

LEGAL MEDICINE

PATHOLOGY AND TOXICOLOGY

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Introduction by

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N E W Y O R K



LEGAL MEDICINE
PATHOLOGY AND TOXICOLOGY

To the Memory of
CHARLES NORRIS
First Chief Medical Examiner
of
the City of New York

PREFACE

In preparing the second edition the authors were confronted with such an accumulation of new material that they found it necessary to enlarge the scope of the book. The method of presentation is still based on the division of the subject into legal medicine and toxicology. The principal changes are a more detailed description of the various subjects, and the addition of new original photographs to illustrate the characteristic conditions and typical pathologic lesions encountered in medicolegal cases.

For the pathologist who must determine the cause of death by autopsy and sometimes decide whether the deceased died of a trauma or a natural disease condition, a knowledge of medicolegal pathology is a matter of importance. Accordingly the first forty chapters are devoted for the most part to this subject. Four chapters (6, 7, 8, 36) are concerned with the role played by traumatic lesions and natural disease processes in causing death, especially when there is an association of these two factors in the same case.

Statistical data compiled from the Annual Reports of the Office of the Chief Medical Examiner in the City of New York from 1918 to 1951 have been incorporated in the different chapters indicating the frequency of deaths from natural causes from the different types of trauma, especially their subdivisions into accidental, suicidal or homicidal varieties. It was considered that such an arrangement of material helped to round-out the overall conception of medicolegal conditions as they are encountered in a large metropolitan center like New York City.

Much new material has been introduced to elaborate the old text. Entirely new subject matter has been added, such as the autopsy findings in embalmed bodies in Chapter 5; cardiac contusions in Chapter 11; traumatic cerebral edema in Chapter 12; injuries incurred in sport in Chapter 14; the Rh-Hr groups in Chapter 27; pathologic lesions in poison cases in Chapter 29; uranium compounds in Chapter 31; the more recent organic drugs in Chapter 35; and operative and postoperative deaths in Chapter 38.

Subjects considered a part of medical jurisprudence such as the corpus delicti, the responsibility of the physician to the government, malpractice, insanity, confidential communications, dying declarations and insurance claims are again presented, but at greater length and in more detail. The authors are grateful to Mr. Rowland H. Long, General Counsel of the Massachusetts Mutual Life Insurance Company, for his advice and help in preparing this material.

The authors are indebted to Alexander S. Wiener, the serologist in the Office of the Chief Medical Examiner in the City of New York, for his advice and assistance in rewriting Chapter 27 on the *Human Blood Groups*, especially the Rh-Hr section and other recent discoveries.

An entirely new discussion dealing with the analytic phase of toxicology is presented, subdivided on the basis of the classification of poisons which is determined, in turn, by the analytic methods for their detection. The material, representing data and unpublished experimental work compiled over a period of some fifteen years, has been obtained and organized primarily from the files of the Microchemical-Physical Laboratory. The technical divisions of the Office of the Chief Medical Examiner in the City of New York comprise the Forensic Pathology Laboratory, the Bacteriology-Serology Laboratory, the Chemical Laboratory, and the Microchemical-Physical Laboratory. When the Microchemical-Physical Laboratory was instituted, one of its functions was the application and adaptation of all physical and analytic methods, new and old, for the detection of new pharmaceuticals. Emphasis from the start has

been on the qualitative analysis of poisons as unknowns, without regard to history or autopsy findings, and the text is presented this way. Following the text as described could require more sample material than is usually available and more labor than might be practical in routine laboratory operations. We assume the analyst has sufficient working knowledge to take those shortcuts inherent in any analytic process; the material has not been written or intended for the untrained or inexperienced person.

Chapter 42 follows conventional, straightforward procedures for the analysis of gaseous poisons in air and their detection in tissue and body fluids. In Chapter 43, the mechanics of spectrographic analysis are omitted. The text is concerned primarily with the interpretation of spectrographic plates in the qualitative analysis of the general unknown type of case, based on observations of normal and toxic levels of metals in human tissues. Methods for the preparation of test samples and specific qualitative and quantitative procedures for individual metals most likely to be encountered are also described. Methods of analysis for the inorganic, nonmetallic poisons discussed in Chapter 44 are adaptations of existing schemes of analysis in inorganic qualitative chemistry, applied to the special problems of toxicology. In Chapter 45, which is concerned with steam distillation and the isolation and identification of volatile compounds, part of the material is taken from the process for the routine examination for volatile poisons as used in the Chemical Laboratory of the Medical Examiner's Office. Chapter 46 is a discussion of ethyl alcohol and the problems pertaining to its analysis and the physiologic significance of the chemical values. Whereas the material in the other chapters is relatively complete, Chapter 47 is the introduction to and partial analysis for the nonvolatile organic compounds. Infrared and ultraviolet spectrophotometry, as well as other specialized procedures which should be integral parts of the analyses, have not been included. The special chemical and physical properties of individual compounds from which final confirmation is made must be obtained from the literature. The material was developed from the point of view of analysis for an unknown. Consequently organization was based on the reactions, and compounds, with few exceptions, are not discussed individually. The reactions for each compound are summarized in the Appendix although they are not tabulated in the Index.

The authors are particularly indebted to Grace Adams Khan of the Microchemical-Physical Laboratory who was instrumental in the preparation of the analytic toxicology section, and to D. Alan Eagleson who, while a Dazian Fellow in Forensic Toxicology in the New York University Post-Graduate Medical School, did much to develop methods and to check and complete existing procedures. Leo Dal Cortivo, biochemist, Hospital for Special Surgery, helped develop organic methods and cross-checked data on color reactions. The authors also wish to thank associates of the medical examiner's laboratories: L. Goldbaum for the quantitative determination of metals and work on the identification of the acid extraction group; A. Stolman for work on color reaction in nonaqueous solutions; M. Feldstein for work on the identification of barbiturates; A. Ames and H. Siegel for work on alcohol and volatile compounds; and H. Schwartz for work on the recovery of organic compounds from tissue. The authors are also indebted to A. O. Gettler and his students for their work from the Chemical Laboratory of the Chief Medical Examiner.

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INTRODUCTION

This book is one of the few authoritative works on legal medicine and toxicology in this country. Condensed in a single volume, suitable for everyday reference, is the knowledge of a group of experts based upon the medical investigation of violent, sudden and suspicious deaths in the medical examiner's office of the second largest city in the world. This work aptly confirms the opinion of Littlejohn that "There is only one path to the mastery of forensic medicine, and that is, an extensive practical experience acquired by a daily whole-time application and study of the medical problems which are presented by the crimes of a large community."

Told in their own language and profusely illustrated, the contents represent cases actually observed and investigated by the authors. They show that forensic medicine is a practical science which rests upon correct and accurate interpretation of fact; a science upon which the life and happiness of the individual and the safety of the community often rests.

All recent advances in legal medicine have been given due consideration. In civil life as well as in military life, the character and types of weapon have changed, and industrial advances have also brought forth new occupational hazards and poisons. Many developments in toxicology, especially micro-analysis, have been necessary to cope with this progress. Further, the great incidence of automobile injuries, the accidents associated with aviation, and the threat of chemical warfare have created situations which require considerable additions to the subject matter of any work on legal medicine.

The volume is especially valuable to those of us who are trying to improve the status of legal medicine and toxicology. In attempting to obtain proper support for such work we are constantly confronted with the statements of those who call attention to the vast material and excellent type of work performed in the continental medicolegal institutes. The authors clearly show what has been and what is being done in America.

While it is true that adequate physical equipment and competent personnel of an institution make for careful work in the actual performance of the medicolegal autopsy, experience has shown that in many instances a careful analysis of details at the scene of the crime by the medical officer, in conjunction with the police, is as important as the actual autopsy. The Medical Examiner's Act of the City of New York specifically requires that a medical examiner observe and take charge of the body at the scene of the crime. The practical application of this system is well described in this book.

The number of investigations made by the Office of the Chief Medical Examiner of the City of New York far exceeds that of any similar institute in the world. In the City of New York about 81,000 deaths occur annually; of these, some 20,000 must be investigated by the medical examiner's office. This office issues approximately twenty per cent of all death certificates. Few people realize the vast amount of work such investigations necessitate. The toxicological work done under the auspices of this office is enormous; materials from over 2,000 human bodies are analyzed annually for the presence of poisons.

In the discussion of the various poisons this book gives in complete detail the symptoms, lethal doses and autopsy findings, and in addition, the directions for collecting and transporting the proper organs to the toxicologist for analysis. Unlike most previous works on the subject, details of analysis for, and identification of, the various poisons have been confined to three separate chapters instead of the usual

procedure of giving such details at the end of the discussion of each poison. In these chapters the system of routine toxicological examination employed in the toxicological laboratory of the Office of the Chief Medical Examiner under the supervision of Dr. Alexander O. Gettler is clearly described.

This book reflects the knowledge gained by the authors at the autopsy tables of the City Mortuary located in the Department of Laboratories at Bellevue Hospital. For many years they have performed the necropsies on almost all the cases which come under the jurisdiction of the Medical Examiner's Office of the Borough of Manhattan.

All the authors were close associates of Dr. Charles Norris, the first Chief Medical Examiner of the City of New York whose foresight, patience, honesty and ceaseless effort developed his office into one of the outstanding agencies of its kind.

It would have been a great source of pride to their Chief to know that his pupils have dedicated this work in his honor. Dr. Norris would have derived great satisfaction had he lived to know that this group of his followers forms one of the most prominent teaching organizations in this country to which the student may turn for expert instruction in forensic medicine. His pupils man the staff of the Department of Forensic Medicine at the New York University College of Medicine—a department which he conceived and organized in 1934. The authors also teach forensic medicine at the College of Physicians and Surgeons of Columbia University and at the Cornell University Medical College, as well as at other schools in the City of New York.

This book so completely and thoroughly covers the subjects of legal medicine and toxicology that it should become the handbook and daily guide for the coroner, the coroner's physician, the county physician, the medical examiner, the toxicologist and the pathologist. Further, any laboratory assistant or technician who, in an official or semi-official capacity, may be called upon to aid in the investigation of the so-called coroner's case, will find the work invaluable.

But the value of the book does not end here. The text should serve as a guide for teaching and for reference in the police schools and crime laboratories. It will be of aid to the police, homicide squads, detectives and photographers in the scientific detection of crime and in the apprehension and conviction of the criminal.

Finally, the surgeon, the internist, especially the cardiologist, as well as the members of the legal profession, criminologists, and those who are interested in the occupational hazards and poisons of present-day industry should find a wealth of material and detailed instruction in this work.

HARRISON S. MARTLAND

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The Medical Examiner and the Coroner

Definition of Terms. The practice of using the terms legal medicine and medical jurisprudence interchangeably has led to considerable confusion as to their correct meaning. Actually they denote essentially different subjects which, however, are closely related. Medical jurisprudence is that part of the law which is concerned with the regulations governing the professional practice of the doctor of medicine. Portions of this subject which are important to the physician will be discussed in subsequent sections. Legal or forensic medicine is that part of medical science which is employed by the legal authorities for the solution of legal problems. Theoretically all branches of medicine may be included in this definition, for the law has used them all when need has arisen, and any doctor who testifies in court in his professional capacity can be considered a practitioner of legal medicine. The term, however, is usually restricted to that specialized branch of medical knowledge used by physicians officially employed by the local government of a community when they investigate suspicious and violent deaths, or cases involving nonfatal injury such as rapes, sexual offenses or abortions which may subsequently come before the courts. In the United States the medical investigation of fatal cases is done most often by an elected official of the county known as the coroner. In a few states, however, similar functions are performed by a physician known as the medical examiner who is an appointed officer of the county or municipal government.

THE CORONER

The office of the coroner originated in the early days of English history, probably a few decades before the Norman Conquest. Originally the coroner was appointed by the King to represent the Crown as its magistrate in a certain district. The first incumbents of this office were men in high station, usually of noble blood, and the office enjoyed high prestige. The duty of the coroner was to see that the interests of the Crown were given due recognition, especially in transactions involving money, such as the discovery of treasure or the investigation of crimes punishable by fines.

The statute of Edward IV (4 Ed. I. *stiled de officio coronatoris*) stated specifically that the coroners in every county were to be the conservators of the peace and were to be chosen according to the rules contained in the statutes concerning their election. When a coroner was informed of any death from felony or misadventure, or of treasure unlawfully buried in the earth, or of a case of rape, or of a jail break, or of similar disturbances of the peace, he issued a mandate to the sheriff to summon to him the people in the adjacent townships to inquire about the truth of the matter. If the problem concerned a corpse which had apparently died a violent death, the coroner and jurors selected by him viewed the dead body and proceeded to make an investigation and inquest into the circumstances of death; at the end of the proceedings they decided by what means and why the deceased came to an untimely end. If enough evidence was produced at the inquest to charge

a person with the crime of felonious homicide, the sheriff would be directed to seize the lands and the coroner to confiscate the chattels of the accused for the Crown. In like manner, if a person suspected of a crime became a fugitive, whether guilty or not, the coroner was empowered to declare him an outlaw and to seize his goods and chattels. Even in cases of misadventure, if a domestic animal or a moveable object was instrumental in causing the death of a person, it was forfeited to the king under the name of a deodand; similarly, the property of a suicide was confiscated. These few specimens of the statute will be sufficient to indicate the activities of the early coroners.

As the centuries passed and the social conditions of England changed, the status of the coroner declined both in the rank of the individual selected to fill that office and in the prestige accorded the office itself. The important duties were gradually stripped from him until his principal function was to hold inquests on all cases of death of a violent or suspicious nature. The duties of the coroner in present-day England have been somewhat modified from those of his medieval prototype but not altered in any essential particular. When colonies of Englishmen began to settle in other parts of the world, the institution of coroner was transferred there and at this day is found in the British Commonwealths and in most states of the American Union.

In the United States the coroner is typically a county official elected by popular vote for a term of office which varies from two to four years; in order to continue in office he must be re-elected at the end of that period. In most communities previous knowledge of law or medicine is not considered essential for a coroner, and the only qualification is that the candidate should be eligible for a place on the ticket of the predominant political party. In some states, as in Louisiana, the coroner when possible must be a graduate of a medical school and licensed to practice in that state.

The duties of the coroner are principally the investigation of all cases of suspicious or violent death which have occurred in his county. The laws defining his authority over deaths of this sort vary in the different states and are often phrased in vague language, but the tendency is to limit the cases under his jurisdiction to deaths which have presumably resulted from external causes. In some communities other duties may be assigned to the coroner, such as the examination of allegedly psychopathic individuals, responsibility for the health of persons in the jails, or the assumption of duties usually assigned to a sheriff.

When the coroner is notified of a death which requires his official attention, he follows a routine which varies with the individual community. Usually either he or his representative visits the body at the scene of death and decides whether or not the circumstances warrant an extensive investigation. If he considers that the case is not a suspicious one he may release the remains to the next of kin without further formality; in this case a physician appointed by him may issue the death certificate, or that duty may be assumed by another organization, as, for example, in Cook County, Illinois, where it is performed by the Registrar of the Health Department. If an autopsy is required the coroner is empowered to perform it, if he is a physician, or to delegate a physician to perform it. If poisoning is suspected the coroner usually has the authority to make provision for all necessary chemical analyses on the organs of the deceased.

If the case is a suspicious one, an inquest is conducted in order to determine the way in which the deceased met his death. In some localities a jury is selected

and taken to view the body in company with the coroner; in other places this visit is not considered essential. The coroner then convenes his court over which he presides as judge with the jury in attendance and proceeds to take the testimony of witnesses under oath. Most of the time he conducts the examination of the witnesses himself but on occasion he may allow attorneys representing interested parties to ask questions. Medical testimony may be taken or the report of the autopsy may be read into the record, but the coroner usually has the right to disregard such evidence at his discretion. At the end of the hearing the coroner may deliver a charge to the jury and allow them to bring in a verdict on how death occurred: by natural causes, misadventure, suicide or homicide. In some cases he may direct the jury to bring in a certain verdict without allowing them to vote. As a result of testimony given in his court the coroner can order the arrest of any person or persons implicated in a homicide, in which case he must transmit the findings of his court to the higher authorities. In some jurisdictions the coroner conducts his court like a magistrate without a jury.

The coroner system in practice has shown itself to be entirely inadequate for the duties it must perform. The incumbent of such an office labors under such heavy disadvantages that even with the best intentions he is hampered in his work. The laws which regulate his duties lack precision, especially in defining the kinds of cases which come under his jurisdiction. In performing a necessary autopsy he is exposed continually to the possibility of a liability suit brought by relatives of the deceased who may question the legality of the autopsy. Like most minor elected officials he is vulnerable to pressure from politicians, an influence which rarely works for disinterested ends. He is usually crippled by lack of funds so that there is little chance for him to improve his organization.

The basic theory behind the coroner system is fallacious: that a local magistrate without special qualifications in law or medicine can conduct a judicial investigation successfully for the purpose of determining the cause of death. The determination of the cause of death is purely a medical problem, and it is only in comparatively recent times that the coroner has sought medical aid for this purpose. Generally his medical representatives have not always been competent and there is nothing in the existing statutes which will ensure that his physicians will be the ones best qualified for their duties. The coroner system is entirely unsuitable for the complexities of present-day civilization and needs to be replaced by a more workable type of medicolegal organization.

THE MEDICAL EXAMINER

The first suggestions of the medical examiner system are to be found in the *archiatri populares* of the Roman Empire, who were official physicians appointed for certain districts principally to treat the indigent sick. There is not any record to indicate that these physicians had any medicolegal functions. The *archiatri* are principally significant as an indication that the governing powers had begun to realize that medical knowledge was worthy of employment by the state.

Town physicians similar to the *archiatri* were a regular institution in the European cities of the Middle Ages; they served the community as medical practitioners, army surgeons, police doctors and medicolegal experts. The statute laws of some of the northern Italian republics in the thirteenth to the sixteenth centuries specified the qualifications a physician must possess to be employed as an expert in legal medicine. One such law stipulated that the incumbent should be 30 years of

age, a resident for 20 years in the district where he was to serve, politically reliable and competently trained in the legal branch of the profession. The statutes generally required the official expert to visit a dead or wounded individual as soon as possible, to examine his injuries and to make a written report in which the physician is to express his opinion on whether or not the lesions were mortal. The examination consisted of a visual inspection of the wounds; autopsies at that period were not officially recognized. In some laws there was the stipulation that at least two experts should participate in the same examination in order to avoid error as much as possible. The experts were called in to investigate suspected cases of poisoning, to examine psychopathic individuals and to give testimony in criminal and civil trials. Here the true beginnings of the European medicolegal systems made their appearance, for here the state recognized the value of medical knowledge for certain processes of law.

The Bamberg Code appeared in 1507 and the *Constitutio criminalis Carolina* enacted by the Emperor Charles V appeared in 1530; both increased the importance of legal medicine by their insistence that medical testimony was an essential part of the proof in trials involving questions of infanticide, abortion, poisoning, fatal wounds and other forms of bodily injury. The statute did not specify that autopsies were to be performed on the bodies of the victims in cases of this type. In 1562 a judicial autopsy was performed in Paris by Ambroïse Paré, and around the end of the sixteenth century the autopsy in medicolegal cases began to be generally practiced. With the increasing complexity of European civilization in the nineteenth century, the different governments were forced to improve the administration of forensic medicine, and this resulted in the establishment of the great medicolegal institutes all over the continent in the large centers of population.

The system in the European cities allots to the police and the judicial authorities the duty of investigating the circumstances of all deaths reported to them, and if there is any suspicion or appearance of criminal violence, the body is sent to the medicolegal institute for autopsy. Cases of death which do not belong to this category are usually disposed of through some other channel. Except on special occasions the medicolegal experts are rarely called in to investigate the scene where the body was found. They are principally concerned in performing the autopsy and such chemical and microscopic examinations as may be necessary to establish the cause of death. In addition the medicolegal institutes are occupied with a number of heterogeneous activities which include: (1) interpretation of laws regulating the practice of medicine or of laws requiring medical knowledge for their interpretation; (2) psychiatric examination of individuals involved in court trials in which mental sanity is a point at issue; (3) examination of persons whose claims for state insurance are open to controversy; (4) alcohol determinations on the blood and urine of persons involved in traffic accidents; (5) blood group determinations on the principals in paternity cases; and (6) performance of police laboratory examinations. Such divergent pursuits are a heritage from the days when medicolegal science was much simpler and the experts gladly assumed any scientific task which might be allotted to them by the legal authorities. At the present time these duties present quite a problem in administration, and many of them could be transferred to other laboratories and organizations which could perform them more efficiently. Everything considered, however, the European institutes have functioned satisfactorily, though they are open to criticism on matters which will be discussed later.

The present method of medicolegal investigation in Scotland deserves a brief description as it is derived from the system used in France and has no connection

with the coroner system of England. Each district in Scotland is served by an official called the procurator-fiscal who in addition to being the prosecutor has the duty of investigating all cases of death which have occurred without the attendance of a physician, or unexpectedly, or by violent means or under suspicious circumstances. This official has the power to call in the police and to direct their investigation, and he has the authority to summon witnesses before him in order to obtain the facts. If the case seems to him to be homicidal, he is empowered to call in two physicians to examine the body; and he can order an autopsy after he has obtained the authorization of the sheriff in the district. When his report is complete, it is sent with the autopsy findings to the higher legal authorities in the Crown Office of Scotland for final disposal.

The medical examiner systems in the United States are based upon the same principles as those underlying the European institutes, though somewhat modified in the process of adaptation to conditions in this country. The American organizations have two advantages over the European: (1) the American medical examiners concentrate their efforts on the investigation of deaths which have occurred as a result of violence or under suspicious circumstances and are consequently not harried by the unrelated activities embraced by the European institutes; (2) the American systems, unlike the European, prescribe the visit of the examining physician to the scene where the body was found. This greatly reduces the chance of losing important items of medical evidence which otherwise might be overlooked.

The first medical examiner system was established in Massachusetts where it was adopted in 1877, after the abolition of the coroner's office. Similarly, in New York City, the Office of the Chief Medical Examiner was established by a law passed by the state legislature in 1915 and began to function in 1918. Today the medical examiner system also exists in the states of Maine, Maryland, New Hampshire, Rhode Island and Virginia and in some of the counties of New York and New Jersey. The original Massachusetts and New York City organizations are the prototypes of the other medical examiner systems in the United States: Massachusetts has been the model for the systems in the New England states; and the medical examiner offices in Essex County, New Jersey, and Nassau and Westchester Counties, New York, and in the states of Maryland and Virginia have been patterned after that of New York City. It is probable that the future development of the system in the United States will follow the practice of the offices in New York City or in Massachusetts. As these differ from each other in some essential particulars it is desirable to describe them in more detail.

The medical examiners in Massachusetts are appointed for terms of seven years by the governor with the advice and consent of the council, according to the formula that they shall be "able and discreet men learned in the science of medicine." In their respective districts they investigate all deaths which are supposed to have occurred from violence, and they perform autopsies "upon being authorized in writing by the district attorney, mayor or selectmen of the district." After he has investigated the circumstances of death the medical examiner may issue his death certificate merely after an external examination of the body, and he performs an autopsy when the district attorney decides that the nature of the case is such that this procedure is warranted. Provision is also made for all necessary chemical examinations.

The original Massachusetts medical examiner system labors under several disadvantages: the first is that a medical examiner and his assistant are appointed for a district and work under conditions which do not allow them contact with other

examiners so that mutual aid and criticism are generally lacking. The second disadvantage is inherent in the appointment of the medical examiner by the governor of the state. The governor is given considerable freedom in selecting the physician to fill this office and is not constrained by law to choose the best qualified person. The most serious criticism can be directed against that part of the law which places in the district attorney the power to determine whether or not an autopsy shall be performed in any particular case. Such officials do not always realize that certain types of homicide may masquerade as natural deaths and be totally overlooked unless an autopsy is performed. The refusal of a district attorney to allow an autopsy on a case of this type would seriously hamper the medical investigation and thus create difficulties for his own prosecution. This same criticism can be urged with equal force against the medicolegal systems in Scotland and on the continent of Europe which place similar discretionary powers in the hands of the legal authorities.

Recently the powers of the medical examiners in Massachusetts have been extended. Chapter 38 of the General Laws of the Commonwealth of Massachusetts (as amended by Chapter 632 of Acts and Resolves of 1945) gives the medical examiners discretionary authority to perform autopsies, similar to the provisions in the New York Law.

The Office of the Chief Medical Examiner in New York City is organized in a somewhat different fashion.* The head of the office called the Chief Medical Examiner, is appointed by the mayor from the classified lists compiled by the Municipal Civil Service on the basis of a competitive examination. He is authorized to make appointments of qualified deputy and assistant medical examiners and other employees from the classified civil service lists as may be provided pursuant to law. The law states that the chief medical examiner is to be a skilled pathologist and microscopist, and that his deputy and assistant medical examiners are to have the same qualifications. The distinctive feature of this office is that it functions as an organization with a responsible head having general charge of the way in which it performs its duties.

It is required by statute that the Office of the Chief Medical Examiner shall be open day and night with a clerk always present. When calls are received from the police or from physicians or hospitals notifying the office of a case of death which requires its attention, the clerk relays the information to the medical examiner on duty. He visits the scene of death and makes his investigation independently of other agencies. He inquires into the circumstances of death, takes the names of witnesses and examines the body at the scene. He then writes out a report of his investigation and files the record in the Office of the Chief Medical Examiner.

Deaths with which the medical examiner is especially concerned are those which have occurred "as the result of criminal violence, or by a casualty, or by suicide, or suddenly when in apparent health, or when unattended by a physician, or in prison, or in any suspicious or unusual manner." If the medical examiner is convinced from his examination of the body and of the circumstances that the cause of death can be ascertained beyond a reasonable doubt and that the death is not a suspicious one, he may issue a certificate of death based upon his investigation of the circumstances and the external examination of the remains and release the body to the relatives. However, if he believes that an autopsy is necessary, he or another medical examiner performs the autopsy. The autopsy findings are recorded in detail and together with

* See Appendix for the law providing for the establishment and operation of the Office of Chief Medical Examiner in New York City.

other data on the case are filed in the records in the central office. Whenever necessary, chemical, microscopic, serologic and bacteriologic examinations are performed on the organs or secretions of the deceased in the appropriate laboratories which are part of the organization.

The chief medical examiner or his assistants have the power to subpoena witnesses and take testimony under oath concerning any matter within the jurisdiction of the office. Such hearings are solely for the purpose of obtaining information about the circumstances of death to enable the medical examiner to qualify and classify properly the death which he is investigating. The medical examiner does not have any judicial functions similar to the coroner, nor has he any official authority to order the arrest of any person. In New York City the judicial powers of the coroner have been transferred to the magistrate's court.

The records in the Office of the Chief Medical Examiner are an indispensable part of the government of the city. Reports of the findings in homicidal and suspicious deaths are sent regularly to the district attorney as they are necessary for his work as prosecutor. The case records are also subpoenaed in civil court actions and workmen's compensation hearings.

The medical examiner system of New York City has worked satisfactorily not only in the metropolis but also in Essex County, New Jersey, Nassau and Westchester Counties, New York, and more recently in the states of Maryland and Virginia. Although the system is not perfect by any means, it gives more satisfactory results than any so far devised. It possesses the advantages of an organization which has a responsible commander who allows his subordinates freedom and discretion in their investigations. The fact that the individual medical examiner is responsible for determining the cause of death and issuing the death certificate tends to make him especially careful in carrying out his investigations and less likely to overlook deaths of a suspicious nature.

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2

Investigation at the Scene of Death

The medical examiner or coroner's physician must determine by his investigation whether death in any given case is due to natural causes or to trauma. If it is the result of trauma, he must decide whether it occurred accidentally or was inflicted with suicidal purpose or with homicidal intent. In this task the examination of the scene where the body was found is a matter of considerable importance. The following account is a description of the method of investigation employed by the Office of the Chief Medical Examiner in the City of New York.

PROCEDURE

As soon as the medical examiner is notified of a death requiring his attention, he proceeds promptly to the scene and takes charge of the body as required by law. If the case is a homicide, or a suspected one, he usually finds members of the police department in charge and their different specialists conducting their own line of investigation, such as examining different objects and surfaces for fingerprints, photographing the body and the premises or searching for weapons. It is advisable in many instances for the medical examiner to delay his investigations until the police have finished their work as a matter of cooperation with that department and in order not to disturb any clues.

The way in which the medical examiner conducts his investigation will depend largely on circumstances. As soon as possible he should note on his report the time of his arrival at the scene and the nature and location of the premises. If the proper persons are present, the body of the deceased should be identified to him by a relative or friend whose name, relationship to the dead person and address are duly recorded on the report. The police officers who were the first to arrive at the scene also identify the body to the medical examiner and their names, titles, shield numbers and precinct are entered on the record. The significance of these identifications in the establishing of the corpus delicti will be discussed later. If the requisite information can be obtained, the data which are necessary for the death certificate may be compiled.

It is important for the medical examiner to obtain all possible information about the circumstances of death from the police and other persons. Some victims may die or be killed in the presence of witnesses, in which case the manner and time of death is easily ascertained. In other instances a body is found dead, and it may not be easy to determine just how, when and where death occurred. Usually the place where the corpse is found is the scene of death, but it is always possible that the body was brought there from some other location in order to confuse the police investigation. It must be remembered that the scene of death is not always the place where the fatal injuries were received, for some traumatic injuries of the head, chest and abdomen are not immediately disabling, and the victim may move himself from the place of occurrence a long distance to the place where death supervened (Fig. 2-1).