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THE COVER

This month's cover photograph is illustrative of the properly packed toxicological specimens described in this month's reprint article on that subject. (M.S.H.P. photograph)

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THE TECHNICIAN

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CONTENTS

TOXICOLOGICAL EVIDENCE

Ed. Note: The following material is reprinted from the July, 1943 issue of the B.C.I. BULLETIN of the New York State Police, by permission of the editor of that publication. The article contains in brief form a number of the more important factors which must be considered in handling of toxicological evidence, and should prove of interest and value both to the criminal investigator and to the police analyst.

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Toxicology is defined as "the science of poisons, their origin, their properties, their action on the system the treatment of their harmful effects and the methods of detection by chemical or other means." Science being a systematized body of truths, places the toxicologist within the category of scientists. Consequently, the findings of a toxicological analysis are such that they can always be confirmed by another analyst. Such is not the case of handwriting examination. That is a matter of personal opinion based upon observation and experience. Comparison of typewriting falls within the realm of science when results are based upon mathematical measurement of variances in letter characteristics.

Witthaus has stated: "Purely chemical evidence is of fact rather than of opinion and the chemical witness is expert only in that he requires exceptional skill and training that he may ascertain the facts."

Forensic toxicology which is especially associated with the detection of poisons, is in contradistinction to medical toxicology or the recognition, prevention and cure of cases of poisoning, such cases usually being the concern of a medical practitioner. The forensic toxicologist must

be familiar with all branches of the subject so that his testimony may assume the broad aspects which are so important in criminal investigations.

To define a poison is a difficult matter. There is no specific group of substances to which such a name applies. There are several definitions available. In "Legal Medicine and Toxicology" by Peterson, and Haines, there is stated: "A poison is a substance which, when absorbed into the blood, is capable of seriously affecting health or destroying life, and this is its usual effect upon the healthy body." In Gonzales, Vance and Helpern's "Legal Medicine and Toxicology", a poison is defined as "a substance which acts on the body chemically and physiologically, consistently causing a disturbance of function which may result in illness or death."

In both of these definitions it will be observed that such substances as powdered glass, nails, etc., are excluded as these articles produce their effects in a mechanical manner.

Poisons are introduced into the body in various ways. Many of them are taken by mouth and are absorbed in the circulation after passing through the stomach. Others are inhaled and enter the blood stream through the lungs. Some are introduced by hypodermic injection or absorbed from the intact skin. Poison, after absorption, circulates in the blood and attacks the various organs and tissues. Many poisonous substances cause most of their damaging effects at the points of excretion.

Poisons are successfully classified according to their physical and chemical properties. Webster lists toxic substances into four categories; gaseous poisons, inorganic poisons, alkaloidal poisons, and non-alkaloidal organic poisons. When one considers that this classification includes several hundred toxic substances, it is obvious that the task of the toxicologist is very difficult unless full cooperation of all concerned in the investigation is forth-

coming.

In cases of suspected or known poisonings, much importance lies in the post-mortem examination. The necropist has a very definite important role in toxicological examinations. On the acumen which the pathologist displays in his conduct of the autopsy depends the success of the investigation for unless the proper material is saved for chemical analysis, the toxicologist may not be able to conduct his analysis properly.

The post-mortem examination of a dead body should consist of a thorough autopsy and histological examination in order to determine what pathological conditions are present. The purpose of a complete autopsy lies not only in observing the conditions of the organs but also in ruling out natural causes of death which might have produced clinical manifestations similar to poisoning. In cases of criminal poisonings, this factor cannot be over-emphasized. A complete autopsy does not consist of simply removing the stomach. It should include an examination of all the organs (brain, neck organs, and spinal cord) and should preferably be performed by a competent pathologist.

Under no circumstances should the body be embalmed before the necropsy as the embalming process vitiates any chemical tests which may subsequently be necessary. Embalming fluid, which usually contains ethyl alcohol, formaldehyde, glycerine, inorganic salts and dye stuffs, renders impossible the detection of alcohol and cyanides in the organs. Besides interfering with the chemical tests, the embalming process also produces confusing artifacts in the body. If, however, the body has already been embalmed, then samples of the embalming fluid and cavity preparation material used should be taken and submitted to the analyst.

Many poisons produce characteristic histological alterations. The following changes are usually found:

GASTRO-INTESTINAL TRACT: Inflammation, corrosion, hemor-

rhage, ulceration, perforation; Mineral acids, caustic alkalies, ammonia, heavy metal salts, sodium fluoride, phosphorus, halogens, oxalic acid, aconite, croton oil, cantharides, gelsemium, muscarine, phenols, veratrum and wood alcohol.

ODOR OF GASTRIC CONTENTS: Volatile substances having specific odors, such as: Alcohol, benzene, chloroform, cyanide, ether, nicotine, nitrobenzene, opium, phenol, lysol.

COLORED MATERIALS IN STOMACH: Grayish white undissolved material: Arsenic oxide, remnants of tablets, etc. Green or blue coloration: Copper salts and dye added to fluoride and strychnine. Yellow color: Picric acid, nitric acid. Black: Sulfuric, oxalic acids. Luminous particles (in the dark): Phosphorus. Pink to violet: Permanganate. Blue or brown: Iodine. Bright red: Mercurochrome.

SKIN, DISCOLORATION: Icteric tint: Phosphorus, arsenic, alcohol. Cherry red or pink: Carbon monoxide, cyanide. Brown (chocolate color): Nitrobenzene, chlorates, acetanilid. Blue lividity: Carbon dioxide. Dark blue-gray: Silver (chronic).

GUMS, DISCOLORATION, usually in chronic poisonings: Lead, copper, bismuth, mercury, silver.

BLOOD, COLOR OF: Chocolate color: Nitrobenzene, acetanilid, chlorates. Cherry red or pink: Carbon monoxide, cyanide. When an autopsy is to be performed in a suspected case of poisoning, it is wise to have the toxicologist, who is to make the chemical examination of the organs, present, if possible, in order that he may personally see to it that the specimens of tissue are properly handled and collected. However, this is rarely done, as at the time of the autopsy it may not have been decided what is to be done with the organs removed, so that it not infrequently happens that contaminations are introduced by carelessness

on the part of those making the autopsy. While it seems to be frequently considered as sufficient to remove only the stomach for chemical examination in cases of poisoning, yet it should be remembered that the poison that is found in the stomach has not as yet taken an active part in the poisoning, as, for all intents and purposes, this poison is still outside the body, that is, it has not, with very few exceptions, been absorbed and can not, therefore, act as a poison owing to its elimination either by absorption or by vomiting, so that the results of this examination alone would be negative, when quite appreciable amounts might have been found in other organs. In all cases, the toxicologist should insist on having a large part of the liver (of which he should know the total weight), both kidneys, a part of the intestines, and, in some cases, he may require the brain and spinal cord, or, if death from chloroform or ether is suspected, the lungs.

Many inquiries have been received as to the quantity of what particular organ is necessary to perform a complete analysis. Too frequently it has been our experience to receive a small piece of liver with the request that analysis be made to ascertain the nature of the poison. When one considers that a fatal dose of a poison may be 100 mgs. and that this amount may be distributed throughout 5,000 gms. of tissue, and that if only 100 gms. of tissue are submitted for analysis, this amount can only contain 2 mgs. of the poison. During the process of extraction in analytical procedure, a loss of 50% may occur thus allowing the toxicologist an insignificant 1 mg. of poison to isolate and identify. One pound is equal to 453,592 mgs.

Dr. Alexander O. Gettler, Toxicologist, Chief Medical Examiner's Office, New York City, in a recent paper sets forth a list of materials best adapted for chemical analysis.

G. I. TRACT: In acute deaths, for all poisons taken by mouth, and especially for mineral acids, caustic alkalies, ammonia, nitrites, nitrates, chlorates, sulfides.

BRAIN: For alcohol, ether, benzene, chloroform, chloral, alkaloids, barbiturates.
LIVER: Heavy metals, oxalic acid, fluorides, barbiturates.
KIDNEYS: Mercury.
LUNGS: For inhaled gases, vapors, dusts.
BLOOD: For gases such as carbon monoxide, hydrogen sulfide. For methemoglobin (acetanilid, nitrobenzene, chlorates). From left and right heart chambers for drowning test.
URINE: Fluorides, barbiturates, oxalic acid, lead, mercury, arsenic.
BONES, ETC: Arsenic, lead, radium, in chronic poisonings.

In the course of this discussion there has been mentioned the matter of information to be furnished the analyst when evidence is submitted. The material should not be submitted to the toxicologist simply with a request to search for poisons. He should be provided with whatever information there is regarding the probable or possible nature of the suspected poison no matter how meager it may be. Where necropsy findings definitely point to a certain poison or groups of poisons the toxicologist should be so informed so that he may directly test for the suspected substance. In the absence of such leading information, considerable time may elapse before the routine systematic analysis for all poisons will reveal the substance present. This delay may hamper the investigation of the case by the police authorities.

The question now arises, "What information can be obtained which will assist the toxicologist in his search for the poison?" The first and often very important step in the investigation of a fatal poisoning is a thorough examination of the scene where the death occurred or where the body was found. An intensive search should be made for containers from which the deceased may have taken the poison such as cups, drinking bottles, jars, cans, paper bags, and submit them to the chemical laboratory. All food found in and around the premises, even the garbage can, should be confiscated for chemical analysis. It must be remembered that the poison may have been put into the food by some person. Also, the surrounding locality and any possible

place into which the perpetrator of the crime may have thrown or secreted the poison must be carefully examined.

Also, any information relative to the ante mortem symptoms of the deceased will provide many clues and leads both to the pathlogist and toxicologist.

VOMITING, PURGING, ABDOMINAL PAINS: Mineral acids, organic acids, caustic alkalies, heavy metal salts, halogens, phosphorus, fluorides, aconite, cantharides, croton oil, gelsemium, phenols, muscarine, veratrum, wood alcohol.

DELIRIUM:-Alcohol, belladonna group, camphor, cocaine, solanine.

CONVULSIONS: Aconitine, brucine, camphor, picrotoxin, santonin, strychnine, ammonium salts.

STUPOR, COMA: Alcohol, chloroform, ether, paraldehyde, carbon monoxide, hydrogen sulfide, barbiturates, chloral, sulphonal, atropine, heroin, morphine, nicotine.

PUPILS DILATED: Acontine, atropine, cocaine, gelsemium, hydroscyamine, strammonium.

PUPILS CONTRACTED: Codeine, muscarine, nicotine, opium group, physostigmine, pilocarpine.

DYSPNEA: Carbon monoxide, carbon dioxide, strychnine, all easily volatile organic liquids.

CYANOSIS: Acetanilid, amyl nitrite, aniline, antipyrine, benzene, nitrobenzene, nitroglycerine, opium group, pheacetin, chlorates.

VISION OR HEARING AFFECTED: Aconite, belladonna, cocaine, coniine, nicotine, quinine, wood alcohol, barium salts.

ODOR OF BREATH: From various substances that have characteristic odors.

DISCOLORATION OF THE SKIN: Cherry red or pink: carbon monoxide, cyanide. Brown (chocolate): acetanilid, nitrobenzene, chlorates.

These symptoms are not alone indicative of poisoning; they can be symptomatic of certain diseases or pathological changes.

VOMITING, PURGING AND ABDOMINAL PAINS: Gastritis, cholera, uremia, many acute infectious diseases, brain tumor.

DELIRIUM: Epilepsy, insanity, delirium tremens.

STUPOR, COMA: Uremia, acidois, cerebral hemorrhage, brain injury and other brain diseases.
PUPILS DILATED: Certain nervous diseases causing optic atrophy, sympathetic irritation.
PUPILS CONTRACTED: Certain nervous diseases, such as tabes.
DYSPNEA: Diseases of cardiac and respiratory system.
CYANOSIS: Diseases of cardiac and respiratory system.
VISION OR HEARING AFFECTED: Blindness or deafness--partial or total.
ODOR OF BREATH: Diabetes.
DISCOLORATION OF THE SKIN: Jaundice.

Information as to medications which have been administered to or were used by the deceased is of vital importance as oftentimes the toxicologist will detect trace amounts of poisons present in the organs. Being armed with the knowledge of the nature of the medication, the toxicologist will be in a position to explain these trace amounts of poison and, consequently prevent any misleading conception which may cause confusion on the part of the police investigator.

In stressing the importance of securing and submitting for analysis, generous samples of evidence, we wish to point out that in most cases, abundant quantity of sample is available. The pathologist usually needs but a small amount for his microscopic examination. The remaining portion can well be taken for analysis. As soon as possible, each organ should be placed in a thoroughly clean wide-mouthed glass jar with a glass top instead of the usual metal screw cap. If the analyst collects his own specimens he will, of course, see to it that everything that comes in contact with the evidence is scrupulously clean but if, as usually happens, the one who performs the post-mortem examination places the organs in the vessels, unwitting mistakes may lead to contamination of which the chemist is, of course, unconscious and may report the presence of substances which have had nothing to do with the actual poisoning. It is preferable to add no preservative to the organs but, rather, to transport them as rapidly as possible

to the toxicologist who can then do with them as he sees fit.

It is unnecessary to mention that the identity of the organs examined in any case of poisoning be established beyond any doubt as those removed from a certain body. The courts must be satisfied that no substantial change has taken place in the evidence. If the chemist collects the specimens at the time of autopsy, he, of course, is in a position to testify as to their identity. However, when such organs are to be transported to the chemist, the greatest care must be exercised in order to prevent any possibility of a question arising as to the source of the organs examined. Since it is oftentimes inconvenient to have personal delivery of the organs to the laboratory, it is suggested that the well-packed, carefully sealed specimens be forwarded by insured railway express with the request that the person to whom directed personally sign the receipt, or by forwarding the specimens special delivery parcel post, return receipt requested. In this manner, a direct relation between the sender and the receiver is established so that the identity of the contents of the package may be established should this question arise at a later date. On receipt of the specimens, the toxicologist will make meticulous observation and notes as to the method by which the specimens were sent, from whom received, the time received and the place of reception. In addition, he will carefully describe the package, noting the wrappings, the nature of the bindings, type of containers, presence or absence of special seals, with particular emphasis as to any evidence indicating that the seals might have been tampered with. This is of the utmost importance as this information will be brought out in any criminal proceeding and the person from whom the package was received must testify as to the nature of the package forwarded by him. If there is any discrepancy in the two descriptions, the opposing attorney will be quick to take advantage of the possibility of doubt that the specimens received were not those forwarded. Continuity of the evidence must be established to be of any value in judicial proceeding.

The anatomy of various animals differs somewhat from the human body. Then, too, animals are subjected to many more and entirely different poisons than the human being. Consequently, evidence in an animal poisoning case will, at times, be of a different nature. The majority of poisons are introduced into the animal through the mouth and are absorbed in the stomach or stomachs as in the bovines. Occasionally it is found that the poison was injected into the animal either as a hypodermic or in capsule form through the rectum. In most cases, stomach and contents, liver and kidneys, will contain the toxic substances, and from an analysis of these organs, the toxicologist will be able to state with accuracy the presence and quantity of such substances.

In recapitulating the type of evidence necessary, we wish to point out that it is not always possible to submit generous portions of all the organs. Decompositions, destruction and other changes may result in the loss of several or all of the organs. We can only request that whenever and wherever possible, submit generous portions of evidence in clean glass containers as soon as possible to the analyst with all available information as to the type of poison suspected. The following list of organs is only a guide for the investigator to be followed in those cases where a particular poison is suspected:

ALCOHOL:

Entire brain or
4 ounces of blood or
contents of bladder.

The stomach contents will show the presence of alcohol but cannot be considered as a criteria for determination of intoxication.

CARBON MONOXIDE:

8 ounces of blood.

VOLATILE POISONS:

Ether
Chloroform
Cyanides
Phosphorous
Benzine, etc.
Entire brain, stomach and stomach contents.
Must be submitted as quickly as possible.
Keep under refrigeration.

HEAVY METALS:

Lead
Arsenic
Silver
Bismuth, etc.
Liver, kidneys.

ALKALOIDS:

Morphine
Codeine
Strychnine
Heroin
Atropine, etc.
Liver, kidney and blood.

GLUCOSIDES:

Digitalis
Oleander
Strophanthus
Liver and kidney.
Stomach and stomach contents.

BARBITURATES:

Brain and urine.
Liver and kidneys.

Stomach contents (in acute cases)

CORROSIVES:

Sulphuric acid
Nitric acid
Lye
Oxalic acid
Stomach and stomach contents.
Liver and kidneys.

POISONOUS GASES:

Sulphur dioxide
Hydrogen sulphide
Carbon monoxide
Blood (and sample of air)--Lungs.

DROWNINGS:

Blood from the right and left hearts in individual containers. Sample of water.

BURNINGS:

Blood from the heart.
This is used to determine the carbon monoxide content to establish whether or not death occurred prior to or as a result of the fire. It is an established fact that a dead body does not absorb carbon monoxide.

ALL HOMICIDES:

Blood for blood grouping.
This information may prove very significant in the event that a blood stain found on the clothing of a suspect is of the same group as the blood of the deceased and different from the suspect's own blood group.

It is a well established fact that a person may die from poisoning and yet no poison be found by careful and accurate chemical analysis. This fact has often been overlooked in some cases where acquittal has resulted because the jury believed that where no poison was found, none could have been taken and, consequently, death could not have resulted from poisoning. In this connection, Taylor states: "Hence the statement that no person can die from poison, except the poison be found in the body, is a mockery, a delusion, and a snare, admirably adapted to cover a multitude of secret deaths from poison, which, but for this dogma, might be revealed by pathology and physiology. It is all the more dangerous because the history of crime shows us that the arts of the murderer, especially of the scientific or professional murderer, are daily becoming more refined." It must be remembered that if symptoms and post-mortem findings are not somewhat suggestive of poisoning, or at least compatible with it, the medical jurist is not justified in giving an opinion that death is due to poisoning in the absence of positive findings in the tissues.

It is clear then that the investigation of suspected poisoning cases, especially criminal cases, requires meticulous examination at autopsy, exact handling of evidence, and proper chemical analysis. Complete cooperation on the part of the pathologist in making a complete autopsy and removing the proper specimens for analysis; on the part of the investigator in making a proper search for indications as to the nature of the poison and for securing the proper evidence from the pathologist, and the responsibility of transmission of the evidence to the toxicologist; and on the part of the toxicologist to make a complete and accurate analysis of the evidence submitted to him; all are necessary in order that complete and accurate investigation of the suspected poisoning be accomplished. The absence of any of these factors will seriously affect the investigation.

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WOOD IDENTIFICATION PROCEDURES #I

By John E. Davis

Technician with the Laboratory of the Missouri
State Highway Patrol

It is not often that problems involving the necessity for a wood identification procedure come to the attention of the police laboratory technician. Most of his work is concerned with the routine testing and examination of blood, hair, fibers, fingerprints, firearms, documents, toxicological specimens, etc. However, in such a field as this, one can never know but what the next case submitted will be one involving evidential material of an entirely different sort from any previously received. Accordingly it becomes advisable for the laboratory worker to at least become familiar with the methods and procedures involved in identification of various miscellaneous materials, and to understand something of the significance of the different characteristics upon which those identifications are made.

Wood identification problems as such, would not be frequently brought to the attention of the police laboratory. Yet a knowledge of wood anatomy may be most helpful even in cases where such problems do not exist. For example, the identification of various products derived from wood (paper, fibre-board, etc.) are made easier by the possibility of identifying (as present) some particular type of wood substance, or as proving it definitely absent.

In like manner, a knowledge of the commercial uses of the different types of wood may serve to indicate the possible source of a given specimen, and obviously one must identify the material before information as to its commercial use and sources can be sought.

Aside from its practical application in the laboratory, the ability to recognize, in everyday life, the many

different kinds of wood around one, and to judge of their quality and adaptability to a particular use may serve as a most satisfying and practical type of knowledge.

Beginning with this issue of THE TECHNICIAN there is presented the first in a series of articles on this subject. Information to be presented will have been obtained originally, in large part, from the following sources:

(1) Notes taken by the author during the lecture and laboratory course in "Wood Identification", offered at the University of California, under Professor Emanuel Fritz, Forestry Department,

(2) "The Identification of Timbers of Temperate North America" by Samuel J. Record (John Wiley & Sons, pub.)

(3) "Identification of the Commercial Timbers of the United States, by H. P. Brown, and A. J. Panshin (McGraw-Hill Book Company, Inc., pub.)

(4) "The Properties and Uses of Wood", by Arthur Koehler (McGraw-Hill Book Company, Inc., pub.), and

(5) Various technical notes and publications issued by the Forest Products Laboratory, Madison, Wisconsin.

Reference (2), (3), and (4) are standard texts, each of which should be at the disposal of anyone engaged in the study of wood-identification procedures. The books of Rec-

ord, and Brown and Panshin, are primarily concerned with the descriptive identification of woods---both macroscopically and microscopically---and each includes a "key"* which may be followed through in the identification process. The key in each, while fundamentally the same, is arranged in different fashion, and so may supplement the other when properly used.

Koehler's book, on the other hand, is not intended for use in identification procedures, but it does contain invaluable information regarding the mechanical and physical properties of wood, as well as describing methods of commercial "production" of lumber, uses of the different woods, etc.

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From the criminological standpoint, there are three main questions which may confront the investigator as regards a wood identification problem. These are:

(1) What species of wood is this?
(2) Are these two (or more) specimens of the same species?

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* "Key" -- A systematic listing of the characteristics of a subject or material, so arranged as to facilitate an identification, by reference first to gross and generally existing "non-specific characters, followed by a step-like graduation to more and more specific characteristics leading to the specific identification of a single specimen, or to a non-distinguishable group.

* "Key" -- "A table in which the salient characters of a group of plants or animals (or of species, genera, etc.) are arranged so as to facilitate the determination of their names and taxonomic relationships." ---- Webster's New International Dictionary.

(3) Did these two specimens have origin in the same single piece of lumber?

Of these, the first is the only one which necessitates a specific identification, and requires of the examiner the ability to so identify it. The second, while not necessarily requiring such an ability does call for a thorough familiarity with wood anatomy, and a knowledge of the factors upon which identifications are generally based. The examination likewise calls for a knowledge of the characteristics of wood, plus the ability to properly apply that information to the problem at hand.

In order to make such determinations, the technician should have available a large collection of known wood specimens; one or more standard references on the subject and should have had experience in making examinations and identifications on those known samples.

It is not difficult to obtain a standard wood-collection kit for use in this type of work. A number of commercial sources are available, from which accurately labeled samples may be obtained.* The cost of these collections is relatively small, ranging from two to ten dollars, and they frequently contain specimens not ordinarily obtainable

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* National Lumber Mfgs. Association, 1337 Connecticut Avenue, Washington, D. C.; New York Biological Supply Company; General Biological Supply House, Inc., 761-765 East 69th Place, Chicago, Illinois; New York Scientific Supply Company, 111-113 East 22nd. Street, New York, N. Y.

(The National Lumber Mfgs. wood sample kit sells for $1.95, plus shipping costs, contains 48 samples, and is practically the same as others costing three or four times as much.)

otherwise. One may also form his collection of specimens taken from scrap wood piles, broken furniture, boxes, etc., or from planing mills and lumber yards. However, if collected in this manner, it may become necessary to submit the samples to a more experienced technician for identification, either because the collector is unable to identify it, or because of the fact that commercial names are sometimes applied rather loosely to woods similar in appearance or working qualities. A wood identified by the planing mill worker as "elm" may be hackberry to the wood technologist -- that identified as white pine may be sugar pine, etc.

Standard reference tests have already been mentioned.

Experience in making the examinations can be obtained only by practice. Obviously one should first direct his efforts toward identification of known wood specimens, by reference to the key presented in the texts. Later, practice in identification (both by use of the key, and comparison with the known samples) of "unknown" wood samples may be undertaken. By such means, one is soon enabled to identify numerous woods without reference either to a key or to standards.

The examination and identification of wood specimens may be made either macroscopically, or microscopically. Our present discussion will be concerned primarily with the macroscopic identification, micro-characteristics being mentioned only insofar as they serve to account for or explain the features observed with the unaided eye or with the hand lens.

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(To be continued in the February TECHNICIAN)

LETTERS TO THE EDITOR:

The Technician
Missouri State Highway Patrol
Jefferson City, Missouri

Gentlemen:

In response to your editorial note in the November issue of THE TECHNICIAN, relative to "Raising the standards of the profession generally",

(1) It appears to me that it would be difficult to assign titles to many of the workers in the general field. This because of restrictive overlapping. In my own case, for example, I do toxicological work plus some "Scientific Crime" work. I think you will find much similar overlapping. I do not consider myself as an expert "crime doctor", and yet I have done some work along this line. There are but few complete "scientific crime laboratories."

(2) Also in my own case, it would be difficult to establish a definite qualification standard which would adequately cover my work. On the one hand, I would be over-estimated, while on the other I would be under-estimated.

(3) A standardization of tests would be welcomed by all, I am sure. However, considerable latitude would have to be shown. One test may work well in the hands of certain technicians, but not in the hands of others. "Requirements to be met by applicants" is in the hands of employing agencies and not in the hands of our society (when and if it is some day established).

(4) "Formulation of rigid rules and regulations of

practice in regard to testing methods, court testimony, etc." is also subject to employing agencies and local courts. Certainly a model set of such rules and regulations would be helpful, but difficult of enforcement.

(5) How can "accepted testing methods and procedures" be "enforced"? It would be splendid to have a set of methods comparable to the A.O.A.C., but "our society" could hardly enforce their use any more than the A.O.A.C. enforces the use of its methods on any worker.

(6) "Promotion of educational programs" is admirable and to be greatly desired. Such a program is to be found in Massachusetts --- in connection with Harvard University I believe. They hold periodic meetings on Medico-Legal topics.

(7) "Methods of reporting" is governed somewhat by local requirements. Some agencies request interpretative reports, while others desire only statements of facts. "Filing" is a personal matter.

(8) "Minimum Standards" in wages, hours, working conditions, etc. is certainly governed by employing agencies alone. Certain recommendations could be suggested, but surely not enforced.

Such an organization or society as you contemplate is admirable, and to be highly desired. But I fail to see how such a body would or could become an enforcing group. It could suggest, but hardly enforce, rules and regulations.

Or am I missing the whole point of your editorial?

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I would like to see an organization established, but think

it should be more of a cooperative group than a dictatorial body.

Yours very truly

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This writer has raised a number of interesting points, undoubtedly others of our readers have had similar questions in mind regarding this matter. It is difficult to satisfactorily reply to such questions in correspondence. Personal discussions are almost necessarily the only satisfactory means of clearing up matters of so controversial a nature. However, for the interest of all concerned, there appears below the reply to the above letter. Perhaps others will make comment in future correspondence, and so enable us to better formulate the plans which have so frequently been referred to in our publication.

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Dear Sir:

Your letter of recent date has just been received and brought to my attention for reply.

You have made a number of interesting comments, and I am sure that others of our readers will have had similar reactions to some of the ideas set forth in our publication from time to time. I would like to take this opportunity to clarify a few of the points which are brought out in your letter, as regards the material presented in the November TECHNICIAN.

(1) In your first paragraph, there is a question re-

garding the difficulty which would be involved in assigning a professional title classification to certain workers such as yourself who are specialists in one branch of work related to police analyses, and we do only infrequent general analyses in the police field.

I realize that this is a definite problem. However, I think it could be solved in such instances by either of two methods --- preferably using both. (a) Where the specialist works outside of a police agency, or where he adheres strictly to one or at the most, two types of analytical work he might be called by the most appropriate title, omitting all designation by the formerly arranged scheme. Thus a man would be recognizable by the Society as a Toxicologist, a Firearms Examiner, a Documents Examiner, a Pharmacologist, etc. etc. and nothing more. (b) But where he works within or closely associated with a police laboratory, and has at the same time a number of different types of analyses to perform (and ability in such general work) he would be classifiable according to the outline referred to in previous issues of the TECHNICIAN, and, if needed, might be graded with "sub-titles" indicating the man's particular proficiencies as junior and senior grade or some similar manner.

e.g. "Police Laboratory Technicians"

Toxicologist	S.G.
Firearms Examiner	J.G.
Microscopist	J.G.
Micro-chemist	J.G.

Admittedly there would be difficulties in assigning such titles. Nevertheless it should be possible by some means, and whether this or another system was utilized, I think it would be better than the methods now followed. At any rate, we would no longer have "Ballistics Experts" merely because that happened to be the title conferred by a department upon its technician regardless of his ability.

(3) In your third paragraph, reference is made to the

"Standardization of Tests" and the difficulties involved here.

You are correct in stating that considerable latitude would have to be shown to care for differences in ability and technique of the test in the hands of different men. However, it was not intended that only one test should be accepted as "official". Rather a number were implied, and these should be reliable and satisfactory for general purposes. Methods of testing, manner of procedure (the importance of which you must be aware, considering your toxicological experience), quality of reagents used (an important and oft-neglected matter) etc. could all be stressed.

"Requirements to be met by applicants" is, as you state, largely in the hands of employment agencies and not in those of our Society (if and when) and that is just our point.

It should be one of our functions to organize so satisfactory a system in this respect that employment agencies would realize its worth and adopt the measures recommended. You are correct here and later, when you say we cannot and should not "force" anyone to abide by our recommendations. But we can and should use educational measures to bring these matters to the attention of the proper persons and agencies. Other organizations have done it. There is no reason why we cannot. We do not suggest a Labor Union, nor a dictating body of workers at all. What must be done is to so organize ourselves as to win the respect of these agencies, and by that means obtain their cooperation. The well planned organization is, after it is once firmly established, more likely to be consulted by others than it is to have to take the initiative itself.

(4) & (5) In these paragraphs you again bring up the point of enforcement. We have no intentions of using "force" in the ordinary sense. As you say, we could do so no more than does the A.O.A.C. Yet I daresay that the A.O.A.C. methods have contributed much to the reliability and consistency of present day testing methods and the results obtained thereby. Such enforcement actually amounts to lit-

tle more than bringing to each worker a realization that he would do better to follow the methods than not to ----- for his own personal security in the field. In a Society, one can easily enforce the following of recommendations by denying membership and the privileges associated with it, to members who violate the code of ethics of that organization. That is the basis of man's whole social organization. Or to be more specific, observe the power of the Legal and Medical associations in this respect.

(7) As to methods of reporting, we had in mind for the most part the reporting of "number of cases handled", etc. such as is done in biennial and annual reports of these agencies. I also believe that the written case reports could be made more uniform, and such as to satisfy the needs of all. It should not be too difficult to express facts, and interpretations, in a more or less standard manner. Filing is a personal matter, as stated, but do you not think that a more or less standard system of Cross Filing, etc. could be worked out to advantage? Some filing systems must be better than others. Why not determine what these are and recommend their use?

(8) As to "Minimum Standards in Wages, Hours, etc.," you again point out that enforcement could not be effected. However, I disagree. At first they could not. But as our Society grew and become more and more recognized, its opinions would become more and more respected at the same time. Eventually each worker, and each laboratory would desire to obtain the recognition of the Society. One finds that in a new organization that first it is the organization itself which desires and must strive for recognition. After that it is others who strive for recognition by the society so organized. By denying membership to individuals, and by denying "official" recognition of laboratories who would not maintain the recommended standards, one would have a powerful tool with which to work. Many methods could be used to sharpen this tool, not the least of which would be the knowledge (in the hands of a defence attorney, e.g.) that the technician or laboratory in question was not rec-

cognized by this Society. It would take time, yes, but it can be done.

Power cannot be assumed by an organization such as this --- it must be granted. It actually boils down to a case of,

"Do you as an individual desire to become a member of this Society, abide by the recommended practices and methods outlined by it, and enjoy the advantages associated with membership", and "Does your laboratory desire official recognition by the Society, and will it abide by the recommendations made in order to enjoy that recognition", or Do you prefer to ignore those advantages and remain outside the organization?

I believe you will find that once a Society of this sort is initiated, and if it appears to be standing on firm ground, that it will be recognized by other already-existent societies in related fields. There is then a tendency on the part of the latter to cooperate with the former, and to use influence to see that the new organization shall survive. That is merely representative of the spirit of cooperation which originally permitted both to be formed.

Your comments are appreciated, and accepted (as this is intended) in a friendly light. We would be happy to receive any further suggestions or ideas regarding this or other matters relating to the proposed Society.

Yours very truly

John E. Davis, Lab. Tech.
M.S.H.P.

ACTIVITIES

On January 8, Lieutenant Edmund I. Hockaday, Director of the Missouri State Highway Patrol Laboratory, departed for Washington, D. C., where he will undergo the course of training offered by the Federal Bureau of Investigation at the National Police Academy.

Lieutenant Hockaday will be gone for a period of fourteen weeks, during which time he will have opportunity to study the methods of the Federal Bureau of Investigation, to visit their laboratories, and become acquainted with the procedures followed there in handling and analyzing evidential materials.

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Soon to be released by the Laboratory of the Missouri State Highway Patrol, is a small printed pamphlet describing the proper methods to be used in collecting and preserving evidence for laboratory analysis. This publication was prepared primarily for distribution to uniformed members of this department, and to local law-enforcement agencies. However, a limited number of copies will be available to outside persons and departments. Should any of our readers desire a copy of this publication, requests may be sent to the Editor of THE TECHNICIAN.

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SCIENTIFIC LABORATORY
BUREAU OF CRIMINAL INVESTIGATION
NEW YORK STATE POLICE
545 BROADWAY
ALBANY 7, NEW YORK

Editor, THE TECHNICIAN
Missouri State Highway Patrol
Jefferson City, Missouri

Dear Sir:

Reference is made to the article "Of Interest" which appears on page 27 of the November issue of THE TECHNICIAN.

We wish to take this opportunity to offer the complete services of the New York State Police Laboratory to any of the readers of THE TECHNICIAN, or to any law enforcing agency located in your section of the country who may wish to submit evidence for examination or possibly, research work.

It is quite impossible for us to enumerate all of the services included in this invitation. The New York State Police Scientific Laboratory is completely equipped and staffed to handle any examination which may arise in the course of criminal investigation. This comprehensive inclusion goes so far as to include translation of foreign languages, cryptographic analyses, and deciphering of codes, Of course, all of the standard practices such as chemistry, physics, and microscopy of all types, etc.

We trust that your sincere efforts to offer cooperation to your readers will meet with great success.

Sincerely yours

William E. Kirwan
Director

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