

Contents

Contributors vii

Foreword ix

1. Skeletons in action: Inferring behaviour from our bones

Kimberly A. Plomp, Rebecca J. Gilmour, and
Francisca Alves Cardoso

2. Bone biology and microscopic changes in response to behaviour

Lily J.D. DeMars, Nicole Torres-Tamayo, Cara Stella Hirst,
and Justyna J. Miskiewicz

- 2.1 Introduction 7
- 2.2 Bone anatomy and cells 8
- 2.3 Long bone micro-anatomy, modelling, and remodelling 10
- 2.4 Bone functional adaptation 15
- 2.5 Bone histology and behaviour in archaeological humans 17
- 2.6 Trabecular bone structure and behaviour 22
- 2.7 Conclusions 29
- Acknowledgments 29
- References 30

3. Biosocial complexity and the skull

Suzy White and Lumila Paula Menéndez

- 3.1 Introduction 39
- 3.2 The skull 40
- 3.3 Origins and dispersals 42
- 3.4 Transition to agriculture 48
- 3.5 Adaptations to environmental changes 51
- 3.6 Culture and communication 53
- 3.7 Summary and conclusion 57
- References 60

4. Activity and the shoulder: From soft tissues to bare bones

Francisca Alves Cardoso and Aaron Gasparik

- 4.1 Introduction 73
- 4.2 Activity versus occupation 74
- 4.3 Entheses 75
- 4.4 Shoulder joint anatomy 77
- 4.5 Studies of shoulder activity in modern contexts 84
- 4.6 Archaeological studies of activity and the shoulder 88
- 4.7 Synthesising clinical and bioarchaeological studies 97
- 4.8 Conclusions and future directions 98
- References 102

5. Archery and the arm

Jessica Ryan-Despraz

- 5.1 Introduction 109
- 5.2 Basic biomechanics: The kinesiology of archery 110
- 5.3 Common bone adaptation responses to archery 112
- 5.4 Injuries in modern archers 118
- 5.5 Studies in biological anthropology 125
- 5.6 Conclusion 128
- Acknowledgments 129
- References 130

6. Tool use and the hand

Christopher J. Dunmore, Fotios Alexandros Karakostis,
Timo van Leeuwen, Szu-Ching Lu, and Tomos Proffitt

- 6.1 What behaviours are unique to the human hand? 136
- 6.2 Hominin hand morphology and tools in the past 140

6.3 Soft tissues	148
6.4 Soft tissue traces in the archaeological record	151
6.5 Internal bone morphology	154
6.6 Conclusions	158
Glossary	158
References	159

7. Behaviour and the bones of the thorax and spine

Kimberly A. Plomp

7.1 Introduction	173
7.2 The human spine	174
7.3 The human thorax	175
7.4 Locomotion	175
7.5 Activity-related palaeopathology of the spine	179
7.6 Corsetry and binding	181
7.7 Violence and ritual behaviour	185
7.8 Conclusion and ways forward	187
References	187

8. Human behaviour and the pelvis

Sarah-Louise Decrausaz and Natalie Laudicina

8.1 Introduction	193
8.2 The human pelvis	194
8.3 The human pelvis vs. the fossil and nonhuman primate pelvis	195
8.4 Childbirth	199
8.5 Movement (locomotion and gait)	204
8.6 Health, disease, and trauma	206
8.7 Everyday behaviours	211
8.8 Conclusion	213
References	213

9. Horse riding and the lower limbs

William Berthon, Christèle Baillif-Ducros, Matthew Fuka, and Ksenija Djukic

9.1 Introduction	219
9.2 Modern riders and sports medicine	222

9.3 Biological anthropology of horse riding	226
9.4 The identification of reliable horse riding-related skeletal changes	240
References	244

10. Locomotion and the foot and ankle

Kimberleigh A. Tommy and Meir M. Barak

10.1 Introduction	255
10.2 Experimental studies that support bone functional adaptation in the ankle and foot	256
10.3 Development in archaeological and anthropological research	263
10.4 Conclusion	272
References	273

11. Injury, disease, and recovery: Skeletal adaptations to immobility and impairment

Rebecca J. Gilmour, Liina Mansukoski, and Sarah Schrader

11.1 Introduction	281
11.2 Progression of disuse bone loss	282
11.3 Asymmetry	286
11.4 Recovery following disuse	288
11.5 Bioarchaeological studies	290
11.6 Discussion and ways forward	299
11.7 Conclusion	302
References	302

12. Acting on what we have learned and moving forward with skeletal behaviour

Rebecca J. Gilmour, Kimberly A. Plomp, and Francisca Alves Cardoso

Index 315