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W. R. TRACEY, ESQ.
Chief Constable
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SCIENCE AND ITS RELATION TO CRIME DETECTION

BY JOHN F. C. B. VANCE, F.C.B. (ENG.) F.C.I.C.

In response to repeated requests we republish the following article written by Mr. F. C. B. Vance, who has an international reputation as an outstanding authority on criminology.—Editor.

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THE unchangeable laws of nature demand progression or retrogression; a state of inertia or non-progressiveness is impossible.

Science in its relation to crime is more than ever being reflected into criminal methods of today. It is necessary, therefore, that the best available scientific methods and assistance be placed at the disposal of the Police Department.

It is also necessary that the Police Officers of today should have a general knowledge of the application of science to crime detection, particularly in regard to the care of exhibits at the scene of crime and the care and removal of said exhibits to the Scientific Laboratory.

In the case of major crime it is vitally important that nothing be touched or in any way disturbed until the arrival of a trained criminal technician. In the meantime careful search should be made for foot prints, automobile tire marks, wagon marks, hoof marks, etc. These should be preserved by covering with empty boxes, inverted. Search should also be made for bullets, gun, knife, stick, stone, bloodstains or any other material thing which may have any possible relationship to the investigation in hand. It is well to remember that since we are dealing with tangible objects that all such objects are capable of being examined scientifically, and that all material things have special characteristics and that upon the relationship of these characteristics to other factors used in the act of committing any given crime, depends the basis upon which evidence is adduced. In other words, your whole case is mainly built upon the things and matter that can be examined.

Let us assume that the case is one of murder on a public highway or other open space, it will be the duty of the officers to immediately restrict the number of persons who will have access to the immediate surroundings. One of the first actions should be to rope off, if possible, all access to the scene of the crime. Careful examination of the ground should be made for footprints and these should be preserved in the manner already described, noting carefully the direction from which they came, the weight of impressions, length of stride, whether the impression is the full shoe, with heel, or the ball of the foot. Automobile tire impressions, if any, should be noted and portions of these carefully preserved in the manner described above and the direction of the tracks marked by driving pegs into the ground. A heavier impression in the soil usually indicates that the vehicle has stopped at the point of this deeper impression and the reason for this apparent stop should be closely investigated.



JOHN F. C. B. VANCE

City, Provincial and Dominion Analyst, Inspector in Charge
of Police Bureau of Science, Vancouver, B. C.

The body should not be moved nor should any rearrangement of clothing be permitted. Care should be taken to prevent the removal by wind or other means, of any loose hair, loose fabric, vegetation, soil or other material lying on the clothing or in the hands or fingernails of the deceased person. If absolutely necessary these exhibits may be removed and placed in clean glass containers or envelopes. The receptacles should be marked by the officer, giving date and time. He would also describe the location from whence exhibits were obtained.

Examination should be made for bloodstains. It should be carefully noted whether these stains are liquid or congealed, bright red or dark in colour, size of stains and location, also whether blood has spurted from an artery or flowed from a wound. Stains should be traced upon the ground and brush, and preserved in the manner described. Blood stained clothing or

other articles should always be wrapped loosely in separate paper containers. Blood stains should not be permitted to touch or contact each other. Identification of the different bloods (human and animal) is a delicate undertaking requiring many hours of tedious laboratory work. Stains must first be identified as blood, then classified as human blood, then again defined as belonging to a definite blood group, which in time may eliminate suspects or other blood group classifications. If care is not taken to keep separate the various articles suspected to contain blood, identification and grouping is made more difficult and sometimes impossible, the laboratory tests indicating carelessness in handling the exhibits through contamination of the different stains, thereby destroying valuable evidence and causing a considerable loss of time and much expense to the Scientific Laboratory.

Revolvers and other weapons found at the scene of crime should not be touched by the hands but should be lifted with special tongs and placed carefully into cardboard boxes provided for this purpose by the Scientific Laboratory. Any unnecessary handling will destroy the material evidence contained thereon such as finger prints, dust, fabric, powder gases, stains, etc. Bullets and cartridge cases when found should be immediately placed in special glass containers and must not be handled, marked or mutilated in any manner. This is of the utmost importance, as the physical examination of these articles depends upon the marks and scratches on the external surfaces of the bullets and cartridge cases. Portions of fabric, blood, or bone contained within the lead bullet should not be interfered with.

Samples of soil, dust and vegetation should be collected at intervals, depending upon the nature of the case in hand. These samples should be placed in glass containers or sealed envelopes.

Clothing in cases of sexual offences should never be wrapped up, but should be placed in cardboard boxes in such a manner that the stained portion of the garment will not be disturbed.

Exhibits of glass fragments, wood splinters, plaster, fabric, etc., should be placed in separate glass containers or Bureau of Science envelopes properly marked and sealed.

Burnt or partially burnt documents or papers should not be opened, but should be carefully placed in a cardboard box, marked and sealed.

Liquor exhibits should be marked and delivered to the Laboratory without unnecessary delay. If this is not convenient, they should be kept at a temperature of 45 degrees F. until such time as delivery is possible.

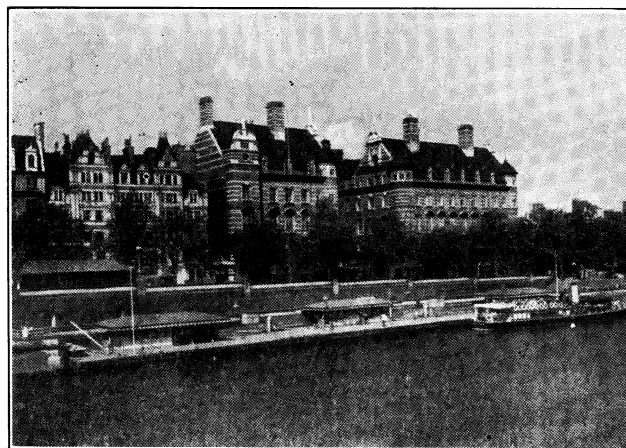
In accidents or death by automobile, always preserve any glass found on the roadway in the vicinity of the accident and examine the road for tire impressions, skid marks, blood stains, flesh, etc. These should all be preserved in the manner before described. Measurements necessary in occurrences of this nature should be carefully taken and recorded. The metal joints on bumpers, headlights, radiators and fenders should be examined for hair, fabric, etc. These should be either carefully removed and placed in proper receptacles or else the exhibits should be protected until the Scientific Bureau is called into the case.

Narcotic drugs, such as morphine, cocaine, and heroin are composed of white powder or tablets and in appearance resemble boracic acid and baking powder. Opium is a brown powder, but this drug prepared for smoking is a dark mass resembling very thick molasses in appearance. When narcotics are seized, the packages should be marked and delivered to the Laboratory as soon as possible.

The exhibits must never be permitted to leave the possession of the officer collecting or seizing same, until he personally has delivered them safely to the laboratory.

In presenting his evidence to the Court, the officer should be in a position to immediately identify the exhibits which had been delivered by him to the Scientific Laboratory for examination. His identification mark or initial, together with the date, should be visible on the containers or clothing exhibits. He should also have clearly in his mind the date and time when such exhibits and certificates were returned to him from the Scientific Laboratory.

In describing each article presented to the Court, he should state, for instance: "That the stains are



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red or brown, or resemble blood; that the contents of certain packages contain powders of certain described colours; that bottles contain so many inches high of liquid of a described colour." When the officer attempts to interject into the trial his opinion that certain stains are blood stains; that certain packages contain narcotic drugs; such as cocaine, morphine, heroin, opium, etc., that certain bottles contain liquor and so on, he then enters the field of a professional chemist or toxicologist, and must submit to cross-examination as such.

Each division in the Police organization has its own particular duty to perform and since results from scientific examination depend to a great extent, and sometimes almost entirely, upon the condition and physical properties of the subject matter under examination, the officer should remember that he is the individual who has charge of the most important factors. He will have noted the material evidence which he feels will have a bearing on the case. The preservation of evidence will provide the basis for scientific examination, this basis, if carelessly or in-

efficiently handled, may produce negative results. The factors above cannot be compared or related by the human eye alone. Instruments and apparatus outside the control of the officer in charge of the case must be used, and it depends upon his intelligence and his care whether the material submitted by him can be constructed by the Scientific Laboratory into tangible evidence either for or against the accused person.

Be cautious. Use the utmost care in your manner of handling material exhibits. You are the first official to appear at the scene of a crime. It is entirely within your power to carry the case through to a successful conclusion by the careful and intelligent preservation of material evidence or you may completely ruin the case through carelessness, lack of knowledge, or the failure to carry out instructions.

Ranch Life for Juvenile Delinquents

JUVENILE court and probation officials of San Francisco are confident they have found the best solution to date for the rehabilitation of juvenile delinquents in the maintenance of Log Cabin Ranch.

The experience has been under way for nearly two years. An average of 30 minor offenders at one time worked out their "debt to society" on the ranch. From a total of 49, only one after his return home, has relapsed and become a "peater." All the others have been living happy, normal lives since.

The experiment was begun in 1939. With funds donated by a foundation, the city purchased a 240-acre ranch near Gualala, in the northern part of the state, located in a woody region. The annual cost of operating the ranch has been about \$20,000, including all salaries.

The ranch is supervised by Frank Kelly, who has five assistants, including a junior and a senior high school instructor and a recreational director.

"The ranch has provided an ideal outlet for the energy of the boys there," Chief Probation Officer R. B. Miller declared. "Both their energy and their thoughts are directed to constructive endeavors, and that gives them a financial interest in the success of their own rehabilitating endeavors."

They perform regular ranch duties and the work of maintenance and the repair of property, and have their own plots of ground on which to raise vegetables.

"Through bookkeeping transactions, the boys may purchase young calves, sheep or pigs from the ranch, raise them and sell them to the ranch or on the market."

"The ranch pays them the prevailing market price for their stock, less the original price. If the ranch buys the stock, it is slaughtered and served on the table."

A similar procedure applies to vegetable raising. If a boy is interested in truck gardening, he may buy plants or seeds, raise a crop and sell it either on the market or to the ranch.

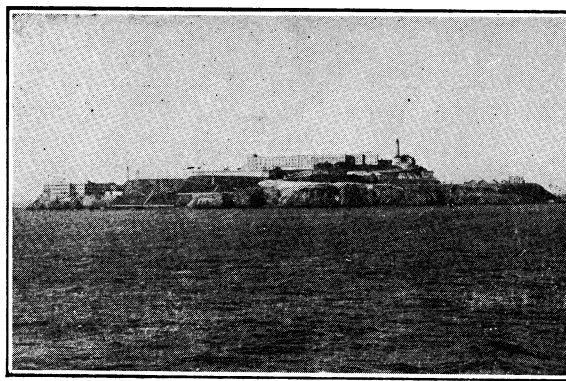
"All of the boys return home," Miller declared, "in much better physical condition from the outdoor and active life they have led and with a keen interest in life and the possibilities of work. It also keeps them from all association with undesirable characters through their rehabilitation period."

Montreal Police

ANOTHER 130 Montreal policemen were added recently to those who are qualified to give first aid to those injured on the streets, when Police Director Fernand Dufresne presented membership certificates in the St. John Ambulance Association to this number of officers who had passed all examinations. More than 500 of Montreal's policemen are now qualified to wear the emblem of the association on their sleeves.

Director Dufresne congratulated the men on their excellent marks attained after six weeks of study under Lieut. L. Binnett, instructor, and urged them to take all precautions in the summer months to prevent school children from being hurt in street accidents.

"This city has a force that I am proud of," he said. "I want it to remain that way. You are being watched closely and do not act in any way which will bring censure from any direction."



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