Volume I & II

THE PATHOLOGY OF HOMICIDE

A VADE MECUM FOR PATHOLOGIST, PROSECUTOR AND DEFENSE COUNSEL

LESTER ADELSON, M.D.

Pathologist and Chief Deputy Coroner
Cuyahoga County Coroner's Office
Professor of Forensic Pathology
Case Western Reserve University
School of Medicine
Cleveland, Ohio

With a Foreword by

Samuel R. Gerber, M.D., J.D.

Coroner of Cuyahoga County
Cleveland, Ohio

CHARLES C THOMAS • PUBLISHER • SPRINGFIELD • ILLINOIS

THE PATHOLOGY OF HOMICIDE

THE PATHOLOGY OF HOMICIDE

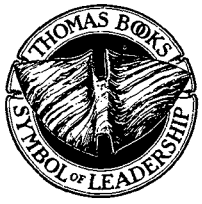
A VADE MECUM FOR PATHOLOGIST, PROSECUTOR AND DEFENSE COUNSEL

By

LESTER ADELSON, M.D.
Pathologist and Chief Deputy Coroner
Cuyahoga County Coroner's Office
Professor of Forensic Pathology
Case Western Reserve University
School of Medicine
Cleveland, Ohio

With a Foreword by

Samuel R. Gerber, M.D., J.D.
Coroner of Cuyahoga County
Cleveland, Ohio



CHARLES C THOMAS · PUBLISHER
Springfield · Illinois · U.S.A.

Published and Distributed Throughout the World by
CHARLES C THOMAS • PUBLISHER
Bannerstone House
301-327 East Lawrence Avenue, Springfield, Illinois, U.S.A.

ISBN 0-398-03000-6
Library of Congress Catalog Card Number: 73-14511

Printed in the United States of America
N-1

Library of Congress Cataloging in Publication Data

Adelson, Lester, 1914—

The pathology of homicide.
Includes bibliographies.

1. Medical jurisprudence. 2. Homicide. I. Title. [DNLM: 1. Coroners and medical examiners. 2. Forensic medicine. 3. Homicide. W860 A231p 1974]

RA1055.A3 614'.19 73-14511
ISBN 0-398-03000-6

DEDICATION

To my Mother and Father

FOREWORD

THE AUTHOR, LESTER ADELSON, M.D., my friend and co-worker for more than two decades in the Coroner's Office of Cuyahoga County, Ohio has introduced a new look into the field of forensic pathology. Writing incisively, he takes the reader step by step through the role of the pathologist in the investigation of homicide from the discovery of the victim to expert testimony in court.

He shows by example, repeatedly, the vital importance of the pathologist in the laboratory investigation of deaths resulting from violence or from unusual or suspicious causes. Since proof is essential in the determination of homicides, both the medical and legal aspects of evidence are reviewed in detail. The learned doctor points out the primary lesson that . . .

> "Until the pathologist has demonstrated that death was produced directly or indirectly by some kind of violence or culpable negligence, there is no homicide to investigate. . . . If he misdiagnoses a non-existent homicide, he may place an innocent person in jeopardy. . . . Conversely, if he fails to give adequate weight to the part played by violence and concludes that death resulted *entirely* from natural causes, a murderer goes free, and a crime goes unpunished."

Yet this is not the only lesson to be found in this book, for it is a primer or a series of lessons that will serve as an invaluable guide both to the expert and the beginner in the field of forensic pathology. For example, the doctor concerns himself not only with the expertise of the pathologist but also with the skills and methodologies of the other professional and technical experts who become regularly or occasionally involved in the examination of known or suspected homicides. He stresses the importance of establishing the *mode* and *manner* of *death* as well as the *cause* of *death*. He pointedly indicates the need of the "team concept" and reviews how each expert can complement the work of another to complete the entire picture of the cause or manner of death. He confirms the necessity of positive and continued cooperation with the police and other law enforcement offices. As a background for his work, Dr. Adelson cites statistics relating to homicide by various categories, causes, and methods. He wisely explains the many avenues of life which cause persons to become involved in homicide, and then stops to point out the necessity to differentiate the homicidal death from deaths from suicide, accident or natural causes.

The author, out of his vast background of experience, deals extensively not only with the importance of the autopsy but also with its methodology.

Because of his desire to inform the pathologist with little or no forensic experience in the field, he dwells particularly on the absolute necessity of proper performance in observation in the examination of a dead body. The pathologist, he suggests, has the duty not only of determining the cause of the death but "the manner and mechanism" and find such evidence, if possible, that will "stand up in court."

His coverage of the nature of the autopsy is truly a check list of valuable knowledge for one to follow. He discusses what to look for, how the evidence must be recognized, acquired, and then preserved against misuse or abuse. In this respect, he outlines the scheme for submitting evidence to the FBI laboratory, and how to make use of its facilities.

Again, realizing from his many experiences in court the importance of the right kind of evidence, Dr. Adelson concludes his treatise with guidelines as to the handling of evidence for use in court, and then refers to points to be considered when the pathologist is to be called as a witness.

It is a distinct pleasure to be asked to introduce this work of Dr. Adelson because it reveals his expertness not only in this special field of medicine but as a lucid and accomplished writer. What he has put down on these pages will prove to be invaluable to men now in, or entering, the new field of forensic pathology.

SAMUEL R. GERBER

PREFACE

IN HIS DAY-TO-DAY WORK, the forensic pathologist deals with a broad variety of natural and violent deaths. He is constantly reminded and repeatedly impressed with the age-old truth which tells him that although there is only one way in which to be born, there are many ways in which to die.

The major portion of the forensic pathologist's case load is made up of persons of all ages who have died suddenly and unexpectedly from natural causes, i.e., diseases, whether they be degenerative, infectious, metabolic or neoplastic. The remainder of his "patients" have died as a result of suicide, accidents of all types, and violence of undetermined origin as well as from homicidal trauma.

Every unnatural death represents a tragic waste of human life and human resources. For those of us who have a high regard and a deep respect for the sanctity of human life and for the meaningfulness of human existence, the unending stream (indeed, it often seems like a torrent) of bloody, broken and poisoned victims of lethal violence is a recurring, distressing spectacle which is simultaneously deeply disturbing emotionally and strongly challenging professionally.

Although any violent death is deplorable, those wherein a life has been taken by the malicious, purposeful act of another are generally of the greatest concern to the law enforcement authorities and, if we can believe the news media, of greatest interest to the community generally.

The current trend toward the utilization of violent means to provide "solutions" to all types of controversies and disagreements, whether they be public and political or personal and private, is an inescapable fact of contemporary life. The increased propensity toward the employment of lethal violence in connection with such "ordinary" crimes as armed robbery and burglary, and the mounting frequency of assassinations (and attempted assassinations) involving prominent and obscure citizens alike gives any consideration of homicide an immediacy matched by comparatively few other aspects of day-to-day life on today's current scene.

This volume represents a distillation, as it were, of my experience with the medicolegal aspects of homicide investigation, acquired by more than two decades of active personal involvement in the daily activities of the Cuyahoga County Coroner's Office which serves Cleveland, Ohio and its suburbs. I believe that the self-evident importance of the pathologist's role in and his contributions to successful homicide investigation will be

apparent to the reader as he thoughtfully peruses these pages and reflects on their life and death implications for the persons immediately concerned and for society as a whole.

The social, historical, judicial, moral, economic and humanitarian ramifications of the constantly mounting number and rate of homicides provide a more than adequate justification for the appearance of this volume. Certainly the acquisition of sound medical evidence to aid in the adjudication of this most serious of crimes deserves the best efforts of the laboratory physician.

In addition to addressing myself to the task of imparting the critical aspects of the "know how" of the medical phases of homicide investigation, I have dwelt at some modest length on the equally important aspect of "know why." As a thoughtful, skilled and key participant and operator in this highly complex area, the "occasional" forensic pathologist should be acutely and sensibly aware of the rationale underlying the various facets of his professional responsibilities and duties. Only when he is thus thoroughly informed does his work take on the significance and relevance which are the hallmarks of his truly crucial contributions to the correct solution to these threats to the peace, safety and dignity of his community.

Finally, the ultimate justification for my writing this volume is the respect and regard which all of us owe to the importance of every human life. The untimely, unnatural and unjustified termination of *any* human life is a challenge and a threat to the basic moral and ethical values which form the bedrock of what we choose to call our "human and humanitarian society." When murder screams her alarums, they cry out for a valid response. This volume hopefully provides part of that response.

L.A.

ACKNOWLEDGMENTS

ALTHOUGH I AM SOLELY RESPONSIBLE for the authorship of this volume (and for its faults and shortcomings), the task of completing it could not have been accomplished without the unstinting help of many of my colleagues and dedicated co-workers at the Cuyahoga County Coroner's Office whose contributions I am delighted to acknowledge.

Dr. Charles S. Hirsch, Deputy Coroner and Associate Pathologist, is responsible for the major portion of the photomicrographs, and Messrs. Sidney J. Pancner, Michael F. Walsh and Frank J. Kukla, the staff of the Photographic Department at the Cuyahoga County Coroner's Office, took many of the gross photographs and processed all of the illustrations in this monograph. A special word of appreciation is extended to the memory of the late Lawrence Johnson, who worked with me early in my association with the Coroner's Office in launching the photographic library which is now so valuable an asset to this institution.

The roentgenograms were taken by Messrs. James E. Roberson and Ernest C. Duncan, who also provided highly skilled assistance in the Autopsy Room with the anatomic dissections on which much of this volume is based. The roentgenographic diagnoses and interpretations were made by Dr. Benjamin Kaufman, Consulting Roentgenologist to the Cuyahoga County Coroner's Office.

The chemical data originated in the Toxicology Laboratory of the Cuyahoga County Coroner's Office, where the analyses were carried out under the supervision of Dr. Irving Sunshine, Chief of the Toxicology Department.

Non-anatomic aspects of homicide investigation including such features as the grouping of known and suspected blood stains, investigation of known and suspected seminal stains, and the scrupulous study of the clothing of homicide victims and their alleged assailants were performed by Miss Mary E. Cowan and her associates in the Trace Evidence Department of the Cuyahoga County Coroner's Office.

The numerical data are based largely on figures taken from the annual statistical reports of the Cuyahoga County Coroner's Office, veritable treasure houses of accurate and painstakingly accumulated information, prepared by the Statistical Department of the Office.

It is a pleasure for me to express my gratitude to the law enforcement agencies in Cuyahoga County, including the several municipal police de-

partments, the Sheriff's Detective Bureau, and the Ohio State Highway Patrol, with whom I have worked constantly and intimately during my years of association with the Coroner's Office. A special word of appreciation is richly deserved by the members of the Homicide Unit, the Scientific Investigation Unit, the Accident Prevention Bureau and the Hit-Skip Unit of the Cleveland Police Department. All are staffed by true professionals who answer the challenges of homicide investigation with exemplary displays of skill, ingenuity, imagination and dedication.

I am deeply indebted to Mr. John T. Corrigan, the Prosecuting Attorney of Cuyahoga County and his predecessor, the late Mr. Frank J. Cullitan, and to their many Assistant Prosecutors, too numerous to name individually, with whom I have been associated in the courtroom phases of homicide adjudication. They have been excellent teachers, and extremely patient and understanding in helping me to learn to become a "good witness." In this same context, I should like to express my appreciation to the Judiciary of the Court of Common Pleas of Cuyahoga County and to the Judges on the various municipal court benches in whose courtrooms I have testified for their many courtesies over the years. Not the least of my respected mentors in courtroom technique and comportment have been the members of the Defense Bar who have cross-examined me during my numerous appearances in the forensic arena. They, too, have my gratitude.

To Dr. Samuel R. Gerber, Coroner of Cuyahoga County since 1936 and my highly esteemed superior at the Coroner's Office, I am indebted for the scholarly and thoughtful Foreword which graces this volume. He also enhanced the accuracy of the manuscript by his meticulous proofreading, a task truly above and beyond the call of his duties.

A word of deep and most sincere appreciation to my respected teacher, loyal friend and former Chief in the Department of Pathology at Case Western Reserve University School of Medicine, Dr. Alan R. Moritz, now Professor Emeritus, for his constant encouragement and invaluable suggestions.

Dr. John R. Carter, my current Chief in the Department of Pathology, has also provided me with encouragement and many ideas which have aided immeasurably in the production of this volume. I am deeply in his debt for his repeated acts of kindness and his patience during the years I have labored on this opus.

My thanks to the W.B. Saunders Company, Callaghan & Company, and the Williams and Wilkins Company for their permitting me to use previously published photographic material as noted in the legends of the appropriate figures.

Dr. Gordon Stairs, Entymologist at Ohio State University, identified the maggot in Fig. IV-14. Mr. Carl Paulits, Senior Medical Photographer at the

Institute of Pathology of Case Western Reserve University School of Medicine, supplied Figures VIII-26A and VIII-26B.

Although there is no specific reference to them as such in the bibliographic citations at the end of each chapter, I have drawn heavily on informative outlines prepared by my predecessors and successors at the now defunct Department of Legal Medicine at Harvard Medical School. Here I spent a most rewarding fourteen-month Fellowship, being exposed to the challenges and initiated into the gratifications of a career in Forensic Pathology. The outlines were prepared to guide the students attending the Seminars on Homicide Investigation, organized by the late Mrs. Frances Glessner Lee, the benefactress of the Department. They have been invaluable to me in the writing of this volume.

Mrs. Barbara E. Burtch, my faithful amanuensis over the years of my association with the Cuyahoga County Coroner's Office, has been most helpful in assisting me with many of the tedious details which are an inescapable feature of writing a volume of this type, and Mrs. Marlene J. Orlando has been a model of patience, persistence and accuracy in typing and retyping the many drafts of the manuscript. Miss Lucille Smith and Mrs. Mary Ellen Laycock also contributed to the secretarial efforts.

To all those whom I have named and to the others whose names I may have inadvertently overlooked, many, many thanks.

L.A.

CONTENTS

THE PATHOLOGY OF HOMICIDE

CHAPTER I

HOMICIDE AND THE PATHOLOGIST

INTRODUCTION

THE TERM *homicide* (literally, the killing of a human being) embraces every mode of violent death by which one person's life is taken by another. It is defined legally as the destruction of human life by the act, agency, procurement or culpable omission of some other person or persons. It can result from an act or from *failure to perform an act* where the duty to act is imposed by law. Thus, where the law places on the parent or guardian the responsibility for looking after the child's health and well-being, failure to provide essential food or medical care which results in death is homicide. Included in these homicides are deaths from starvation and from medically treatable diseases whose obvious presence was wilfully ignored by the adult in charge of the child.

Homicide is the most serious crime committed against persons, and its grave implications make its detection, solution and adjudication matters of vital importance to every citizen and to the entire community as well as to law enforcement authorities, judiciary and bar. Civilized society has always reacted with a mixture of horror and macabre fascination to the unlawful taking of a human life while paradoxically accepting with comparative equanimity the wholesale slaughter of the battlefield. Confronted by a criminally violent death, society demands that the assailant be promptly identified and apprehended. After he has been taken into custody and tried for his crime, punishment is usually severe if he is found guilty.

Other than for treason, which can be viewed as an attempt to "murder" or destroy the state, "man-slaying" is the ultimate crime.

Homicide Defined

The *crime* of homicide in all its various forms (murder and manslaughter) and degrees is the creation of a statute, inasmuch as a crime must be clearly designated by a formally enacted law. However, homicide has been condemned from time immemorial, even in cultures where human life has not been considered especially sacred or valuable.

Criminal Homicide

Homicides are either *criminal* or *non-criminal.* The former encompasses violent deaths which are legally classified as murder (in the first or second degree) or manslaughter. Justifiable or excusable homicides constitute the non-criminal group.

Justifiable Homicide

Homicides are justifiable when they are carried out by law enforcement officers legally performing their duties when acting under competent authority. Examples include homicides arising in the course of retaking fleeing felons, making legal arrests or preventing the commission of a felony.

Persons not professionally involved in law enforcement may commit justifiable homicides in resisting attempts at murder or serious harm to themselves or to someone else, or in defending their homes or property. In taking some other person's life in self-defense, the individual must truly believe that he stands in imminent danger of death or serious injury and that his only salvation is to kill his assailant. The slayer must not have provoked the quarrel or been the aggressor in creating the danger he seeks to overcome by his self-defensive acts.

Excusable Homicide

A homicide is excusable when accident or mishap results in the unanticipated and unintended death of some other person. Deaths falling into this category must have occurred as a result of a lawful act carried out in a lawful way with lawful means.

Some Dimensions of the Homicide Problem in the United States

The Federal Bureau of Investigation reported that there were an estimated 15,810 homicides in the United States in 1970, an increase of 1,220 over the 14,590 recorded in 1969, a rise of eight percent. The long term trend in homicide reveals an increase from 7,942 in 1950 to 9,000 in 1960 to 15,810 in 1970. The rise in the past decade was seventy-six percent.

The homicide *rate* in 1970 was 7.8 per 100,000 inhabitants, a rise from the rate of 7.2 per 100,000 in 1969. This represents an eight percent increase in the murder *rate* of 1970 over 1969.

The consistent uptrend both in absolute number of homicides and in homicide rates reflects the general increase in *all* crimes of violence, i.e. homicide, forcible rape, armed robbery and aggravated assault, reported in recent years. Criminal homicide accounts for slightly more than two percent of violent crime.

Analysis of the 1970 data indicates that male murder victims outnumbered female victims by a ratio of more than three to one. Nationwide, the

ratio of arrests for murder was more than five males for each female. Six of every ten victims were between twenty and forty-five years of age with thirty percent falling into the twenty to twenty-nine age group.

The fact that police authorities are powerless to *prevent* a large proportion of these lethal crimes derives from the circumstances and motives surrounding the fatal incident. Unlike other serious criminal offenses (e.g. burglary, robbery and kidnapping), criminal homicide is, to a large extent, an *intimate, personal* crime as demonstrated by the fact that most homicide victims are killed by close relatives, friends and acquaintances. (One may kill one's wife, husband, child, brother, fiancé or best friend. One rarely robs them at gunpoint, kidnaps them or burglarizes their homes.) Killings in the family unit constituted twenty-five percent of all homicides in 1970. In over half these incidents the principals were husband and wife, with wives making up more than half the victims. Killings of children by parents (filicide) constituted fifteen percent of intrafamily slayings.

About one in every fourteen homicides (seven percent) resulted from romantic triangles or lovers' quarrels. The female was the victim in fifty-five percent of the latter. However, when a third party complicated the romantic triangle, ninety-three percent of the victims were men.

The second largest group of homicides in 1970 was made up of so-called "felony-homicides," i.e. killings committed in connection with such other serious crimes as robbery, burglary, rape, kidnapping and arson. Such crimes comprised twenty-nine percent of the overall homicide incidence, an increase from twenty-seven percent in 1969 and twenty-five percent in 1968. Over the years, less than three percent of all homicides have been attributed to "injury by intervention by police."

Firearms continue to be the predominant weapon with sixty-five percent of all homicide victims killed by guns. In fifty-two percent the weapon was a handgun, in eight percent it was a shotgun, and in five percent it was a rifle. Cutting and stabbing weapons were used in nineteen percent, other weapons (blunt objects, poison, arson, explosives and drowning) in eight percent, and personal weapons such as hands, fists and feet were involved in the remainder.

From the police standpoint, more homicides are cleared or "cleaned up" by arrest than is any other type of serious criminal offense. In 1970 approximately eighty-six percent of all criminal homicides were "solved" in the sense that the assailant was identified and apprehended (or gave himself up), and the issue of innocence or guilt was adjudicated. This high figure for solutions in homicide far exceeds that attained for such crimes as burglary, robbery or auto theft. The fact that the person responsible for causing death was identified and taken into custody in almost nine of every ten homicides means that *medical* testimony is required regularly in connection with

judicial proceedings where it aids in the just and proper disposition of whatever *legal* issues are to be adjudicated.

ENTER THE PATHOLOGIST

The word *homicide* carries a double connotation—biological (or medical) *and* legal. The *medical* criterion of homicide is conclusive demonstration that death was violent, i.e. caused by injury. Demonstration that the lethal violence arose from an (unlawful) act, agency, procurement or culpable omission of another person satisfies the *legal* requirement.

The importance of determining the *cause of death* brings into sharp focus the major though not sole function of the physician on the homicide investigating team. The very nature of this key responsibility—lucid, incontrovertible exposition of lethal physical or chemical damage—indicates that the physician best suited for this assignment is the anatomic pathologist.

To discuss a physician's role in homicide investigation appears to be a bald contradiction in terms. *Here* is medicine, a humanitarian and scientific discipline concerned with observation, study and treatment of persons who are ill or hurt. *There* stands homicide with its glaring connotation of criminally violent death. Yet murder and medicine come into intimate contact in the person of the pathologist who helps investigate any death in which (unlawful) violence is known or alleged to have been involved. Establishment of the cause of death is but one facet of his overall contribution to the solution of the case. He must simultaneously search for, recognize, acquire and preserve evidence present *in* or *on* the body which may bear upon the apprehension and conviction of those who committed the crime. Objective data which exonerate an innocent suspect are sought for and accurately documented with equal vigor and zeal.

From his observations, study and analysis of the fatal end-result, the pathologist can often deduce critical facts and opinions which are uniquely valuable for reconstructing the circumstances surrounding the lethal incident and for re-creating the incident itself. This latter portion of the pathologist's contribution can be regarded as helping in elucidating the pathogenesis of the homicidal incident.

The Pathology of Homicide

The phrases *pathology of homicide* and *pathology of trauma,* though related, are not synonymous. The latter is concerned with the cellular, tissue, organ and total bodily responses to injury, whatever the *modality* of violence responsible for the injury (e.g. mechanical, thermal, chemical, electrical etc.), the *manner* of its origin (i.e. homicidal, suicidal, accidental or undetermined), and whether the victim *survived.* The pathology of homicide

includes the foregoing biological phenomena and responses plus such essential criteria as:

1. The injured person *died* from trauma.
2. The violence was (unlawfully) inflicted by a second person (or persons) with the intent to do bodily harm.
3. Judicial proceedings are required to adjudicate the innocence or guilt of the person (s) responsible for death.

The pathologist now shifts the scene of his professional activities from his accustomed workplaces in the autopsy room and microscope bench to the unfamiliar locale of the courtroom.

The Corpus Delicti

The term *corpus delicti,* literally the *body of the offense* or the *body of the crime,* is often used erroneously to designate the physical body of the victim of homicide. The *corpus delicti* of homicide is the fact that a person died from unlawful violence.

Proving a charge of homicide involves proof of two propositions: first, an unlawful lethal act was performed, and second, it was done by the person or persons charged with the crime and none other.

The Hospital Pathologist and Homicide

Currently and for the foreseeable future, the number of physicians in the United States who practice forensic pathology as their *sole* or *primary* professional activity is small. At the same time, the number of deaths which require skilled anatomic study from a *medicolegal* standpoint is large and constantly growing larger. These deaths are too numerous and too widely scattered to permit the decedents to be autopsied by one of the limited number of career forensic medical investigators, even in these days of jet air travel. Accordingly, the hospital pathologist must place his professional skills at the disposal of the law enforcement authorities in his own community at least. Autopsies performed by non-medical persons or even by physicians not solidly grounded in gross and microscopic anatomic pathology are hazardous and frequently unreliable. If critically demanding professional work of this type is permitted to fall into the hands of persons who are not truly "professionals," tragic miscarriages of justice must inevitably occur.

This volume is designed to serve as a *vade mecum* for the "occasional" forensic pathologist, the practicing hospital pathologist for whom the performance of a medicolegal autopsy is a relatively infrequent event. Because he lacks a broad background of experience in the anatomic aspects of *violent* death and is unfamiliar with the non-medical laboratory disciplines

commonly utilized in their investigation, even the best trained and best intentioned hospital pathologist will probably commit serious errors of observation, omission or interpretation as he goes about this professional duty. Such errors will, all too often, interfere with proper adjudication of the forensic issues, an eventuality which carries the frightening possibility of accusation (and conviction) of an innocent person as well as the unfortunate and erroneous acquittal of one who is guilty.

The Pathologist as a Member of the Homicide Investigating Team

When the *hospital* pathologist performs an autopsy in an instance of known or suspected homicide, he becomes *temporarily* a *forensic* pathologist. As such, he is a member of a team of experts, each of whom should regard his part of the investigation as a challenge involving a series of problems requiring solutions and a series of questions requiring answers. An old poem summarizes the multifaceted queries posed by homicides (and other grave offenses).

Quis, quid, ubi, quibus, auxilis, cur, quomodo, quando?
Who, what, where, with what, with whose help, why, how, when?
What was the crime, who did it, when was it done and where?
How done and with what motive; who in the deed did share?

Close teamwork is essential for solving any complex crime, and *every* homicide is a complex crime. Some are merely less complex than others. "Simple" homicides are non-existent.

Every member of the homicide team must know not only *what* is expected of him but also *why* he must carry out his portion of the investigation in a particular way.

The Detective

The detective faces the difficulties, frustrations and dangers of tracing and apprehending suspects, finding reliable witnesses and attempting to get valid information from people who don't want to talk to him because of fear, ignorance or complicity. He must deal simultaneously with cranks and crackpots who seemingly always have a ready and rich supply of wild tips and misleading information, none of which can be ignored without "checking out" lest it have some grain of truth or value.

Interrogation without intimidation is the working rule. Interviewing techniques are employed to ascertain facts, to sift truth from untruth, and to probe cautiously without impairing the ultimate forensic value and validity of the facts and data he elicits. Evidence suitable for presentation and acceptance in court is the sought-after goal.

The Trace Evidence Expert

The trace evidence expert grapples with such problems as finding and identifying peculiar stains, grouping blood and blood stains, establishing the source of paint chips, recognizing and matching hairs and fibers, and contending with a variety of items ranging from a "bacillus to a battleship."

Other Police Specialists

The "fingerprint man" searches for and photographs obvious fingerprints, dusts for latent fingerprints and then attempts to match them against known prints. The *firearms identification expert* (popularly miscalled the "ballistics expert") tries to match bullet and suspected gun and, when circumstances indicate its advisability, attempts to establish the range of fire when the fatal bullet was dispatched. The *police photographer* methodically photographs the scene of the incident with emphasis on documentation of physical evidence. He (or some other photographer) works in the autopsy room in close concert with the pathologist, systematically photographing the victim, his injuries and whatever other features may have ultimate evidentiary (and research or teaching) value.

The Toxicologist

The *toxicologist* performs chemical analyses on blood, urine, bile, viscera and alleged involved containers to detect, identify and quantitate whatever drugs or chemicals may have played some part in the fatality.

The foregoing experts are utilized frequently in homicide investigations. When the circumstances indicate, the professional skills of dentists, physical anthropologists, entymologists, anatomists, botanists, roentgenologists and many other specialists may be required.

The Pathologist

Where does the pathologist fit into this heterogeneous group? Regardless of the kind of violence responsible for death, *every* homicide necessitates the acquisition of medical evidence which proves beyond a reasonable doubt that the victim died from injury or, phrased differently, that death resulted from an unnatural cause. This crucial facet of the inquiry falls logically and inescapably into the laboratory physician's area of professional expertise.

However, to say that the forensic pathologist's only function is to establish the cause of death is a lamentable oversimplification of the degree of his participation and the worth of his contributions. Certainly, he must prove that death resulted from violence or there is no homicide to be investigated. But his contribution, more often than not, goes far beyond merely providing a sound answer to the basic question, "What was the cause

of death?" Other questions frequently arise in connection with homicide investigation of the victim.

For example, the victim was found "shot to death" with multiple "obvious" entrance and exit bullet wounds. A complete autopsy provides answers to the following questions:

1. Were the injuries truly produced by bullets?
2. Did death result from gunshot injuries? Was the victim dead before the shots were fired? If so, what *was* the cause of death?
3. In addition to gunshot wounds, does the victim have injuries *not* produced by a firearm? If so, how or with what kind of weapon were *they* inflicted?
4. What kind of a gun (or guns) fired the shots?
5. From what distance (s) were the shots fired?
6. From what direction (s) were the shots fired?
7. What are the individual characteristics of the responsible gun or guns?
8. If multiple bullet wounds are present, could they have been produced by one bullet?
9. Were the multiple bullets which struck the victim fired from one or more guns?
10. How long could the victim survive his injuries?
11. How much purposeful activity could he perform after he was shot?

Frequently the question is asked why autopsies are performed in what are loosely termed "open and shut" cases, a misleading phrase used by persons happily ignorant of the headaches, heartaches and frustrations which are so much a part of the daily routine of those actively engaged in homicide investigation. *They* rarely refer to an "open and shut" case. Let us proceed further and say that the commission of the homicide has been established with certainty and that the suspect has already confessed. Why go to the trouble and expense of doing an autopsy when, for all practical purposes, the case is "cleaned up?" Even in these latter instances, the performance of a complete postmortem examination is required if only to *substantiate the truth of the confession.*

Recent decisions by the Supreme Court dealing with the rights of the accused to benefit of counsel during even the earliest stages of criminal investigation and interrogation mean that fewer confessions are forthcoming to help law enforcement authorities "clean up" their cases. Moreover, if a confession was obtained under conditions which do not conform strictly to criteria laid down by the nation's supreme judicial body, the statement is inadmissable in the courtroom and is therefore of no value to the prosecution. Law enforcement authorities, deprived of the assistance formerly

furnished by the suspect who "convicted himself out of his own mouth," must henceforth rely more heavily on the acquisition of precise, *objective* data which associate perpetrator with fatal incident.

Although not as common as false denials of guilt, false confessions are not rare. A properly performed autopsy furnishes objective facts which can negate the weight and worth of such misleading statements and thus spares the investigating authorities the expenditure of time and effort to "check out" the fraudulent admission.

CASE: A forty-six year old woman was found dead on her living room floor by neighbors who dropped in for a visit. Her husband, obviously intoxicated, was sitting on the floor nearby. Interrogated shortly thereafter by the police, he told them that he had stabbed his wife with an ice pick, and he turned over to them an ice pick whose shaft was soiled with reddish-brown stains, suggestive of blood. He was immediately taken into custody.

At autopsy the victim's posterior cervical region disclosed a circular skin perforation which though suggestive of having been inflicted by an ice pick was more characteristic of a distant type entrance gunshot wound. X-ray of her head and neck prior to anatomic dissection revealed a metallic object in her neck between the right mastoid and first cervical vertebra. Following complete autopsy which included recovery of the cervical pellet, the cause of her death was established as a gunshot wound of the neck which had resulted in perforation of the right side of the atlas, fracture of the atlanto-occipital articulation, subdural and subarachnoid hemorrhages over her spinal cord and posterior aspects of both cerebral and cerebellar hemispheres, contusions of both occipital lobes and medullary petechiae. (Figs. I-1A & I-1B)

Confronted with the true cause of death, the husband admitted shooting his wife and then throwing the gun onto the roof of a garage adjacent to his home where it was subsequently found. The stains on the ice pick shaft were demonstrated to be non-hemic by appropriate laboratory tests.

The Medicolegal Autopsy

The implications of a crime as serious and complex as homicide indicate that *complete* anatomic study should be carried out as soon as possible in any death which *may* have resulted from the purposeful, intentional or even "accidental" act of another person. Partial autopsies have no place in forensic pathologic practice, and the files of any busy medicolegal office contain innumerable examples of cases in which complete autopsy placed a death in a totally different light from that postulated initially. Occasionally one reads or hears about bodies being exhumed for second and even third "autopsies." Such repeated examinations are rarely as rewarding or revealing as a properly performed *first* autopsy. Performing a second autopsy, in addition to being emotionally traumatic to the decedent's family and friends and expensive (exhumation and reburial are costly), indicates that the original autopsy was either incompletely carried out, incorrectly observed or erroneously interpreted.

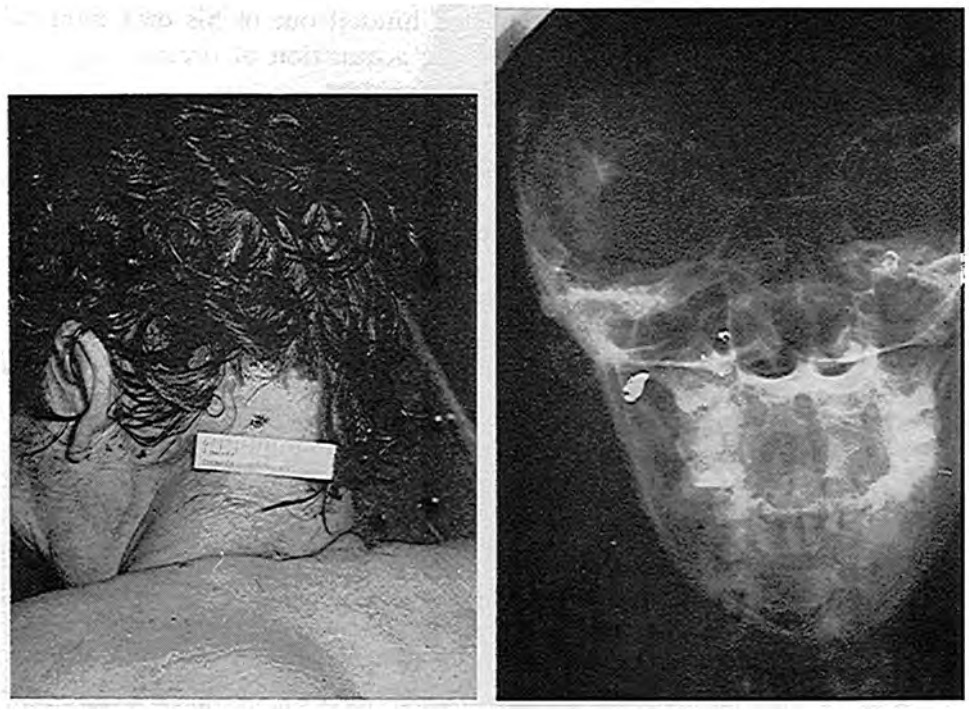


Figure I-1A. Cervical dermal injury allegedly inflicted with an ice pick.
Figure I-1B. Anteroposterior roentgenogram of head and upper neck of decedent in Figure I-1A showing deformed bullet between right mastoid and first cervical vertebra. Tiny metallic fragments indicate a portion of the course of the missile.

"Medicolegal Masquerades"

An important source of potential confusion which arises in the investigation of known and unsuspected violent deaths derives from what have been called "medicolegal masquerades." Violent deaths may be accompanied by minimal or no external evidence of injury, and conversely, deaths from natural causes can occur under such circumstances or in such fashion as to suggest falsely that violence was operative. Accordingly, the pathologist is confronted from the outset with the problem of distinguishing between deaths caused by disease from those caused by injury or by *combinations* of injury and disease.

If death was violent, the *manner* in which the fatal hurt was sustained must be established. Homicides can be arranged or "rigged" to suggest that death resulted from suicide or accident. Accidental deaths and suicides can occur under circumstances which create a false facade of homicide. If anatomic and other investigative efforts in a violent death do not yield sufficiently definitive data to permit a categorical diagnosis of homicide,

suicide, or accident, the fatality must be ascribed to the classification of "violence of undetermined origin."

If deaths involving criminality are not to be dismissed as having resulted from natural disease or non-criminal violence, complete anatomic study and police investigation are essential. Conversely, if incorrect diagnoses of homicide are to be excluded from fatalities wherein criminality was *not* involved, the same approach holds true. False positive and false negative impressions of homicide usually result from incomplete investigation of some critical aspect of a suspicious death.

The Search for Truth

Ever present in the minds of those involved in the investigation of known or suspected homicides must be the question, "Does the medical evidence (i.e. the autopsy findings) corroborate or contradict the statements given by the suspect and other witnesses?" The ordinary layman is not a trained observer, and in moments of stress, danger or excitement he is often an extremely unreliable or faulty observer. When questioned by police about what happened, he relates in good faith what he *thinks* he saw or what he thinks the police want to hear. Superimposed on the information from these well-meaning but inaccurate witnesses are versions of the incident related by persons who lie or tell half-truths.

The pathologist has a great advantage in that the dead body does not lie to him. It tells him the truth if he knows how to search for and recognize it when he sees it.

The old adage, "Dead men tell no tales" is untrue. A dead body is extremely eloquent and honestly informative if one listens to the tales it tells. In an unwitnessed homicide (unwitnessed, that is, except by assailant and victim), the anatomic findings and the evidence in and on the body may furnish the only key which unlocks the door to the correct solution.

THE PATHOLOGIST'S CONTRIBUTION TO HOMICIDE INVESTIGATION

The day-to-day activities of the hospital pathologist and of his technicians in the clinical laboratory and blood bank are ordinarily directed toward helping restore health to patients who are under some other physician's care. Laboratory studies and determinations ("tests") are performed to establish specific diagnoses, to determine probable etiologic factors, to indicate rational therapy and to offer a basis for sound prognosis. If the patient dies and comes to autopsy, the aims of the postmortem examination are to evaluate accuracy of clinical diagnosis and efficacy of treatment as well as to demonstrate the morbid anatomic complex of the lethal process

and whatever other diseases may be present. Under some conditions, data derived from the hospital autopsy may be utilized for a clinicopathologic conference or be incorporated in some research project.

When the pathologist performs a *medicolegal* autopsy, and especially one which may involve fatal criminal violence, he must orient his efforts and thoughts in a new direction and aim them at goals which are quite different from those which characterize his "routine" necropsies. Now, in addition to the purposes outlined in the preceding paragraph, laboratory data derived from *this* professional activity *may* be utilized for the solution and possible prosecution of a grave criminal offense. As such, they will be minutely scrutinized for many different purposes by attorneys for prosecution *and* defense.

When the pathologist participates as the *medical expert* in the investigation of known, alleged, suspected or unsuspected homicides, he carries several responsibilities which are his and his alone. *They cannot be delegated.* On him falls the burden of acquiring critical medical data, of recognizing and conserving items of great evidentiary and probative value and of reaching valid conclusions ("opinions") on the basis of his observations and previous professional training and experience.

The medical (pathological) aspects of homicide investigation embrace several intimately related though separate phases:

1. Establishment and objective documentation of the cause of death by a complete autopsy with visualization of *all* injuries, lethal and otherwise.
2. Detection and recognition of previously unsuspected homicides.
3. Recognition, recovery, preservation and proper transmission of evidentiary material present in or on the body whose study and evaluation do not ordinarily fall into the area of the pathologist's professional competence. Included in this category are such items as bullets, paint and glass chips (hit-skip traffic fatalities), hairs, foreign fibers, clothing, and the like.
4. Careful and impartial presentation of his medical evidence before a Grand Jury and in trial court is the weightiest responsibility which devolves upon the pathologist. The most skillfully performed medicolegal autopsy is worth little in the courtroom if the information and evidence derived from it are presented by a "poor" witness, that is, one who mumbles, or who is biased, or who loses his temper and argues with attorneys, or, in short, who commits any of the mortal or venal forensic sins which damn his testimony in the eyes of the jury. (The reader is referred to the final chapter in this volume for a discussion in depth of the pathologist's responsibilities and behavior as a witness.)

Cause, Manner and Mechanism of Death

The necessity of establishing *cause* and *manner* of death in known or suspected homicides has already been mentioned. To avoid semantic difficulties, these two terms—*cause of death* and *manner of death*—must be defined precisely and utilized thoughtfully. (This admonition holds true for *all* medical terms used by the pathologist in connection with his observations and testimony deriving from his participation in the homicide investigation.)

Cause of Death

The *cause* of death is the injury, disease or the combination of the two responsible for initiating the train of physiological disturbances, brief or prolonged, which produced the fatal termination. When trauma kills so quickly that there was no opportunity for sequelae or complications to develop, the injury is both the *immediate* and *proximate* cause of death. However, if the injury was survived for a sufficiently prolonged interval which permitted the development of serious sequelae (e.g. pneumonia, empyema, peritonitis or massive pulmonary embolism), the latter are the *immediate* cause of death. Responsibility for evoking these terminating processes must be ascribable to the initial trauma, provided that a *direct* relation exists between it and the terminating complication. The original injury thus becomes the *proximate* cause of death.

Complete anatomic examination, together with other indicated laboratory studies (histological, chemical, immunological and bacteriological), which stem from it, is the time-honored method of determining the cause of death. Functioning as a morbid anatomist, the pathologist seeks for organic abnormalities—traumatic, natural or both—whose presence is incompatible with survival. These lesions he terms the "anatomic cause of death." When anatomic changes are non-specific, meager or absent, recourse to chemical analyses often yields information which clarifies obscure problems. From a considered judgement of *all* available data, the pathologist incriminates an injury, a group of injuries, a chemical, a disease, or a combination of injury and disease as the lethal agency.

Establishing the cause of death is an interpretive, two step intellectual process, deriving from and depending upon sound evaluation of morphologic evidence of injury or of injury and disease, *and* the results of toxicological, biochemical and microbiologic studies. The first step involves recognizing structural organic changes (morbid anatomic features) or chemical abnormalities responsible for cessation of vital function. Recognition and specific diagnoses of these morphological and chemical abnormalities then become the point of departure for a logical sequence of synthetic and analytic cogitation which explains the fatal course.