylamine, *N*-Nitrosod phenylamine, 2-Nitrodiphenylamine, 2,4'-Dinitrodiphenylamine, 4,4'-Dinitrodiphenylamine.

Reduced Pressure Distillation Apparatus—Recovery of volatile liquids in arson investigations. The problem of removing flammable liquid evidence from solid materials during arson investigations has been difficult and sometimes impossible if ASTM petroleum distillation and other similar methods were used. Specifically, the problem arises when the attempt is made to insert construction materials such as floor boards, siding, etc.; wearing apparel; parts of human anatomy, etc., into the usual side arm flasks for the distillation process. In addition to the pure mechanical difficulties, the severe mutilation of the evidence nec-

essary has had somewhat adverse effects on the cases in the courts. The reduced pressure distillation pressure apparatus described here, has been able to overcome the above defects and for the past eight years has successfully performed the work for which it was designed. Description of apparatus. 1. Evidence receptacle—30 gallon cast iron container with ground faces on container and cover. Projected ring on face of cover matching reception groove on face of receptacle. 2. Copper tubing to vapor traps immersed in saline ice (1), Carbon Dioxide (2) baths consecutively, with ground glass micro stopcocks isolating each trap. 3. Manometer—loss of vacuum indicator. 4. Cenco-Hyvavacuum pump. The apparatus successfully removes and condenses for analysis liquids up to the viscosity and vapor pressure of No. 3 fuel oil without the application of heat to the receptacle. If heat is needed for rapidity or because of the characteristics of the evidence, infra-red is recommended. (Submitted by Loren G. Farrell, Assistant Fire Marshal, City of Detroit Fire Department.)

Microanalysis of Opiates by X-Ray Diffraction—S. T. Gross and F. W. Oberst report a non-destructive method of analysis of opiates in the *Journal of Laboratory Clinical Medicine*, 32:94-101 (1947). This method consists of packing the sample into a small hole in sheet metal and passing a .01 inch beam of copper K radiation through the sample. The cassette is placed at 5 cm. from the sample. Comparison is then made with known patterns in order to make the identification. It has been possible to identify .0007 mg. of morphine.

Laboratory Staff Vacancy—The Los Angeles County Civil Service Commission has just announced a vacancy in the position of Crime Laboratory Technician in the Los Angeles County Sheriff's Department with a monthly salary of \$417.00. Applicants must have the following qualifications: Be a college graduate with specialization in physics, chemistry, or related field, and have 3 years experience in the laboratory investigation of physical evidence in connection with a law enforcement agency. The examination will be given in locations throughout the United States convenient to the applicants' residence. Full information and applications may be obtained from the office of the Commission, 102 Hall of Records, 220 N. Broadway, Los Angeles 12, Calif.