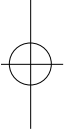
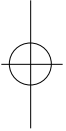
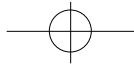
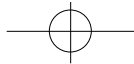


# Flesh and Bone





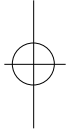


# **Flesh and Bone**

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## **An Introduction to Forensic Anthropology**

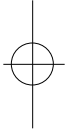
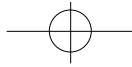
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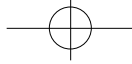


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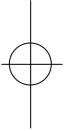
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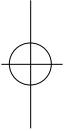
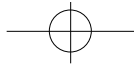
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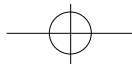


*To the Memory of Lisa Shore*

*Born November 20, 1987  
Died October 22, 1998*

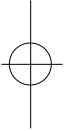
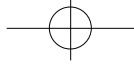




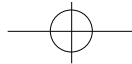


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## Preface

I am the mother of a child who died under mysterious circumstances, and as a result have met and worked with a broad spectrum of forensic investigators—coroners, pathologists, toxicologists, pharmacologists, police, and document examiners. The process of piecing together the events that led to this tragedy could never be undertaken by one person. The efforts and energy of many individuals were integral to the investigative process. It is still ongoing.

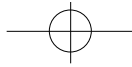
Very often a lot is already known about a person who died. Forensic examiners will concentrate on learning about the manner of death, the means of death, who committed the deed, why, and what evidence can be gathered to substantiate their findings.

Sometimes however, the investigation has to begin at a more basic level. Who was the deceased? How old was he or she? Was it a he or a she? What can their bodies tell us about how they died? Forensic anthropologists study human skeletal remains to learn as much information as possible about a deceased person. It is only after they conduct their investigations and studies that others can begin to try and answer other questions.

A perpetrator may attempt to hide evidence by interfering with or relocating human remains, leaving the forensic anthropologist with skeletal parts and fragments. Weather, animal life, insects, soil—the natural environment—all contrive to move, erase, and erode vital evidence. At times, forensic anthropology can be likened to trying to assemble an inordinately complicated puzzle, one with many or most of the pieces missing. It is the forensic anthropologist who must try and put those pieces together in a meaningful way—to reconstruct essential elements of humanity out of anatomic and skeletal remains.

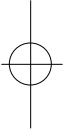
When an individual dies in unusual or suspicious circumstances, whether a child in a hospital (like mine) or an unknown person whose remains are found, we owe to their collective memories an obligation to learn as much as we can about the circumstances of their death. We may find our answers through the efforts of forensic analysis, police investigations, coroner's inquests, and even, occasionally, by the perseverance of the victim's loved ones. These efforts can provide answers to crucial questions, demonstrate ways to avert future tragedies, and help ensure that perpetrators are brought to justice.

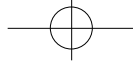
Forensic anthropology is an integral part of the meaning—and the method—behind the motto of the Office of the Chief Coroner for Ontario: “We speak for the dead to protect the living.”



I cannot adequately express my gratitude to the author for dedicating this book to my late daughter Lisa, and giving me this opportunity to write some words in her memory.

Sharon Shore  
[www.lisashore.com](http://www.lisashore.com)  
August 2000



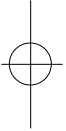
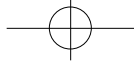


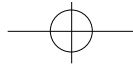
## Acknowledgments

I am indebted to a number of individuals who contributed invaluable time, energy and resources towards the creation of this book. Foremost, my gratitude goes to Dr. Remonda Kleinberg who initiated the idea and got the ball rolling in a significant direction. A very special thanks to John Doucette for allowing me access to the V. Doucette collection, his photographic expertise and inexhaustible efforts to make everything turn out right, and to Angela Milana for dropping everything to photograph collections in various cities. The Office of the Chief Coroner, Toronto Police Services- Forensic Identification Services and the C.A.R.E.S Unit, and the Centre of Forensic Sciences graciously provided case material, resources and pivotal information. Their professionalism and courtesy were inspiring. For giving me access to skeletal collections and/or slide material I must thank the American Academy of Forensic Sciences, Valeri Craigle and The Utah State Office of the Medical Examiner, The Department of Forensic Pathology at the University of Sheffield, Rachel Gropper and Paul Smith of The Michener Institute for Applied Health Sciences, Dr. Max Friesen, Mercedes Doretta of the Argentine Forensic Anthropology Team (EAAF), Dr. Bonnie Chandler, and The Royal Ontario Museum. For the abundant information and resources on teeth, I am grateful to forensic odontologist Dr. George Burgman, and Dr. Ann Dale, curator of The Dental Museum.

As the manuscript unfolded Dr. Shelley Saunders and Dr. Kathryn Denning offered sound research advice and editing suggestions. Howard Kleinberg and Shelagh Lariviere contributed creative editing ideas, while Michelle Hirson did the layout for the forensic science section. Their efforts were critical.

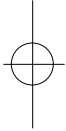
Lastly and most important, I want to thank my husband Keren for the support, guidance and friendship during every stage of this book.

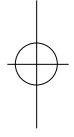
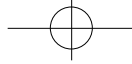


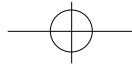


## About the Author

Myriam Nafte received an Honours B.A. in Anthropology, and a B.Ed degree from York University. She completed an M.A. in Physical Anthropology at McMaster University in 1992. She has taught college courses in skeletal anatomy, forensic anthropology and archaeology, and she continues to volunteer her services for criminal casework in the United States and Canada.







## Introduction

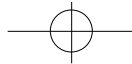
Forensic anthropology is defined here as the analysis of human skeletal remains within the context of a legal investigation.

Using a variety of methods and techniques, forensic anthropologists examine parts of the skeleton, take extensive measurements, and look for particular bumps and grooves on bone. From this process they are usually able to ascertain an individual's sex, approximate age at death, stature and racial origins. They could also determine whether individuals suffered any trauma or disease. Further examination could possibly reveal the health of individuals, whether they were left or right-handed, whether or not they had given birth, and sometimes even their occupation in life.

In the event that skeletal remains are found, providing an analysis of the material may prompt a legal investigation. In one such case a woman came upon some bone fragments and an assortment of teeth while gardening. Thinking that she had uncovered her neighbor's dog burial, she quickly reburied them. However, curiosity got the better of her and she dug them up again to get a closer look. The bones and teeth were brought to a forensic anthropologist and identified as human. Legal authorities were called and an investigation followed. The entire backyard was excavated by police to reveal the scattered remains of a teenage girl who had gone missing ten years earlier.

Conversely, identifying remains may actually prevent the time and expense of a large-scale legal investigation. In this case a crew of construction workers found bones wrapped in rags and newspaper, along with old shoes and torn shirts stuffed in between the walls of an old house. To the astonished crew, it appeared as if a massacre had taken place. They contacted police who brought the strange assortment to my attention. The assemblage turned out to be a mixture of dog, pig, and horse bones, some crushed and mixed into a form of plaster, and others wrapped in cloth and newspaper, filled with sawdust. According to one of the local farmers, the odd mixture was commonly used as insulation back when the house was first built in the late 1800s.

The discovery of human skeletal remains sets off an immediate series of events once the police are involved. By law, a human body can never be left where it was found. All deaths must be accounted for, and some form of recovery and identification must take place. If the body has decomposed or is skeletonized, recovery and identification are often done by a forensic anthropologist. Any subsequent legal investigation would compel information from a variety of sources, for example from eyewitnesses, suspects, next of kin, and other forensic specialists. Ultimately, the goal is to positively identify the individual and to reconstruct the events surrounding his/her death.



The aim of this book is to give the reader a good background in forensic anthropology by outlining some of the methods and procedures that best define the discipline. It is also designed to introduce readers to the rapidly growing area of forensic science by providing a comprehensive look at many of the participants in the field.

As an introductory guide, the book is an appropriate resource for anthropology and criminology students, individuals in law enforcement, or anyone with an interest in this subject. I avoid technical terminology whenever possible in an effort to keep the reader's attention and interest and to engage those who are working in the field. Technical terms that are used appear in boldfaced type and are explained in the text itself, while references are provided for those with interests in a particular area. The photographs, charts, and illustrations are arranged to complement the text and render it more comprehensible.

All of the chapters begin with their own introduction, and are suited for general understanding. The book follows a logical sequence. Firstly, chapter one discusses all things forensic, which will hopefully clarify many of the misconceptions that exist regarding dead bodies. The broad field of anthropology is defined in chapter two to give one insight as to how a branch of this discipline came to be used as an investigative tool in such a short period of time. Since an examination of human remains is integral to forensic anthropology, chapter three outlines the process of death, decomposition and skeletonization, and chapter four provides a textual and photographic inventory of the human skeleton. The current methods and techniques of examining the human skeleton to determine factors such as sex, age, race, stature, and evidence of trauma are highlighted in chapters five and six. Chapter seven discusses the reconstruction of identity through the process of facial reconstruction, and a detailed description of DNA profiling. Lastly, chapter eight deals with the modern application of forensic anthropology to human rights missions.

There are many graphic photographs depicting human bodies in various stages of decay and which have sustained severe trauma or injury. Out of respect for the victims and their families, the photographs published do not reveal the individual's identity, nor are their case histories discussed. The use of such images in this publication comes with an understanding that the dead need to be honored, not only for the opportunity they have provided for our learning but also in memory of their individual experiences as human beings.