

HUMAN IDENTIFICATION

HUMAN IDENTIFICATION

Case Studies in

————— *Forensic Anthropology* —————

Edited by

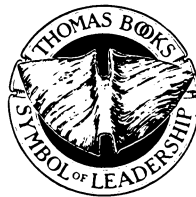
TED A. RATHBUN, Ph.D.

*Department of Anthropology
University of South Carolina
Columbia, South Carolina*

and

JANE E. BUIKSTRA, Ph.D.

*Department of Anthropology
Northwestern University
Evanston, Illinois*



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

Published and Distributed Throughout the World by

CHARLES C THOMAS • PUBLISHER

2600 South First Street
Springfield, Illinois 62717

This book is protected by copyright. No part of it
may be reproduced in any manner without written
permission from the publisher.

© 1984 by CHARLES C THOMAS • PUBLISHER

ISBN 0-398-04875-4 (cloth)

ISBN 0-398-06337-0 (paper)

Library of Congress Catalog Card Number: 83-24268

With THOMAS BOOKS careful attention is given to all details of manufacturing and design. It is the Publisher's desire to present books that are satisfactory as to their physical qualities and artistic possibilities and appropriate for their particular use. THOMAS BOOKS will be true to those laws of quality that assure a good name and good will.

Printed in the United States of America

SC-R-3

Library of Congress Cataloging in Publication Data

Main entry under title:

Human identification.

Bibliography: p.

Includes index.

1. Forensic anthropology—Case studies. 2. Criminal
investigation—Case studies. I. Rathbun, Ted A.

II. Buikstra, Jane E.

GN69.8.H85 1984 614'.1 83-24268

ISBN 0-398-04875-4.— ISBN 0-398-06337-0 (pbk.)

ABOUT THE AUTHORS

Editors

Jane E. Buikstra, currently a Professor of Anthropology at Northwestern University, received her graduate degrees from the University of Chicago. Her forensic interests in individuation, burned remains, and forensic archaeology derive from her osteological training in prehistoric human variation and mortuary customs. A Fellow of the American Academy of Forensic Sciences and diplomate of the American Board of Forensic Anthropology, she serves as a consultant to various law enforcement agencies in Illinois and in Indiana. Although her bio-archaeological research has centered in the North American Midwest, her studies have also taken her to South America, the Canadian Arctic, Africa, as well as other regions of the United States.

Ted A. Rathbun received his M.A. degree in 1966 and his Ph.D. in 1971, both from the University of Kansas, and is Associate Professor of Anthropology at the University of South Carolina. His academic work has concentrated on the osteology, paleopathology, and demography of prehistoric populations in Iran, Iraq, and South Carolina. Although he was appointed as consulting physical anthropologist to the Office of the Chief Medical Examiner at the Medical University of South Carolina in 1971, most of Dr. Rathbun's forensic consultations involve human identification for coroners and law enforcement agencies. He lectures on forensic anthropology to various groups and offers a yearly course on human identification in forensic anthropology to undergraduate and graduate students. He is a member of the American Academy of Forensic Sciences and is a Diplomate of the American Board of Forensic Anthropology.

Other Contributors

J. Lawrence Angel is curator of Physical Anthropology at the National Museum of Natural History, Smithsonian Institution, Washington, D.C. He received a Ph.D. at Harvard University in physical anthropology and has done field work in Greece, Turkey, and Cyprus on the social biology of culture growth. In addition to anthropology (at Berkeley, Minnesota, Harvard, and George Washington Universities) he has taught human anatomy (Jefferson

Medical College, Howard, and the U.S. Naval Hospital in Philadelphia). Dr. Angel has analyzed forensic skeletons at the Smithsonian since 1962. He is current president of the American Board of Forensic Anthropology.

William M. Bass received his first training in Forensic Anthropology under Dr. Charles E. Snow while working on his master's degree at the University of Kentucky. A desire for further training in Forensic Anthropology led Dr. Bass to the University of Pennsylvania, where he completed his Ph.D. under Dr. Wilton M. Krogman. He and Dr. Krogman worked jointly on many cases while Bass was a graduate student, and Dr. Bass has continued a tutorship program with his students at the University of Kansas (1960–1971) and the University of Tennessee (1971–present).

Richard H. Brooks received a Ph.D. from the University of Colorado and is affiliated with the University of Nevada, Las Vegas, where he is Research Professor of Anthropology, and Principal Museum Anthropologist.

Sheilagh T. Brooks was born in Tampico, Tamaulipas, Mexico and became a U.S. citizen in 1945. She received a Ph.D. in physical anthropology from the University of California, Berkeley and is Professor of Anthropology at the University of Nevada, Las Vegas, having joined the staff in 1966.

Margaret C. (Peggy) Caldwell, the daughter of a U.S. Foreign Service officer, traveled extensively with her family and as a senior in high school participated as a paleoanthropological assistant on the International Afar Research Expedition at the Hadar in the Rift Valley of Ethiopia. She was awarded a Master of Arts degree in Physical Anthropology from Arizona State University in 1981. During her graduate education she undertook several specialized projects in osteology and received additional training in forensic anthropology at the University of Arizona. Ms. Caldwell is currently a collaborator in the Department of Anthropology, Smithsonian Institution, teaches science at the Brearley School, and acts as a consultant to Dr. Gross, the New York City Medical Examiner. She is a member of the American Association of Physical Anthropologists and a trainee affiliate of the American Academy of Forensic Sciences.

Homer R. Campbell, Jr., received his D.D.S. from Baylor University School of Dentistry in 1956. He has been in private practice in Albuquerque since 1959. He has been associated with the New Mexico Medical Investigator's Office since its beginning in 1973 and is currently the Chief Forensic Odontologist. He is also Clinical Associate Professor in the Department of Pathology at the University of New Mexico School of Medicine. Dr. Campbell is a Diplomate of the American Board of Forensic Odontology, Inc., and conducts a growing practice in forensic odontological consultation. He is recognized as an innovator in the analysis of bite marks.

Michael Charney, Ph.D., was educated in anthropology at the Universities of

Texas and Colorado and at Columbia University. He is presently serving as Emeritus Professor of Anthropology at Colorado State University and is the director of the Center of Human Identification. He is a frequent consultant for law enforcement agencies in the mountain states, but has worked for other agencies from New Jersey through Canada. He has published numerous articles dealing with forensic anthropology and is probably best known for his work in casting materials and facial reconstruction techniques. He was codirector in the identification of multiple deaths in the Big Thompson flood. Dr. Charney is a fellow of the American Academy of Forensic Sciences and a Diplomate of the American Board of Forensic Anthropology.

Della Collins Cook is Associate Professor of Anthropology at Indiana University. Her interests include skeletal biology, paleopathology, and demography in North American Indian populations. She is presently evaluating population differences in dental and postcranial growth arrest indicators in prehistoric midwestern materials. She received her M.A. from the University of Chicago in 1971 and her Ph.D. in 1976.

R. C. Dailey is a consultant to the Florida Department of Law Enforcement. He has been doing forensic physical anthropology for the past 16 years and regularly lectures on methods of estimating age, sex, and racial origin as well as participating in law enforcement sponsored training programs.

Jack Duncan is currently a research and training specialist with the Florida Department of Law Enforcement. He has 17 years' experience in crime processing and was a crime laboratory analyst for 10 years.

Michael Finnegan is a Professor of Anthropology and Director of the Osteology Laboratory at Kansas State University. He is a consultant in forensic osteology and holds a Ph.D. in anthropology from the University of Colorado. He was a postdoctoral fellow at the Smithsonian Institution and is a fellow of the American Academy of Forensic Sciences, a member of the International Association for Identification, and a Diplomate of the American Board of Forensic Anthropology. Dr. Finnegan is a recipient of the Kansas Attorney General Certificate of Merit in recognition of outstanding service rendered to law enforcement in and for the State of Kansas by a private citizen. He has published numerous articles on theory, method, and application of osteological analysis in population studies and forensic application.

George W. Gill is currently an Associate Professor of Anthropology at the University of Wyoming. He received a Ph.D. from the University of Kansas. He has studied burial archaeology and human osteology in populations in western Mexico, the northwestern plains of North America, and on Easter Island. Dr. Gill has provided human skeletal identification service to the Wyoming State Crime Laboratory since 1972. In 1978 he became a Diplomate of the American Board of Forensic Anthropology and is also a member

of the American Academy of Forensic Sciences. He has authored several articles and has contributed to books and special volumes.

Claire C. Gordon received her Ph.D. degree in Biological Anthropology from Northwestern University in 1982, after receiving an M.A. degree in Anthropology from Northwestern in 1977 and a B.S. degree in Biology from the University of Notre Dame in 1976. During eight years of archeological fieldwork, she has done research in Southern Illinois, the American Southwest, and Micronesia. Dr. Gordon currently holds the position of Research Anthropologist at the U.S. Army Natick Research & Development Center, where she conducts research in anthropometry, allometry, and biomechanics for application in the human engineering of personal protective clothing and equipment.

Thomas Grubbs received an M.S. degree in Mechanical Engineering from the University of Houston in 1968 and is a Professional Engineer in the State of Texas. He is currently an Aerospace Technologist with the National Aeronautics and Space Administration (NASA) at the Lyndon B. Johnson Space Center, Houston, Texas. For the past 18 years he has been responsible for mechanical design and analysis related to spacecraft, aircraft, and various specialized mechanical devices, presently working on a manned EVA task simulator for Space Shuttle 5. He has had 8 years of forensic engineering experience, mainly related to mechanical design, stability, and accident reconstruction.

Sathya V. Hanagud is Professor of Aerospace Engineering, Georgia Institute of Technology, Atlanta, Georgia. He received an M.S. Aerospace Engineering degree from the India Institute of Science in Bangalore and a Ph.D. from Stanford University in 1963, with specialization in catalyzation of structures, metals, and impact loading. He teaches in the field of structural engineering and materials and is a specialist in aircraft crash dynamic reconstruction. For 7 years he conducted research at Stanford Research Institute. He has written over 100 scientific papers.

Rodger Heglar is a Professor of Anthropology at San Francisco State University, having joined the faculty in 1967. He received his Ph.D. from the University of Michigan and has taught there (1959–1963) and at Southern Illinois University (1963–1966). He is recognized professionally in both physical anthropology and forensic anthropology. In physical (biological) anthropology his teaching and research interests are the biology of human populations, particularly in the New World, skeletal biology, paleopathology, paleoserology, and medical anthropology. In forensic anthropology (medicolegal investigation) he is Board certified and practices among the northern and Bay Area California counties. He is an Assistant Medical Examiner-Coroner in San Francisco and deputized in several neighboring counties, where his investiga-

tion and opinion in unknown person or homicide cases are desired.

J. Michael Hoffman received an M.D. degree in 1970 from the University of Maryland and M.A. and Ph.D. degrees in 1972 and 1973 from the University of Colorado. He has held teaching appointments at Northern Arizona University, the University of California-Berkeley (where he was also Curator of Human Osteology at the R. H. Lowie Museum of Anthropology), and Colorado College. His research interests include human osteology, skeletal paleopathology, and forensic physical anthropology.

Paul N. Jolly is currently Chief Deputy Coroner for the Hamilton County Coroner's Office, Cincinnati, Ohio, and Assistant Clinical Professor of Pathology at the University of Cincinnati, where he earned an M.D. degree in 1941. He has served as chief of the section of pathology for the Ohio State Medical Association, as president of the Ohio Society of Pathologists, and as counselor for Ohio for the American Society of Clinical Pathologists.

Allen M. Jones has been Forensic Pathologist, Office of the Chief Medical Examiner, Oklahoma City, since 1979. He earned M.S. and M.D. degrees from the University of Louisville and was an American Cancer Society Fellow in Surgical Pathology at Washington University. He served a residency (1975–1976) in forensic pathology, Office of the Medical Investigator, Albuquerque, New Mexico, advancing to Assistant, and Associate, Medical Investigator. He has taught at Washington University School of Medicine and the Department of Pathology at the University of New Mexico and is presently Clinical Assistant Professor of Pathology at the University of Oklahoma Health Sciences Center. Dr. Jones is certified by the National Board of Medical Examiners and the American Board of Pathology in both Anatomic Pathology and Forensic Pathology. He is a Fellow of the American Academy of Forensic Sciences.

Ellis R. Kerley was awarded an M.S. degree from the University of Michigan in 1956 and a Ph.D. degree from the University of Michigan in 1962 and has postgraduate work in Forensic Pathology and Orthopedic Pathology at the Armed Forces Institute of Pathology. His professional experience includes 3 years of research in medical genetics at the Bowman Gray School of Medicine (1950–1953); identification of the Korean War dead at Kokura, Japan (1954–1955); research in skeletal variability and age change at the Orthopedic Pathology Section of the Armed Forces Institute of Pathology (1957–1966); teaching in the Anthropology departments of the University of Kentucky, University of Kansas, and University of Maryland; and teaching in the Anatomy Department of the University of Puerto Rico Medical School. He has served as a forensic consultant for the Armed Forces, FBI, and coroners and medical examiners in various parts of the U.S. as well as the Congressional Subcommittee on the Investigation of the Assassination of President

John F. Kennedy. Dr. Kerley has held numerous professional offices and received many professional honors.

Lowell J. Levine received the D.D.S. degree from New York University in 1963. In private practice in Bayside, New York, Dr. Levine has been both on active duty and in the Naval Reserve for over 10 years. He is frequently consulted by investigative agencies around the country. He is past President and a Fellow of the American Academy of Forensic Sciences and a Diplomate of the American Board of Forensic Odontology, Inc. He is a Clinical Associate Professor in the Department of Forensic Medicine at the New York School of Medicine.

James L. Luke received his M.D. from Western Reserve University. He has served in the offices of the Chief Medical Examiner in New York and Oklahoma and became the Chief Medical Examiner of Washington, D.C. in 1971. His specialties in forensic research concern the pathology of strangulation, problems of forensic pathology and pediatrics, and blunt force injury. He is a fellow of the American Academy of Forensic Science.

William R. Maples received his Ph.D. in Anthropology from the University of Texas (Austin) in 1967. Dr. Maples spent 4 years in Kenya, where he was associated with various biomedical projects. He has taught at Western Michigan University and the University of Florida. He is currently Curator of Physical Anthropology at the Florida State Museum and Professor of Anthropology at the University of Florida. He is Head of the State Medical Museum of Florida. Dr. Maples is a Diplomate of the American Board of Forensic Anthropology and a Fellow in the American Academy of Forensic Sciences.

Patricia McFeeley is Associate Medical Investigator, Office of the Medical Investigator, New Mexico Center for Forensic and Environmental Science, Albuquerque, and Assistant Professor of Pathology, University of New Mexico, School of Medicine. Her M.D. degree was earned at the University of New Mexico in 1972, followed by 4 years of pathology residency training at the University of New Mexico and at Denver Children's Hospital and a fifth year at the University of New Mexico as a Forensic Pathology Fellow. Dr. McFeeley has conducted medical investigations in numerous aircraft accidents during the past 5 years as Assistant Medical Investigator in her present position. She is a member of the American Academy of Forensic Sciences and is certified by the American Board of Pathology in both Anatomic and Forensic Pathology.

Dan Morse is a retired physician and has held the position of Research Associate in the Department of Anthropology, Florida State University, for the past 13 years. He is certified by the American Board of Forensic Anthropology and has been a consultant to the Florida Department of Law Enforcement for the past 8 years.

Thomas T. Noguchi was Chief Medical Examiner-Coroner, Los Angeles. His recognition of the importance of forensic anthropology paved the way for the formulation of the research design for the skeletal aging study by Suchey.

Patricia A. Owings received the M.A. degree in Anthropology at California State University-Fullerton in 1981. Her M.A. thesis was based on epiphyseal union of the anterior iliac crest and medial clavicle, the research being done at the Department of the Chief Medical Examiner-Coroner, Los Angeles.

Anthony J. Perzigian is Associate Professor of Anthropology and Adjunct Associate Professor of Anatomy at the University of Cincinnati. He received a Ph.D. degree from Indiana University in 1971. His research focuses on the skeletal and dental biology of prehistoric populations. Dr. Perzigian is a Fellow of the American Anthropological Association and the Human Biology Council, a member of the American Association of Physical Anthropologists, and an associate commentator for *The Behavioral and Brain Sciences*. His forensic work has been performed for the Hamilton County Coroner's Office, Cincinnati, Ohio.

Theodore A. Reyman, M.D., Director of Laboratories at Mount Carmel Mercy Hospital, Detroit, Michigan, has held an interest in forensic pathology since his training as a resident, which included sessions at the Wayne County (Michigan) Medical Examiner's Office under Dr. Edward Zawadski. He has continued this interest through a close working relationship with Werner Spitz, M.D., the present Chief Medical Examiner. Dr. Reyman was eager to examine the tissues of Elmer McCurdy when the material was made available by Dr. Thomas Noguchi, bridging the gap between forensic pathology and the study of Egyptian and other mummified bodies that Dr. Reyman has examined in the past as part of the multidisciplinary team under the aegis of the Paleopathology Association.

J. Stanley Rhine received his Ph.D. from the University of Colorado in 1969. He taught anthropology at Colorado State University for 4 years and then assumed the post of Associate Professor at the University of New Mexico in Albuquerque. He is also Associate Curator of Physical Anthropology for the Maxwell Museum of Anthropology, and since 1974 he has been a consultant to the State Medical Investigator. He is certified by the American Board of Forensic Anthropology.

Norman J. Sauer received his Ph.D. degree in 1974 from Michigan State University, where he presently teaches. While most of his research and writing have involved Great Lakes area Native American and European skeletal samples, he has been consulting with law enforcement agencies in Michigan and nearby states for 10 years. He lectures regularly to state and

local agencies about the recovery of and the information that can be gained from decomposed remains. He is a member of the American Academy of Forensic Scientists and a Diplomate of the American Board of Forensic Anthropology.

Sir Sydney A. Smith (d. 1969) received his M.D. at Edinburgh University and was Professor of Forensic Medicine there until assuming Emeritus status in 1953. Over his distinguished career he was a consultant to the Egyptian government in forensic medicine and also to the World Health Organization. He is probably best known for his *Text Book in Forensic Medicine*, first published in 1925 and now in its 10th edition, and for his popular work *Mostly Murder*, published in 1960.

Clyde C. Snow, a founding member of the American Board of Forensic Anthropology, received his M.A. in zoology from Texas Tech and his Ph.D. in physical anthropology from the University of Arizona. He served as part of the consultant team in the review of the Warren Commission investigation into the death of President John F. Kennedy. He has recently retired from the Federal Aviation Administration's Civil Aeromedical Institute, where he conducted extensive research related to aviation safety. Dr. Snow is currently a full-time consultant in forensic physical anthropology.

Richard G. Snyder has an educational background in Physical Anthropology with M.A. and Ph.D. degrees from the University of Arizona. He has done postdoctoral work in dental anthropology and in aerospace medicine at Ohio State University and the USAF School of Aerospace Medicine. He is currently Research Scientist and Head, Biomedical Department, Transportation Research Institute, Institute of Science and Technology, and Professor of Anthropology, Department of Anthropology, The University of Michigan and has held academic appointments at Michigan State University and the Universities of Oklahoma, Chicago, and Arizona. His experience also includes Manager of Biomechanics, Ford Motor Company; Chief, Physical Anthropology Laboratory, Civil Aeromedical Research Institute, Federal Aviation Administration; and Research Anthropologist, Applied Research Laboratory, College of Engineering, University of Arizona. Dr. Snyder is internationally recognized as an authority on human impact tolerances; he has authored over 390 scientific papers and has received many awards. He is a member of numerous aviation, medical, and scientific biological societies, and is Board Certified in Forensic Anthropology.

T. Dale Stewart is currently Anthropologist Emeritus of the National Museum of Natural History. He identified skeletal remains for the Federal Bureau of Investigation for many years while serving as curator of Physical Anthropology at the Smithsonian Institution and has long been recognized

as a distinguished scholar in forensic topics, especially age changes in young American males. Dr. Stewart received his M.D. from the Johns Hopkins Medical School and has conducted major identification seminars. He is a member of the American Anthropological Association, American Academy of Forensic Sciences, National Academy of Sciences, and is a consultant to the American Board of Forensic Anthropology.

Lucile E. St. Hoyme received her graduate education at George Washington University and Oxford University, where she was awarded the doctoral degree in 1963. Currently an emeritus curator at the Smithsonian Institution, she has been active in various phases of physical anthropological research and education. Included among her research interests are human variability, dental pathology, growth and development, and sexual dimorphism in the skeleton. This background in physical anthropology and ability to communicate clearly about the field have served Dr. St. Hoyme well in forensic anthropological consultant roles as well as in the teaching of forensic applications of physical anthropology.

James Stoutamire was a Research Associate in the Department of Anthropology, Florida State University and conducted the field training program in forensic archaeology. He is a professional archaeologist presently employed by the Florida Office of Coastal Management, Department of Environmental Regulation.

Judy Myers Suchey received an M.A. degree in Anthropology at the University of Kansas (1967) and a Ph.D. at the University of California, Riverside (1975). She is a physical anthropologist specializing in human osteology and forensic anthropology. Her major research specialty is skeletal aging. She has taught at California State University, Fullerton since 1969, currently holding the title of Professor. Dr. Suchey has worked on over 200 forensic cases throughout Southern California during the past 12 years while serving on the staff of Coroner's Offices in Los Angeles, Orange, and San Bernardino counties. She is a Fellow of the American Academy of Forensic Sciences, a Diplomate of the American Board of Forensic Anthropology, and an officer of the Board of Forensic Anthropology (Treasurer).

Robert I. Sundick specialized in Physical Anthropology at the University of Toronto, receiving his M.A. degree there in 1967 and his Ph.D. in 1972. His doctoral dissertation was written on human skeletal growth as observed in American Indian populations. Between 1976 and 1978 he lived in Europe, examining Middle Ages European and prehistoric Nubian skeletons for age changes. He is currently investigating the similarities and differences seen in skeletal growth from various population groups. He has been at Western Michigan University since 1969 and is a Professor of Anthropology. He has been a member of the American Academy of Forensic Sciences since 1976

and is now a Fellow of the Academy and a Diplomate of the American Board of Forensic Anthropology.

Douglas H. Ubelaker received his Ph.D. from the University of Kansas in 1973. Since that time he has served as Curator of Physical Anthropology and currently is Chairman of the Department of Anthropology, National Museum of Natural History/Natural Museum of Man, Washington, D.C. Since 1978 he has served as consultant on forensic anthropology for the Federal Bureau of Investigation, Washington, D.C., for which he has prepared over 100 case reports. Dr. Ubelaker's research focuses primarily on problems in New World skeletal biology with special interest in prehistoric demography, bone microscopy, the prehistoric biology of Ecuador, and the excavation and interpretation of prehistoric mortuary sites.

Charles P. Warren holds M.A. degrees in anthropology from both Indiana University (1950) and the University of Chicago (1961). He is currently an Associate Professor of Anthropology in the Department of Anthropology, University of Illinois at Chicago. Professor Warren has done extensive field work in Southeast Asia, both as an ethnographer and as a physical anthropologist employed by the U.S. Department of Defense. He has been awarded a Fulbright Fellowship to the Philippines (1950–1951), a U.S. Public Health Service Grant (1958–1960), a National Science Foundation Science Faculty Fellowship (1963–1964), and the Meritorious Civilian Service Award from the Department of the Army (1975). He is a consultant to the law enforcement agencies in the Chicago Metropolitan region and to the U.S. Army Memorial Affairs Agency, Washington, D.C. He has published a book and a number of articles on the ethnography of Philippine tribal groups and has written extensively in the field of forensic anthropology. His most recent field experiences were in Southeast Asia, where he worked and did field research in Thailand, Viet Nam, and Kampuchea.

Curtis W. Wienker is Associate Professor and Director of the Graduate Program in the Department of Anthropology at the University of South Florida, Tampa. He received an M.A. and Ph.D. from the University of Arizona. He serves as a consultant to medical examiners in the greater Tampa Bay area and maintains a research interest in the population biology of living peoples.

Charles G. Wilber, Ph.D., received his graduate education at the Johns Hopkins University and later at the Air Force School of Aviation Medicine. He is Professor of Zoology and director of the Forensic Science Laboratory at Colorado State University. He has published numerous articles, technical reports, and books dealing with various aspects of forensic biology. He has particularly emphasized traumatic injuries, wound ballistics, and forensic toxicology. Dr. Wilber is qualified as an expert witness in his specialty areas, averaging 12 appearances per year in local, state, and federal courts. He is a

Fellow of the American Academy of Forensic Sciences, the New York Academy of Sciences, and is a member of the American Physiological Society. He is on the editorial board of the *American Journal of Forensic Medicine and Pathology* and edits a series of monographs dealing with environmental studies (Charles C Thomas, Publisher).

Dean V. Wiseley (deceased) was formerly Chief, Forensic Medicine Division, Department of Chief Medical Examiner-Coroner, Los Angeles. He generously gave his time in support of the skeletal age research from 1977 to 1980. In particular, he examined medical records and autopsy reports on all the females in the study.

CONTENTS

Section I

THE ROLE OF THE FORENSIC ANTHROPOLOGIST

The Case for Cooperative Research

Chapter

- | | |
|--|----|
| 1. PERSPECTIVE ON THE
REPORTING OF FORENSIC CASES | 15 |
| T. Dale Stewart | |
| 2. STUDIES IN IDENTIFICATION, NO. 3 | 19 |
| Sir Sydney A. Smith | |
| 3. FORENSIC ANTHROPOLOGY IN NEW MEXICO | 28 |
| J. Stanley Rhine | |

Section II

CIRCUMSTANCES OF DEATH

Exhumation Techniques

- | | |
|--|----|
| 4. FORENSIC ARCHAEOLOGY | 53 |
| Dan Morse, R. C. Dailey, James Stoutamire, and Jack Duncan | |
| 5. PROBLEMS OF BURIAL EXHUMATION,
HISTORICAL AND FORENSIC ASPECTS | 64 |
| Sheilagh T. Brooks and Richard H. Brooks | |
| 6. PERPENDICULAR FORENSIC ARCHAEOLOGY | 87 |
| Lowell J. Levine, Homer R. Campbell, Jr., and J. Stanley Rhine | |

Human vs. Nonhuman Remains

- | | |
|--|----|
| 7. IDENTIFICATION OF NONSKELETONIZED
BEAR PAWS AND HUMAN FEET | 96 |
| J. Michael Hoffman | |

Mass Disasters

- | | |
|---------------------------------------|-----|
| 8. THE BIG THOMPSON FLOOD | 107 |
| Michael Charney and Charles G. Wilber | |

9. IDENTIFICATION OF MILITARY REMAINS:	
Field and Laboratory Problems	113
Charles P. Warren	
<i>Commingling</i>	
10. THE CASE OF THE SEVERED SKULL:	
Individuation in Forensic Anthropology	121
Jane E. Buikstra, Claire C. Gordon, and Lucile St. Hoyme	
<i>Time Since Death</i>	
11. TIME INTERVAL SINCE DEATH: A Difficult Decision	136
William M. Bass	
<i>Burned Remains</i>	
12. BURNED REMAINS	148
Rodger Heglar	
13. IS IT POSSIBLE TO CONSUME A BODY COMPLETELY IN A FIRE?	159
William M. Bass	
<i>Cause of Death</i>	
14. DEATH BY STRANGULATION	
A Forensic Anthropological Case from Wilmington, Delaware	168
J. Lawrence Angel and Peggy C. Caldwell	
15. MANNER OF DEATH:	
Skeletal Evidence of Blunt and Sharp Instrument Wounds	176
Norman J. Sauer	
16. FORENSIC BIOMEDICAL AND ENGINEERING INVESTIGATIONS OF FATAL TRAUMA ATTRIBUTED TO SEAT FAILURE AND ROTATIONAL ACCELERATION IN A LIGHT AIRCRAFT CRASH	185
Richard G. Snyder, Sathya V. Hanagud, Allen M. Jones, Thomas Grubbs, and Patricia McFeeley	

Section III

BIOLOGICAL CATEGORIES

Sex Diagnosis

17. SEX DETERMINATION FROM HUMAN SKELETAL REMAINS:	
A Case of Mistaken Assumption	229
Curtis W. Wienker	

Estimation of age at death: Pre-adult Years

18. SKELETAL AND DENTAL IDENTIFICATION
OF AN ADOLESCENT FEMALE 244
Anthony J. Perzigian and Paul N. Jolly
19. THE OKLAHOMA CITY CHILD DISAPPEARANCES OF 1967:
Forensic Anthropology in the Identification of Skeletal Remains 253
Clyde C. Snow and James L. Luke

Adult Years: Pubic Symphysis

20. SKELETAL AGING OF UNIDENTIFIED PERSONS 278
Judy Myers Suchey, Patricia A. Owings,
Dean V. Wiseley, and Thomas T. Noguchi

Skeletal Microstructure

21. MICROSCOPIC AGING OF HUMAN BONE 298
Ellis R. Kerley

Dental Microstructure

22. ADULT AGE DETERMINATION FROM THE DENTITION 307
Della Collins Cook

Ancestry: Skeletal Metric Determination

23. A FORENSIC TEST CASE FOR A NEW METHOD OF
GEOGRAPHICAL RACE DETERMINATION 329
George W. Gill

Section IV**INDIVIDUAL IDENTIFICATION***Facial Reproductions*

24. PERSONAL IDENTIFICATION: Facial Reproductions 347
Ted A. Rathbun
25. FACIAL REPRODUCTION IN COURT 357
J. Stanley Rhine

Skeletal Attributes

26. THE IDENTIFYING PATHOLOGY 363
William R. Maples
27. THE LIFE AND AFTERLIFE OF ELMER J. MCCURDY:
A Melodrama in Two Acts 371
Clyde C. Snow and Theodore A. Reyman

28. FORENSIC ANALYSIS OF OSSEUS MATERIAL
EXCAVATED AT THE JAMES SITE,
CLAY COUNTY, MISSOURI 380
Michael Finnegan

Section V

PRESENTING EVIDENCE

29. POSITIVE IDENTIFICATION FROM THE
RADIOGRAPHIC COMPARISON OF FRONTAL
SINUS PATTERNS 399
Douglas H. Ubelaker
30. ASHES TO ASHES, DUST TO DUST,
OR WHERE DID THE SKELETON GO? 412
Robert I. Sundick

Author Index 425

Subject Index 431

HUMAN IDENTIFICATION

Section I
THE ROLE OF THE FORENSIC ANTHROPOLOGIST
The Case for Cooperative Research

Forensic Physical Anthropology? Probably very few people have heard of this scientific specialty. Its major focus is upon the identification of human remains in a legal context. Other specialists in the medical and legal fields are also concerned with identification, but physical anthropologists who specialize in skeletal analysis bring a particular perspective to those instances when identification cannot be made with traditional medical and legal means: fingerprints, dental and medical records, or personal recognition. We have developed special methods, skills, a documented data base, and theoretical orientations for the analysis of human remains.

Once a forensic anthropologist has become involved in the collaborative activities dealing with human remains in a legal setting, our purposes and potential contributions need to be made clear to the cooperating participants. Essentially, the forensic anthropologist provides direct physical or circumstantial information from the human remains to allow the designated authority to determine identity of the deceased and the circumstances of death. Since the anthropologist is a consultant, cooperation with law enforcement personnel—forensic pathologists, coroners or medical examiners, forensic odontologists, attorneys, and judicial officials—is essential. Communication and the establishment of responsibility are important aspects of any given case.

As the case studies in this volume illustrate, forensic physical anthropologists can provide service at the discovery site of human remains, determine if the bones are indeed human or not, provide organizational and analytical expertise at mass disasters involving multiple deaths, help to unravel the intricacies when commingling of multiple remains has occurred, and suggest possible time intervals since death. Burned remains can be especially challenging—even so, the incinerated skeleton may frequently provide clues to identity. Cause of death, although ultimately determined by a physician or the courts, may be suggested by the anthropologist from skeletal analysis. Individual identification of a decedant from the probable match with skeletal attributes such as sex, age at death, ancestry or social attribution of race, probable living height, and unique features of the skeletal structure may be made by the legal authorities. Presentation of findings and opinions as an expert witness in court may also be necessary if litigation is involved.