

WINCHESTER STUDIES

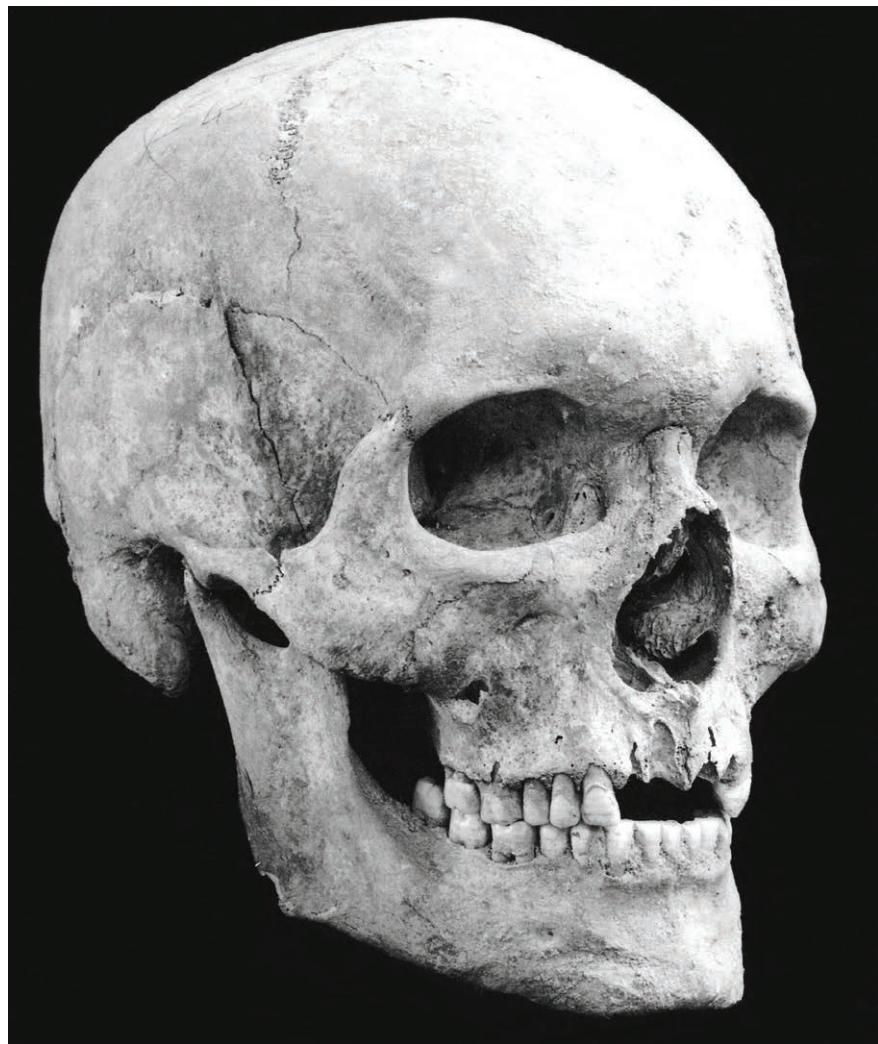
General editor: Martin Biddle



9.i

THE PEOPLE OF EARLY WINCHESTER





A citizen of medieval Winchester. The skull of a robust adult male from a medieval earth grave in the cemetery of Winchester Cathedral.
(CG 1965, MG 688, Final phase 78–80, mid 14th to 15th cent.)

WINCHESTER STUDIES 9.i

THE PEOPLE OF EARLY WINCHESTER

Edited by
CAROLINE M. STUCKERT

With contributions by
Caroline M. Stuckert (Parts 2, 3, and 5),
Martin Biddle and †Birthe Kjølbye-Biddle (Part 1),
and Theya Molleson, †John Price, Rosemary Powers, and Pauline Sheppard (Part 4)

and additional contributions by
Sue Browne, J. L. Macdonald, and Katie Tucker

ARCHAEOPRESS ARCHAEOLOGY



ARCHAEOPRESS PUBLISHING LTD
First and Second Floors
13-14 Market Square
Bicester
OX26 6AD

www.archaeopress.com

ISBN 978-1-80327-014-2
ISBN 978-1-80327-015-9 (e-Pdf)

© Winchester Excavations Committee and Archaeopress 2025

First published in 2017 by Oxford University Press under ISBN 978-0-19-813170-0.



This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

This book is available direct from Archaeopress or from our website www.archaeopress.com

**This study of the People of Early Winchester
was supported by grants and gifts from**

The Lord Ashburton KG
The Avocet Trust
A. J. P Ayres
Charlotte Bonham Carter Charitable Trust
Jane Benson
Julian Benson
Dudley Bryant
Carol Calderari-Bianchi
Felicity Calderari
Giles Clarke
Dr Richard W. Greaves
Hampshire County Council
D. J. Critchley
The Friends of Winchester College
The Headley Trust
Robert Kiln Charitable Trust
Sir Andrew Large
The Linbury Trust
J. L. Macdonald
The Marc Fitch Fund
Members of the Friends of Winchester Studies
Sir Jeremy Morse
The National Science Foundation (USA)
Department of Anthropology, University of Pennsylvania (USA)
The late Richard Petersen and Mrs Margaret Petersen
Julia Sandison
Sir James Scott Charitable Trust
Nigel McNair Scott
St Swithun's School
WARG: Winchester Archaeology and Local History
Chris Webb
Winchester City Council
The Warden and Fellows of Winchester College
The Winchester Excavations Committee (general funds)

General Editor's Preface to the Reprinted and Open Access Edition

Since 2021, volumes in the *Winchester Studies* series have been made available in facsimile of the original out-of-print editions. Developments in digital technologies now enable academic publishing to reach wider audiences with options to read online or print on demand. From the earliest days of the development of technology to enable online publication, we have been exploring options for digitising our volumes, while maintaining close attention to the quality of reproduction, especially of our large scale and complex illustrations. Those familiar with our volumes will understand and appreciate the care that has been taken with the illustrations. The team at Archaeopress have ensured important facets like scale and pagination are maintained throughout each volume. It is only through the expertise, dedication, and enthusiasm of Archaeopress and their team that this attention to detail and accuracy in digital reproduction has been achieved, and for that we are very grateful.

Martin Biddle
March 2023

GENERAL EDITOR'S PREFACE

THE WINCHESTER excavations of 1961–71 began in a wholly *ad hoc* manner in July 1961 in response to the impending construction of a new hotel on the site of the Cathedral Car Park.

There was then no statutory protection for the buried remains of the urban past, and it was entirely due to the efforts of Roger Quirk CB, whose study of the Old and New Minsters had led him to the view that the site of the hotel lay within the New Minster Precinct and might even include the site of the minster church itself, that arrangements were made for an excavation which lasted from July until the end of the year, and beyond during the early stages of construction.

Everything had to be improvised. When a cemetery of tenth- to eleventh-century date was uncovered, it was to Don Brothwell, then one of Dr Jack C. Trevor's group located in the Duckworth Laboratory in the Department of Archaeology and Anthropology at Cambridge (where I had graduated that summer) that I naturally turned for study of the physical anthropology of the burials.

As the excavations continued over the following decade, on many sites and on an ever increasing scale, Don Brothwell, who had by then moved to the Department of Anthropology at the British Museum (Natural History), now the Natural History Museum, took the lead role in dealing with the vast quantities of human remains recovered from excavations on the Cathedral Green notably, indeed nobly, assisted by his colleagues, Theya Molleson and Rosemary Powers.

Outside Cambridge, Manchester, and London there were then no major centres for the study of buried human remains in this country, and few people qualified to do the work. The excavation of the Lankhills Roman cemetery in 1967–72 highlighted the problem: no-one could be found to carry out a comprehensive study of the Romano-British skeletons and we were fortunate to obtain the help of Miss Mary Harman to provide the initial aging and sexing of the bodies, essential for the production of the report.

The Department of Anthropology at the University of Pennsylvania in Philadelphia is one of the most distinguished centres for the study of ancient human remains. As recorded in Part 1 (pp. 1–6) it was in 1974 that Connie Stuckert from the Penn department visited Winchester to discuss a possible subject for a doctoral dissertation. In the course of time, in addition to continuing work on her dissertation, she agreed to prepare a full report on the Lankhills skeletons, and eventually took on the editing of this present volume.

Today, with the introduction of fully-funded archaeological investigation of sites threatened by development, a vibrant tradition of palaeoanthropology has developed in this country, resulting in the appearance of an already considerable and constantly increasing number of outstanding publications. The work at Winchester stood on the cusp between the older, amateur tradition by which local doctors were recruited to report on skeletal material and the new world of a highly professional discipline.

Winchester was fortunate from the start in securing the advice and active involvement of Professor Don Brothwell and his colleagues at the Natural History Museum and most fortunate again at a later stage to secure the crucial contribution of Dr Connie Stuckert who has brought to

conclusion this study of the human remains of over 3000 people covering some 1300 years of the population history of an English city, an achievement apparently hitherto unparalleled.

I am particularly grateful to members of the Winchester Research Unit office in Oxford, Katherine Barclay, Clare Chapman, and Francis Morris for their unstinting help in seeing this volume through the press.

Martin Biddle

Encaenia

25 June 2015

Note: the appearance of a volume on human osteology in a series devoted so far mainly to archaeology and history suggested the need for a Glossary, which appears here as Appendix D (pp. 442–56).

EDITOR'S PREFACE

A LONG journey began when I first walked into Martin Biddle's office in the summer of 1974. I could not have foreseen that 40 years later the end result would be this volume. Trained as both an archaeologist and physical anthropologist, at the time I was a young graduate student hunting a research topic that would permit me to use skeletal data as a resource in addressing cultural dynamics. Specifically, I was interested in the seemingly rapid and radical transition from the lifestyle and cultural patterns of a Roman province to that of Anglo-Saxon England. By the early 1970s emerging archaeological data was beginning to present a picture of this culture change that was at variance with aspects of the rather meagre historical record, and infinitely more complex, but no one, at that time, had looked at the composition of the populations involved. Was there truly massive population replacement? Or did the population remain essentially unchanged, indicating far more complex cultural processes at work?

I decided to tackle this question in one region of England, using a variety of statistical techniques and collecting the largest sample of both Roman period and Early Anglo-Saxon skeletons possible at that time in a circumscribed geographic area. Hampshire quickly became the logical place to look. Ultimately I was able to obtain data from over 770 skeletons from nine separate sites, two Romano-British and seven Early Anglo-Saxon. The results of that research, partially funded by grants from the National Science Foundation and the University of Pennsylvania, constitute Part 3 of this volume.

Many people helped along the way, and I am deeply indebted to all of them, named and unnamed. Sadly, some are no longer with us.

Special thanks goes to the General Editor of *Winchester Studies*, Martin Biddle, and the late Birthe Kjølbye-Biddle for unfailing guidance, assistance, and support over four decades and two continents, even when our opinions differed. It has been an incredible collaboration. The project would not have been possible without access to the skeletons themselves, and for this I am grateful to a small army of people including Giles Clarke, Kenneth Qualmann, Sonia Hawkes, Alison Cook, Vera Evison, Audrey Meaney, John Musty, Don Brothwell, Rosemary Powers, Adrien Rance, Fred Aldsworth, Robin Harvey, Leslie Webster, David Rudkin, and Graham Johnson. My assistant in England in 1976–77, Sylvia Meacock, with her combination of manual dexterity and training as a nurse, proved invaluable in sticking skulls back together. Later, after Martin Biddle had invited me to publish the Lankhills bones as part of this volume, I returned to Winchester several times to investigate the skeletal pathology of the Lankhills sample, now presented here in Part 2, which had not been part of my original project. Michael Zimmerman M.D., Ph.D. and Morrie Kricun M.D. both provided essential diagnostic assistance and information, although I must accept any errors as mine alone. Thanks also go to the University of Southampton, Einstein Medical Center in Philadelphia, and to Dr David Wilson, St Luke's Hospital, Oxford, for the many radiographs needed for this study. A trans-Atlantic project of this sort would not have been possible without the unflagging support of the Anthropology Department, University of Pennsylvania as well as my doctoral dissertation committee, and also many individuals at both the Winchester Research Unit and the then City Archaeologist's Office, Winchester. My thanks to all of them.

Work on the Cathedral Green Anglo-Saxon and medieval skeletons proceeded along a completely different track, involving a separate group of researchers initially led by Don Brothwell and subsequently brought to completion by Theya Molleson. An overview of the history of this project is given in Part 1.

Delays in publishing a project of this magnitude are perhaps inevitable, but also create issues that must be addressed. It would be incorrect to assume that because work started 40 years ago, all the data accumulated and methodology employed are both 40 years old and also outdated. This project has been a work in progress, sometimes moving forward, sometimes on hold, for many years. It is true that if we were to design a comprehensive study of this nature today, it would be done somewhat differently, would stress greater consistency in methodology, and would take greater advantage of scientific advances not available until recently. That said, many of the techniques employed in this study are still in use today, and are still valid. As, we believe, are the results.

One of the most significant challenges we have faced is the potential impact on our findings of data from more recent excavations, especially those at Lankhills in 2000–5 and at the other Romano-British cemeteries in Winchester. As new information has become available, we have evaluated and incorporated it as appropriate, and an extended discussion will be found in Part 2. Another challenge has lain in the increasing use of DNA analyses to address questions of population movements in general, and the Romano-British/Anglo-Saxon transition in particular. In England, most of this work has been done in parts of the country other than Hampshire, and has been done using modern populations as the sample, not skeletal material from the period. It of course raises the question of whether conclusions based on older statistical techniques continue to be valid. Part 3 discusses this question in some detail. At present, DNA studies do not appear to contradict our results.

Long delays in publication have also opened up new opportunities to include important work in this volume that would not have been possible ten or twenty years ago. Katie Tucker has stepped forward with a new and greatly improved forensic analysis of the Lankhills decapitations. Jock Macdonald has provided an updated and revised interpretation of the ritual involved, which has been able to incorporate all the decapitations from Lankhills, including those from the later excavations, and has also been able to take advantage of the data provided by physical anthropology.

When I agreed in 2008 to edit the entire volume, I realized that a very large task lay before me. It could not have been accomplished without the help of Theya Molleson in bringing Part 4 into final form, for which I am most thankful indeed. Dr Janet Monge, Department of Anthropology, University of Pennsylvania, and Dr Hans-Chr. Petersen, Department of Statistics, University of Southern Denmark, provided timely assistance on several occasions. I also owe thanks to Helen Rees of the Winchester City Museums for all sorts of assistance, and most especially to Katherine Barclay of the Winchester Research Unit. She was a remarkable source of information and advice, a problem-solver extraordinaire, and she saved my sanity more than once. To these, and the many other research and excavation teams, staff, and volunteers who all touched this project at one time or another, my deepest thanks.

Caroline M. Stuckert

*Newtown Square, Pennsylvania
5 June 2014*

CONTENTS

List of illustrations	xiii
List of tables	xxi
List of abbreviations	xxviii
List of references	xxxi

PART 1. INTRODUCTION *by* Martin Biddle

Introduction	1
Concept	1
The origin, growth, and completion of this study	4
The outcome: a summary	6

PART 2. ROMANO-BRITISH POPULATIONS FROM LANKHILLS AND OTHER CEMETERIES IN WINCHESTER *by* Caroline M. Stuckert

1. Introduction	7
2. Demography	16
3. Physical characteristics	48
4. Dentition	72
5. Pathology	91
6. Lankhills decapitations revisited <i>by</i> J. L. Macdonald	147
7. Catalogue of the burials from the Lankhills 1967–1972 excavations	173

PART 3. THE TRANSITION FROM ROMANO-BRITISH TO EARLY ANGLO-SAXON IN HAMPSHIRE *by* Caroline M. Stuckert

1. Introduction	205
2. Archaeological background: the Early Anglo-Saxon sites	206
3. Demography	212
4. Physical characteristics	218
5. Dentition	238
6. Discussion	255

**PART 4. ANGLO-SAXON AND MEDIEVAL POPULATIONS FROM
THE OLD AND NEW MINSTER AND CATHEDRAL CEMETERIES**
by Theya Molleson, Rosemary Powers, †John Price, and Pauline Sheppard

1. Introduction	261
2. Demography	270
3. Physical variation	285
4. Discontinuous variation and congenital anomalies	303
5. Dental health	324
6. General health	338
7. Injuries	364
8. Conclusions	385

**PART 5. THE POPULATION OF WINCHESTER: A MILLENIUM
OF CONTINUITY AND CHANGE** *by* Caroline M. Stuckert

1. Introduction	391
2. Population continuity and change	392
3. Health and lifestyle	401
4. Discussion	412

APPENDICES

A. Other burial groups found 1961–71 <i>by</i> Martin Biddle and †Birthe Kjølbye-Biddle, with a contribution <i>by</i> Sue Browne	417
B. Statistical methods of determining sex developed for the study of the Hampshire Romano-British and Early Anglo-Saxon skeletal samples <i>by</i> Caroline M. Stuckert	429
C. Grave concordance: Anglo-Saxon and Medieval burials from the Old Minster and Cathedral cemeteries <i>by</i> Caroline M. Stuckert	437
D. Glossary	442

INDEXES

I. Anthropology	457
II. Archaeology and History	468
III. Romano-British graves from Lankhills excavations 1967–72 (LH) and 2000–5 (OA)	471

LIST OF ILLUSTRATIONS

Photographs and radiographs by courtesy of Martin Biddle, Einstein Medical Center (Philadelphia), Jay Erwin, Morrie Kricun, Natural History Museum (London), St Luke's Hospital (Oxford), Caroline M. Stuckert, Katie Tucker, and the University of Southampton.

Line drawings by Simon Hayfield, Rosemary Powers, and Mark Redknap.

Frontispiece. A citizen of medieval Winchester

1.1	Burial sites in England and Hampshire referred to in this volume	2
1.2	Burial sites in Winchester and its suburbs referred to in this volume	3
2.1	Lankhills Romano-British cemetery, excavation 1971, looking east	9
2.2	Lankhills Graves LH 308 (1–3), LH 291, and LH 250, as excavated	10
2.3	Lankhills 1967–72, age and sex distribution of the burials	11
2.4	Mortality distribution, Lankhills 1967–72	25
2.5	Mortality distribution, Lankhills 1967–72, Area W (310–370/90)	27
2.6	Mortality distribution, Lankhills 1967–72, Areas F, E, O (350–410)	27
2.7	Mortality distribution, Lankhills 1967–72 and 2000–5 and Wessex Archaeology excavations combined	36
2.8	Mortality distribution, Victoria Road West	37
2.9	Mortality distribution, Lankhills 1967–72, Area W, Lankhills Areas F, E, O, and Victoria Road West compared	38
2.10	Mortality distribution, males, Lankhills and Victoria Road West compared	38
2.11	Mortality distribution, females, Lankhills and Victoria Road West compared	38
2.12	Mortality distribution using Oxford Archaeology age categories, all Lankhills excavations combined, compared to Victoria Road West	40
2.13	Cranial indices, Lankhills 1967–72 excavations	54
2.14	Male and female statures, Lankhills 1967–72 excavations	54
2.15	Cranial indices, Lankhills 1967–72 and 2000–5 excavations combined	56
2.16	Statures, Lankhills 1967–72 and 2000–5 excavations combined	57
2.17	Mean cranial indices, selected Romano-British sites	64
2.18	Mean stature in centimetres, selected Romano-British sites	68
2.19	Caries in the right M ₁ . LH 46, child	74
2.20	Abscess of the left M ₁ . LH 352, male	77
2.21	Ante mortem loss of dm ² . LH 46, child	77

2.22	LEH, upper incisors and canine, LH 112, male	79
2.23	Mandibular dental crowding and rotation. LH 365, female	80
2.24	Impacted lower right canine. LH 97, male	80
2.25	Probable congenital absence, upper central and lateral incisors. LH 410, male	81
2.26	Healed fracture, left nasal bone. LH 119, female	93
2.27	Healed fracture, right orbit. LH 231, intrusive skull of a male	93
2.28	Femoral neck fracture. LH 226, male	93
2.29	Healed misaligned fracture of the right clavicle. LH 161, male	94
2.30	Well-aligned healed fracture of the right tibia. LH 47, male	94
2.31	Fragments of four fractured ribs. LH 349, male	95
2.32	Healed spiral fracture, distal right tibia, with ankylosis to the fibula. LH 410, male	95
2.33	Dislocation, right shoulder. LH 389, adult	96
2.34a–b	Myositis ossificans traumatica. LH 94, male, and LH 374, female	97
2.35	Possible osteochondritis dessicans. LH 20, male	98
2.36a–b	Transmetatarsal amputation, right forefoot. LH 299, male	99
2.37	Amputation of phalanges, left hand. LH 427, male	100
2.38	Decapitation. Chop through body and arch of C4. LH 297, female	101
2.39	Decapitation. Incised cuts to right superior facet of C4. LH 348, adolescent	102
2.40	Decapitation. Chop through inferior border of mandible. LH 379, female	103
2.41	Decapitation. Incised cuts into the anterior body of C5. LH 445, female	104
2.42	Traumatic osteoarthritis, right knee. LH 218, female	107
2.43	DISH of T6–12. LH 299, male	111
2.44	Mild cribra orbitalia of the left orbit. LH 107, male	113
2.45	Possible rickets, right femur. LH 154, child	117
2.46	Hyperostosis frontalis interna. LH 249, female	118
2.47a–b	Periostitis of the tibia. LH 192, male, and LH 252, ?male	120
2.48	Ethmoid osteoma, nasal aperture. LH 436, ?female	122
2.49a–c	Subarticular cyst, right scapula. LH 283, male	123
2.50	Partial left-side ankylosis of a sixth lumbar vertebra to the sacrum. LH 104, male	124
2.51	Spina bifida occulta of the sacrum. LH 304, male	125
2.52a–b	Possible congenital bilateral hip dysplasia. LH 66, female	126
2.53	Distribution of M3 agenesis, other dental agenesis, and Carabelli's cusp, Lankhills 1967–72	131

2.54	Distribution of dental crowding, rotation, and retained deciduous dentition, Lankhills 1967–72	131
2.55	Distribution of skeletal anomalies, Lankhills 1967–72	132
2.56	Groupings of possibly related individuals, Lankhills 1967–72	132
2.57a–b	Poorly aligned, healed fracture, right tibia. LH 204, female	136
2.58	Decapitated burials and associated graves. Lankhills 1967–72 and 2000–5	150
2.59	Decapitations: Association A. LH 427 and LH 400	155
2.60	Decapitations: Association B. LH 451 and LH 447	157
2.61	Decapitations: Association C. LH 441, LH 445, and LH 443	158
2.62	Decapitations: Association D. LH 120 and LH 37	159
2.63	Decapitations: Association E. OA 1329, OA 1317, and OA 1180	161
2.64	Decapitations: Association F. OA 1515, OA 1373, and OA 1440	162
2.65	Decapitations: Association G. LH 348 and LH 347	163
2.66	Decapitations: Association H. LH 379 and LH 378	164
2.67	Decapitations: possible Association J. OA 1150	166
2.68	Decapitations: possible Association K. OA 110	167
2.69	Markings on a dish from grave LH 250	172
2.70	Possible vertebral osteoarthritis, cremation burial LH 359, adult	201
2.71	Fragments of animal bone mixed in with a cremation burial LH 359	202
2.72	Possibly pathological foramen completely penetrating a metatarsal. Cremation burial LH 420, adult	202
2.73	Rust stains from hobnails on bone fragments from cremation burial LH 454, ?child	202
3.1	Chronological relationship of Romano-British and Early Anglo-Saxon cemeteries in Hampshire	207
3.2	Mortality distributions, Pooled Roman and Combined Saxon samples from Hampshire	215
3.3	Mortality distributions, males, Pooled Roman and Combined Saxon samples from Hampshire	216
3.4	Mortality distributions, females, Pooled Roman and Combined Saxon samples from Hampshire	216
3.5	Mean statures, Pooled Roman and Early Anglo-Saxon samples	220
3.6	Cranial indices, Pooled Roman sample	222
3.7	Cranial indices, Combined Saxon sample	222
3.8	Cranial indices, males, Pooled Roman and Combined Saxon samples	222
3.9	Cranial indices, females, Pooled Roman and Combined Saxon samples	222

4.1	Winchester Cathedral: the excavation of Old Minster, looking east, 1966	262
4.2	Anglo-Saxon burials at Old Minster and the Anglo-Saxon charnel	263
4.3	Winchester Cathedral: the excavation of medieval 'cist' graves, looking north, 1966	264
4.4	Medieval burials in the cemetery to the north of the cathedral, 1966	268
4.5	Grading of attrition of the occlusal surface of the molar teeth	269
4.6	Cumulative curves of attrition grades on the upper molar teeth for the Winchester populations	274
4.7	Cumulative curves of attrition grades on the lower molar teeth for the Winchester populations	274
4.8	A late medieval sickroom. Manuscript illumination	276
4.9	Burial in the time of plague in the Middle Ages. Manuscript illumination	277
4.10	Sex distribution, Anglo-Saxon and medieval adult samples, Cathedral Green, Winchester	281
4.11	Age distribution, Anglo-Saxon samples, Cathedral Green, Winchester	281
4.12	Age distribution, Anglo-Saxon and medieval graves, Cathedral Green, Winchester	283
4.13	Cranial index, Anglo-Saxon graves, Cathedral Green, Winchester	292
4.14	Cranial index, Anglo-Saxon charnel, Cathedral Green, Winchester	292
4.15	Cranial index, medieval earth graves, Cathedral Green, Winchester	292
4.16	Cranial index, medieval cist graves, Cathedral Green, Winchester	292
4.17	Stature, Anglo-Saxon graves, Cathedral Green, Winchester	295
4.18	Stature, medieval earth graves, Cathedral Green, Winchester	295
4.19	Stature, medieval cist graves, Cathedral Green, Winchester	295
4.20	General canonical analysis of selected Anglo-Saxon and medieval groups, males	298
4.21	General canonical analysis of selected Anglo-Saxon and medieval groups, females	298
4.22	Canonical analysis of a series of cranial vault measurements for Winchester samples and comparative groups of males	298
4.23	Canonical analysis of a series of cranial vault measurements for Winchester samples and comparative groups of females	298
4.24	Occipital and cranial base variation in males	299
4.25	Occipital and cranial base variation in females	299
4.26	Fronto-parietal variation for Winchester and comparative groups, males	300
4.27	Upper facial variation for Winchester and comparative groups, males	300
4.28	Upper facial variation for Winchester and comparative groups, females	300

4.29	Variation in the mandible for Winchester and comparative groups, males	301
4.30	Variation in the mandible of the Anglo-Saxon and medieval females	301
4.31	Metopic suture. ASC Skull 938, adult	304
4.32	Bregmatic ossicle. MG 340, male	306
4.33a-j	Tracings of bregmatic ossicles recorded in the adult Winchester Cathedral Green samples	307
4.34	Wormian ossicles in the lambdoid suture. ASC Skull 939B, male	308
4.35	Epipteris ossicles around the spheno-parietal suture and a parietal notch bone. ASC Skull 938, adult	309
4.36	Epipteris ossicle. MG 340, male	310
4.37	Torus palatinus and torus maxillaris. MG 297, male	310
4.38a-g	Dental anomalies in seven Anglo-Saxon and medieval skulls	312
4.39a-d	Agenesis and other dental anomalies in four Anglo-Saxon and medieval skulls	313
4.40a-j	Dental crown and root anomalies in ten Anglo-Saxon and medieval teeth	314
4.41a-b	Shovel-shaped incisors. ASG 783, male, and ASG 874, adult	315
4.42	Stafne's defect. Unnumbered earth grave, medieval	316
4.43a-d	Degrees of vertebral clefting and spina bifida of the sacrum	317
4.44	Reconstructed foot of an Anglo-Saxon with microdactyly of the first metatarsal. ASG 940, male	319
4.45	Hydrocephalus. DCN 903, Anglo-Saxon child, c.6½ years	320
4.46	Diaphysial aclasia. ASG 932. Child, c.3 years	321
4.47	Frequency of metopism and lambdoid bones	322
4.48	Frequency of torus palatinus and torus mandibularis	323
4.49	Principal components analysis of a series of non-metric traits in early southern English groups	323
4.50	Comparison of molar attrition rates for Anglo-Saxon and medieval samples from Cathedral Green, Winchester	326
4.51	Occlusal caries, right M ¹ . MG 340, male	326
4.52	Caries in the left PM ² and M ¹ . MG 205, male	329
4.53	Relative frequencies of caries in the Winchester Cathedral Green samples	329
4.54	Occlusal caries distribution and frequency in the Winchester Cathedral Green samples	331
4.55	Relative frequencies of pulp exposure in the Winchester Cathedral Green samples by tooth position (1-8)	331
4.56a-b	Apical abscesses. MG 271, male, and MG 269, male	332
4.57	Abscess distribution and frequency in the Winchester Cathedral Green samples	332

4.58a-c	Ante mortem tooth loss in three medieval mandibles	333
4.59	Ante mortem loss of teeth in the Winchester Cathedral Green samples	334
4.60	Dentistry in a medieval illumination	334
4.61	Periodontal disease and wear. MG 846, male	337
4.62	Rickets in the leg bones of a six-year-old medieval child from an unnumbered burial	339
4.63a-d	Four examples of different degrees of <i>cribra femoris</i> in subadults and adults. Unprovenanced	340
4.64	Common sites for soft tissue calcifications	341
4.65	Ankylosis of left elbow, presumably the result of an infective arthritis. ASG 324, female	342
4.66	Possible active tuberculosis. MG 389, adolescent	343
4.67	Radiograph of probable spinal tuberculosis (Pott's disease). MG 890, adolescent	344
4.68a-b	Chronic osteomyelitis of the tibia in two medieval males	345
4.69	Resorption of the nasal spine in leprosy. MG 854, male	346
4.70a-e	Non-specific periostitis in adult tibiae. Cathedral Green, unprovenanced	348
4.71a-b	Extreme proliferative periostitis of the left tibia and fibula, with radiograph. Cathedral Green, unprovenanced medieval adult	350
4.72a-b	Osteoarthritis of the joints from an Anglo-Saxon charnel adult, and an unstratified medieval adult	353
4.73a-b	Possible rheumatoid disease of the foot (MG 702, female) and fusion of joints (MG 312, male)	354
4.74a-f	Degenerative changes in the adult femur	355
4.75	Osteoarthritis of the knee. Unprovenanced adult	356
4.76a-b	Osteoarthritis of the shoulder (ASG 295, female) and spine (unprovenanced)	357
4.77	Hallux valgus, commonly called 'bunions'. Unstratified medieval, adult	358
4.78a-b	Defects of the vertebrae. Unprovenanced, adult	358
4.79a-b	Diffuse idiopathic skeletal hyperostosis (DISH) in the spine. Anglo-Saxon charnel, adult, and unstratified medieval, adult	359
4.80	Diffuse idiopathic skeletal hyperostosis (DISH) in the spine. Anglo-Saxon charnel, adult	360
4.81	Atrophied thumb, medieval priest. MG 898, male	360
4.82a-b	Osteitis deformans (Paget's disease). ASC skull 734, adult, and unstratified medieval, adult	361
4.83	Osteoma on the frontal bone. MG 216, male	362
4.84a-b	Possible metastatic carcinoma. CACP 1961, G 30, Anglo-Saxon, juvenile	363

4.85a-d	Healed blade cuts on the skull. ASG 44, male, ASC skull 117, male, and unnumbered skull from a medieval earth grave	366
4.86a-b	Healed cranial injuries. ASC skull 120A, male, and ASG 449, male	367
4.87a-b	Unhealed (probably fatal) cranial injuries. ASG 417, male, and CG 1966, Tr. XXVII (19), male	368
4.88	Cranial injuries showing no signs of healing. ASC Skull 775, male	368
4.89	The murder of Archbishop Thomas Becket in a medieval illumination	369
4.90	Two 'crater' lesions on the sagittal suture immediately posterior to bregma. ASC Skull 573, male	370
4.91	'Crater' lesion, lateral view, ASC Skull 950, male	370
4.92	Radiograph of the 'crater' lesion from the same individual	370
4.93	Variations in position of 'crater' lesions in the top of the skull, Cathedral Green samples	371
4.94	Anglo-Saxon helmet from Benty Grange, Monyash, Derbyshire	371
4.95a-e	Healed fractures of the lower leg, Cathedral Green samples	374
4.96	Distribution of sites of fractures, including possible blade injuries	375
4.97a-b	Complications of fractures. MG 171, male, and MG 905, female	375
4.98a-b	Healed compound fracture of the right femur. MG 1146, female	376
4.99	Unset or poorly set healed fracture of the right tibia. Unnumbered medieval, male	377
4.100a-g	Healed fractures of the forearm, Cathedral Green samples	378
4.101a-c	Colles' fractures in the radius. MG 367, male, an unstratified medieval adult, and Anglo-Saxon charnel, adult	379
4.102a-b	Healed fractures of the humerus. MG 159, male, and ASG 600, male	379
4.103a-b	Badly healed fracture of the right tibia and fibula. Unnumbered medieval earth grave, adult	380
4.104	Representation of a knee crutch after Hieronymous Bosch	380
4.105a-b	Fracture and dislocation of the right ankle joint. Unstratified medieval, adult	381
4.106a-c	Dislocation of a major joint. MG 876, adult female	382
4.107	Evidence of stress and injury to postcranial bones. ASG 295, female, and ASG 460, female	382
4.108a-b	Dislocation of the left elbow and injury to the hand. MG 198, female	383
4.109	Radius and ulna showing amputation of right hand. MG 184, female	383
4.110	Standard deviations of cranial length v. cranial breadth for Winchester Cathedral Green samples and comparative English samples	387
4.111	Mean male statures v. mean female statures for Winchester Cathedral Green samples and comparative English samples	387

4.112	Mean platymeric indices v. mean platycnemic indices for Winchester Cathedral Green samples and comparative English samples	389
4.113	Cranial 'shape' v. cranial 'size' for Winchester Cathedral Green samples and comparative English samples	389
5.1	Late Roman Winchester <i>c.350</i>	393
5.2	Early to Mid Anglo-Saxon Winchester, 5th to 8th centuries	394
5.3	Mean stature indices, Roman to medieval	396
5.4	Mean cranial indices, Roman to medieval	396
5.5	Late Saxon Winchester, <i>c.993–1066</i>	398
5.6	Winchester <i>c.1148</i>	399
5.7	Winchester <i>c.1400</i>	404
5.8	Age distributions, Roman to medieval	405
5.9	Dental pathology: Winchester: Romano-British and medieval samples compared	406

LIST OF TABLES

2.1	Skeletal preservation by age and sex, Lankhills excavations, 1967–72	17
2.2	Extra bones found in storage boxes, Lankhills excavations, 1967–72	20
2.3	Mortality distribution, Lankhills excavations, 1967–72	24
2.4	Mortality distribution, Area W (AD 310–370/90), Lankhills excavations, 1967–72	26
2.5	Mortality distribution, Areas F, E, O (AD 350–410), Lankhills excavations, 1967–72	26
2.6	Distribution of ages at death, Lankhills excavations, 1967–72 and Victoria Road West: Wilcoxon's t-test for ordered categories	26
2.7	Age distributions, Lankhills excavations, 1967–72: Gowland and the current study compared	29
2.8	Tests of significance, age and sex distributions, Lankhills excavations, 1967–72: Gowland v. the current study	30
2.9	Adult sex distributions, Lankhills excavations, 1967–72: Gowland and the current study compared	30
2.10	Age distributions, Oxford Archaeology excavations at Lankhills, 2000–5: Oxford Archaeology and the current study compared	31
2.11	Tests of significance, age and sex distributions, Oxford Archaeology excavations at Lankhills, 2000–5 v. the current study	31
2.12	Adult sex distributions, Oxford Archaeology excavations at Lankhills, 2000–5, and the current study compared	32
2.13	Total Lankhills age distributions: Lankhills 1967–72, Lankhills 2000–5, and Wessex Archaeology Lankhills excavations combined	33
2.14	Total Lankhills sex distributions: Lankhills 1967–72, Lankhills 2000–5, and Wessex Archaeology Lankhills excavations combined	33
2.15	Mortality distribution, Lankhills 1967–72 excavations, using Oxford Archaeology age categories	34
2.16	Mortality distribution, Oxford Archaeology excavations, 2000–5	34
2.17	Mortality distribution, Lankhills 1967–72 and 2000–5 excavations combined	35
2.18	Total Lankhills mortality distribution, 1967–72, 2000–5, and Wessex Archaeology excavations combined	35
2.19	Mortality distribution, the Roman cemetery at Victoria Road West	37
2.20	Mortality distribution, Victoria Road West, using Oxford Archaeology age categories	39
2.21	List of selected Roman and sub-Roman sites	42
2.22	Percentages of adults and subadults in selected Romano-British sites	42

2.23	Cranial and mandibular measurements, Lankhills 1967–72 excavations	50
2.24	Postcranial measurements, males, Lankhills 1967–72 excavations	51
2.25	Postcranial measurements, females, Lankhills 1967–72 excavations	52
2.26	T-tests, cranial and mandibular measurements, males v. females, Lankhills 1967–72 and Victoria Road West	53
2.27	T-tests, cranial indices, males v. females, Lankhills 1967–72 and Victoria Road West	53
2.28	Cranial indices, Lankhills 1967–72 and Victoria Road West	54
2.29	T-tests, stature, males v. females, Lankhills 1967–72 and Victoria Road West	54
2.30	Statures in centimetres, Lankhills 1967–72, Lankhills 2000–5, and Victoria Road West	55
2.31	T-tests, cranial indices by sex, Lankhills 1967–72 and Victoria Road West	55
2.32	T-tests, stature by sex, Lankhills 1967–72 and Victoria Road West	55
2.33	Range of cranial indices, Lankhills 1967–72 excavations	55
2.34	Range of cranial indices, Lankhills 1967–72 and 2000–5 excavations combined	56
2.35	Upper facial index, Lankhills 1967–72 excavations	56
2.36	Upper facial index, Lankhills 1967–72 and 2000–5 excavations combined	57
2.37	Cranial height index, Lankhills 1967–72 excavations	57
2.38	Cranial height index, Lankhills 1967–72 and 2000–5 excavations combined	57
2.39	Platymeric index, Lankhills 1967–72 excavations	58
2.40	Platymeric index, Lankhills 1967–72 and 2000–5 excavations combined	58
2.41	Platycnemic index, Lankhills 1967–72 excavations	59
2.42	Platycnemic index, Lankhills 1967–72 and 2000–5 excavations combined	59
2.43	Humerus and radius asymmetry, Lankhills 1967–72 excavations	60
2.44	Humerus and radius asymmetry, Lankhills 1967–72 and 2000–5 excavations combined	60
2.45	Cranial and mandibular measurements, Victoria Road West	61
2.46	T-tests, cranial and mandibular measurements by sex, Lankhills 1967–72 v. Victoria Road West	62
2.47	Cranial indices, all Winchester Romano-British cemetery samples	64
2.48	Stature, all Winchester Romano-British cemetery samples	64
2.49	Mean cranial measurements, five Romano-British sites	66
2.50	Cranial indices, selected Romano-British sites	67
2.51	Mean cranial height indices, selected Romano-British sites	67
2.52	Mean stature in centimetres, selected Romano-British sites	68
2.53	Sexual dimorphism index (DI), selected Romano-British sites	70

2.54	Frequency (TPR) of caries, adults, Lankhills 1967–72	73
2.55	Frequency (TPR) of abscesses, adults, Lankhills 1967–72	75
2.56	Frequency (TPR) of ante mortem tooth loss, adults, Lankhills 1967–72	76
2.57	Congenital absence, M3, adults, Lankhills 1967–72	78
2.58	Presence of linear enamel hypoplasia (CPR), Lankhills 1967–72	78
2.59	Frequency (TPR) of caries, adults, Victoria Road West	83
2.60	Frequency (TPR) of abscesses, adults, Victoria Road West	84
2.61	Frequency (TPR) of ante mortem tooth loss, adults, Victoria Road West	85
2.62	Congenital absence, M3, adults, Victoria Road West	87
2.63	Frequency of dental pathology and M3 agenesis at selected Roman and sub-Roman sites	88
2.64	Enamel hypoplasias in selected Roman and sub-Roman sites	89
2.65	Occurrence of fracture by bone, Lankhills 1967–72	92
2.66	Frequency of fracture by bone, Lankhills 1967–72	92
2.67	Occurrence of vertebral osteophytosis, Lankhills 1967–72	110
2.68	Occurrence of extraspinal osteoarthritis, Lankhills 1967–72	112
2.69	Occurrence of cribra orbitalia by age and sex, Lankhills 1967–72	114
2.70	Frequency (CPR) of cribra orbitalia by age and sex, Lankhills 1967–72	115
2.71	Occurrence of dental and skeletal anomalies listed by burial, Lankhills 1967–72	128
2.72	Frequency of fractures in the skull and long bones, Lankhills 1967–72 and 2000–5 combined	135
2.73	Pathology other than fracture and osteoarthritis, Lankhills 1967–72 and 2000–5	138
2.74	Frequency of cribra orbitalia, Lankhills 1967–72 and 2000–5	139
2.75	Frequency of non-specific periostitis, Lankhills 1967–72 and 2000–5	139
2.76	Lankhills decapitations and associated burials	148
2.77	The Romano-British cemetery at Lankhills: the occurrence of coffins, hobnails, and grave goods in the nine decapitations with associated burials	169
3.1	Mortality distribution, the Saxon 1 sites	213
3.2	Mortality distribution, the Saxon 2 sites	213
3.3	Mortality distribution, Combined Saxon sites	214
3.4	Mortality distribution, Pooled Roman sample	214
3.5	Distribution of ages at death, Wilcoxon's t-test for ordered categories	215
3.6	Mean stature, Pooled Roman and Early Anglo-Saxon samples	220
3.7	T-tests of stature, males v. females, Pooled Roman and Early Anglo-Saxon samples	220
3.8	Sexual dimorphism index (DI), Roman and Early Anglo-Saxon samples	220

3.9	T-tests of stature by sex, Pooled Roman and Early Anglo-Saxon samples	221
3.10	Cranial indices, Pooled Roman and Early Anglo-Saxon samples	221
3.11	T-tests of cranial indices, males v. females, Pooled Roman and Early Anglo-Saxon samples	221
3.12	T-tests of cranial indices by sex, Pooled Roman and Early Anglo-Saxon samples	223
3.13	Cranial and mandibular measurements, Pooled Roman sample	223
3.14	Cranial and mandibular measurements, Saxon 1 sample	224
3.15	Cranial and mandibular measurements, Saxon 2 sample	225
3.16	Cranial and mandibular measurements, Combined Saxon sample	226
3.17	T-tests of cranial and mandibular measurements, males v. females, Pooled Roman and Early Anglo-Saxon samples	227
3.18	T-tests of cranial and mandibular measurements, males, Pooled Roman and Early Anglo-Saxon samples	228
3.19	T-tests of cranial and mandibular measurements, females, Pooled Roman and Early Anglo-Saxon samples	229
3.20	Stepwise multivariate discriminant functions, cranial metric traits, Pooled Roman and Early Anglo-Saxon samples	230
3.21	Non-metric traits scoring system	230
3.22	Cranial non-metric traits, Pooled Roman sample, distribution of observations	231
3.23	Cranial non-metric traits, Saxon 1 sample, distribution of observations	232
3.24	Cranial non-metric traits, Saxon 2 sample, distribution of observations	233
3.25	Cranial non-metric traits, Combined Saxon samples, distribution of observations	234
3.26	Cranial non-metric trait frequencies, Pooled Roman and Early Anglo-Saxon samples	235
3.27	Univariate chi-square tests of significance, cranial non-metric traits, males v. females, Pooled Roman and Early Anglo-Saxon samples	235
3.28	Univariate chi-square tests of significance by sex, cranial non-metric traits, Pooled Roman and Early Anglo-Saxon samples	236
3.29	Multivariate analyses of cranial non-metric traits, Pooled Roman and Early Anglo-Saxon samples	237
3.30	Frequency (TPR) of caries in adults, Pooled Roman sample	239
3.31	Frequency (TPR) of abscesses in adults, Pooled Roman sample	240
3.32	Frequency (TPR) of ante mortem tooth loss in adults, Pooled Roman sample	241
3.33	Frequency of congenital absence, M3, adults, Pooled Roman sample	242
3.34	Frequency (TPR) of caries in adults, Saxon 1 sample	243
3.35	Frequency (TPR) of caries in adults, Saxon 2 sample	244
3.36	Frequency (TPR) of caries in adults, Combined Saxon sample	245

3.37	Frequency (TPR) of abscesses in adults, Saxon 1 sample	246
3.38	Frequency (TPR) of abscesses in adults, Saxon 2 sample	247
3.39	Frequency (TPR) of abscesses in adults, Combined Saxon sample	248
3.40	Frequency (TPR) of ante mortem tooth loss in adults, Saxon 1 sample	250
3.41	Frequency (TPR) of ante mortem tooth loss in adults, Saxon 2 sample	251
3.42	Frequency (TPR) of ante mortem tooth loss in adults, Combined Saxon sample	252
3.43	Frequency of congenital absence, M3, Adults, Saxon 1 sample	253
3.44	Frequency of congenital absence, M3, Adults, Saxon 2 sample	253
3.45	Frequency of congenital absence, M3, adults, Combined Saxon sample	253
4.1	Number of individuals available for study, Cathedral Green, Winchester	279
4.2	Adult:Subadult ratio in the burials represented by the right mandible, Cathedral Green, Winchester	279
4.3	Adult sex distribution based on right mandible or cranium including left maxilla (Anglo-Saxon charnel only), Cathedral Green, Winchester	280
4.4	Age distribution, Anglo-Saxon samples, Cathedral Green, Winchester	282
4.5	Age and sex distribution in individuals represented by the right mandible, Anglo-Saxon graves, Cathedral Green, Winchester	282
4.6	Age and sex distribution in individuals represented by the right mandible, medieval earth graves, Cathedral Green, Winchester	283
4.7	Age and sex distribution in individuals represented by the right mandible, medieval cist graves, Cathedral Green, Winchester	284
4.8	Cranial measurements in millimetres, males from Anglo-Saxon graves, Cathedral Green, Winchester	286
4.9	Cranial measurements in millimetres, females from Anglo-Saxon Graves, Cathedral Green, Winchester	287
4.10	Cranial measurements in millimetres, males from the Anglo-Saxon charnel, Cathedral Green, Winchester	288
4.11	Cranial measurements in millimetres, females from the Anglo-Saxon charnel, Cathedral Green, Winchester	289
4.12	Cranial measurements in millimetres, males from medieval earth and cist graves, Cathedral Green, Winchester	290
4.13	Cranial measurements in millimetres, females from medieval earth and cist graves, Cathedral Green, Winchester	291
4.14	Postcranial measurements in millimetres, males from Anglo-Saxon graves, Cathedral Green, Winchester	293
4.15	Postcranial measurements in millimetres, females from Anglo-Saxon graves, Cathedral Green, Winchester	293

4.16	Postcranial measurements in millimetres, males from the Anglo-Saxon charnel, Cathedral Green, Winchester	293
4.17	Postcranial measurements in millimetres, females from the Anglo-Saxon charnel, Cathedral Green, Winchester	294
4.18	Postcranial measurements in millimetres, males from medieval earth and cist graves, Cathedral Green, Winchester	294
4.19	Postcranial measurements in millimetres, females from medieval earth and cist graves, Cathedral Green, Winchester	294
4.20	Stature, males and females, Cathedral Green, Winchester	295
4.21	Samples used for multivariate analysis in Chapter 3 (Illus. 4.20–4.30), Chapter 4 (Illus. 4.47–4.49), and Chapter 8 (Illus. 4.110–4.113)	296
4.22	Percentage frequencies of non-metric traits, Cathedral Green, Winchester	305
4.23	Hypodontia (agenesis) in the samples from Cathedral Green, Winchester	311
4.24	Third molar agenesis, males and females, Cathedral Green, Winchester	311
4.25	Vertebral clefts in selected British populations	318
4.26	Sternal anomalies, Cathedral Green, Winchester	318
4.27	Molar attrition grades, Cathedral Green, Winchester	325
4.28a	Dental pathologies: caries and pulp exposure, total percentage of occurrences for tooth positions 1–8, Cathedral Green, Winchester	327
4.28b	Dental pathologies: ante mortem loss and abscesses, total percentage of occurrences for tooth positions 1–8, Cathedral Green, Winchester	328
4.29a	Frequency (TPR) of ante mortem loss and apical abscesses, Cathedral Green, Winchester	330
4.29b	Frequency (TPR) of caries and pulp exposure, Cathedral Green, Winchester	330
4.30	Significance tests of dental pathology percentages: upper and lower combined, male and female combined, Cathedral Green, Winchester	335
4.31	Frequency (CPR) of periodontal disease, Cathedral Green, Winchester	335
4.32	Observed occurrences of periostitis, Cathedral Green, Winchester	347
4.33	Osteoarthritis by joints, Cathedral Green, Winchester	351
4.34	Cut marks and fractures of the skull, Cathedral Green, Winchester	365
4.35	‘Crater’ lesions on the skull, Cathedral Green, Winchester	365
4.36	Injuries to postcranial bones, Cathedral Green, Winchester	372
4.37	Major age contrasts in excavated Anglo-Saxon and medieval samples	386
4.38	Sex ratios in excavated Anglo-Saxon and medieval samples	386
5.1	Stature in centimetres and sexual dimorphism, Winchester Romano-British and medieval samples	406

5.2	Percentages of dental pathology, Winchester Romano-British and medieval samples	406
5.3	Comparison of study samples with national samples	414
A.1	Adult:Immature ratios in samples from Roman, Anglo-Saxon, and medieval sites in or near Winchester	424
A.2	Percentage age distribution in samples from Winchester	424
A.3	Percentage age distribution, adults 17-45 years, Winchester samples	425
A.4	Percentage sex distribution by age, Winchester samples	425
A.5	Stature in metres, sites in or near Winchester	426
A.6	Cranial indices, samples from Winchester	427
A.7	Frequency of metopism at sites in or near Winchester	427
A.8	Oral pathology in samples from Winchester	428
B.1	Sexing with discriminant functions: code numbers assigned to variables	430
B.2	Test designations for discriminant functions	430
B.3	Discriminant functions, Roman sample	433
B.4	Discriminant functions, Saxon 1 sample	434
B.5	Discriminant functions, Saxon 2 sample	435

LIST OF ABBREVIATIONS

<i>Arch J</i>	<i>Archaeological Journal</i>
<i>Am J Phys Anthropol</i>	<i>American Journal of Physical Anthropology</i>
<i>Am Antiq</i>	<i>American Antiquity</i>
<i>Ann Eugen</i>	<i>Annals of Eugenics</i>
<i>Antiq J</i>	<i>Antiquaries Journal</i>
A-P	Anterior-posterior: used e.g. to define shaft diameter of long bones
ASC skull	Anglo-Saxon Charnel skull from Cathedral Green
ASG	Anglo-Saxon Grave: designation for Anglo-Saxon burials at Cathedral Green
BABAO	British Association for Biological Anthropology and Osteoarchaeology
BAR	British Archaeological Reports
<i>Brit Dent J</i>	<i>British Dental Journal</i>
<i>Brit J Radiol</i>	<i>British Journal of Radiology</i>
CACP	Cathedral Car Park: site code used for burials found at excavations at this site in Winchester in 1961
<i>Caries Res</i>	<i>Caries Research</i>
CBA	Council for British Archaeology
CG	Cathedral Green: site code used for the Anglo-Saxon and medieval cemeteries of the Old Minster, New Minster, and the Norman and later cathedral in Winchester in 1962-70
CI	Cranial Index
<i>Clin Radiol</i>	<i>Clinical Radiology</i>
CPR	Crude Prevalence Rate
DCN	Data Code Number: used by the British Museum (Natural History) team to reference records of their work on individual bodies from the Anglo-Saxon and post-Conquest cemeteries on the Cathedral Green, Winchester
<i>Dent Rec</i>	<i>Dental Record</i>
DF	Degrees of freedom
DI	Dimorphism Index (stature)
DISH	Diffuse Idiopathic Skeletal Hyperostosis
dm	deciduous molar: lower case indicates immature dentition (Scheuer and Black, 2004, 149)
DNH	Dorset Natural History and Archaeological Society
<i>Drug Develop Res</i>	<i>Drug Development Research</i>
EHR	<i>Economic History Review</i>

<i>Genet Epidemiol</i>	<i>Genetic Epidemiology</i>
<i>HB</i>	<i>Human Biology</i>
<i>HFC</i>	Hampshire Field Club and Archaeological Society
<i>I1</i>	Incisor 1
<i>I2</i>	Incisor 2
<i>Indet.</i>	Indeterminate
<i>Intl J Osteoarchaeol</i>	<i>International Journal of Osteoarchaeology</i>
<i>Intl J Paleopath</i>	<i>International Journal of Paleopathology</i>
<i>Israel J Med Sci</i>	<i>Israel Journal of Medical Sciences</i>
<i>JAMA</i>	<i>Journal of the American Medical Association</i>
<i>J Am Acad Orthop Surj</i>	<i>Journal of the American Academy of Orthopaedic Surgeons</i>
<i>J Am Dent Assn</i>	<i>Journal of the American Dental Association</i>
<i>J Anat</i>	<i>Journal of Anatomy</i>
<i>J Archaeol Sci</i>	<i>Journal of Archaeological Science</i>
<i>J Epidemiol Commun H</i>	<i>Journal of Epidemiology and Community Health</i>
<i>J Forensic Sci</i>	<i>Journal of Forensic Sciences</i>
<i>J Hum Evol</i>	<i>Journal of Human Evolution</i>
<i>J Int Assoc Dent Child</i>	<i>Journal of the International Association of Dentistry for Children</i>
<i>J Roy Anthrop Inst</i>	<i>Journal of the Royal Anthropological Institute</i>
<i>LEH</i>	Linear enamel hypoplasia
<i>LH</i>	Lankhills: site code used to designate graves from the 1967–72 excavations
<i>M¹</i>	‘upper’ (i.e. maxillary) Molar 1. Superscript is used similarly for the other upper teeth
<i>M₁</i>	‘lower’ (i.e. mandibular) Molar 1. Subscript is used similarly for the other lower teeth
<i>MASCA</i>	Museum Applied Science Center for Archaeology (University of Pennsylvania)
<i>MG</i>	Medieval Grave: designation for medieval burials at Cathedral Green. Grave numbers 1 to 499 are cist graves; numbers from 500 are earth graves.
<i>MoLAS</i>	Museum of London Archaeological Service (now MOLA)
<i>Mol Biol Evol</i>	<i>Molecular Biology and Evolution</i>
<i>na</i>	Not available
<i>N, n</i>	Number in population <i>or</i> number in sample or ‘set’ under consideration
<i>n/N</i>	Number of cases noted (n) in a larger set (N)
<i>NM</i>	New Minster, Winchester
<i>No.</i>	Number
<i>nr</i>	Not recorded
<i>NS or ns</i>	Not significant

OA	Osteoarthritis when discussing pathology; also, Oxford Archaeology when used to designate graves from the Lankhills 2000–5 excavations
OM	Old Minster, Winchester
P	Probability of statistical significance
PM1	Pre-molar 1, sometimes called PM3
PM2	Pre-molar 2, sometimes called PM4
PPA	Paleopathology Association
<i>Proc Hants FC</i>	<i>Proceedings of the Hampshire Field Club and Natural History Society</i>
<i>Proc Roy Irish Acad</i>	<i>Proceedings of the Royal Irish Academy</i>
<i>Proc Soc Antiq London</i>	<i>Proceedings of the Society of Antiquaries, London</i>
SAA	Society for American Archaeology
S.D.	Standard deviation
SHA	Society for Historical Archaeology
<i>t</i>	The <i>t</i> -statistic
TPR	True Prevalence Rate
Tr.	Trench
TRAC	Theoretical Roman Archaeology Conference
<i>Trans Birmingham Warwickshire Archaeol Soc</i>	<i>Transactions of the Birmingham and Warwickshire Archaeological Society</i>
WANHS	Wiltshire Archaeological and Natural History Society
WHO	World Health Organisation
WS 1	Martin Biddle (ed.), <i>Winchester in the Early Middle Ages</i> , Winchester Studies 1 (Oxford, 1976)
WS 2	D. J. Keene, <i>Survey of Medieval Winchester</i> , Winchester Studies 2, in two parts (Oxford, 1985)
WS 3.i	Martin Biddle and Francis Morris, <i>Pre-Roman and Roman Winchester, Part I: Venta Belgarum</i> , Winchester Studies 3.i (Oxford, in preparation)
WS 3.ii	Giles Clarke, <i>Pre-Roman and Roman Winchester, Part II: The Roman Cemetery at Lankhills</i> , Winchester Studies 3.ii (Oxford, 1979)
WS 4.i	Birthe Kjølbye-Biddle and Martin Biddle, <i>The Anglo-Saxon Minsters of Winchester</i> , Winchester Studies 4.i (Oxford, forthcoming)
WS 5	Martin Biddle, <i>The Brooks and Other Town Sites of Medieval Winchester</i> , Winchester Studies 5 (Oxford, in preparation)
WS 7.ii	Martin Biddle (ed.), <i>Object and Economy in Medieval Winchester</i> , Winchester Studies 7.ii (Oxford, 1990)
WS 8	Martin Biddle (ed.), <i>The Winchester Mint and Coins and Related Finds from the Excavations of 1961–71</i> , Winchester Studies 8 (Oxford, 2012)

LIST OF REFERENCES

Acsadi and Nemeskeri 1970
G. Acsadi and J. Nemeskeri, *History of Human Life Span and Mortality* (Budapest, 1970)

Adams and Sheppard 1978
G. Adams and P. Sheppard, 'Osteological Report', in Collis 1978, 277–9

Adams and Tobler 2007
Geoff Adams and Rebecca Tobler, *Romano-British Tombstones Between the 1st and 3rd Centuries AD*. BAR British Series 437 (Oxford, 2007).

Aldsworth 1979
Fred Aldsworth, 'Droxford Anglo-Saxon Cemetery, Soberton, Hampshire', *Proc Hants FC*, 35 (1979), 93–182

Alvesalo and Portin 1969
L. Alvesalo and P. Portin, 'The inheritance pattern of missing, peg-shaped and strongly mesio-distally reduced upper lateral incisors', *Acta Odontologica Scandinavica*, 27 (1969), 563–75

Anderson 1976
J. R. Anderson, *Muir's Textbook of Pathology*, 10th ed. (Chicago, 1976)

Anderson 1984
J. R. Anderson, *Muir's Textbook of Pathology*, 12th ed. (London, 1984)

Anderson 1998
S. Anderson, 'King Alfred Place, human skeletal remains', Winchester Museums Archive, KAP88 (unpublished)

Angel 1964
J. Lawrence Angel, 'Osteoporosis: thalassemia?', *Am J Phys Anthropol*, 22 (1964), 369–74

Angel 1966
J. Lawrence Angel, 'Porotic hyperostosis, anemias, malarias, and marshes in prehistoric Eastern Mediterranean', *Science*, 153 (1966), 760–63

Angel 1967
J. Lawrence Angel, 'Porotic hyperostosis or osteoporosis symmetrica', in Brothwell and Sandison (eds.) 1967, 378–89

Annable and Eagles 2010
F. K. Annable and Bruce N. Eagles, *The Anglo-Saxon Cemetery at Blacknall Field ('Black Patch'), Pewsey, Wiltshire*, WANHS Monograph no. 4 (Devizes, 2010)

Aristophanes, *Frogs*
See Dover (ed.) 1993

Arnold 1984
C. J. Arnold, *Roman Britain to Saxon England* (Bloomington, 1984)

Barber and Bowsher 2000
Bruno Barber and David Bowsher, *The Eastern Cemetery of Roman London: Excavations 1983–1990*, MoLAS Monograph, 4 (London, 2000)

Barber et al. 1997
Geraldine Barber, Iain Watt, Juliet Rogers, 'A comparison of radiological and palaeopathological diagnostic criteria for hyperostosis frontalis interna', *Int J Osteoarchaeol*, 7 (1997), 157–64

Barnett (ed.) 1981
V. Barnett (ed.), *Interpreting Multivariate Data* (Chichester, 1981)

Bass 1971
William M. Bass, *Human Osteology: a Laboratory and Field Manual* (Columbia, 1971)

Bass 1995
William M. Bass, *Human Osteology: a Laboratory and Field Manual*, 4th ed., Special publication no. 2 of the Missouri Archaeological Society (Columbia, Mo., 1995)

Bassett (ed.) 1992
S. Bassett (ed.), *Death in Towns: Urban Responses to the Dying and the Dead, 100–1600* (New York, 1992)

Berry 1978
A. Caroline Berry, 'Anthropological and family studies on minor variants of the dental crown', in Butler and Joysey (eds.) 1978, 81–98

Berry and Berry 1967
A. Caroline Berry and R. J. Berry, 'Epigenetic Variation in the Human Cranium', *J Anat*, 101 (1967), 361–79

Biddle 1964
Martin Biddle, 'Excavations at Winchester, 1962–63. Second interim report', *Antiq J*, 44 (1964), 188–219

Biddle 1965
Martin Biddle, 'Excavations at Winchester, 1964. Third interim report', *Antiq J*, 45 (1965), 230–61

Biddle 1966
 Martin Biddle, 'Excavations at Winchester, 1965. Fourth interim report', *Antiq J*, 46 (1966), 308–39

Biddle 1967
 Martin Biddle, 'Excavations at Winchester, 1966. Fifth interim report', *Antiq J*, 47 (1967), 251–79

Biddle 1968
 Martin Biddle, 'Excavations at Winchester, 1968. Sixth interim report', *Antiq J*, 48 (1968), 250–84

Biddle 1969
 Martin Biddle, 'Excavations at Winchester, 1968. Seventh interim report', *Antiq J*, 49 (1969), 295–329

Biddle 1970
 Martin Biddle, 'Excavations at Winchester, 1969. Eighth interim report', *Antiq J*, 50 (1970), 277–326

Biddle 1972
 Martin Biddle, 'Excavations at Winchester, 1970. Ninth interim report', *Antiq J*, 52 (1972), 93–131

Biddle 1973
 Martin Biddle, 'Winchester: the development of an early capital', in Jankuhn et al. (eds.) 1973, 229–61

Biddle 1975
 Martin Biddle, 'Excavations at Winchester, 1971. Tenth and final interim report, parts 1 and 2', *Antiq J*, 55 (1975), 96–214, 295–337

Biddle 1983
 Martin Biddle, 'The study of Winchester: archaeology and history in a British town', *Proceedings of the British Academy*, 69 (1983), 299–341

Biddle 1987
 Martin Biddle, 'Early Norman Winchester', in J. C. Holt (ed.) 1987, 311–31

Biddle (ed.) 1976
 Martin Biddle (ed.), *Winchester in the Early Middle Ages*, Winchester Studies 1 (Oxford, 1976)

Biddle (ed.) 1990
 Martin Biddle (ed.), *Object and Economy in Medieval Winchester*, Winchester Studies 7.ii (Oxford, 1990)

Biddle (ed.) 2012
 Martin Biddle (ed.), *The Winchester Mint and Coins and Related Finds from the Excavations of 1961–71*, Winchester Studies 8 (Oxford, 2012)

Biddle and Kjølbye-Biddle 2007
 Martin Biddle and Birthe Kjølbye-Biddle, 'Winchester: from *Venta* to *Wintancæster*', in Gilmour (ed.) 2007, 189–214

Biddle and Morris, in preparation
 Martin Biddle and Francis Morris, *Pre-Roman and Roman Winchester, Part I: Venta Belgarum*, Winchester Studies 3.i (Oxford, in preparation)

Biddle and Pike 1966
 Martin Biddle and A. W. Pike, 'Parasite eggs from medieval pits in Winchester', *Antiquity*, 40 (1966), 293–5

Biddle and Quirk 1962
 M. Biddle and R. N. Quirk, 'Excavations near Winchester Cathedral, 1961', *Arch J*, cxix (1962), 150–94

Birkby 1966
 Walter H. Birkby, 'Evaluation of race and sex identification from cranial measurements', *Am J Phys Anthropol*, 24 (1966), 21–8

Black 1978
 T. K. Black, III, 'A new method for assessing the sex of fragmentary skeletal remains: femoral shaft circumference', *Am J Phys Anthropol*, 48 (1978), 227–31

Blau and Ubelaker (eds.) 2009
 S. Blau and D. H. Ubelaker (eds.), *Handbook of Forensic Anthropology and Archaeology* (Walnut Creek, 2009)

Boddington 1982
 A. Boddington, 'The methods of palaeodemography. A case study of Later Anglo-Saxon England', manuscript of 1st draft (unpub., 1982)

Boddington 1996
 A. Boddington, *Raunds Furnells, The Anglo-Saxon Church and Churchyard* (London, 1996)

Bonsall 2011
 Laura Bonsall, 'Fracture trauma in a late Roman population from Winchester (*Venta Belgarum*), Hampshire, UK', unpublished manuscript based on paper presented at the 13th Annual Conference, BABAQ (Edinburgh, 2011)

Booth et al. 2010
 Paul Booth, Andrew Simmonds, Angela Boyle, Sharon Clough, H. E. M. Cool, and Daniel Poore, *The Late Roman Cemetery at Lankhills, Winchester: Excavations 2000–2005*. Oxford Archaeology Monograph No. 10 (Oxford, 2010)

Boyleston et al. 2000
 A. Boyleston, C. J. Knusel, C. A. Roberts, 'Investigation of a Romano-British rural ritual in Bedford, England', *J Archaeol Sci*, 27 (2000), 241–54

Boyleston and Roberts 2004
A. Boyleston and C. Roberts, 'The Roman inhumations', in Dawson 2004, 322–50

Bradlaw 1934
R. V. Bradlaw, 'An inheritance of dwarfed or absent upper lateral incisors in three generations', *Dent Rec*, 54 (1934), 113–18

Brash and Young 1935
J. C. Brash and M. Young, 'The Bidford-on-Avon skulls', *Biometrika*, 27 (1935), 373–87

Brass (ed.) 1971
W. Brass, *Biological Aspects of Demography* (London, 1971)

Brass et al. 1968
W. Brass, A. J. Cole, P. Demeny, D. Heisel, F. Lorimer, A. Romanuk, E. Dewall, *The Demography of Tropical Africa* (Princeton, 1968)

Broadberry et al. 2010
Stephen Broadberry, Bruce M. S. Campbell, Bas van Leeuwen, 'English medieval population: reconciling time series and cross sectional evidence' (Coventry, 2010), <http://www2.warwick.ac.uk/fac/soc/economics/staff/academic/broadberry/wp/medievalpopulation7.pdf>

Brongers 1969
J. A. Brongers, 'Schedeltrepanaties', *Spiegel Historiae*, 4 (1969), 41–6

Brook 1974
A. H. Brook, 'Dental anomalies of number, form and size: their prevalence in British schoolchildren', *J Int Assoc Dent Child*, 5 (1974), 37–53

Brook 1975
A. H. Brook, 'Variables and criteria in prevalence studies of dental anomalies of number, form and size', *Community Dentistry and Oral Epidemiology*, 3 (1975), 288–93

Brothwell 1961
D. R. Brothwell, 'The palaeopathology of early British man: an essay on the problems of diagnosis, and analysis', *J Roy Anthropol Inst*, 91 (1961), 318–44

Brothwell 1965
D. R. Brothwell, *Digging Up Bones* (London, 1965)

Brothwell 1968
D. R. Brothwell, 'The Human remains from Ports Down', in Corney et al. 1968, 36–41

Brothwell 1971
D. R. Brothwell, 'Palaeodemography', in W. Brass (ed.) 1971, 111–30

Brothwell 1972
D. R. Brothwell, *Digging Up Bones*, 2nd ed. (London, 1972)

Brothwell 1981
D. R. Brothwell, *Digging Up Bones*, 3rd. ed. (Ithaca, 1981)

Brothwell (ed.) 1963
D. R. Brothwell (ed.), *Dental Anthropology* (Oxford, 1963)

Brothwell (ed.) 1968
D. R. Brothwell (ed.), *The Skeletal Biology of Earlier Human Populations* (Oxford, 1968)

Brothwell and Krzanowski 1974
Don Brothwell and Wojtek Krzanowski, 'Evidence of biological differences between early British populations from Neolithic to medieval times, as revealed by eleven commonly available cranial vault measurements', *J Archaeol Sci*, 1 (1974), 249–60

Brothwell and Powers 1968
D. R. Brothwell and R. Powers, 'Congenital malformations of the skeleton in earlier man', in Brothwell (ed.) 1968, 173–203

Brothwell and Sandison (eds.) 1967
Don Brothwell and A. T. Sandison, *Diseases in Antiquity, a Survey of the Diseases, Injuries and Surgery of Early Populations* (Springfield, 1967)

Brothwell et al. 2000
D. R. Brothwell, R. Powers, S. Hirst, 'The human biology', in Rahtz et al. 2000, 131–256

Browne 1986
S. Browne, 'Report on the human bone from St. Mary's Abbey, Winchester, Hampshire', Winchester Museums Archive, AVG 81–84 and COE 73 (unpublished, 1986)

Browne 1994
S. Browne, 'Cathedral Close', Winchester Museums Archive, CC90/92 and CC93 (unpublished, 1994)

Browne 2012
S. Browne, 'The third and fourth century burials', in Ottaway et al. 2012, 209–239

Buikstra and Ubelaker (eds.) 1994
Jane E. Buikstra and Douglas H. Ubelaker, *Standards for Data Collection from Human Skeletal Remains*. Arkansas Archaeological Survey Research Series No. 44 (Fayetteville, 1994)

Butler and Joysey (eds.) 1978
 P. M. Butler and K. A. Joysey (eds.), *Development, Function and Evolution of Teeth* (London, 1978)

Capelli et al. 2003
 C. Capelli, N. Redhead, J. Abernethy, F. Gratrix, J. F. Wilson, T. Moen, T. Hervig, M. Richards, M. P. H. Stumpf, P. A. Underhill, P. Bradshaw, A. Shah, M. G. Thomas, N. Bradman, D. B. Goldstein, 'A Y-chromosome census of the British Isles', *Current Biology*, 13 (2003), 979–84

Carey 2012
 Nessa Carey, *The Epigenetics Revolution: How Molecular Biology is Rewriting Our Understanding of Genetics, Disease and Inheritance* (Chichester, 2012)

Carman (ed.) 1997
 J. Carman (ed.), *Material Harm: archaeological studies of war and violence* (Glasgow, 1997)

Carson 2006a
 E. Ann Carson, 'Maximum likelihood estimation of human craniometrics heritabilities', *Am J Phys Anthropol.*, 131 (2006), 169–80

Carson 2006b
 E. Ann Carson, 'Maximum-likelihood variance components analysis of heritabilities of cranial nonmetric traits', *HB*, 78 (2006), 383–402

Carter 1977
 C. O. Carter, *Human Heredity*, 2nd ed. (New York, 1977)

Carver (ed.) 1992
 Martin Carver (ed.), *The Age of Sutton Hoo: The Seventh Century in North-Western Europe* (Woodbridge, 1992)

Cave 1956
 A. J. E. Cave, 'Appendix C. Report on the human remains from Snell's Corner, Horndean, Hampshire', in Knocker 1956, 148–70

Chen (ed.) 1973
 C. L. Chen (ed.), *Disaster in Bangladesh, Health Crises in a Developing Nation* (London 1973)

Chenery et al. 2010
 C. Chenery, J. A. Evans, A. Lamb, G. Müldner, 'Oxygen and strontium isotope analysis', in Booth et al 2010, 421–8

Cherryson et al. forthcoming
 Annia K. Cherryson, Jo Buckberry, Paul McCullough, Helen Rees, and Andrew Reynolds, "He shall be slain and buried in unconsecrated ground": the Anglo-Saxon execution cemetery at Old Dairy Cottage, Winchester', forthcoming

Cheverud 1988
 J. Cheverud, 'A comparison of genetic and phenotypic correlations', *Evolution*, 42 (1988), 958–68

Chochol 1967
 J. Chochol, 'Zur Problematik der vor- und frühgeschichtlichen Schädeltrepanationen. Anthropologische Wertung einiger Funde aus Böhmen', *Anthropologie*, 5 (1967), 3–34

Cicero, *De legibus*
 See Rudd and Powell 2008

Clarke 1979
 Giles Clarke, *Pre-Roman and Roman Winchester, Part II: The Roman Cemetery at Lankhills*, Winchester Studies 3.ii (Oxford, 1979)

Clough n.d.
 Sharon Clough, 'The human remains from Horcott Quarry', unpublished Oxford Archaeology report

Clough and Boyle 2010
 Sharon Clough and Angela Boyle, 'Inhumations and disarticulated human bone', in Booth et al. 2010, 339–403

Cobb 1952
 W. M. Cobb, 'Skeleton', in Lansing (ed.) 1952, 791–856

Collis 1978
 J. Collis, *Winchester Excavations vol. II: 1949–1960* (Winchester, 1978)

Collis (ed.) n.d.
 J. Collis (ed.), *Winchester Excavations 1949–60, vol. III, Excavations in St. George's Street and the High Street*, (Winchester, unpublished)

Comas 1960
 Juan Comas, *Manual of Physical Anthropology* (Springfield, 1960)

Conway et al. (ed.) 1967–70
 R. S. Conway, C. F. Walters, A. H. McDonald, P. G. Walsh, and S. K. Keymer (ed.), *Titi Livi Ab urbe condita*, 6 vols. (Oxford, reprinted, 1967–70)

Cook and Buikstra 1979
 D. C. Cook and J. E. Buikstra, 'Health and differential survival in prehistoric populations: prenatal dental defects', *Am J Phys Anthropol.*, 51 (1979), 649–64

Cool 2010
 H. E. M. Cool, 'Objects of glass, shale, bone and metal (except nails)', in Booth et al. 2010, 267–309

Corney et al. 1967
A. Corney, P. Ashbee, V. I. Evison, D. R. Brothwell, 'A prehistoric and Anglo-Saxon burial ground, Ports Down, Portsmouth', *Proc Hants FC*, 24 (1967), 20–41

Corruccini et al. 1982
Robert S. Corruccini, Jerome S. Handler, Robert J. Mutaw, Frederick W. Lange, 'Osteology of a slave burial population from Barbadoes, West Indies', *Am J Phys Anthropol*, 59 (1982), 443–60

Cotran et al. 1994
R. S. Cotran, V. Kumar, S. L. Robbins, F. J. Schoen, *Robbins Pathologic Basis of Disease*, 5th ed. (London 1994)

Croxford et al. (eds.) 2004
B. Croxford, H. Eckhardt, J. Meade, J. Weekes (eds.), *Thirteenth Annual TRAC, Leicester* (Oxford, 2004)

Crummy et al. 1993
Nina Crummy, Philip Crummy, Carl Crossan, *Excavations of Roman and Later Cemeteries, Churches, and Monastic Sites in Colchester, 1971–88*, Colchester Archaeological Report 9 (Colchester, 1993)

Cummings and Hedges 2010
Colleen Cummings and Robert Hedges, 'Carbon and nitrogen stable isotope analyses', in Booth et al. 2010, 411–20

Cumont 1909
Franz Cumont, *Oriental Religions in Roman Paganism*, 2nd ed. (New York, 1956)

Cumont 1922
Franz Cumont, *After Life in Roman Paganism* (New Haven, 1922)

Dahlberg (ed.) 1971
Albert A. Dahlberg (ed.), *Dental Morphology and Evolution* (Chicago and London, 1971)

Dale 1903
W. Dale, '[on the discovery of an Anglo-Saxon cemetery at Droxford, Hants]', *Proc Soc Antiq London*, 19 (1903), 125–9

Dale 1906
W. Dale, 'On the discovery of An Anglo-Saxon cemetery at Droxford, Hants', *Proc*, 5 (1906), 173–7

Dawes and Magilton 1980
Jean D. Dawes and J. R. Magilton, *The Cemetery of St Helen-on-the-Walls, Aldwark*, The Archaeology of York, vol. 12 (London, 1980)

Dawson 2004
M. Dawson, *Archaeology in the Bedford Region*, BAR British Series 373 (Oxford, 2004)

DiBennardo and Taylor 1979
R. DiBennardo and J. V. Taylor, 'Sex assessment of the femur: a test of a new method', *Am J Phys Anthropol*, 50 (1979), 635–38

Dinwiddie 2011
Kirsten Egging Dinwiddie, 'An Anglo-Saxon cemetery at Twyford, near Winchester', *Proc Hants FC*, 66 (2011), 75–126

Donaldson et al. 1990
L. J. Donaldson, A. Cook, R. G. Thompson, 'Incidence of fractures in a geographically defined population', *J Epidemiol Commun H*, 44(3) (1990), 241–5

Dover (ed.) 1993
Kenneth Dover (ed.), *Aristophanes Frogs* (Oxford, 1993)

Eckhardt et al. 2009
H. Eckhardt, C. Chenery, P. Booth, J. A. Evans, A. Lamb, G. Müldner, 'Oxygen and strontium isotope evidence for mobility in Roman Winchester', *J Archaeol. Sci.*, 36 (2009), 2816–25.

Ellis Davidson 1992
H. Ellis Davidson, 'Human sacrifice in the Late Pagan period in North-Western Europe', in Carver (ed.) 1992, 331–40

El-Najjar et al. 1978
Mahmoud Y. El-Najjar, Mike V. DeSanti, Leon Ozbek, 'Prevalence and possible etiology of dental enamel hypoplasia', *Am J Phys Anthropol*, 48 (1978), 185–92

Ennis et al. 1972
J. T. Ennis, M. C. Gueri, G. R. Serjeant, 'Radiological changes associated with leg ulcers in the tropics', *Brit J Radiol*, 45 (1972), 8–14

Esmonde Cleary 2000
S. Esmonde Cleary, 'Putting the dead in their place: burial location in Roman Britain', in Pearce et al. (eds.) 2000, 127–43

Evans et al. 2006
Jane Evans, Nick Stoodley, Carolyn Chenery, 'A strontium and oxygen isotope assessment of a possible fourth century immigrant population in a Hampshire cemetery, southern England', *J Archaeol Sci*, 33 (2006), 265–72

Eveleth and Tanner 1976
P. B. Eveleth and J. M. Tanner, *Worldwide Variation in Human Growth* (London, 1976)

Evison 1963
V. I. Evison, 'Sugar-loaf shield bosses', *Antiq J*, 43 (1963), 38–96

Evison 1988
 V. I. Evison, *An Anglo-Saxon Cemetery at Alton, Hampshire*, HFC Monograph 4 (Winchester, 1988)

Farwell and Molleson 1993
 D. E. Farwell and T. I. Molleson, *Poundbury Volume 2: the Cemeteries*, DNH monograph series 11 (Dorchester, 1993)

Ferguson 1970
 John Ferguson, *The Religions of the Roman Empire* (London, 1970)

Foot 1992
 Robert Foot, 'An Early Christian symbol from Winchester?', *Winchester Museums Service Newsletter*, 13 (July 1992), 6–8

Ford 2002
 W. J. Ford, 'The Romano-British and Anglo-Saxon settlement and cemeteries at Stretton-on-Fosse, Warwickshire', *Trans Birmingham Warwickshire Archaeol Soc*, 106 (2002), 1–115

Forster et al. 2004
 P. Forster, V. Romano, F. Cali, A. Rohl, M. Hurles, 'MtDNA markers for Celtic and Germanic language areas in the British Isles', in Jones (ed.) 2004, 91–111

Frisancho et al. 1973
 A. Roberto Frisancho, Jorge Sanchez, Danilo Pallardel, Lizandro Yanez, 'Adaptive significance of small body size under poor socio-economic conditions in southern Peru', *Am J Phys Anthropol*, 39 (1973), 255–61

Furneaux (ed.) 1897
 Henry Furneaux (ed.), *The Annals of Tacitus* (Oxford, 1897)

Gantz (trans.) 1976
 F. Gantz (trans.), *The Mabinogion* (London, 1976)

Garmonsway 1975
 G. N. Garmonsway (trans.), *The Anglo-Saxon Chronicle*, 2nd ed. (New York, 1975)

Geake 1997
 Helen Geake, *The Use of Grave-goods in Conversion Period England, c.600–c.850*, BAR, British Series 261 (Oxford, 1997)

Gejvall 1960
 N. G. Gejvall, *Westerhus, Medieval Population and Church in Light of Their Skeletal Remains* (Lund, 1960)

Gibbs et al. 2008
 Ronald S. Gibbs, Beth Y. Karian, Ingrid Nygaard, Arthur F. Haney, *Danforth's Obstetrics and Gynecology*, 10th ed. (Philadelphia, 2008)

Gilbert and Mielke 1985
 Robert I. Gilbert and James H. Mielke, *The Analysis of Prehistoric Diets* (Orlando, 1985)

Giles 1970
 Eugene Giles, 'Discriminant function sexing of the human skeleton' in Stewart (ed.) 1970, 99–109

Giles and Elliot 1963
 Eugene Giles and Orville Elliot, 'Sex determination by discriminant function analysis of crania', *Am J Phys Anthropol*, 21 (1963), 53–68

Gilmour (ed.) 2007
 Lauren Adams Gilmour (ed.) *Pagans and Christians—from Antiquity to the Middle Ages: papers in honour of Martin Henig, presented on the occasion of his 65th birthday*, BAR Intl Series 1610 (Oxford 2010)

Goodman et al. 1988
 Alan H. Goodman, R. Brooke Thomas, Alan C. Swedlund, George J. Armelagos, 'Biocultural perspectives on stress in prehistorical, historical and contemporary population research', *Yearbook of Physical Anthropology*, *Am J Phys Anthropol*, 31 (1988), 169–202

Gottfried 1978
 R. S. Gottfried, *Epidemic Disease in Fifteenth Century England* (Leicester, 1978)

Gower and Digby 1981
 J. C. Gower and P. G. N. Digby, 'Complex relationships in two dimensions', in Barnett (ed.) 1981, 83–108

Gowland 2002
 Rebecca Gowland, *Examining Age as an Aspect of Social Identity in Fourth to Sixth Century England through the Analysis of Mortuary Evidence*, unpublished Ph.D. thesis (University of Durham, 2002)

Gowland 2004
 Rebecca Gowland, 'The social identity of health in Late Roman Britain', in Croxford et al. 2004, 135–46

Gowland 2006
 Rebecca Gowland, 'Ageing the past: examining age identity from funerary evidence', in Gowland and Knüsel (eds.) 2006, 143–54

Gowland and Knüsel (eds.) 2006
 Rebecca Gowland and Christopher Knüsel (eds.), *Social Archaeology of Funerary Remains* (Oxford, 2006)

Gowland and Western 2012
 R. L. Gowland and A. G. Western, 'Morbidity in the marshes: using spatial epidemiology to investigate skeletal evidence for malaria in Anglo-Saxon England

(AD 410–1050), *Am J Phys Anthropol*, 147 (2012), 301–11

Grant 1972
J. C. Boileau Grant, *Grant's Atlas of Anatomy*, 6th ed. (Baltimore, 1972)

Graunt 1662
J. Graunt, *Natural and Political Observations Made Upon the Bills of Mortality* (London, 1662)

Gray and Wolfe 1980
J. P. Gray and L. D. Wolfe, ‘Height and sexual dimorphism of stature among human societies’, *Am J Phys Anthropol*, 53(3) (1980), 441–56

Green 2010
F. J. Green, ‘Part 4: Roman plant remains from Winchester; evidence from the suburbs and defenses’, in Maltby 2010, 327–42

Gregg and Steele 1982
J. B. Gregg and J. P. Steele, ‘Mastoid development in ancient and modern populations’, *JAMA*, 238 (1982), 459–464

Hanihara 1958
Kazuro Hanihara, ‘Sexual diagnosis of Japanese long bones by means of discriminant function’, *Zinruigaku Zassi*, LXVI (1958), 187–96

Hanihara 1959
Kazuro Hanihara, ‘Sex diagnosis of Japanese skulls and scapulae by means of discriminant function’, *Zinruigaku Zassi*, LXVII (1959), 191–7

Hardwick 1960
J. L. Hardwick, ‘The incidence and distribution of caries throughout the ages in relation to the Englishman’s diet’, *Brit Dent J*, 108 (1960), 9–17

Hassall and Tomlin 1994
M. W. C. Hassall and R. S. O. Tomlin, ‘Roman Britain in 1993. II. Inscriptions’, *Britannia*, 25 (1994), 293–314

Härke 2011
Heinrich Härke, ‘Anglo-Saxon immigration and ethnogenesis’, *Medieval Archaeology*, 55 (2011), 1–28. DOI: 10.1179/174581711X13103897378311

Hatcher 1977
J. Hatcher, *Plague, Population and the English Economy 1348–1530* (London, 1977)

Hawkes and Grainger 2003
Sonia Chadwick Hawkes with Guy Grainger, *The Anglo-Saxon Cemetery at Worthy Park, Kingsworthy near Winchester, Hampshire*, Oxford University School of Archaeology Monograph no. 59 (Oxford, 2003)

Henderson 1981
J. D. Henderson, ‘Report on the human bones: Crowder Terrace (TC74–77), Winchester’, manuscript, AML no. 801264 (London, 1981)

Hengen 1971
O. P. Hengen, ‘Cribra orbitalia: pathogenesis and probable etiology’, *Homo*, XXII (1971), 57–75

Hennessy and Stringer 2002
Robin J. Hennessy and Chris B. Stringer, ‘Geometric morphometric study of the regional variation of modern human craniofacial form’, *Am J Phys Anthropol*, 117 (2002), 37–48

Herrera et al. 2014
Brianne Herrera, Tsunehiko Hanihara, Kanya Godde, ‘Comparability of multiple data types from the Bering Strait region: cranial and dental metrics and non-metrics, mtDNA, and Y-chromosome DNA’, *Am J Phys Anthropol*, 154 (2014), 334–48

Hershkovitz et al. 1999
Israel Hershkovitz, Charles Greenwald, Bruce M. Rithschild, Bruce Latimer, Olivier Dutour, Lyman M. Jellema, Suzanne Wish-Baratz, ‘Hyperostosis frontalis interna: an Anthropological perspective’, *Am J Phys Anthropol*, 109 (1999), 303–25

Higginbotham and Kuhn 2005
T. O. Higginbotham and J. E. Kuhn, ‘Atraumatic disorders of the sternoclavicular joint’, *J Am Acad Orthop Surg*, 13 (2005), 138–45

Hodges 1989
R. Hodges, *The Anglo-Saxon Achievement* (London, 1989)

Holden and Mace 1999
Clare Holden and Ruth Mace, ‘Sexual dimorphism in stature and women’s work’, *Am J Phys Anthropol*, 110 (1999), 27–45

Holt (ed.) 1987
J. C. Holt (ed.), *Domesday Studies* (Woodbridge, 1987)

Holck 2002
P. Holck, ‘Two “medical” cases from medieval Oslo’, *Intl J Osteoarchaeol* 12 (2002), 166–72

Homes Hogue 2006
S. Homes Hogue, ‘Determination of warfare and interpersonal conflict in the protohistoric period: a case study from Mississippi’, *Intl J Osteoarchaeol*, 16 (2006), 236–48

Horace, *Odes*
See Quinn (ed.) 1980

Horrox and Ormrod (eds.) 2006
 Rosemary Horrox and W. Mark Ormrod (eds.), *A Social History of England 1200–1500* (Cambridge, 2006)

Howells 1941
 W. W. Howells, ‘The Early Christian Irish: the skeletons at Gallen Priory’, *Proc Roy Irish Acad*, 46 C (1941), 103–219

Howells 1966
 W. W. Howells, *The Jomon Population of Japan. A Study by Discriminant Analysis of Japanese and Ainu Crania*, Papers of the Peabody Museum, Harvard University, vol. 57 (Cambridge, MA, 1966)

Howells 1969
 W. W. Howells, ‘The use of multivariate techniques in the study of skeletal populations’, *Am J Phys Anthropol*, 31 (1969), 311–14

Howells 1973
 W. W. Howells, *Cranial Variation in Man: a Study by Multivariate Analysis of Patterns of Difference Among Recent Human Populations*, Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, vol. 67 (Cambridge, MA, 1973)

Hummert and Van Gerven 1985
 James R. Hummert and Dennis P. Van Gerven, ‘Observations on the formation and persistence of radiopaque transverse lines’, *Am J Phys Anthropol*, 66 (1985), 297–306

Humphreys and King (eds.) 1981
 S. C. Humphreys and Helen King (eds.), *Mortality and Immortality: the Anthropology and Archaeology of Death* (London, 1981)

Hurley 2011
 D. W. Hurley, *Suetonius: the Caesars* (Indianapolis, 2011)

Huss-Ashmore et al. 1982
 Rebecca Huss-Ashmore, Alan H. Goodman, George J. Armelagos, ‘Nutritional inference from paleopathology’, in Schiffer (ed.) 1982, 395–476

Jankuhn et al. (eds.) 1973
 Herbert Jankuhn, Walter Schlesinger, Heiko Steuer (eds.), *Vor- und Frühformen der europäischen Stadt im Mittelalter*, ii (Göttingen, 1973)

James 1999
 T. B. James, *The Black Death in Hampshire*, Hampshire Papers 18 (Winchester, 1999)

Jarcho (ed.) 1966
 S. Jarcho (ed.), *Human Palaeopathology* (New Haven, 1966)

Jesch and Molleson
 J. Jesch and T. Molleson, ‘The death of Magnus Erlendsson and the relics of St. Magnus’, in Owen (ed.) 2013, 127–43

Johnston 1962
 Francis E. Johnston, ‘Growth of the long bones of infants and young children at Indian Knoll’, *Am J Phys Anthropol*, 20 (1962), 249–54

Jones 1996
 Michael E. Jones, *The End of Roman Britain* (Ithaca and London, 1996)

Jones (ed.) 2004
 M. Jones (ed.), *Traces of Ancestry: Studies in Honor of Colin Renfrew*, McDonald Institute Monograph Series (Cambridge, 2004)

Jordan et al. 1994
 D. Jordan, D. Haddon-Reece, A. Bayliss, *Radiocarbon Dates from Samples Funded by English Heritage and Dated Before 1981* (London, 1994)

Karasik et al. 2000
 D. Karasik, E. Ginsburg, G. Livshits, O. Pavlovsky, E. Kobyliansky, ‘Evidence of major gene control of cortical bone loss in humans’, *Genet Epidemiol*, 19 (2000), 410–21

Keene 1985
 D. J. Keene, *Survey of Medieval Winchester*, Winchester Studies 2, in two parts (Oxford, 1985)

Kennedy 1986
 G. E. Kennedy, ‘The relationship between auditory exostoses and cold water: a latitudinal analysis’, *Am J Phys Anthropol*, 71 (1986), 401–15

Kirchengast 2000–1
 S. Kirchengast, ‘Zur bedeutung der subsistenzform für den menschlichen Sexualdimorphismus’, *Archaeologia Austriaca*, 84–85 (2000–2001), 79–86

Kjølbye-Biddle 1975
 Birthe Kjølbye-Biddle, ‘A cathedral cemetery: problems in excavation and interpretation’, *World Archaeology*, 7(1) (1975), 87–108

Kjølbye-Biddle 1992
 Birthe Kjølbye-Biddle, ‘Dispersal or concentration: the disposal of the Winchester dead over 2000 years’, in Bassett (ed.) 1992, 210–47

Kjølbye-Biddle and Biddle, forthcoming
 Birthe Kjølbye-Biddle and Martin Biddle, *The Anglo-Saxon Minsters of Winchester*, Winchester Studies 4.i (Oxford, forthcoming)

Knocker 1956
G. M. Knocker, 'Early burials and an Anglo-Saxon cemetery at Snell's Corner near Horndean', *Proc Hants FC*, 19 (1956), 117–70

Krogman 1962
Wilton Marion Krogman, *The Human Skeleton in Forensic Medicine* (Springfield, 1962)

Langer 1964
W. L. Langer, 'The Black Death', *Sci Am*, 210(2) (1964)

Lansing (ed.) 1952
A. I. Lansing (ed.), *Cowdry's Problems of Ageing*, 3rd ed. (Baltimore, 1952)

Leach 2001
Peter E. Leach, *Excavation of a Romano-British Roadside Settlement in Somerset: Foss Lane, Shepton Mallet 1990*, Britannia Monograph Series, No. 18 (London, 2001)

Le Double 1903
A. F. Le Double, *Traité des Variations des Os du Crâne de l'Homme et de leur Signification au Point de Vue de l'Anthropologie Zoologique* (Paris, 1903)

Lehmann 1959
E. L. Lehmann, *Testing Statistical Hypotheses* (New York, 1959)

Le Roy Ladurie 1972
Emmanuel Le Roy Ladurie, *Times of Feast, Times of Famine: A History of Climate Since the Year 1000*, trans. Barbara Bray (London, 1972)

Leslie et al. 2015
Stephen Leslie, Bruce Winney, Garrett Hellenthal, Dan Davison, Abdelhamid Boumertit, Tammy Day, Kataryna Hutnik, Ellen C. Royston, Barry Cunliffe, Wellcome Trust Case Control Consortium 2, International Multiple Sclerosis Genetics Consortium, Daniel J. Lawson, Daniel Falush, Colin Fremin, Matt Pirinen, Simon Myers, Mark Robinson, Peter Donnelly, Walter Bodmer, 'The fine-scale genetic structure of the British population', *Nature*, 319 (19 March 2015), DOI: 10.1038/nature14230

Lewis 1966
M. J. T. Lewis, *Temples in Roman Britain* (Cambridge, 1966)

Liebe-Harkort and Ástvaldsdóttir 2011
C. Liebe-Harkort and A. Ástvaldsdóttir, 'Visual and radiographic assessment of dental caries by osteologists; a validity and reliability study', *Intl J Osteoarchaeol*, 21 (2011), 55–65

Livy, *Ab urbe condita*
See Conway et al. (ed.) 1967–70

Loe 2009
L. Loe, 'Perimortem trauma', in Blau and Ubelaker (eds.) 2009, 263–83

Macdonald 1979
J. L. Macdonald, 'Religion', in WS 3.ii 1979, 404–33

MacGregor and Spector 1999
A. J. MacGregor and T. D. Spector, 'Twins and the genetic architecture of osteoarthritis', *Rheumatology*, 38 (1999), 583–90

Maltby 2010
M. Maltby, *Feeding a Roman Town: Environmental evidence from the excavations in Winchester, 1972–1985* (Winchester, 2010)

Mann et al. 2009
Michael E. Mann, Zhihua Zhang, Scott Rutherford, Raymond S. Bradley, Malcolm K. Hughes, Drew Shindell, Caspar Ammann, Greg Fuluvegi, Fenbiao Ni, 'Global signatures and dynamical origins of the Little Ice Age and Medieval Climate Anomaly', *Science*, 326 (5957), 1256–60. DOI: 10.1126/science.1177303

Márquez-Grant and Loe 2008
Nicholas Márquez-Grant and Louise Loe, 'Chapter 3: The human remains', in Simmonds et al. 2008, 29–65

Martin and Saller 1957
R. Martin and K. Saller, *Lehrbuch der Anthropologie, Band I* (Stuttgart 1957)

Martin-Kilcher 2000
Stefanie Martin-Kilcher, 'Mors immatura in the Roman world—a mirror of society and tradition', in Pearce et al. (eds.) 2000, 63–77

Martinez-Abadias et al. 2009
N. Martinez-Abadias, M. Esparza, T. Sjøvold, R. Gonzales-José, M. Santos, M. Hernandez, 'Heritability of human cranial dimensions: comparing the evolvability of different cranial regions', *J Anat*, 214 (2009), 19–35

Mattingly 2006
David J. Mattingly, *An Imperial Possession: Britain in the Roman Empire, 54 BC–AD 409* (London, 2006)

Mays 1991
S. A. Mays, 'The medieval burials from the Blackfriars Friary, School Street, Ipswich, Suffolk (excavated 1983–85)', *Ancient Monuments Laboratory Report*, 16/91 (London, 1991)

Mays 2007
 S. Mays, 'Spondylolysis in the lower thoracic-upper lumbar spine in a British medieval population', *Intl J Osteoarch.*, 17 (2007), 608–18

Mays 2010
 Simon Mays, *The Archaeology of Human Bones*, 2nd ed. (Abingdon, 2010)

McGee et al. 1992
 J. O'D. McGee, P. G. Isaacson, N. A. Wright, *The Oxford Textbook of Pathology* (Oxford, 1992)

McKenzie and Brothwell 1967
 William McKenzie and Don Brothwell, 'Diseases in the ear region', in Brothwell and Sandison (eds.) 1967, 464–73

McKern and Stewart 1957
 T. W. McKern and T. D. Stewart, *Skeletal Age Changes in Young American Males, Analyzed from the Standpoint of Identification*, Technical report EP-45, Headquarters Quartermaster Research and Development Command (Natick, 1957)

McNeill 1976
 W. H. McNeill, *Plagues and Peoples* (Garden City, NY, 1976)

McWhirr et al. 1982
 Alan McWhirr, Linda Viner, Calvin Wells, *Roman-British Cemeteries at Cirencester*, Cirencester Excavations II (Cirencester 1982)

Meaney and Hawkes 1970
 Audrey L. Meaney and Sonia Chadwick Hawkes, *Two Anglo-Saxon Cemeteries at Winnall, Winchester, Hampshire*, The Society for Medieval Archaeology Monograph Series, No. 4 (London, 1970)

Mensforth et al. 1978
 R. P. Mensforth, C. O. Lovejoy, J. W. Lallo, G. J. Armelagos, 'The role of constitutional factors, diet, and infectious disease in the etiology of porotic hyperostosis and periosteal reactions in prehistoric infants and children', *Medical Anthropology*, 2(1) part 2 (1978), 1–59

Miles 1963
 A. E. W. Miles, 'The dentition in the assessment of individual age in skeletal material' in Brothwell (ed.) 1963, 191–210

Miller et al. 2012
 Gifford H. Miller, Áslaug Geirdóttir, Yafang Zhong, Darren J. Larsen, Bette L. Otto-Btiesner, Marika M. Holland, David A. Bailey, Kurt A. Refsnider, Scott J. Lehman, John R. Southon, Chance Anderson, Helgi Björnsson, Thorvaldur Thordarson, 'Abrupt onset of the Little Ice Age triggered by volcanism and sustained by sea-ice/ocean feedbacks', *Geophysical Research Letters*, 39, L02718. DOI: 10.1029/2011GL050168

Mitchell et al. 2013
 P. D. Mitchell, H.-Y. Yeh, J. Appleby, R. Buckley, 'The intestinal parasites of King Richard III', *The Lancet*, 382 (2013), 888

Mitchinson et al. 1996
 M. J. Mitchinson, J. Arno, P. A. W. Edwards, R. W. F. Le Page, A. C. Minson, *Essentials of Pathology* (Oxford, 1996)

Møller-Christensen 1953
 V. Møller-Christensen, *Ten Lepers from Naestved in Denmark* (Copenhagen, 1953)

Møller-Christensen 1958
 V. Møller-Christensen, *Bogen om Abelholt Kloster* (Copenhagen, 1958)

Molleson 1981
 T. Molleson, 'The archaeology and anthropology of death: what the bones tell us', in Humphreys and King (eds.) 1981, 15–32

Molleson 1993
 T. I. Molleson, 'The human remains', in Farwell and Molleson 1993, 141–243

Molleson 2010
 T. I. Molleson, 'Environmental and social destitution in a medieval Orkney island community may demonstrate the role of acute Vitamin A deficiency in the occurrence of epigenetic anomalies', *Anthropologica et Praehistorica*, 121 (2010), 57–64

Molleson and Cox 1993
 T. I. Molleson and M. J. Cox, *The Spitalfields Project Vol. 2: the Anthropology—the Middling Sort*. CBA Research Report 86 (York, 1993)

Mood et al. 1974
 A. M. Mood, F. A. Graybill, D. C. Boes, *Introduction to the Theory of Statistics* (New York, 1974)

Moore and Corbett 1973
 W. J. Moore and E. Corbett, 'Distribution of dental caries in British populations. Iron Age, Romano-British, and medieval periods', *Caries Res* 7 (1973), 139–53

Moseley 1963
 J. E. Moseley, *Bone Changes in Hematologic Disorders* (New York, 1963)

Mosley 1966
J. E. Moseley, 'Radiographic studies in hematologic bone disease', in Jarcho (ed.) 1966, 121–30

Mullan 2007
John Mullan, *Mortality, gender, and the plague of 1361–2 on the estate of the Bishop of Winchester*, Cardiff Historical Papers 8 (Cardiff, 2007)

Mynors (ed.) 1972
R. A. B. Mynors (ed.) *P. Vergili Maronis opera* (Oxford 1972)

Nathan and Hass 1966
H. Nathan and N. Hass, ‘‘Cibra orbitalia’’ a bone condition of the orbit of unknown nature, *Israel J Med Sci*, 2 (1966), 171–91

Nie et al. 1975
Norman H. Nie, C. Hadlai Hull, Jean G. Jenkins, Karin Steinbrenner, Dale H. Bent, *Statistical Package for the Social Sciences* (New York, 1975)

Nock 1933
A. D. Nock, *Conversion: the old and the new in religion from Alexander the Great to Augustine of Hippo* (Oxford, 1933)

Oppenheimer 2006
Stephen Oppenheimer, *The Origins of the British, a Genetic Detective Story: the Surprising Roots of the English, Irish, Scottish and Welsh* (New York, 2006)

Ortner 1984
Donald J. Ortner, ‘Bone lesions in a probable case of scurvy from Metlatavik, Alaska’, *MASCA Journal*, 3 (1984), 79–81

Ortner et al. 1999
Donald J. Ortner, Erin H. Kimmerle, Melanie Diez, ‘Probable evidence of scurvy in subadults from archaeological sites in Peru’, *Am J Phys Anthropol*, 108 (1999), 321–31

Ortner and Mays 1998
Donald J. Ortner and Simon Mays, ‘Dry-bone manifestations of rickets in infancy and early childhood’, *Intl J Osteoarchaeol*, 8 (1998), 45–55

Ortner and Putschar 1981
Donald J. Ortner and Walter G. J. Putschar, *Identification of Pathological Conditions in Human Skeletal Remains*, Smithsonian Contributions to Anthropology, No. 28 (Washington, 1981)

Ossenberg 1976
Nancy S. Ossenberg, ‘Within and between race distances in population studies based on discrete traits of the human skull’, *Am J Phys Anthropol*, 45 (1976), 701–15

Ottaway et al. 2012
P. J. Ottaway, K. E. Qualmann, H. Rees, G. D. Scobie, *Roman Cemeteries and Suburbs of Winchester: Excavations 1971–86* (Winchester, 2012)

Owen (ed.) 2013
Olwyn Owen (ed.), *The World of Orkneyinga Saga—‘The Broad-Cloth Viking Trip’* (Kirkwall 2013)

Paget 1877
J. Paget, ‘On a form of chronic inflammation of bones (osteitis deformans)’, *Trans. Med.-Chir. Soc.*, 60 (1877), 37–63

Pattison 2008
John E. Pattison, ‘Is it necessary to assume an apartheid-like social structure in Early Anglo-Saxon England?’, *Proc R Soc B*, 275 (2008), 2423–29

Pearce et al. (eds.) 2000
J. Pearce, M. Millet, M. Struck (eds.), *Burial, Society and Context in the Roman World* (Oxford, 2000)

Pearson 2002
Andrew Pearson, *The Construction of the Saxon Shore Forts* (Oxford, 2002)

Penrose 1947
L. S. Penrose, ‘Some notes on discrimination’, *Ann Eugen*, 13 (1947), 228–37

Penrose 1954
L. S. Penrose, ‘Distance, size and shape’, *Ann Eugen*, 18 (1953–54), 337–43

Pharr 1952
C. Pharr, *The Theodosian Code and Novels and the Sirmondian Constitutions* (Princeton, 1952)

Philpott 1991
R. Philpott, *Burial Practices in Roman Britain: a survey of grave treatment and furnishing AD 43–410*, BAR Brit Ser 219 (Oxford, 1991)

Pindborg 1970
J. J. Pindborg, *Pathology of the Dental Hard Tissues* (Philadelphia, 1970)

Pinter-Bellows 1993
Stephanie Pinter-Bellows, ‘The human skeletons’, in Crummy et al. 1993, 62–91

Pinter-Bellows 2001
Stephanie Pinter-Bellows, ‘The human skeletons’, in Leach 2001, 261–87

Pons 1955
J. Pons, 'The sexual diagnosis of isolated bones of the skeleton', *HB*, 27 (1955), 12–21

Postan 1973
M. M. Postan, *Essays on Medieval Agriculture and General Problems of the Medieval Economy* (Oxford, 1973)

Postan and Titow 1959
M. M. Postan and J. Titow, 'Heriots and prices on Winchester manors', *EHR*, 11 (1959), 392–411

Powell 1996
F. Powell, 'The human remains', in Boddington 1996, 113–24

Power and O'Sullivan 1992
C. Power and V. R. O'Sullivan, 'Rickets in 19th century Waterford', *Archaeology (Ireland)*, 6 (1992), 27–28

Price 1975
John L. Price, 'The radiology of excavated Saxon and medieval human remains from Winchester', *Clin Radiol*, 26 (1975), 363–70

Quinn (ed.) 1980
Kenneth Quinn (ed.), *Horace, The Odes* (London, 1980)

Rahtz et al. 2000
P. Rahtz, S. Hirst, S. M. Wright, *Cannington Cemetery*, Britannia Monograph Series, No. 17 (London, 2000)

Raxter et al. 2007
M. H. Raxter, B. M. Auerbach, C. B. Ruff, 'Technical note: revised Fully stature estimation technique', *Am J Phys Anthropol*, 138 (2007), 817–8

Relethford 1994
J. H. Relethford, 'Craniometric variation among modern human populations', *Am J Phys Anthropol*, 95 (1994), 53–62

Rees et al. 2012
H. Rees, P. J. Ottaway, and M. Gomersall, 'The Late Roman Northern Cemetery: Discussion', in Ottaway et al. 2012, 127–32

Resnick (ed.) 1995
D. Resnick (ed.), *Diagnosis of Bone and Joint Disorders*, 3rd ed. (London, 1995)

Ricaut et al. 2010
F.-X. Ricaut, V. Auriol, N. Cramon-Taubadel, C. Keyser, P. Murali, B. Ludes, E. Crubézy, 'Comparison between morphological and genetic data to estimate biological relationship: the Egyin Gol necropolis (Mongolia)', *Am J Phys Anthropol*, 143 (2010), 355–64

Rigby 2006
S. H. Rigby, 'Introduction: Social structure and economic change in late medieval England', in Horrox and Ormrod (eds.) 2006, 1–30

Roberts 1987
Charlotte A. Roberts, 'Case report 9: scurvy', *PPA Newsletter*, 57 (1987), 14–15

Roberts and Cox 2003
Charlotte Roberts and Margaret Cox, *Health and Disease in Britain: from Prehistory to the Present Day* (Stroud, 2003)

Roberts and Manchester 1995
Charlotte Roberts and Keith Manchester, *The Archaeology of Disease*, 2nd ed. (Ithaca, 1995)

Roberts and Manchester 2005
Charlotte Roberts and Keith Manchester, *The Archaeology of Disease*, 3rd ed. (Ithaca, 2005)

Roffey and Marter 2010
Simon Roffey and Phil Marter, 'Excavations at St Mary Magdalen, Winchester, 2008–2010', Summary Report (MHARP 2010) (Winchester 2010)

Roffey and Tucker 2012
Simon Roffey and Katie Tucker, 'A contextual study of the medieval hospital and cemetery of St Mary Magdalen, Winchester, England', *Intl J Paleopath*, 2 (2012), 170–80

Ross 1967
Anne Ross, *Pagan Celtic Britain* (London, 1967)

Rubin et al. 2000
Laurence A. Rubin, Millan S. Patel, David E. C. Cole, 'Genetic determinants of bone mass acquisition and risk for osteoporosis', *Drug Develop Res*, 49(3) (2000), 216–26

Rudd and Powell 2008
Niall Rudd (trans.) and J. G. F. Powell (intro. and notes), *Marcus Tullius Cicero: the Republic and the Laws* (Oxford 2008)

Russell 1985
J. C. Russell, *The Control of Late Ancient and Medieval Population* (Philadelphia, 1985)

Salway 1998
P. Salway, *Roman Britain* (Oxford 1998)

Sarnat and Schour 1941–1942
B. G. Sarnat and I. Schour, 'Enamel hypoplasia in relation to systemic disease: a chronologic, morphologic and etiologic classification', *J Am Dent Assn*, 28 (1941), 1989–2000, 29 (1942), 67–75

Sartoris 1995
D. Sartoris, 'Developmental dysplasia of the hip', in Resnick (ed.) 1995, 4067–94

Scheuer and Black 2004
L. Scheuer and S. Black, *The Juvenile Dentition* (New York, 2004)

Schiffer (ed.) 1982
M. B. Schiffer (ed.), *Advances in Archaeological Method and Theory*, vol. 5 (London, 1982)

Schmorl 1932
G. Schmorl, 'Über osteitis deformans Paget', *Virchows Archive*, 283 (1932), 694–751

Schour and Massler 1941
I. Schour and M. Massler, 'The development of the human dentition', *J Am Dent Assoc*, 28 (1941), 1153–60

Schultz 1979
M. Schultz, 'Diseases of the ear region in early and prehistoric populations', *J Hum Evol*, 8(6) (1979), 575–80

Scott and Duncan 2001
S. Scott and C. J. Duncan, *Biology of Plagues* (Cambridge, 2001)

See et al. 2008
A. W. See, M. E. Kaiser, J. C. White, M. Clagett-Dame, 'A nutritional model of late embryonic vitamin A deficiency produces defects in organogenesis at a high penetrance and reveals new roles for the vitamin in skeletal development', *Development Biology*, 316, 171–90

Simmonds et al. 2008
Andrew Simmonds, Nicholas Marquez-Grant, Louise Loe, *Life and Death in a Roman City*. Oxford Archaeology Monograph No. 6 (Oxford, 2008)

Smith and Brickley 2004
M. J. Smith and M. B. Brickley, 'Analysis and interpretation of flint toolmarks found on bones from West Tump Long Barrow, Gloucestershire', *Intl J Osteoarchaeol*, 14 (2004), 18–33

Soren and Soren (eds.) 1999
David Soren, Noelle Soren (eds.), *A Roman Villa and a Late Roman Infant Cemetery: Excavation at Poggio Gramignano, Lugnano in Teverina* (Rome, 1999)

Sparks and Janz 2002
C. S. Sparks and R. L. Janz, 'A reassessment of human cranial plasticity: Boas revisited', *Proc Natl Acad Sci USA*, 99 (2002), 14636–39

Spector 2012
Tim Spector, *Identically Different: Why You Can Change Your Genes* (London, 2012)

Spradley and Jantz 2011
M. K. Spradley and R. L. Jantz, 'Sex estimation in forensic anthropology: skull versus postcranial elements', *J Forensic Sci*, 56 (2011), 289–96. DOI: 10.1111/j.1556-4029.2010.01635.x

Steele 2000
J. Steele, 'Handedness in past human populations: skeletal markers', *Laterality*, 5 (2000), 193–220

Steinbock 1976
R. Ted Steinbock, *Paleopathological Diagnosis and Interpretation* (Springfield, 1976)

Stevenson 1924
Paul H. Stevenson, 'Age order of epiphyseal union in man', *Am J Phys Anthropol*, 7 (1924), 53–93

Stewart 1979
T. Dale Stewart, *Essentials of Forensic Anthropology* (Springfield, IL, 1979)

Stewart (ed.) 1970
T. Dale Stewart, *Personal Identification in Mass Disasters* (Washington, DC, 1970)

Stini 1969
William Stini, 'Nutritional stress and growth: sex difference in adaptive response', *Am J Phys Anthropol*, 31 (1969), 417–26

Stini 1985
William A. Stini, 'Growth rates and sexual dimorphism in evolutionary perspective', in Gilbert and Mielke 1985, 191–226

Stirland and Waldron 1990
Ann J. Stirland and Tony Waldron, 'The earliest cases of tuberculosis in Britain', *J Archeol Sci*, 17(2) (1990), 221–30

Stojanowski and Duncan 2009
C. M. Stojanowski and W. N. Duncan, 'Historiography and forensic analysis of the Fort King George "skull": craniometric assessment using the specific population approach', *Am J Phys Anthropol*, 140 (2009), 275–89

Stroud and Kemp 1993
G. Stroud and R. L. Kemp, *Cemeteries of St Andrew, Fishergate* (York, 1993)

Stuart-Macadam 1982
P. L. Stuart-Macadam, *A Correlative Study of a Paleopathology of the Skull*, Ph.D. thesis, Department of Physical Anthropology, Cambridge University (Cambridge, 1982)

Stuart-Macadam 1985
Patty Stuart-Macadam, 'Porotic hyperostosis: represent-

ative of a childhood condition', *Am J Phys Anthropol*, 66 (1985), 391–98

Stuart-Macadam 1987a
P. Stuart-Macadam, 'Porotic hyperostosis: new evidence to support the anemia theory', *Am J Phys Anthropol*, 74 (1987), 521–26

Stuart-Macadam 1987b
P. Stuart-Macadam, 'A radiographic study of porotic hyperostosis', *Am J Phys Anthropol*, 74 (1987), 511–20

Stuart-Macadam 1989
Patty Stuart-Macadam, 'Porotic hyperostosis: relationship between orbital and vault lesions', *Am J Phys Anthropol*, 80 (1989), 187–93

Stuart-Macadam 1992
P. Stuart-Macadam, 'Anemia in past human populations', in Stuart-Macadam and Kent (eds.) 1992, 151–70

Stuart-Macadam and Kent (eds.) 1992
P. Stuart-Macadam and S. K. Kent (eds.), *Diet, Demography and Disease: Changing Perspectives on Anemia* (New York, 1992),

Stuart-Macadam et al. 1998
P. Stuart-Macadam, B. Glencross, M. Kricun, 'Traumatic bowing deformities in tubular bones', *Intl J Osteoarcheol*, 8 (1998), 252–62

Stuckert 1980a
Caroline M. Stuckert, 'Aspects of population continuity in Dark-Age England' (abstract), *Am J Phys Anthropol*, 52 (1980), 284

Stuckert 1980b
Caroline M. Stuckert, 'Roman to Saxon: population biology and archaeology', unpublished paper presented at the SAA annual meeting (Philadelphia, 1980)

Stuckert 1982
Caroline M. Stuckert, 'History, archaeology, and skeletons: a case study in culture change', unpublished paper presented at the SHA annual meeting (Philadelphia, 1982)

Stuckert 1985
Caroline M. Stuckert, *The Human Biology of Budeč, Czechoslovakia: A Study of Biocultural Adaptation in the Slavic and Medieval Periods*, Ph.D. dissertation, University of Pennsylvania. University Microfilms. (Chicago, 1985)

Stuckert 2010
Caroline M. Stuckert, 'Chapter IV. The human remains', in Annable and Eagles 2010, 111–37

Stuckert and Kricun 2011
Caroline M. Stuckert and Morrie E. Kricun, 'A case of bilateral forefoot amputation from the Romano-British cemetery of Lankhills, Winchester, UK', *Intl J Paleopath*, 1 (2011), 111–16

Swanton 1973
M. J. Swanton, *The Spearheads of the Anglo-Saxon Settlements* (London, 1973)

Swanton 1974
M. J. Swanton, *A Corpus of Anglo-Saxon Spear Types*, BAR no. 7 (Oxford 1974)

Szilágyi 1959
J. Szilágyi, 'Adatok az átlagos élettartam kérdéseihez Aquincumban és Pannónia más részeiben', *Antik tanulmányok*, 6 (1959), 31–80, 221–43

Tacitus, *Annals*
See Furneaux (ed.) 1897

Taussig 1984
Michael J. Taussig, *Processes in Pathology and Microbiology*, 2nd ed. (Oxford, 1984)

Taylor et al. 2013
G. M. Taylor, K. Tucker, R. Butler, A. W. Pike, J. Lewis, S. Roffey, et al., 'Detection and strain typing of ancient *Mycobacterium leprae* from a medieval leprosy hospital', *PLoS One*, 2013 Apr 30; 8(4):e62406. DOI: 10.1371/journal.pone.0062406

Tertullian, *De Anima*
See Waszink (ed.) 2010

Thieme and Schull 1957
F. P. Thieme and W. J. Schull, 'Sex determination from the skeleton', *HB*, 29 (1957), 242–73

Thomas 1981
Charles Thomas, *Christianity in Roman Britain to AD 500* (London, 1981)

Thomas et al. 2006
Mark G. Thomas, Michael P. H. Stumpf, Heinrich Härke, 'Evidence for an apartheid-like social structure in early Anglo-Saxon England', *Proc R Soc B*, 273 (2006), 2651–57

Thomas et al. 2008
Mark G. Thomas, Michael P. H. Stumpf, Heinrich Härke, 'Integration versus apartheid in post-Roman Britain: a response to Pattison', *Proc R Soc B*, 275 (2008), 2419–2421

Titche et al. 1981
Leon L. Titche, Stanley W. Coulthard, Richard D. Wachter, A. Cole Thies, Lucy L. Harries, 'The

prevalence of mastoid infection in prehistoric Arizona Indians', *Am J Phys Anthropol.*, 56 (1981), 269–73

Titow 1960
J. Z. Titow, 'Evidence of weather in the account rolls of the Bishopric of Winchester 1209–1350', *EHR*, 12 (1960), 360–407

Titow 1970
J. Z. Titow, 'Le climat à travers les rôles de comptabilité de l'évêché de Winchester (1350–1450)', *Annales ESC*, xxv (1970), 312–50

Todd 1920
T. Wingate Todd, 'Age changes in the pubic bone I: the male white pubis', *Am J Phys Anthropol.*, 3 (1920), 285–334

Todd and Lyon 1924
T. Wingate Todd and D. W. Lyon Jr., 'Endocranial suture closure, its progress and age relationship. Part I. Adult males of white stock', *Am J Phys Anthropol.*, 7 (1924), 325–84

Toomey 1977
Caroline Stuckert Toomey, 'The Romano-British Skeletal Series from Victoria Road, Winchester: a Preliminary Report', unpublished manuscript (Winchester 1977)

Topf et al. 2006
A. L. Topf, M. T. P. Gilbert, J. P. Dumbacher, A. R. Hoelzel, 'Tracing the phylogeography of human populations in Britain based on 4th – 11th century mtDNA genotypes', *Mol Biol Evol.*, 23 (2006), 152–61

Torgerson 1951
J. Torgerson, 'The developmental genetics and evolutionary meaning of the metopic suture', *Am J Phys Anthropol.*, 9 (1951), 193–207

Trotter and Gleser 1952
Mildred Trotter and Goldine C. Gleser, 'Estimation of stature from long bones of American whites and negroes', *Am J Phys Anthropol.*, 10 (1952), 463–514

Trotter and Gleser 1958
Mildred Trotter and Goldine C. Gleser, 'A re-evaluation of the estimation of stature from long bones of American whites and negroes', *Am J Phys Anthropol.*, 16 (1958), 79–123

Tucker 2012a
Katie Tucker, "Whence this Severance of the Head?" *The Osteology and Archaeology of Human Decapitation in Britain*, unpublished Ph.D. dissertation (University of Winchester, 2012)

Tucker 2012b
Katie Tucker, 'A Note on the Decapitation Burials', in Ottaway et al. 2012, 240–2

Turner 2009
B. M. Turner, 'Epigenetic responses to environmental change and their evolutionary implications', *Phil. Trans. Roy. Soc. B*, 364 (2009), 3403–18

Ubelaker 1978
Douglas H. Ubelaker, *Human Skeletal Remains: Excavation, Analysis, Interpretation* (Chicago, 1978)

Vann 2000
S. Vann, 'Handedness in humans: Skeletal asymmetry at Lankhills Roman cemetery, Winchester', unpublished MA thesis (University of Southampton, 2000)

VerMilyea et al. 2009
M. D. VerMilyea, L. P. O'Neill, B. M. Turner, 'Transcription independent heritability of induced histone modification in the mouse preimplantation embryo', *PLoS ONE*, 4(6) (2009), e6086

Vergil, *Aeneid*
See Mynors (ed.) 1972

Vyhnánek 1967
L. Vyhnánek, 'Röntgendiagnostische Beiträge zur Beurteilung der Trepanationen im alten Knochenmaterial', *Anthropologie*, 5(3) (1967), 35–8

Wakely 1997
J. Wakely, 'Identification and analysis of violent and non-violent head injuries in osteo-archaeological material', in Carman (ed.) 1997, 24–46

Walker et al. 2009
P. L. Walker, R. R. Bathurst, R. Richman, T. Gjerdum, V. A. Andushko, 'The causes of porotic hyperostosis and cribra orbitalia; a reappraisal of the iron-deficiency hypothesis', *Am J Phys Anthropol.*, 139 (2009), 109–25. DOI 10.1002/ajpa.21031

Warwick 1968
Roger Warwick, 'The skeletal remains', in Wenham 1968, 121–216

Waszink (ed.) 2010
J. H. Waszink (ed.), *Quinti Septimi Florentis Tertulliani De Anima* (Leiden 2010)

Watt 1979
Robin J. Watt, 'Evidence for decapitation', in WS 3.ii 1979, 342–44

Weale et al. 2002
Michael E. Weale, Deborah A. Weiss, Rolf F. Jager, Neil Bradman, Mark G. Thomas, "Y. chromosome

evidence for Anglo-Saxon mass migration', *Mol Biol Evol*, 17 (2002), 1008–21

Weiss 1973
Kenneth M. Weiss, *Demographic Models for Anthropology*, Memoires of the Society for American Archaeology no. 27, *Am Antiq* 38, pt. 2 (1973)

Weiss and Jurmain 2007
E. Weiss and R. Jurmain, 'Osteoarthritis revisited: a contemporary review of aetiology', *Intl J Osteoarchaeol*, 17 (2007), 437–50

Wells n.d.
Calvin Wells, 'Human bones from burial 52', in 'Saint Maurice's Church, High Street, 1958–60', in Collis (ed.) n.d.

Wells 1982
Calvin Wells, 'The human burials', in McWhirr et al. 1982, 135–202

Wenham 1968
Leslie P. Wenham, *The Romano-British Cemetery at Trentholme Drive, York*, Ministry of Public Buildings and Works Archaeological Reports, No. 5 (London, 1968)

Wessex Archaeology 2009
Wessex Archaeology, 'The Winchester Hotel, Worthy Lane, Winchester. Post excavation assessment report and updated project design for analysis and publication', Wessex Archaeology report 66730.02 (unpublished, 2009).

Wheeler and Wheeler 1932
R. E. M. Wheeler and T. V. Wheeler, *Report on the Prehistoric, Roman and Post-Roman Site in Lydney Park, Gloucestershire*, Research Reports of the Society of Antiquaries, 9 (London, 1932)

WHO 2011
World Health Organization, *World Health Statistics, 2011* (Geneva, 2011)

Zant 1993
J. M. Zant, *The Brooks, Winchester, 1987–88: the Roman Structural Remains*, Winchester Museums Service Archaeology Report 2 (Avon, 1993)

Zimmerman and Kelley 1982
Michael R. Zimmerman and Marc A. Kelley, *Atlas of Human Paleopathology* (New York, 1982)