

https://dspace.org/

Undesrstanding variation: A stylistic ethnographic analysis of rock art from the Makgabeng Plateau, Limpopo province, South Africa

Pinto, Lourenco Casimiro

2019
https://hdl.handle.net/10539/28803

Downloaded from a DSpace repository. https://dspace.org/



UNDERSTANDING VARIATION: A STYLISTIC ETHNOGRAPHIC ANALYSIS OF ROCK ART FROM THE MAKGABENG PLATEAU, LIMPOPO PROVINCE, SOUTH AFRICA

Lourenço Casimiro Pinto

0507453V

A thesis submitted to the Faculty of Science, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Doctor of Philosophy

Supervisor: Professor David Pearce

Co-supervisor: Dr Catherine Namono

DECLARATION

I declare that this thesis is my own, unaided work. It is being submitted for the degree of Doctor of Philosophy at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other university.

_____

(Signature of candidate)

__28th__ day of

__FEBRUARY__ 20_19__ in_____

Johannesburg, 2019

ABSTRACT

Recent rock art studies have earmarked certain finger-painted geometric rock art motifs and attributed these to herder, or Khoekhoe, groups across southern Africa. This study investigated the authorship, spatial and temporal distribution, interaction and possible meanings of these geometric rock art motifs. Focusing on a specific area, the Makgabeng, Limpopo Province, South Africa, the relationship between two corpora (finger-painted geometric and fine-line naturalistic rock art) was investigated using a stylistic ethnographic method. A method that allows for a contextual understanding of change through time and space, a method that considers historicity, change and the complex interaction between groups in the area. A comparative study of motifs in the two styles was undertaken at 44 sites in the Makgabeng. In this area, the ethnographies support interpretations that emphasise specific ideas around the body and phenomenological approaches of embodiment for each motif cluster. Through statistical and comparative studies, it was found that it was unlikely that two distinct ethnic groups created two rock art syles. Rather than an introduction of new meanings with the migration of herders, a continuity in beliefs, shared by assimilated Khoe-San groups once extant in the Makgabeng, is demonstrated.

ACKNOWLEDGEMENTS

During researching and writing this thesis I was assisted and advised by several people to all of whom I owe my thanks. I would like to thank Jonas Tloumma, our expert in the Makgabeng, Catherine Namono, Christian Louw, David Pearce, Amanda Esterhuysen, Graham Reeks, Ghilraen Laue, David Morris, Jeremy Hollmann, Peter Black and the Quai Branly Library in Paris. This work is based on research supported by the South African National Research Foundation (NRF). Any opinion, finding and conclusion or recommendation expressed in this material is that of the author and the NRF does not accept any liability in this regard.

TABLE OF CONTENTS

DECLARATION ii

ABSTRACT iii

ACKNOWLEDGEMENTS iv

TABLE OF CONTENTS v

LIST OF FIGURES ix

LIST OF TABLES xvii

TERMINOLOGY

PART 1

I. Introduction: Quo Vadis? 1

1.1. Significance 3
1.2. Objectives and aims 4
1.3. Thesis outline 7
1.4. Discussion 9

II. Who are the Khoekhoen? Origins and Development of Herding in Southern Africa 11

2.1. The archaeological evidence 21
2.2. Languages and genes 25
2.3. Discussion 32

PART 2

III. The Makgabeng: The Place Where Bushmen Drink 35

3.1. Past climate 38
3.2. Fauna and flora 39
3.3. Past inhabitants of the Makgabeng 41
3.3.1. The Earlier and Middle Stone Ages 42
3.3.2. The Later Stone Age 44
3.3.3. Herders 48
3.3.3.1. Thin-walled pottery 49
3.3.3.2. Livestock remains 58
3.3.3.3. Lithics 63
3.3.4. Farmers 68
3.3.5. Known inhabitants 71
3.4. Discussion 75

IV. The Rock Art of the Makgabeng 77

4.1. Early Recordings of Fine-line Rock Art in the Makgabeng 81
4.1.1. Distribution and subject matter of fine-line rock art 82
4.1.2. Dating of the fine-line rock art 88
4.1.2.1. Style and superimpositioning 88
4.1.2.2. Paper chromatography 89
4.2. The Later Years of Rock Art Recording in the Makgabeng 91
4.2.1. Trance-related imagery 91

4.2.2. Natural modelling 97
4.2.3. Female figures and symbolism 101
4.2.4. Dating 109
4.2.4.1. Relative dating and contact imagery 110
4.2.4.2. Direct dating and superimpositioning 111
4.3. Fine-line rock art and interaction 116
4.3.1. Sheep 116
4.3.2. Aprons and loincloths 124
4.4. Farmer Geometric Rock Art 127
4.5. Finger-painted Geometric Rock Art 130
4.5.1. The origins of the geometric rock art 135
4.5.2. Khoekhoe identity and geometric rock art 140
4.5.3. Using ethnographies critically 148
4.5.4. Interpretations of finger-painted geometrics in South Africa 149
4.6. Handprints 154
4.6.1. Techniques and distribution 154
4.6.2. Authorship 158
4.6.3. Interpretations of handprint motifs 163
4.7. Discussion 165

PART 3

V. Enduring Style In Rock Art Studies: A New, Durable Definition 168

5.1. Style in southern Africa: The early years (1928–1948) 169
5.2. Issues arising from early and mid-20th century findings 170
5.3. Style in southern Africa: The later years (1963–1995) 171
5.3.1. New or Processual Archaeology 173
5.3.2. The post-stylistic era 175
5.4. Style in southern Africa in the 21st century 177
5.5. Style in the archaeology of art: towards a new working definition 181
5.6. Discussion 187

VI. Embodiment Theory: The Body And Style 189

6.1. Body theory 189
6.1.1. The body adorned 195
6.1.2. The body in space 197
6.2. Style as middle-range theory 200
6.3. Discussion 201

PART 4

VII. Method: Stylistic Analysis – Variations in Time and across Space 204

7.1. Previous surveys 204
7.2. Sampling strategy 204
7.3. Field recording 207
7.4. Site recording forms 208
7.4.1. Motifs 208
7.5. Input of information into a digital database 214
7.6. Selection of variables and analysis of database 227
7.7. Statistics 227
7.7.1. Contingency tables 228
7.7.2. Cluster analysis 229
7.8. Geographic Information Systems (GIS) 233
7.9. Superimpositioning 234
7.10. Ethnography 235
7.11. Discussion 236

VIII. Results **238**

8.1. First impressions 238
8.1.1. Site analysis 239
8.1.2. Methods of depiction 242
8.1.3. Colour 243
8.1.4. Shape 244
8.2. Comparative motif analysis 250
8.2. Finger-dots 251
8.2.1. Temporal dimension 254
8.2.2. Spatial dimension 256
8.2.3. Motif relationships 258
8.2.4. Conclusions 258
8.3. Handprints 259
8.3.1. Temporal dimension 265
8.3.2. Spatial dimension 266
8.3.3. Motif relationships 269
8.3.4. Conclusions 269
8.4. Geometrics 270
8.4.1. Temporal dimension 276
8.4.2. Spatial dimension 278
8.4.3. Motif relationships 280
8.4.4. Conclusions 280
8.5. Sheep 281
8.5.1. Temporal dimension 284
8.5.2. Spatial dimension 286
8.5.3. Motif relationships 288
8.5.4. Conclusion 288
8.6. Statistics 289
8.6.1. Contingency tables 289
8.6.2. Cluster analysis 290
8.7. Discussion 316

IX. Ethnography: What does a Spiny Cucumber have to do with the Moon? **320**

9.1. The Kalahari Debate 321
9.2. Ethnographic analogies 323
9.2.1. Linguistic diversity 324
9.2.2. Territoriality 325
9.2.3. Continuity 326
9.3. The ethnographies of Khoe-Kwadi speakers 326
9.4. Shared beliefs 328
9.4.1. Body, health and disease 332
9.4.2. Nature, vital force and wind 332
9.4.2.1. Clothing – healing, rain and protection 338
9.4.2.2. The motivation and decoration of clothing 349
9.4.2.3. Geometrics and body modification 351
9.4.2.4. Body markings 360
9.5. Discussion 361

PART 5

X. Discussion: Re-thinking the Geometric Rock Art Tradition **364**

10.1. Geometric motifs 368
10.1.1. Finger and fine-line painted Aprons 369
10.2. Finger-dots and finger-strokes 373
10.3. Handprints 380
10.4. Sheep motifs 384

10.5. Summary 390
10.6. Broader issues 391
10.6.1. Anti-culturalist perspective 391
10.6.2. Interaction 393
10.6.3. Shared beliefs and change 395
10.7. Future approaches 395

XI. References 397

XII. Appendices 451

APPENDIX A 452
APPENDIX B 457
APPENDIX C 476
APPENDIX D 479
APPENDIX E 481
APPENDIX F 483
APPENDIX G 485
APPENDIX H 487
APPENDIX I 489
APPENDIX J 491
APPENDIX K 493
APPENDIX L 495
APPENDIX M 497
APPENDIX N 562

LIST OF FIGURES

Figure 1.1:	Map of research area	2
Figure 1.2:	Reddish-brown fine-line painted human figures	2
Figure 1.3:	White, thickly finger-painted animals and humans	2
Figure 1.4:	White finger-painted complex geometrics	3
Figure 2.1:	Elphick (1985) and Ehrets' (1982) models on herder migrations	18
Figure 2.2:	The migration routes of the proto-Khoekhoen	18
Figure 2.3:	Map showing distribution of Khoe-San languages	26
Figure 3.1:	Map of research area with major rivers and mountains	36
Figure 3.2:	Detail of research area	37
Figure 3.3:	Deep gorge in which Masebe River flows	38
Figure 3.4:	Map of Limpopo Province with excavated	42
Figure 3.5:	Example of ripple-ware pottery	51
Figure 3.6:	Map showing the distribution of sites with Bambata pottery	53
Figure 3.7:	Map of southern Africa with sites yielding excavated livestock remains	60
Figure 3.8:	Photographs of a Vaalpense family, 1919 (Jantje Ndei Mochabeng)	73
Figure 3.9:	Photographs of a Vaalpense family, 1919 (Moklalea Sekoati)	73
Figure 4.1:	Map showing the distribution Early Iron Age and non-entoptic geometric rock art	79
Figure 4.2:	Graph illustrating the frequency of animal depictions in the Limpopo-Shashe Confluence Area (LSCA)	85
Figure 4.3:	Pie graph with percentages of animal depictions in the LSCA	86
Figure 4.4:	Distribution of shaded paintings in southern Africa	87
Figure 4.5:	Shaded paintings from the Makgabeng	87
Figure 4.6:	Shaded painting from the Drakensberg	88
Figure 4.7a:	True-colour image of figures in bending forward posture	94
Figure 4.7b:	False-colour image of figures in bending forward posture	94
Figure 4.8:	Red dorsal line on rhinoceros	95

Figure 4.9a: True-colour image of a therianthropic figure 97

Figure 4.9b: False-colour image of a therianthropic figure 97

Figure 4.10: Examples of formlings in red from the Makgabeng 99

Figure 4.11a: True-colour image of a procession of girls and women 103

Figure 4.11b: False-colour image of a procession of girls and women 104

Figure 4.12: Re-drawing of painting of 'Lehaha la Basadi' (Womens' Cave) 106

Figure 4.13: Sampled carbon black images from Thune Dam, Botswana 114

Figure 4.14: Distribution of sheep paintings and engravings 116

Figure 4.15: White fine-line fat-tailed sheep from the Makgabeng 117

Figure 4.16: Back aprons reminiscient of a a sheep's fat tail 123

Figure 4.17: Y-shaped motif of a fish trap, south of the Limpopo River 125

Figure 4.18: Museum collection of a Bushman loincloth 126

Figure 4.19: A finger-painted antelope in characteristic pasty white paint 127

Figure 4.20: Train site (Bonne Esperance 16) 128

Figure 4.21: Site, Too Late 74, illustrating initiation art 129

Figure 4.22: Red finger-painted geometrics, Zambia 136

Figure 4.23: Red naturalistic art, Zambia 138

Figure 4.24: Red geometric rock art, Zambia 138

Figure 4.25: Frobenius's photograph of the 'junge malerei' (young painting) at Oakleigh Farm, Eastern Cape Province 141

Figure 4.26: Geometrics from Oakleigh Farm, Eastern Cape, Province 142

Figure 4.27: Watercolour of engraved geometrics found near Pniel, Northern Cape Province 151

Figure 4.28: Rock art site, Morgenzon, Ghariep River, Free State 151

Figure 4.29: Example of a full handprint (Willcox's Type 1) 156

Figure 4.30: Distribution of Type One hand imprints 157

Figure 6.1: Significantly Differentiated Figure (SDF) in a trance dance 194

Figure 7.1: Map of sites with property names 205

Figure 7.2a: True-colour image of a figure on flaking rock 216

Figure 7.2b: False colour image of figure on flaking rock (LRE) 216

Figure 7.3a: True-colour image of superimpositioning 217

Figure 7.3b: False-colour image of superimpositioning (LXX) 217

Figure 7.4a: True-colour image of a selection 218

Figure 7.4b: False-colour image of a selection 218

Figure 7.5: Pose 15 in Pose Tool 3D 223

Figure 7.6: Pose 13 in Pose Tool 3D 223

Figure 7.7: Example of a dendrogram 230

Figure 7.8: Example of a Harris Matrix created using ArchEd 1.4.1 235

Figure 8.1: Map showing the distribution of sites in the sample (total number of motifs in relation to size of site 241

Figure 8.2: Bar graph with sample percentages of each technique used 242

Figure 8.3: **Bar graph of all colours used to paint motifs in the sample** **2**44

Figure 8.4: Bar graph of the frequency of shape motif types 245

Figure 8.5: Bar graph demonstrating the total count of colours used to paint anthropomorphic motifs 246

Figure 8.6: Bar graph of the frequency of the most common painted animal species 247

Figure 8.7: Bar graph demonstrating the total count of colours used to paint zoomorphic motifs 248

Figure 8.8: Bar graph demonstrating the total count of geometric shapes 249

Figure 8.9: Bar graph demonstrating the total count of colours that are used to paint geometric motifs 250

Figure 8.10: Frequency of the total count of finger-dots, finger-strokes and micro-dots 251

Figure 8.11a: True-colour image of three forms of finger marks 253

Figure 8.11b: False-colour image of three forms of finger marks 253

Figure 8.12: Distribution of finger-dots and finger-stokes from sites in the Makgabeng 257

Figure 8.13: Pie graph displaying the relationship between finger-dots and other motifs 258

Figure 8.14: Handprints with splayed fingers 260

Figure 8.15: Hanprints close together with fingers together 260

Figure 8.16: Pasty white handprints at De La Roche 42 261

Figure 8.17: Pasty white handprints at Langbryde 40 262

Figure 8.18: Cave of Hands with low entrance 263

Figure 8.19: Detail of handprints at Cave of Hands 263

Figure 8.20: Map showing distribution of handprints in the Makgabeng 267

Figure 8.21: Map from Hot Spot analysis illustrating the locations of high and low handprint concentrations 268

Figure 8.22: Pie graph reflecting the percentages of motif relationships between handprints and other motifs 269

Figure 8.23: Animal skin geometric alongside figure with bow and arrow 270

Figure 8.24: Panel detail of painted bags at a site near the Quthing River, Lesotho 271

Figure 8.25: Large finger-painted white apron or loincloth with tying cords and tassels 274

Figure 8.26: Large finger-painted abstract rectangular apron design 274

Figure 8.27a: True-colour image of possible brush-painted apron in yellow-brown from site, Groenepunt 24B 275

Figure 8.27b: False-colour image of possible brush-painted apron in yellow-brown from site, Groenepunt 24B 275

Figure 8.28: Distribution of aprons and loincloths from the sampled sites 279

Figure 8.29: Pie graph illustrating percentage of motif relationships between apron and loncloth motifs with other variables 280

Figure 8.30a: True-colour image of therianthrope with possible sheep head in trance-like posture 282

Figure 8.30b: False-colour image of therianthrope with possible sheep head in trance-like posture 282

Figure 8.31a: True-colour image of male figure painted to the right of a cluster of black sheep 283

Figure 8.31b: False-colour image of male figure painted to the right of a cluster of black sheep 283

Figure 8.32: Detail of black sheep's head at Bonne Esperance 16 283

Figure 8.33: White fat-tailed sheep with head lowered at Bonne Esperance 15 283

Figure 8.34a: True-colour image of three white sheep with brownish-red faces, ears and horns 285

Figure 8.34b: False-colour image of three white sheep with brownish-red faces, ears and horns 285

Figure 8.35: Map of the distribution of sheep in the sample of sites 287

Figure 8.36: Pie graph indicating the percentages of motif relationships between sheep with other motifs 288

Figure 8.37: Map of sites in cluster one 293

Figure 8.38a: True-colour image of Lotus-coloured undulating line superimposed over brownish-red finger-dots at Bonne Esperance 21 293

Figure 8.38b: False-colour image of Lotus-coloured undulating line superimposed over brownish-red finger-dots at Bonne Esperance 21 293

Figure 8.39: Vertical and horizontal finger-strokes on cealing at Too Late 3 294

Figure 8.40: Three long white finger-strokes over black imagery at Disseldorp 8 294

Figure 8.41: White finger-painted undulating white line at Groenepunt 47 294

Figure 8.42a: True-colour image of brownish-red finger-dots superimposed over aardvark at Too Late 11 295

Figure 8.42b: False-colour image of brownish-red finger-dots superimposed over aardvark at Too Late 11 295

Figure 8.43a: True-colour image of thick white finger-painted human figure with abstract form at Bonne Esperance 21 296

Figure 8.43b: False-colour image of thick white finger-painted human figure with abstract form at Bonne Esperance 21 296

Figure 8.44: Map of sites in cluster two 296

Figure 8.45: Over 33 Finger-dots in semi-ovoid motifs at site Langbryde 40 297

Figure 8.46: Two black geometric shapes at Disseldorp 8 297

Figure 8.47: Two finger-painted rayed concentric circles at Gallashiels 8 298

Figure 8.48: A white semi-ovoid apron motif at Nieuwe Jerusalem 19 298

Figure 8.49: Map of sites in cluster three 298

Figure 8.50: Detail of six nested oval shapes outlined in white at Bonne Esperance 17 299

Figure 8.51: Black motif of a kudu bull. Finger-painted square apron motif superimposed over the bull. At Nieuwe Jerusalem 19 299

Figure 8.52: A brownish-red outline of large antelope at Groenepunt 24A 300

Figure 8.53: Black finger-painted square motifs at Nieuwe Jerusalem 19 300

Figure 8.54: Map of sites in cluster four 300

Figure 8.55a: True-colour image of a complex geometric motif at Groenepunt 35 302

Figure 8.55b: False-colour image of a complex geometric motif at Groenepunt 35 302

Figure 8.56: An oval-shaped geometric at Bonne Esperance 25 302

Figure 8.57: A false-colour image of a brownish-red grid with internal verticla lines at De la Roche 42 302

Figure 8.58: Black unfilled zebra motif at site near Bonne Esperance 2 302

Figure 8.59: Map of sites in cluster five 303

Figure 8.60a: True-colour image of a row of seven or eight yellow-brown human figures with exaggerated calf muscles at Groenepunt 24A 304

Figure 8.60b: False- True-colour image of a row of seven or eight yellow-brown human figures with exaggerated calf muscles at Groenepunt 24A 304

Figure 8.61a: True-colour image of two stick-like yellow-brown animals, walking one behind the other. at Too Late 3 304

Figure 8.61b: False- colour image of two stick-like yellow-brown animals, walking one behind the other. at Too Late 3 (lds) 304

Figure 8.62a: True-colour image of a yellow-brown antelope at Too Late 11 305

Figure 8.62b: False-colour image of a yellow-brown antelope at Too Late 11 (lds) 305

Figure 8.63: A crudely painted yellow-brown sheep at Too Late 11 305

Figure 8.64: Map of sites in cluster six 306

Figure 8.65a: True-colour image of seven to eight brownish-red indeterminate antelope at Groenepunt 47 306

Figure 8.65b: False-colour image of seven to eight brownish-red indeterminate antelope at Groenepunt 47 306

Figure 8.66: Faded white paintings with recognisable wildbeest head and front limb at Groenepunt 24b 307

Figure 8.67a: True-colour image of brownish-red human figure partially superimposed over bending forward figure at Groenepunt 11 308

Figure 8.67b: False- colour image of brownish-red human figure partially superimposed over bending forward figure at Groenepunt 11 308

Figure 8.68: Map of sites in cluster seven 309

Figure 8.69: A bichrome zoomorph at Nieuwe Jerusalem 9 310

Figure 8.70: Yellow-brown seated hyena outlined in white at De la Roche 42 310

Figure 8.71: Cream-coloured kudu with no horns at Bonne Esperance 17 310

Figure 8.72: Indeterminate antelope painted in white with brownish-red remnants of paint at De la Roche 42 310

Figure 8.73: False-colour image of a thin tall human figure holding three arrows/sticks at Groenepunt 11 (ybr) 311

Figure 8.74: Map of sites in cluster eight 312

Figure 8.75a: True-colour image of five handprints at Galashiels 8 313

Figure 8.75b: False-colour image of five handprints at Galashiels 8 (lds) 313

Figure 8.76: One or two handprints in chalky white 313

Figure 8.77: Yellow-brown globular paint smear at Groenepunt 11 313

Figure 8.78: Cave of Hands (GP30) with rows of handprints 313

Figure 8.79: Detail of five handprints from the Cave of Hands (GP30) 313

Figure 8.80: Map of sites in cluster nine 314

Figure 8.81a: True-colour image of three brownish-red standing figures with arrows/sticks through middrifts at Groenepunt 24A 315

Figure 8.81b: False- colour image of three brownish-red standing figures with arrows/sticks through middrifts at Groenepunt 24A (lds) 315

Figure 8.82: Female figure with sagging breasts and coiffure/headdress painted in white at Groenepunt 11 315

Figure 8.83a: True-colour image of a muscular human figure with exaggerated calf and arm muscles at Langbryde 40 315

Figure 8.83b: False-colour image of a muscular human figure with exaggerated calf and arm muscles at Langbryde 40 (rgb) 315

Figure 9.1: Drawing of a young Nama woman, close to the Cape 340

Figure 9.2: Drawing of a young Gonaqua woman with circle and zigzag designs upon her frilled front apron 341

Figure 9.3: Drawing of a mature Khoe woman with geometric diamond-shaped designs upon her front apron 342

Figure 9.4: A figure with elaborate headdress at 'The Witchdoctor of the Makgabeng' shelter 344

Figure 9.5: Clothing around the waist of women at Bonne Esperance 13 345

Figure 9.6: Leather skirt with red circles, said to be Griqua 349

Figure 9.7: Geometric design on an ostrich egg 351

Figure 9.8: Early sketch of the Khoekhoen in the Cape by unknown Dutch artist, 17th century 354

Figure 9.9: Detail of sketch C by unknown Dutch artist 355

Figure 9.10: Khoekhoe women with cheeks and lips reddened. Sketch by Samuel Daniell, 1820 357

Figure 9.11: Namaqua girls with 'blue' clay face paint. Sketch by Thomas Baines, 1864 358

Figure 9.12: Small incisions made on specific parts of the face in G|wi society 360

Figure 9.13: Small incisions upon forehead extending toward the ear and on cheeks of Kua man 360

LIST OF TABLES

Table 2.1: Language groupings showing the chosen groups (Khoe-Kwadi branch) used in this ethnographic study 27

Table 3.1: Comparison of materials found at OBP Shelter 45

Table 3.2: Radiocarbon dates of Bambata pottery across the sub-continent 54

Table 3.3: Summary of the hypotheses on the origins of Bambata pottery 55

Table 3.4: Radiocarbon dates and locations of livestock remians across the sub-continent 60

Table 4.1: The broad rock art groupings found in the Makgabeng 80

Table 4.2: Table with techniques and dates discussed in text 109

Table 4.3: Collated table of three supeimpositioning studies 112

Table 7.1: Tabulated list of sites analysed 206

Table 7.2: Site recording form 209

Table 7.3: SPSS spreadsheet variables with examples 221

Table 7.4: The 11 colours identified in the stylistic analysis 232

Table 8.1: Superimpositioning table of finger-dots, finger-strokes and micro-dots from Harris Matrix 255

Table 8.2: Table illustrating the types of handprints found in the Makgabeng 259

Table 8.3: Superimpositioning of handprints from Harris Matrix 266

Table 8.4: Similarities and differences between bags and front aprons 273

Table 8.5: Superimpositioning table of geometric and clothing motifs 277

Table 8.6: Superimpositioning table of sheep motifs 284

Table 8.7: Contingency table (cross-tabulation) results 289

Table 8.8: Table demonstrating the nine resulting clusters with key variables highlighted 291

TERMINOLOGY

For most African languages, the 'correct' orthography is a colonial construct, since few indigenous languages were written down (A. Smith 2006a: v). The usual appellations of 'Bushmen' and 'Hottentots' are derogatory misnomers. For instance, the word 'San' was a name given to the Bushmen by other cultural groups. In the Khoekhoe language, Sa(a)n or Sān refers to a Bushman, one who gathers (food). San derives from Sáà or Sā which is the verb to forage, gather, glean, collect, pick up (one by one) (Haacke & Eiseb 2002: 109). Historically, the term San came to mean foreigner or a person of lower status who possessed no livestock (P. Mitchell 2002: 248).

After Pippa Skotnes's exhibition 'Miscast' (1996), representatives from indigenous groups argued over such terms as 'Khoe-San'. The representatives of various indigenous groups at the exhibition believed the Khoekhoen had appropriated the name Khoe-San, and thus preferred the term 'Bushman'. Furthermore, an organisation called the 'Ju|'hoan People's Organisation' rejected the word, 'San' and sought to ennoble the previously pejorative term Bushman (Hitchcock & Biesele 2010). In line with the Ju|'hoan Peoples' Organisation and to avoid confusion, the term 'Bushman' is used in this thesis unless referring to specific linguistic groups. In these cases, the appropriate linguistic name will be used.

Following the Khoekhoegowab dictionary (Haacke & Eiseb 2002), this thesis follows the following linguistic conventions – a Khoeb refers to a man while

Khoes refers to a woman. ‘Khoekhoen’ is used as a collective term meaning ‘people’ (A. Smith 2006a: v). The terms ‘Khoekhoe’ or ‘Khoe’ are used as adjectives. This is the self-appellation of modern Khoe-speakers (the Naman of Namibia), which can be found in the Nama dictionary compiled by the Department of African Languages, University of Namibia under the guidance of Wilfred Haacke (A. Smith 2006a: v).

Guide to the pronunciation of the click symbols

IPA- International Phonetic Alphabet

ǀ dental click: tip of the tongue is pressed against the front of the teeth and quickly withdrawn.

ǂ alveolar-palatal click: tip of the tongue is pressed against the alveolar ridge and adjacent palate; then released sharply downwards.

ǃ palatal click: tongue is pressed against the upper palate and released sharply downwards, something like when a cork is pulled from a bottle.

ǁ lateral click: click sound produced at the side of the tongue when tongue is held pressed against the palate.

(from Le Roux & White 2004: ix)

PART 1

I. Introduction: Quo Vadis?
Where are you going? Where to from here?

For decades, authors have discussed the origins of herding societies in southern Africa. From humble beginnings, with migration routes proposed based on limited archaeological evidence, (e.g. Stow 1905; Westphal 1963; Cooke 1965; Elphick 1977, 1985) we have advanced to complex multi-disciplinary approaches that into account linguistic, genetic, archaeological and historical data to piece together the scenario of herders' presence in southern Africa (e.g. Sadr 2008a; Güldemann & Elderkin 2010; Pleurdeau *et al*. 2012; Orton *et al*. 2013; Pickrell *et al*. 2014). Among archaeologists, the findings from excavated material (from sites associated with livestock remains and thin-walled pottery) were often at odds with the results of rock art research.

A watershed study by Benjamin Smith and Sven Ouzman (2004) in the journal, *Current Anthropology*, associated finger-painted geometric rock art with the linguistic evidence for a migration of herders in southern Africa passing through the project's study area, the Makgabeng in the Central Limpopo Basin, Limpopo Province (Fig. 1.1). It was in the Makgabeng where a large portion of the data collected was used to make their argument. A major research priority for these authors was their focus on origins, regarding two rock art 'traditions', the fine-line rock art (Fig. 1.2) and the finger-painted geometric rock art (Fig. 1.4), as distinct from one another (B. Smith & Ouzman 2004: 502). The study of a third art tradition, that of finger-painted farmer rock art present in the Central Limpopo

Basin, was studied and determined to be authored by Northern Sotho speakers (Fig. 1.3).



Figure 1.1: Map of research area with the Makgabeng highlighted with a green pin



Figure 1.2: Reddish-brown fine-line brush-painted human figures at site, Langbryde 40



Figure 1.3: White thickly finger-painted animals and humans associated with Northern-Sotho speakers at site, Bonne Esperance 2



Figure 1.4: White finger-painted complex geometrics associated with Khoekhoe speakers. Notice how the paint adheres to the rock surface in contrast to the Northern Sotho finger-painted rock art

This thesis unpacks problematic concepts, arguments, gaps and inconsistencies in their study before presenting novel data to cast further doubt on their findings and new interpretations of the motifs that are said to make up the geometric rock art tradition. The corollary issues of their study includes identifying 'cultures' from archaeological evidence and assigning authorship to rock art.

1.1. Significance

There has been a plethora of research and publications on the Makgabeng (e.g. Malan 1959; Mason 1962; Eastwood & Cnoops 1998; Hall & B. Smith 2000; Eastwood & Eastwood 2006). Edward Eastwood devoted over 15 years of his life to meticulously recording and interpreting, paintings and engravings. Eastwood's

investigations have shown the Makgabeng as having one of the richest and most dense concentrations of rock art sites in southern Africa. There are more than 660 rock art sites in an area of 333.56 km².

Linguistic, historical and archaeological evidence in this area supports the hypothesis that the Makgabeng constituted an interaction sphere, with many social formations interacting with one another. According to Eastwood and Johannes van Schalkwyk (2002: 27), the Makgabeng, with its long history of interaction, stands out from the rest of the Central Limpopo Basin as far more varied and diverse, with many bodies of rock art sharing the same shelters. The art of the Makgabeng is of great interest, as it depicts cross-cultural motifs such as fat-tailed sheep, geometrics and aprons, that reflect contact between different groups of people. The Makgabeng offers fertile ground on which to explore bigger issues such as the supposed separate origins of Bushman and Khoekhoe groups and the opposing hypothesis of a common origin, the 'hunters with sheep' model.

1.2. Objectives and aims

The intention of this thesis is to understand the nature of interaction (between what has been argued by others to be) two distinct rock art corpora ─ a finger-painted, largely geometric body of rock art and a fine-line, brush painted, rock art consisting mainly of naturalistic representations. A comparative study of the motifs within these two rock art 'traditions' within the Makgabeng formation provided detailed empirical evidence in which conclusions and interpretations were deduced. This study investigated whether a stylistic analysis, using statistics,

could be a useful method to observe connections and, indeed disconnections, between social formations across time and space.

Following the analysis of the rock art, the ethnographic method, in which Bushmen accounts are used to illuminate features of the art, was critically used (e.g. Lewis-Williams 1981: 34). The interpretation of cross-cultural motifs (visually similar motifs created by different cultural groups such as fat-tailed sheep, geometrics and aprons) required a set of ethnographies different from those used to interpret rock art in other parts of southern Africa (e.g. the south-eastern mountains of South Africa). The use of ethnographies of groups of Khoe-speaking Bushmen, who once lived in the Makgabeng or the surrounds, was emphasised. The recognition of motifs linked to Khoe-speaking Bushmen raises questions about the broader diversity of rock art in southern Africa (Eastwood & Van Schalkwyk 2002: 33).

Much of the interpretation of the Makgabeng's rock art has drawn upon the shamanistic explanation (Lewis-Williams 1981; Lewis-Williams and Dowson 1994: 217). The shamanistic rites drawn extensively from non-Khoe-speaking Bushmen may not be a major feature in the rock art of Khoe-speaking Bushmen. Furthermore, the ethnographies of Khoe-speakers have rarely been used in rock art studies (Eastwood & Eastwood 2006). This reveals a lacuna in our knowledge of the diversity of groups, in terms of linguistic differences, territoriality and continuity, creating art.

The research in this area has provided an array of cross-cultural motifs shared by many different identities and functions, which cannot be elucidated by the shamanistic explanation alone (Eastwood 2003). Not only were a different set of ethnographies used, drawn from Central and Eastern Khoe Bushman language groups (e.g. Thunberg 1795; Hoernlé 1918; Baines 1864; Hoff 1990; Valiente-Noailles 1991,1993; Low 2007a, 2007b, 2008), but the application of theories that frame these ethnographies and link them to the rock art were explored. Body and embodiment theory (e.g. Turner 1996; Entwistle 2000; Joyce 2005; Achrati 2007) allowed a framework to understand motifs, all of which have to do with the human body, in one form or another.

The objectives of this study are twofold: The results provide empirical evidence addressing two research questions. One, is style a useful concept? Two, what is the relationship between the fine-line and finger-painted rock art corpora within the Makgabeng? In other words, are there statistical and spatial similarities or differences between the two? Or are they distinct 'traditions', as has previously been suggested?

The aims of the study are:

I. to acquire deeper insight into the intricacies behind rock art variation between two rock art corpora (B. Smith 1998: 216); and

II. to supplement the existing explanatory potential of ethnographies in the interpretation of southern African rock art by using Khoe-speaking Bushman ethnographies in the interpretation of the rock art of the Makgabeng.

1.3. Thesis outline

This thesis is divided into five parts: Part 1 introduces the study before presenting the controversial arguments for the advent of herding in the Limpopo Province and the claims that this is the location where the origins and development of this way of life began. Chapter I gives an overview of the broad concerns in archaeology involving the differences in opinion on problematic terms such as 'hunter-gatherer' and 'herder'. In Chapter II, the complex question of who the Khoekhoen were using evidence from archaeology, linguistics and genetics that are not always complementary, is presented.

Part 2 focuses firmly on the study area, the Makgabeng, and previous research conducted. Chapter III provides insights into the past environment, climate, animal and plant species that occurred in the Makgabeng. From this platform the human or cultural history is understood by reviewing the archaeological evidence in the Makgabeng and surrounding areas – the different peoples on the landscape. Chapter IV critically situates the rock art of the Makgabeng in the socio-political milieu of the time and discusses the significance of this art in relation to other rock arts in South Africa.

Part 3 moves from the specifics of the archaeological evidence including the particulars of the rock art to the methodological and theoretical foundations of this study. Chapter V disputes whether the term 'tradition' is a useful analytical concept, whereas the concept of style may be a more appropriate term, even though it has had a tumultuous history within archaeological circles (e.g. Conkey & Hasfort 1990; Lorblanchet & Bahn 1993; Bednarik 1995; Boast 1997). By Chapter V, I answer Hypothesis One – is style a useful concept? Chapter VI presents the theoretical framework that underlies interaction and the shared iconography through the applicability of body and embodiment theory. This shared iconography facilitates our understandings of how various groups were interacting. The phenomenological aspects of the body, the body embedded in daily perception and practices, are understood in relation to specific motifs, the repeated cross-cultural motifs (e.g. clothing motifs depicted as geometrics). Clothing as an extension of the body delineates the boundary between self and other, individual and society. The body in space emphasises the importance of the non-visual and touch in rock art, especially in relation to finger-dots, strokes, rubbings and handprints. Following on from the previous chapter, the theory of embodiment can use the discourse on style as a middle range theory linking human behaviour and ways of doing, and the theoretical and interpretative field of the body and clothing, to the physical remains in the archaeological record. By Chapter VI, I answer Hypothesis Two – are these traditions distinct or not?

Part 4 presents the techniques used, the results of the study and the ethnographies consulted. In Chapter VII, I demonstrate how the stylistic analysis is used in this

study. Chapter VIII presents the results of the stylistic analysis to provide empirical data to support or question the two hypothesises, while Chapter IX uses the corollary evidence of ethnographic studies to infer meaning from historic and present communities. These ethnographies are applicable to the area and tell us about the rites and beliefs of peoples past and present that once lived in the Makgabeng.

Part 5 interprets the rock art motifs using chosen ethnographies to understand what is occurring on a micro-scale that is specific to this area. The concluding chapter, Chapter X, reflects on the broader issues raised in Part 1 and suggests future approaches to research questions.

1.4. Discussion

The more rock art researchers understand rock art corpora, the more researchers can ascertain similarities and differences within and between bodies of rock art. Many authors (e.g. B. Smith 1998; Blundell 2004; Ouzman 2005; Challis 2008, 2012; Mallen 2008; Henry 2010) have identified the co-occurrence of 'traditions' and the presence of shared motifs in other geographical areas. This calls into question the essentialised nature of defining bodies of rock art as closed. Rather, researchers can identify artists and groups as fluid interacting entities, changing in time and space. This notion of closed identities stems from particular historical and archaeological references to herders, as opposed to Bushmen, which have theoretical implications for future studies. The next chapter unpacks the

historically reified ethnicity termed the Khoekhoen in light of recent archaeological, linguistic and genetic evidence.

II. Who are the Khoekhoen?

Origins and Development of Herding in Southern Africa

The much debated argument on the advent of herding and the 'origins' and development of this 'way of life' into southern Africa is premised on the assumption that the herders in the archaeological past have retained elements of their culture, including their 'identity', for millennia (B. Smith & Ouzman 2004: 521; Eastwood & B, Smith 2005; B. Smith 2006). In many ways, the historic picture of the Khoekhoen in the 15th century, outlined below, is sought in the archaeological record (Sadr 2003).

Starting with the historic accounts of the first encounters between Western explorers and peoples on the coast of South Africa, this chapter chronologically steps back in time through the archaeological, linguistic and genetic evidence. The encountered peoples living a herder's way of life provides strong visual evidence and a lasting coherent narrative.

Throughout this chapter, we see how this image is fragmented when one interrogates at the scanty archaeological evidence. In addition to the scarcity of archaeological remains, the linguistic and genetic evidence is often at odds with the material remains and a 'fit', however uneasy, is problematically sought between these disciplines.

The historic record recounts how in 1488 Bartolomeu Dias and his crew saw pastoralists with numerous cattle and sheep at Mossel Bay in southern Africa

(Boonzaier *et al.* 1996: 53; Orton *et al*. 2013: 108). A century after Dias rounded the Cape of Good Hope, numerous European merchant sailors used this sea route to the Orient (Thompson 2001: 32). Ships stopped at the Cape Peninsula to take on board fresh water and to exchange metals for livestock from these local pastoralists (Thompson 2001: 32). Access to sheep and cattle was the primary incentive in the establishment by the Dutch East India Company (*Vereenigde Oost-Indische Compagnie* (VOC)) of a refreshment outpost at Table Bay in 1652 (Thompson 2001; Orton *et al.* 2013: 108-109). Europeans settled there.

The colonial settlements grew, in size and influence, irrevocably changing the lives of local southern Africans through trade, disease and forced removals (see Elphick 1977, 1985; Fauvelle-Aymar *et al.* 2006; Webley 2007). From the early twentieth century to the present, researchers (e.g. Stow 1905; Westphal 1963; Cooke 1965; Elphick 1977, 1985; Ehret 1982, 1998; A. Smith 1990, 1997; Sadr 2008a, 2014; Dewar & Marsh 2018) have debated how to identify these people in the past, who, through their material traces, introduced the first livestock to southern Africa.

However, the search for material remains that can be unquestionably attributed to pastoralists, in the archaeological record, has proven to be a near impossible exercise. Karim Sadr (2008a: 180) makes a compelling argument against the idea that pastoralists in the past existed as a coherent cultural entity. Rather, the individual aspects which would later comprise that identity in the 15th century – such as the language, economy, kinship system and/or knowledge of herding

practices – may have already been partly present in southern Africa (Sadr 2008a: 180). One can begin to see this through the tracing of archaeological, linguistic and genetic arguments (e.g. Henn *et al*. 2008; Güldemann & Elderkin 2010; Pleurdeau *et al*. 2012). The further one goes back, the more this clearer packaged image of the Khoekhoen is dismantled.

An early view (e.g. Elphick 1985: 10-14; Phillipson 1989; A. Smith 1992: 82-4) posited that domesticates came from the north introduced to southern Africa by hunter-gatherers speaking a proto-Khoe-Kwadi language, approximately 2 000 years ago. It is believed that they obtained their animals through interaction with an early wave of Bantu-speaking farmer groups in the confines of central and southern Africa (southern Zambia, Northern Botswana, western Zimbabwe), or the northern Kalahari (northern Botswana, southern Angola or western Zambia).

The descendants of these Kalahari peoples spread south and it is postulated that they became the historical Khoekhoen. The neighbouring groups did not choose to take up herding and their descendants remained in the Central Kalahari, speaking Central San languages (Morris 2014: 1). This model suggests a diffusion of ideas rather than people (*ibid*.).

The archaeology corroborated the conclusions reached by comparative linguistics, that suggested that livestock herding was practised in southern Africa before the arrival of Bantu-speaking peoples (Ehret 1967, 1998: 228-229). Direct radiocarbon dates (e.g. *ca* 2100 BP at Boundary Shelter, South Africa) for the first

pottery, a thin-walled plain ware found widespread in hunter-gatherer sites, in southern Africa, dated two to four centuries before farmers' arrival (Sadr & Sampson 2006: 248). At the time of arrival, "the nearest contemporary Iron Age settlement was 1 500 kilometres to the west" (*ibid.*). More recent thick-walled pottery, on the other hand, was uniformly associated with migrating Bantu-speaking farmers (Sadr & Sampson 2006: 235). "While the concept of fired clay vessel technology may have diffused southwards across this great distance, the material record provides no shred of support for such a proposition" (Sadr & Sampson 2006: 248).

With the new evidence, and chronology upturning the early view, new hypothesises were crafted. The herding way of life may not have been brought by immigrant Bantu-speaking farmers from the north, as previously stated, but it could be conceivable that thin-walled pottery, livestock and certain lithic patterns came to be in the Makgabeng and southern Africa by other means. How herders or the elements of herding may have come to be in southern Africa is a topic of much debate. Two competing models in this debate have arisen, each with different understandings of how the social economy of hunter-gatherers allowed or disallowed, the accommodation of livestock.

The first, a cultural diffusion model, argues for the indigenous adoption of sheep-keeping by hunter-gatherers (Kinahan 1989; Sadr 2004, 2008). Domesticates and associated knowledge of animal husbandry introduced by herders was passed

down to neighbouring hunter-gatherers, who in then passed it on to other hunter-gatherers, creating a chain of exchange networks (Jerardino *et al.* 2014: 4).

The main proponent of this model is John Kinahan (1989). Kinahan (1989), as do most archaeologists, makes use of ethnographic analogy where contemporary communities are used as analogs for communities in the past. Two of the major criticisms of this method is that, firstly, it attempts to force a fit between the archaeological data and the ethnographic analog (Cummings 2013: 8). Second, the range of people used as analogs today may not be the best analogs for the peoples of the past (*ibid*: 9). However, more complex use of relational analogies has shown that this method can be useful in translating and interpreting the archaeological record and testing hypotheses (Wylie 1982, 1985; Cunningham 2003: 391). Moreover, it allows archaeologists to conceptualise possibilities of existence that may not previously have been considered (Cunningham 2003: 391).

Based on his work in the Central Namib Desert, Namibia, Kinahan (1989: 1) argues that a herding economy arose from the transformation of local hunter-gathering indigenes. For him, the main distinction between hunters-gatherers and pastoralists is that herders own domestic animals, and that the significance of owning stock extends beyond the living animals to the social relations of their ownership (Kinahan 1989: 15). Unlike hunter-gatherers, who have no claim over an animal until it is killed, pastoralists have ownership rights of live animals. Kinahan (1989: 15) argues that every day the pastoralist tends to his or her stock, milks a cow or goat, or repays a debt by giving an ewe, he or she is "reinforcing

prerogatives of ownership which are specific to pastoral society and absent from that of hunters". When herds grow larger than is needed to sustain the food requirements of the population, pastoralists will alleviate these pressures by forming alliances with hunter-gatherers that link them to animals in a chain of claims and obligations (Kinahan 1989: 16).

Kinahan (1989: 16) argues that this

> combination of domestic autonomy and community production is a specific distinguishing characteristic of pastoralism (Bonte 1981) and gives it a remarkable degree of fluidity (Lefébure 1979). The [hunter-gatherer] economy also depends on a fluid community structure (Sahlins 1974; Turnbull 1968), but is based on principles that are entirely antithetical to those of property and accumulation. [However,] the [hunter-gatherer] economy is [also] not immutable [: …] the principle of sharing that unifies the [hunter-gatherer] economy is not the result of a natural instinct or inclination; it is a matter of economic survival and, being a social imperative, it is negotiable. If circumstances favour the emergence of domestic autonomy a fully pastoral economy can be rapidly established. Nonetheless, it is also possible for this economy to entirely collapse if the necessary social and ecological conditions of its survival are not maintained.

By contrast, a second model has been formed by many researchers arguing for a demic diffusion or migration of herders into southern Africa (Stow 1905; Westphal 1963; Cooke 1965; Elphick 1977, 1985; Ehret 1982, 1998; A. Smith 1990, 1997).

The historian, geologist and travel writer, George William Stow (1905), collected oral traditions of diverse peoples. He proposes that the proto-Khoekhoen migrated from somewhere in the northeast African interior, moved southwest until they reached the Atlantic, near present-day Luanda, Angola, and then gradually spread along the west coast, divesting the autochthons of their land, until they arrived at

the Cape Peninsula (Stow 1905: 236). Stow (1905: 236) further describes how the proto-Khoekhoen would not dwell in the east, towards the mountainous areas, possibly the uKhahlamba-Drakensberg, KwaZulu-Natal (hereafter Drakensberg), for fear of the Bushmen and their poisoned arrows.

Cranmer Kenrick Cooke (1965) proposes a migration westward through the upper half of Botswana and thence south through Namibia and South Africa's Northern Cape to the Western Cape. He based this route on the distribution of paintings of sheep and what appeared to be images of 'shepherds' in Zimbabwe, as well as on the ecological unlikelihood of movement through the Central Kalahari (Cooke 1965). His model echoed Stow's model but without north-east Africa as the source (P. Mitchell 2002: 227) (Fig. 2.1).

The migration models of Stow and Cooke have fallen out of favour with researchers, as more convincing models have been proposed. These new migration models stem from linguistic evidence. Ernst Westphal (1963), whose views are elaborated by Richard Elphick (1977, 1985) and Christopher Ehret (1982, 1998), arguing that the proto-Khoekhoen originated in a region at the juncture between Zambia, Zimbabwe and Botswana. Ehret (1998, 2008) proposed that a now extinct Limpopo Khoe-speaking population of Later Stone Age herders would have been the first herders in this general area. He suggests that these people migrated here between 2600 and 2000 BP (Ehret 1998, 2008) (Fig. 2.2).

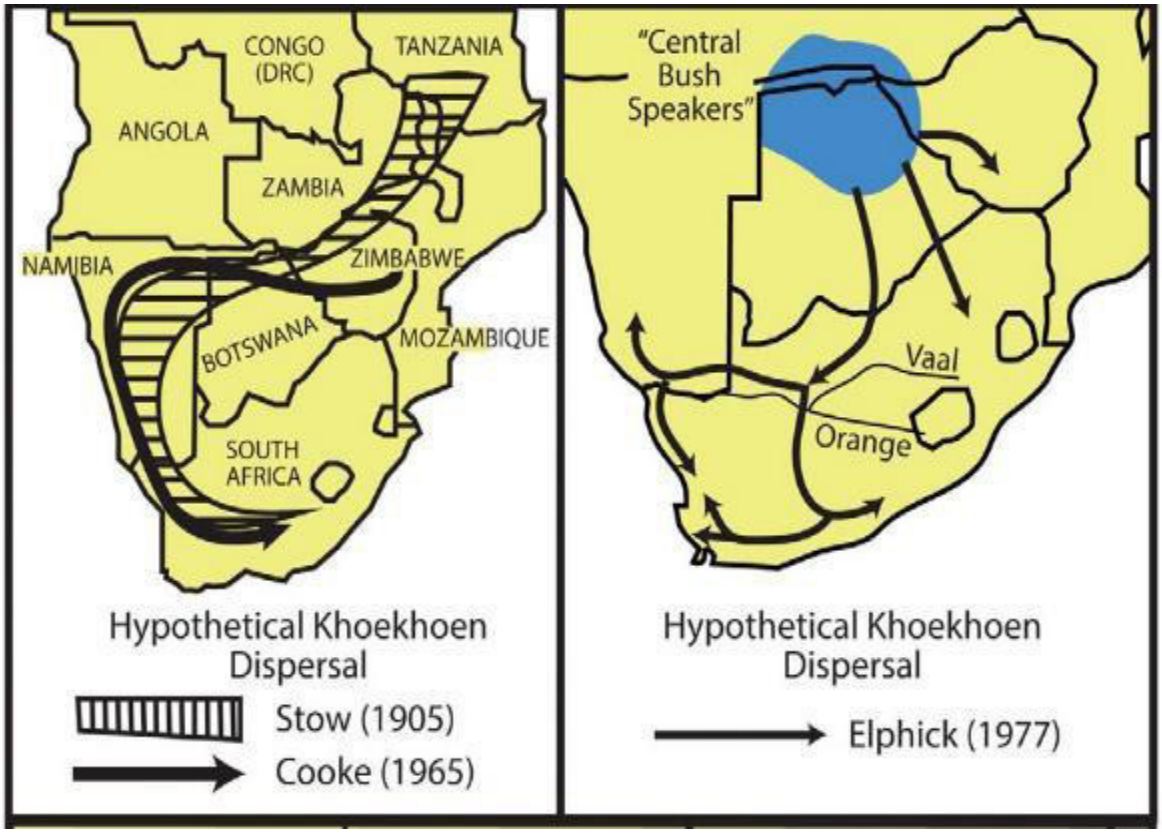


Figure 2.1: Two maps illustrating the possible migration routes of early herders according to Cooke (1965) and Elphick (1985) (from Orton *et al.* 2013, Fig. 1)

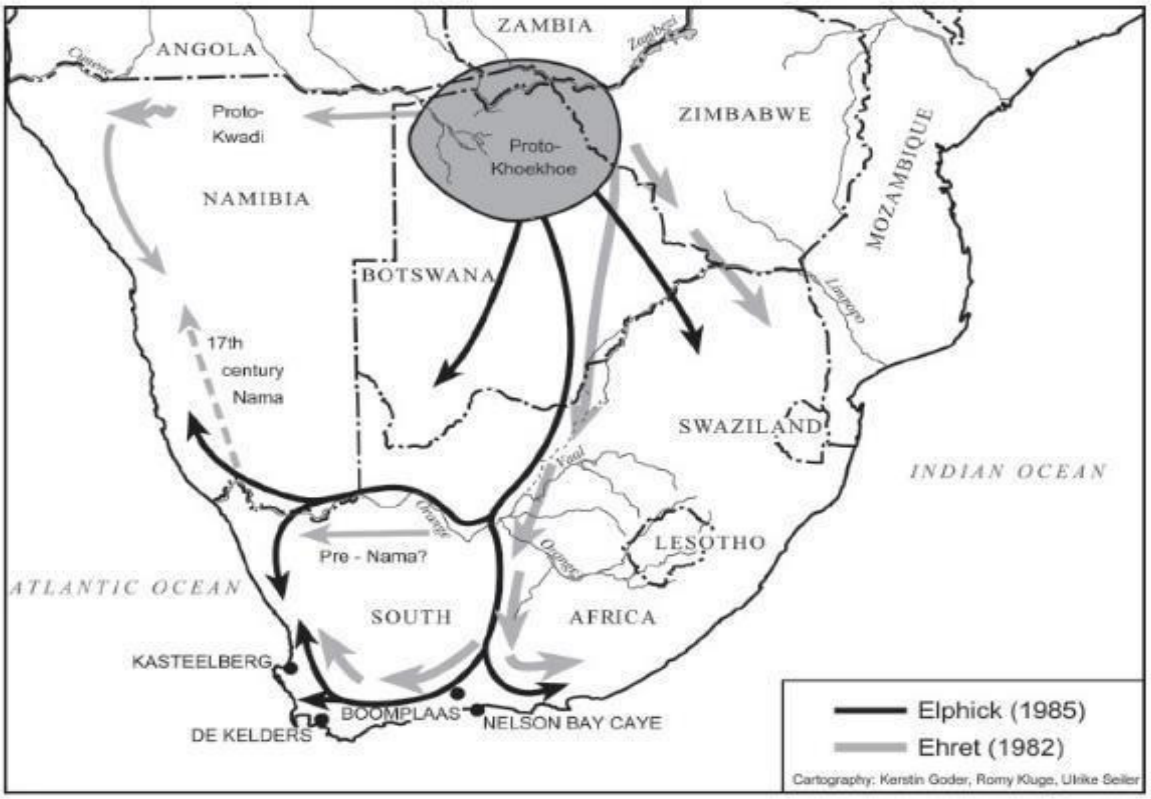


Figure 2.2: The migration routes of the proto-Khoekhoen proposed by Elphick (1985) and Ehret (1982) (Haacke 2008: 173, Fig. 4). Both routes suggest herders would have passed through the Makgabeng

According to this linguistic study, the Makgabeng is situated along one of the routes used by herders when entering South Africa. According to Ehret (1982: 158), on arriving in northern South Africa some groups moved on to the Lowveld while others continued through Gauteng and into the Free State, taking advantage of the good pasture to be had along the Vaal and Orange Rivers.

Critiques and additions to these models were made by Andrew Smith (1990a, 1992, 2000, 2005, 2006a) and Sadr (1998, 2003, 2004, 2008a, 2008b, 2013, 2014, 2015; Sadr & Plug 2001; Sadr *et al*. 2003; Couzens & Sadr 2010).

In opposition to Kinahan and the cultural diffusionist model, A. Smith's (1990a, 2006a) archaeological research in the Western Cape highlighted the problems inherent in perceiving herding, vis-à-vis hunting and gathering, as distinct constituents of the same economy. For A. Smith (1990a) the social relations of hunter-gatherer communities are different from those of herding communities.

A. Smith (1990a: 52) asserts that the nature of the two social relations makes it difficult for hunter-gatherers to easily adopt the herders' way of life. The ethos of pastoralism – with its preoccupation with 'future' returns, "social and symbolic relations with domestic stock, political alliances over the control [of] water and pasture, private and corporate ownership of stock, [bride wealth] and so forth – has little ideological relevance in hunting society" (A. Smith 1990: 57). The adaptation to pastoralism would occur only when the relations of production shift "to include a greater than purely economic role of commodities (that is in

exchange, inheritance and symbolic value)" (A. Smith 1990: 56; cf. Redding 1988). A. Smith (2006: 70) has argued that pastoralism had not been adopted by hunter-gatherers without a reasonable time of apprenticeship to impart knowledge of husbandry skills. Moreover, hunter-gatherers would presumably treat sheep like any other large ungulates and would slaughter and share the meat. Even in the historic record, after a long period of contact, there are few examples of Bushmen taking up herding (A. Smith 2006a: 71). If this shift were not to occur, the society would continue to practise a foraging mode of production (A. Smith 1990: 56). In conclusion, A. Smith (1990a: 67) argues that the two sets of social relations are quite different, and though they are certainly not absolute, they can create major boundaries to deter individuals or groups of hunter-gatherers from becoming herders.

Conservely, Sadr (2014), working on sites on the Vredenburg Peninsula, Western Cape, found continuities rather than disparities within and between sites. He terms A. Smith's view a 'two cultures: two economies model', which seeks to find archaeological evidence for a coherent herder culture and may overplay the disparities between so called 'hunter-gatherer' and 'herder' sites. Sadr and colleagues argue that their results on the Peninsula indicate a steady change in the archaeological artefacts of possibly one and the same population group, since the mid-Holocene (5,000 to 6,000 years ago). These results better fit the hypothesis of cultural hybridisation (Sadr 2014).

Sadr (2014) goes as far as saying, that as more evidence is uncovered, results may favour an 'indigenist' position. This position states that due to the absence of large herder populations, it was hunter-gatherers who initially picked up the herding way of life, while the Khoekhoen may have arrived later (Sadr 2014).

Alternatively, he argues that if herders did migrate to the Vredenburg Peninsula, some 2 000 years ago, they probably comprised small groups that were quickly assimilated, leaving little trace of their existence, as a distinct from hunter-gatherers (Sadr 2014).

Moving beyond these general models and scenarios, I present the archaeological evidence that either supports or refutes them. Later, in Chapter 3, I will relate the archaeological research and models to the archaeology particular to the Makgabeng. In the next section, I review A. Smith and colleagues (1991) archaeological evidence, where they argue that hunter-gatherer sites and herder sites are distinct and can be identified from the excavated materials. This 'two cultures: two economies model' is in many ways reimagined in the arguments surrounding two distinct rock art traditions in the Makgabeng.

2.1. The archaeological evidence

There is little archaeological evidence to support the demic diffusion scenarios, of migrating peoples, proposed by Elphick (1977, 1985) and Ehret (1982, 1998, 2008). Archaeologists have found a few isolated domesticate bones from around 2 000 BP, but there are no clear markers for the introduction of different people or

material culture (Pleurdeau *et al*. 2012). This could be a result of the elusiveness of a mobile herding community leaving few traces, or it could indicate that cultural diffusion may have occurred, with domesticates being adopted by hunter-gatherer groups (Pleurdeau *et al*. 2012).

Domesticates comprise less than 10% of the mammalian faunal remains (Sadr 2013a: 172). From Later Stone Age (LSA) sites across southern Africa, Sadr (2013: 179) found some livestock appearing in the archaeological record in hunter-gatherer sites in widely separated areas of the subcontinent around two thousand years ago, but for the most part these ungulates did not cause a major change in the local subsistence and settlement strategies of LSA peoples. Even the earliest examples of sheep bones at Leopard's Cave, Namibia and Toteng, Botswana, for instance, are uncovered in archaeological sites with clear local hunter-gatherer signatures (Pleurdeau *et al*. 2012). Very few cattle bones, moreover, are found in the earliest sites with sheep bones (Fauvelle-Aymar & Sadr 2008: 1).

Domestic faunal remains are rare and, where present, are often fragmented. These fragmented remains are only identifiable as sheep-sized medium bovids and are often misidentified (Van der Ryst 2006 198). The paucity of bones is the result of poor preservation in some areas (cf. Klein 1984: 110; Turner 1986: 63). Moreover, before radiocarbon dating by accelerator mass spectrometry (AMS), samples of sheep bones were too small to date by conventional radiocarbon dating and had to be dated by association (Sealy & Yates 1996: 109).

In addition to absent or fragmented evidence, Judith Sealy and Royden Yates (1996: 109), discuss issues of post-depositional mixing where, in most cases, purportedly "early sheep bones were younger than the layers in which they were found, sometimes substantially so". Fragments of sheep bones can easily slide down to lower levels and become intermixed with older layers (Sealy & Yates 1996: 109).

Archaeologists find no significant changes in faunal remains at most LSA sites to mark the introduction of domesticates. However, significant changes at this time are visible in material culture, in the stone tool assemblages, of Holocene LSA sites in southern Africa. Around 2 000 years ago, scraping 'tools' (e.g. scrapers) become generally more common while backed 'tools' (e.g. bladelets, points, segments), possibly used as arrow points and barbs, become rarer (Sadr 2013a: 179). Archaeologists interpret these changes as signifying a decline in bow and arrow hunting and an increase in hide preparation, possibly for trade and exchange (Sadr 2013a: 179).

At the same time as these alterations in the stone tool kit were occurring, the raw material used in some parts of southern Africa changed from fine-grained (e.g. silcrete) to coarser-grained stone (e.g. quartz). Some researchers view these changes in material cultural as signalling the migration of Khoekhoe pastoralists (A. Smith 1990, 1992, 2000, 2005), while others argue that the differences in stone tool assemblages represent different activities or functions (Sadr 2013a: 179) (Chapter III).

Although these patterns in material culture occur at several sites, including the northern section of the Vredenburg Peninsula, on the west coast of South Africa dating back 2500 BP, other sites, some 400 kilometres north of the peninsula in Namaqualand, demonstrate no discernible differences "in material culture with the introduction of livestock and ceramics circa 2000 BP" (Webley 2007: 637).

Lastly, ceramics have played an important role in archaeological research on migrations, as ceramics often appear abruptly, in a context of clearly intrusive traits, such as new village or house styles (Sadr 2013a: 181). In southern Africa neither local antecedents nor stylistic markers are found tracing the route and timeframe of a Khoekhoe migration (*ibid*.: 181). While they do occur abruptly, they are always within a context of LSA sites, whose nature, location and associated material culture are indicative of continuity rather than change (*ibid*.: 182). Early thin-walled ceramics found in southern Africa around 2000 BP have no secure stylistic connections to any ceramic traditions north of southern Africa (Fauvelle-Aymar & Sadr 2008: 1; P. Mitchell 2010: 80-81). It is likely that the independent innovation of ceramics occurred in southern Africa (Sadr 2013a: 182; but see Huffman 2007: 349 for an alternate view). Overall, we are far from understanding how these material indices relate to/correlate with the economic, social, cultural, ethnic, or linguistic aspects of the groups that produced them (Sadr 2013a: 184).

2.2. Languages and genes

In many ways, the linguistic and genetic evidence has influenced the thinking of archaeologists and often led researchers to change their direction of enquiry. However, the study of genomic data from modern humans is less than 40 years old (e.g. Vigilant *et al.* 1991) and as a nascent, fast-changing and dynamic field, results are, at best, provisional. Certain geneticists and linguists have demonstrated that in southern Africa, the two branches – Khoe and San – did not emerge together from a proto-Khoe-San ancestor (Ehret 2008; Güldemann 2008; Güldemann & Elderkin 2010). They hypothesise instead that the proto-Khoe-Kwadi languages had an extensive history of independent development in East Africa before the speakers' arrival in southern Africa around 2 500 years ago (Denbow 2013: 158).

Due to the level of linguistic complexity, there is much disagreement among researchers regarding which nomenclature to use and which languages fall into various language families. Tom Güldemann and Rainer Vossen (2000: 102) provide a synthesised model. According to this model, the cluster of Khoe-San languages can be divided into three specific language families that are genealogically linked: Northern Khoe-San languages (Ju), Central Khoe-San languages (Khoe-Kwadi) and Southern Khoe-San languages (Tuu) (Güldemann & Vossen 2000: 102) (Fig. 1.3). Today, many Khoe-Kwadi speakers live in the Central Kalahari and Okavango regions of Botswana, and in much of Namibia (Barnard 1992: 25; Barnard 2007). Formerly, there were also Khoe-speaking groups in parts of South Africa around the Makgabeng (Eastwood *et al*. 2010).

The Central Bushmen speak Khoe languages, "languages not traceable to 'Northern' or 'Southern Bushman' ones, but related to Khoekhoe at a time depth of three to two thousand years" (Barnard 1988: 217).

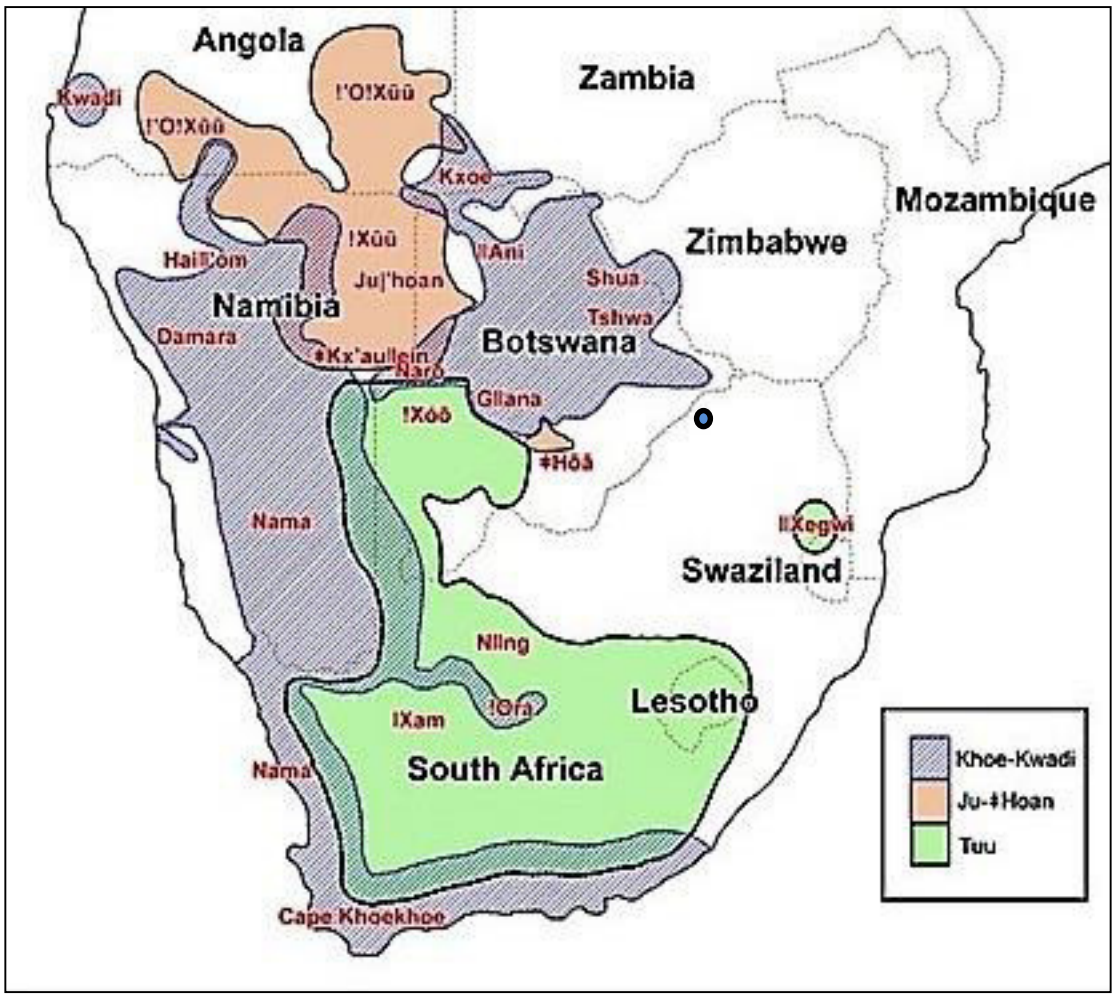


Figure 2.3: Map showing the distribution of Northern Khoe-San languages (Ju), Central Khoe-San languages (Khoe-Kwadi) and Southern Khoe-San languages (Tuu) (Güldemann & Vossen 2000: 102, Map 5.5). Makgabeng indicated with a blue dot

Khoe-Kwadi speakers were the most numerous of Khoe-San languages, but unfortunately these languages are being lost as many Khoe-Kwadi children in Botswana are shifting to the use of Tswana (Chebanne 2002). Khoe-Kwadi speakers are similarly the most culturally diverse of the Khoe-San speakers.

However, the Khoe-Kwadi speakers from Botswana are mainly hunter-gatherers, while in Namibia and South Africa they are, and were, mainly herders (Barnard 1992: 25). It is postulated that a Khoe-Kwadi speaking group may be the descendants of a group which spoke a proto-Khoe-Kwadi language, which later became the Khoekhoen we know from historical records.

A further breakdown of the lineages and branches, as well as the associated languages, is supplied in Table 2.1. The Khoe-Kwadi lineage consists of several languages and dialects. Two language groups are pertinent to the aims of this study: the non-Khoekhoe Khoe-speaking Bushmen, which include the Khwe, contemporary Tshwa (also called the Hiechware, Kua and Tsoa) in Botswana and the Khoekhoe speakers.

Table 2.1: Language groupings showing the chosen groups (Khoe-Kwadi branch) used in this ethnographic study and how they are related (Schlebusch 2010: 9; Table 1.1)

Lineages and branches	Languages and dialects	Remarks
Ju-ǂHõa		
ǂHõa	Single language	Newly affiliated to Ju
Ju (= Northern Khoisan)		
Northwest	!'O!Xũu, !Xũu	
Southeast	Ju/'hoan, ǂKx'au//'e	
Khoe-Kwadi		Possibly related to Sandawe
Kwadi	Single language	Newly affiliated to Khoe
Khoe (= Central Khoisan)		
KhoeKhoe		
North	Eini, Nama-Damara, Hai//om	
South	!Ora, Cape varieties	
Kalahari		
East		
Shua	Cara, Deti, /Xaise, Danisi, Ts'ixa, etc.	
Tshwa	Kua, Cua, Tsua, etc.	
West		
Kxoe	Khwe, //Ani, Buga, G/anda, etc.	
G//ana	G//ana, G/ui, ǂHaba, etc.	
Naro	Naro, etc.	
Tuu (= Southern Khoisan)		
Taa-Lower Nossob		
Taa		
West	N/u//'en, West !Xõo	
East	'N/ohan, N/amani, East !Xõo, Kakia	
Lower Nossob	/'Auni, /Haasi	
!Ui	N//ng; ǂUngkue; /Xam; //Xegwi	

Bold – Independent lineage; Underlined – Earlier classification unit

Unlike the speculative early view of domesticates being adopted from early Bantu-speaking farmer groups in the Northern Kalahari, the recent date of the proto-Khoe-Kwadi lineage in southern Africa earmarks them as the herder group that introduced domesticates into the region prior to the influx of migrant Bantu-speaking agropastoralists from the north (Denbow 2013: 159). It was from these early herders that migrating Bantu-speaking agropastoralists acquired sheep, and possibly cattle, and not the other way around, as previously suggested (*ibid*.).

Genetic studies using different methods, the targeting of Y-chromosomes (male) and using maternal mitochondrial DNA (mtDNA), have also indicated a possible origin point and route of these proto-Khoe-Kwadi peoples. Natalia Mesa and colleagues (2000: 1277-1278) refer to the way in which population genetic analysis is often used in examining the allele frequencies at autosomal (biparental) genetic markers. However, recently, the increasing number of polymorphic markers identified on the non-recombining region of the Y-chromosome enables analysis of male lineages. Brenna Henn and colleagues (2008: 10693) extracted Y-chromosome data from pastoral, agricultural, and hunting and gathering populations in both eastern and southern Africa and found evidence to support the demic diffusion model of pastoralism from eastern to southern Africa, approximately 2 000 years ago. The possible source for pastoralism derived from eastern African southern Nilotic-speaking populations in south-central Africa (Henn *et al*. 2008: 10697).

Two distinct migration events between the regions occurred. The earlier event is dated to more than 30 000 years ago and may have comprised individuals with Khoe-San linguistic affiliations travelling into southern Africa (Henn *et al*. 2008: 10693). The separation of Northern Khoe-San people from their central and southern neighbours took place during this event (Pickrell *et al*. 2012: 4; Schlebusch *et al.* 2012: 374). The second event involved the migration of Bantu-speaking agropastoralists from eastern Africa into southern Africa approximately 1 500 years ago (Henn *et al*. 2008: 10693).

The Y-chromosome data supports a scenario in which pastoralist populations with livestock wandered into south-central Africa around 2000 years ago (Henn *et al*. 2008: 10696). Consequently, these pastoralist populations either mixed with local hunter-gatherers, possibly through intermarriage, or expanded without significant genetic exchange taking place between herders and hunter-gatherers (Henn *et al*. 2008: 10696). Subsequent genetic studies favour the latter scenario.

The Y-chromosome evidence posits a plausible migration route from East Africa to southern Africa. Khoe-San people moved "from northern Tanzania, southward through Tanzania into eastern Namibia/southern Angola", and an approximate date of 2 700 ± 1 100 years ago for this migration is inferred (Henn *et al*. 2008: 10696). The Y-chromosome data supports a migration, albeit small. The question of how these people spread after they reached south-central Africa remains unanswered due to a lack of samples from Namibia, Botswana and South Africa (Henn *et al*. 2008: 10696; P. Mitchell 2010: 83-84).

Since 2010, several genetic studies have begun to use sources from southern Africa. Carina Schlebusch and colleagues (2012: 374) genotyped, quality-filtered and phased approximately 2.3 million single nucleotide polymorphisms (SNPs) in 220 individuals representing 11 populations from southern Africa. Surprisingly, they found the Nama, who speak a Central Khoe-San language and are a Khoe group that traditionally lived a pastoralist lifestyle, demonstrating great genetic similarity to the Southern Khoe-San groups such as the *≠Khomani* and *Karretjie*, while sharing a small but significant genetic ancestry element with eastern African pastoralists (Schlebusch *et al.* 2012: 375). These studies suggest that the Nama originated from a southern San group which adopted, with some introgression or hybridisation, the pastoralist practices of a migrant group from East Africa (Schlebusch 2012: 376).

In 2014, using genome-wide genetic data, Joseph Pickrell and associates (2014: 2637) propose that not only the Nama, but also other Khoe-Kwadi groups, had East African ancestry. They found at least two admixture events in the history of Khoe-San populations (Pickrell *et al*. 2014: 2632). One event involved "populations related to Niger-Congo-speaking African populations", and the other "introduced ancestry most closely related to west Eurasian (European or Middle Eastern) populations" (*ibid*.). They date "this latter admixture event to approximately 900–1,800 years ago and show that it had the largest demographic impact on Khoe-San populations that spoke Khoe-Kwadi languages" (*ibid*.). This model of west Eurasian ancestry begins with a large-scale migration of people

from west Eurasia approximately 3 000 years ago, perhaps, from southern Arabia (D'mt Kingdom) and the arrival of Ethniosemitic languages that resulted in the

> dispersal of west Eurasian ancestry throughout eastern Africa. This was then followed by a migration of an admixed population (perhaps pastoralists related to speakers of Khoe-Kwadi languages) from eastern Africa to southern Africa, with admixture occurring [approximately] 1,500 years ago (Pickrell *et al*. 2014: 2632).

Similar to genetic studies mentioned earlier, these results present a genetic connection between groups that speak non-Bantu click languages in both eastern and southern Africa (Pickrell *et al*. 2012: 4). Pickrell *et al.* (2014: 2637) argue against a cultural diffusion-like process for the spread of pastoralism into southern Africa, citing two observations in the genetic data.

Firstly, the gene flow is asymmetric. Some eastern African populations have up to 50% west Eurasian ancestry whilst in the Middle East and Europe levels of southern African ancestry are significantly lower. Secondly, the presence of west Eurasian ancestry in southern Africa is not mirrored in Central African populations. The complete absence of such signals in these populations is surprising since Central Africa is geographically closer to the purported source of the ancestry (Pickrell *et al*. 2012: 2637). These "geographically specific and asymmetric dispersal patterns" provide a plausible argument against cultural diffusion outside of South Africa (Pickrell *et al*. 2014: 2637).

What about cultural diffusion within South Africa? Results from Y-chromosome and mtDNA studies by Schlebusch (2010: 226-227) found that a group of

migrating east African pastoralists settled in present-day northern Botswana and, possibly, eastern Botswana. Their remnant genetic variation is visible in the extant Khwe and in eastern Khoe-speaking San groups. Schlebusch (2010: 227) argues that the males from the pastoralist group were assimilated, possibly through intermarriage, into San groups, transferring their language and animal husbandry skills to a few of these groups. These groups became known as the Khoe with other Khoe-speaking San groups possibly involved in the process. None of the mtDNA L0k and L0d clade-defining mutations seen in the Khwe group were apparent in the southern Khoe-San and Coloured groups. Schlebusch's research (2010: iv-v) led her to conclude that, after arriving in the general area of northern Botswana, pastoralism spread southwards. This process likely involved both demic and cultural diffusion as some males integrated with the southern groups and they, in turn, adopted pastoralist practices along with the Khoe-language (Schlebusch 2010: iv-v).

2.3. Discussion

The proto-Khoe-Kwadi-speakers later became the Khoekhoen that we know from the historical records of the 17th century. The debates concerning demic diffusion and cultural diffusion have vacillated over time as more evidence is uncovered. It is safe to assume that a small migration of proto-Khoe-Kwadi speakers travelled with domesticates, and possibly with a ceramic tradition, into southern Africa without admixture or introgression, at approximately 2000 BP. The route taken is likely to have been a southern movement through Tanzania, thence through southern Angola/eastern Namibia, into South Africa. However, there is no

evidence to discredit the argument that cultural diffusion could have occurred within southern Africa once the proto-Khoe-Kwadi arrived (Sadr 1998).

Many of these studies above look at the archaeological record from a diffusionist perspective: that the Khoekhoen arrived with the whole pastoralist package, including a cattle-centred worldview that conditioned many of the aspects of their way of life (e.g. Fauvelle-Aymar 2008). The archaeological evidence, our primary source of data, paints a different picture due to the absence of material culture and the issue of how subsistence strategies, such as hunter-gatherer and herder, are problematically conflated with archaeological remains. Diffusionist models are rooted in Western ideas of progress stemming from the 18th century Enlightenment. The idea that hunter-gatherers became herders, and that herders in turn became farmers, is seen as a natural evolutionary progression towards an end (Hopfl 1978; Barnard & Spencer 2002 279; Trigger 2003:17). Lastly, several authors (e.g. Elphick 1985: xxi-xxii; Morris 2004) have recognised that these techno-economic subsistence strategies were not fixed and/or bound to specific groups, but rather that they were fluid and dynamic.

The following chapter looks at the evidence specific to the Makgabeng, seeking specific explanations for the paucity of material culture. Do the theories fit the evidence? Do the diffusionist models align with the archaeological material found in the Makgabeng?

PART 2

III. The Makgabeng: The Place Where Bushmen Drink

This chapter provides insights into the past environment, climate, animal and plant species that occurred in the Makgabeng. From this natural setting, the human or cultural history is revealed by reviewing the archaeological evidence in the Makgabeng and surrounding areas – the different peoples on the landscape. This chapter focuses on the Makgabeng and associated sites in the Limpopo Province. A critical reading of the past archaeological research in this area is undertaken. Using the general models and scenarios discussed in the previous chapter, I identify how the specific archaeology of the region 'fits' or 'does not fit' the proposed theories.

Within the Senwabarwana and Seshego Districts of the Limpopo Province (Fig. 3.1), the Makgabeng is located at the western end of the Soutpansberg mountain range, about 115 km north-east of the Waterberg Biosphere Reserve. The Makgabeng, the Soutpansberg and northern Venda lie in the Central Limpopo Basin.

Physiographically, the Makgabeng formation is characterised by a network of dolerite dykes of varying orientation. These dykes correspond to fault lines that formed 1.92 – 1.87 Ga when the Blouberg sediments were deposited (Hahn 2011: 35). The Makgabeng orographic feature is historically referred to as a 'plateau', but this classification is incorrect, as it is not a flat area. Viewed from afar, the

Makgabeng orographic feature can best be described as a ruggedly eroded, gently westerly-dipping cuesta (Hahn 2011: 35). It is not flat, the western area of the range decreases gradually to form a series of low-lying hills, while in the east the range is a well-defined line of cliffs produced by faulting, or a scarp (*ibid.*).

It is from the eastern scarp that many short, quick-flowing seasonal rivers emerge, creating the tributaries of the Brak River. The southern end of the cuesta drains towards the Seepabana River, a tributary of the Mogalakwena River to the west (Hahn 2011: 36). The longest drainage lines all flow west, following the deeply eroded dolerite dykes that are so distinctive of such landscape. These rivers originate at the peak of the eastern scarp and continue west lengthwise of the slope, draining into the Mogalakwena River (Hahn 2011: 36) (Figs. 3.1 and 3.2).

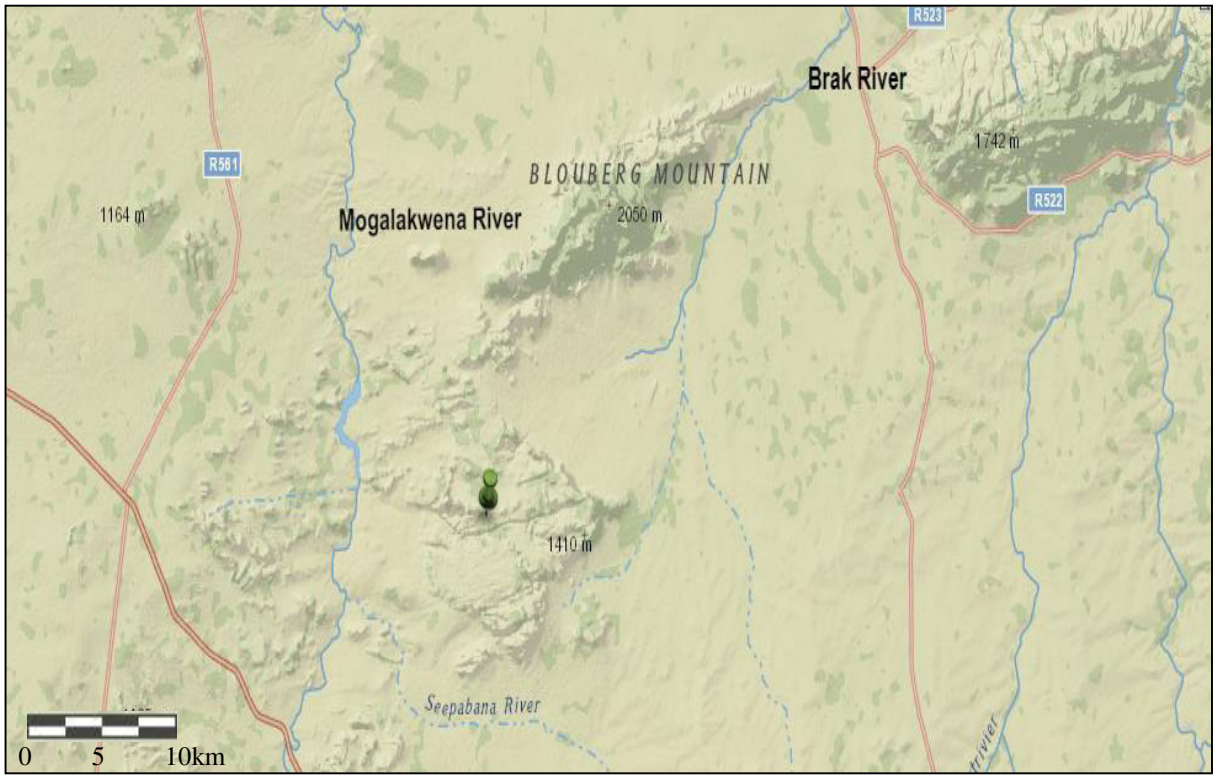


Figure 3.1: Map of research area with rivers and mountains. The Makgabeng is highlighted with a green pin

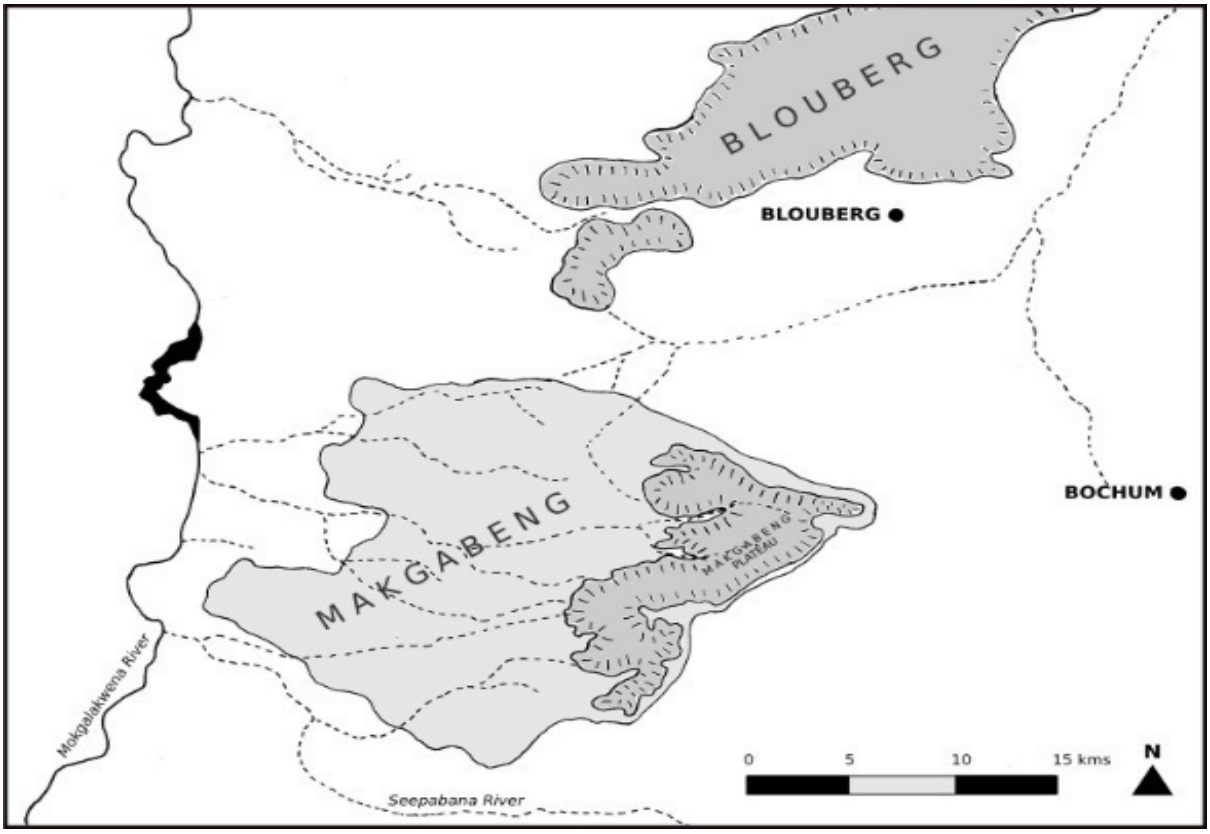


Figure 3.2: Detail of research area showing major rivers and tributaries (simplified map). Drawing by author

Geographically, the Makgabeng formation rises about 200 metres above the surrounding plains and covers an area of 333.56 km². The landscape is extremely rocky, with many small river valleys crisscrossing the countryside. Fine- and medium-grained sandstone rock make up the Makgabeng formation, "while in some places younger, coarser sandstone and conglomerate outcrops [constitute] the steep-sided spires, many of which are found in the northern part" of the Makgabeng (Holt 2009: 20). These tall spires and hills dominate the landscape, along with a deep gorge that transects the Makgabeng and through which flows the Masebe River (Eastwood & Van Schalkwyk 2002: 36) (Fig. 3.3).



Figure 3.3: Deep gorge in which the Masebe River flows. Photo by author

3.1. Past climate

Past climatic information of southern Africa is derived from several proxies, such as palynological reconstructions of past vegetation types, by comparison of fossil pollen data with modern surface pollen spectra between areas, as well as stable isotopes taken from stalagmites (Scott 1982; Holmgren *et al*. 2003; Woodborne *et al*. 2015). According to Louis Scott (1982: 367), climatic data is scarcer in the Makgabeng zone, but the Wonderkrater pollen sequence, the Wonderkrater temperature index and the Makapansgat T7 stalagmite-based record (±110-140 km south of the Makgabeng) all suggest that although conditions became

somewhat cooler and more moist from 4000 to 2000 BP, mainly an arid period persisted in the Limpopo Province (Scott 1982: 364; Holmgren *et al*. 2003: 2322). Moreover, the Scott Farm pollen core registers a slight change to more open savannah vegetation at 3000 to 2000 BP, whereas the bushveld became denser between 1200 and 600 BP (Scott 1982: 367; Holmgren *et al.* 2003). The reconstructed vegetation suggests warmer temperatures and to some extent wetter conditions at this time (Cooke 1965; Scott 1982: 364; Holmgren *et al.* 2003: 2322). The climate, however, was still not as warm and dry as it is today (Scott 1982: 364; Holmgren *et al.* 2003: 2322).

Recently, data from the carbon isotope rainfall proxy record from baobab trees in the Limpopo Basin has provided information on the levels of precipitation in the past. Stephan Woodborne *et al*. (2015: 14) found that this area experienced a high rainfall 875 BP (maximum rainfall of over 700 mm) with a somewhat abrupt transition to more arid conditions taking place at 350 BP. Today, the area exhibits an annual precipitation range of 250-750 mm, with an average of only 320 mm (Kuman, Le Baron & Gibbon 2005: 23).

3.2. Fauna and flora

At present, the vegetation of the Makgabeng forms part of the mixed savannah biome, which is characterised by a grassy ground layer and distinct upper layer of woody plants (Acocks 1975; Low & Rebelo 1996: 19). Within the Makgabeng the vegetation is as diverse as the orography. The eastern side is broken, bushy and

well wooded, whilst the western side consists of open woodland and extensive pasturelands (Eastwood & Tlouamma 2005: 50). Over 250 species of tree and shrub are known, of which more than 40 produce edible fruits or seeds (Holt 2009: 20). From palaeoclimatic reconstructions (Scott 1982: 364; Holmgren *et al.* 2003: 2322; Woodborne *et al*. 2015: 14), the Makgabeng experienced a wetter climate with open savannah grasslands 875 BP. During this time, the vast array of consumable plants in this area were favourable to foraging hunter-gatherers (Holt 2009: 20).

The Makgabeng has also given rise to a variety of habitats for animals. Traversing the area, one notes plant communities ranging from riverine forest to wetland, grassland and woodland, all of which provide ideal habitats for diverse animal communities (Holt 2009: 21). Populations of browsing and mixed-feeding antelope, elephant, rhinoceros, hyena, giraffe, lion, leopard and various smaller animals, were once present (Holt 2009: 22). Most of the wild animals have been hunted to extinction in this area, or have been displaced due to habitat destruction by farming. However, leopards, hyena and several smaller antelope species still live there. The rich resources of the Makgabeng would have been able to sustain a large population of hunter-gatherers before farmers arrived (Eastwood & Van Schalkwyk 2002: 38).

The archaeology attests to different groups residing on the Makgabeng landscape from the Earlier Stone Age (1 500 000 years ago) to the early 20th century (Baines 1872; Selous 1908; Dornan 1925; Mason 1962; Eastwood & Van Schalkwyk

2004; Namono 2004; Van Schalkwyk 2004; Kuman, Le Baron & Gibbon 2005; Van der Ryst 1998, 2006; Modikwa 2008; Holt 2009). These groups practiced different subsistence strategies (hunter-gatherering, herding and farming) and were called various names from outsiders (e.g. Vaalpense, *Masarwa*, *Masetedi*) through the years. The evidence for these past inhabitants is fragmentary and the artefactual introduction of newcomers is often absent (Boshier 1972; Eastwood 2002a; Bradfield *et al*. 2009; Sadr 2015).

3.3. Past inhabitants of the Makgabeng

In the last 50 years, only the results of around 20 large-scale excavations in the Limpopo Province were published covering the time frame from the Earlier Stone age (3.3 million) to the arrival of herders (2000 BP) (e.g. Mason 1962; Kuman, Le Baron & Gibbon 2005; Van Doornum 2005; Van der Ryst 2006; Sadr 2007; Bradfield *et al*. 2009; Forssman 2017) (Fig. 3.4).

Some excavations in the Makgabeng and surrounds exhibit a lengthy timeframe (1 500 000 years ago to 100 BP). These excavations evince a complex picture of past peoples moving across the landscape and settling in certain places. The artefacts uncovered there provide a relative cultural chronology highlighting the intricate and varied history of interaction between hunter-gatherers, herders and agropastoralists.

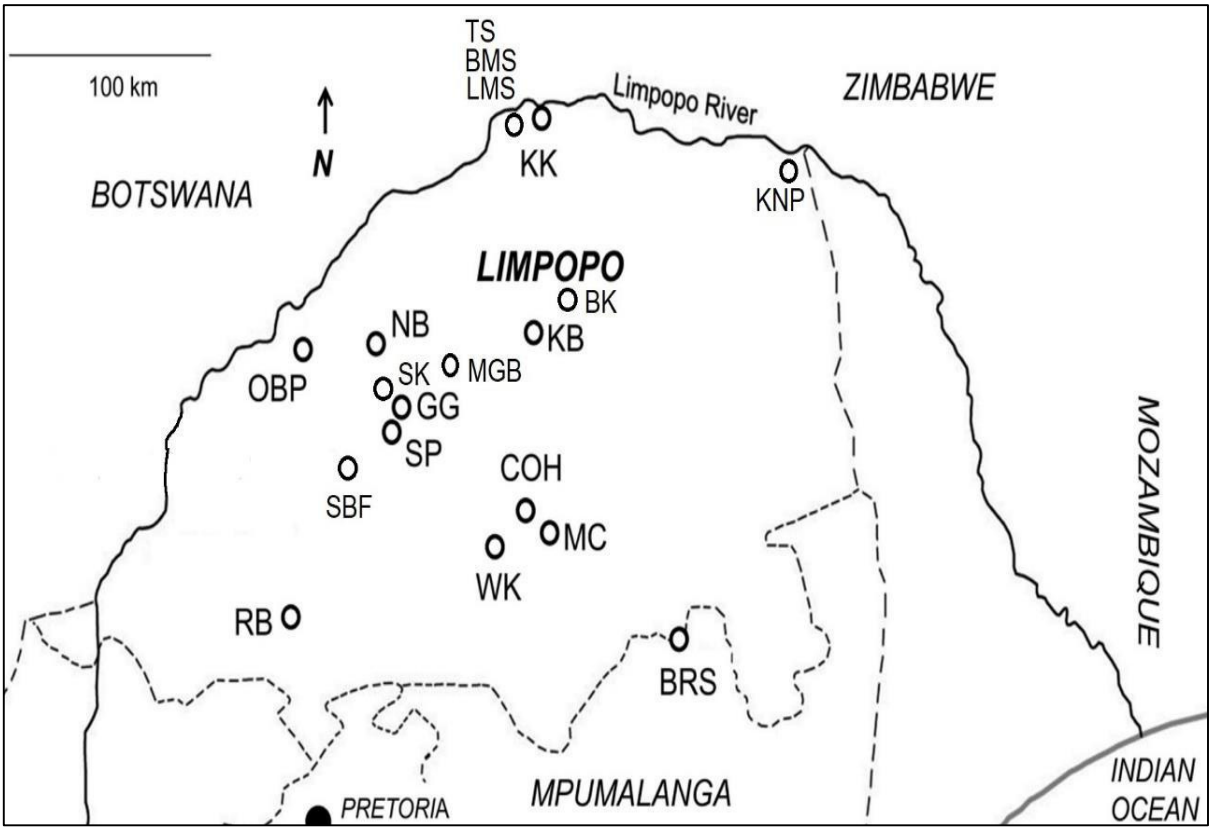


Figure 3.4: Map of the Limpopo Province with the excavated archaeological sites mentioned in the text. SBF, Steenbokfontein; BRS, Bushman rock shelter; COH, Cave of Hearths; GG, Goergap; KB, Kalkbank; KK, Kudu Koppie (including Hackthorne and Keratic Koppie); MC, Mwulu's Cave; NB, North Brabant; OBP, Olieboomspoort; RB, Rooiberg (Blaubank); SP, Schurfpoort; MGB, Makgabeng; TS, Tshisiku Shelter; BMS, Balerno Main Shelter with Balerno Main Shelter 2 and 3; LMS, Little Muck Shelter; WK, Wonderkrater; SK, Skeurkrans; BK, Buffelskom; KNP, Kruger National Park (adapted from Wadley *et al.* 2016: 131, Fig. 1)

3.3.1. The Earlier and Middle Stone Ages

Early Stone Age lithics found in the Limpopo Province suggest that the area has been inhabited for at least the last 1 500 000 years during the Middle Acheulean (Kuman 2007: 188, Table 2; Lombard *et al.* 2012: 139, Appendix A). Large river cobbles or pieces of quartzite were used to make Earlier Stone Age handaxes, which have been found, thinly spread, throughout the Central Limpopo Basin, especially where such deposits were exposed by hydraulic action (Eastwood & Schalkwyk 2002: 7).

A geologist, James Paul Johnson (1912: 18), found Acheulean implements around the Mogalakwena River. Further afield, excavations at sites such the Cave of Hearths in the Makapans Valley World Heritage Site, Jubilee Shelter in the Magaliesberg, Olieboomspoort shelter in the Waterberg and Bushman Rock Shelter in Ohrigstad, Limpopo provide extensive evidence of Earlier Stone Age and Middle Stone Age occupation (Eastwood 2002a: 5; Van der Ryst 2006).

Late Earlier and Middle Stone Age sites from Kudu Koppie, Hackthorne and Keratic Koppie, four km south of the modern Limpopo River, near Limpopo-Shashe Confluence Area, 145 km north east of the Makgabeng, were excavated, with subsequent associated research projects performed on the excavated materials (Kuman, Le Baron & Gibbon 2005; Pollarolo & Kuman 2009; Pollarolo, *et al.* 2010; Wilkins, Pollarolo & Kuman 2010; Sumner & Kuman 2014).

Middle Stone Age (280 000 to 40 000 years ago) lithics are sometimes found in or near rock shelters in the Makgabeng, Soutpansberg and Limpopo Valley. These sites have provided important insights into the technological and behavioural shifts, including the advancement of prepared core reduction strategies, between the late Earlier Stone Age and the Middle Stone Age (Wilkins, Pollarolo & Kuman 2010; Pollarolo *et al*. 2010: 160; Porraz *et al.* 2015). However, little research focusing specifically on the Earlier and Middle Stone Ages of the Makgabeng, has been performed.

3.3.2. The Later Stone Age

The Later Stone Age or LSA (33 000 to 1 100 years ago) is better understood due to more excavated LSA sites in the Limpopo Province (Lombard *et al.* 2012: 139, Appendix A). Revil Mason (1962: 303) conducted small-scale excavations at 11 sites across South Africa. Radiocarbon dates of 1020 ± 150 BP (AD 690 to AD 1292) were established from Makgabeng Shelter by Jean Humphreys, under Mason's supervision (Mason 1962: 303). At the Makgabeng and Olieboomspoort sites, Mason (1962: 303) uncovered "indistinguishable typologies" classified as 'Late Smithfield' (later termed 'Wilton'). Mason (1962: 303) dates Olieboomspoort to 870 ± 150 BP. The scenario sketched by Mason (1962: 310) is that the Makgabeng represents the end of the LSA, with Olieboomspoort people being "descendants of those at Makgabeng, perhaps five generations or so later". This inference, being based on one older date at Makgabeng, and on similar artefacts found in the two sites, is problematic, as it assumes a temporal and spatial continuity with the peoples living at Olieboomspoort and the Makgabeng, derived from limited data.

A re-examination of Mason's excavated material at Olieboomspoort by Maria van der Ryst (2006: 31) confirms a classic Wilton character for the assemblage. Van der Ryst (2006: 37) is surprised that Mason had discovered so few artefacts at Olieboomspoort: "only 189 scrapers, 214 flakes, 12 quartz crystals and five pieces of haematite for the LSA succession".By contrast, Van der Ryst (2006: 37) found a substantial amount of additional material (see Table 3.1), and attributes Mason's scarcity of artefacts to changing methodologies and excavation strategies.

For example, Revil Mason in the 1950s examined 30 LSA sites in the northern part of the country (Mason 1957, 1962). However, he conducted preliminary excavations at 11 of these. In terms of methodology, Mason (1957, 1962) used Goodwin and Van Riet Lowe's lithic typology, which subdivides the LSA into different assemblage types (e.g. Smithfield C, Robberg) which where argued to denote different peoples (Deacon & Deacon 1999: 7). Presently, the Smithfield is used only for assemblages with long end-scrapers and backed bladelets at the terminal sequence in the Karoo (*ibid*: 113). Archaeologists no longer perceive artefact assemblages as denoting people, but rather that these assemblages provide examples of a range of techniques used to interpret the LSA (*ibid*: 114).

Table 3.1: Comparison of materials found at Olieboomspoort (OBP). The relative percentage of Maria Van der Ryst's test trench in relation to the extended excavation is given

Tool Types	**Mason's Trench at OBP**	**Van der Ryst's test Trench F at OBP**	**Relative % compared to extended excavation**
Flakes	424	2386	21
Scrapers	189	479	20
Quartz Crystals	12	776	21
Haematite fragments (pigments)	5	1901	20

More extensive excavations were conducted by Van der Ryst (2006) at Olieboomspoort and Goergap in the Waterberg (approximately 115 km southwest of the Makgabeng). These two sites demonstrated several differences. Olieboomspoort, in the lower lying bushveld of the Mokolo Basin, showed sustained and continuous occupation of the site for over 33 000 years, possibly because of the prime choice of land (Van der Ryst 2006: 30). High frequencies in the production of all types of tools and ornaments from approximately 2 000 years ago suggest that this locality must have been a focal site within the hunter-gatherer landscape. Here two main pulses of social and economic intensification are evident – one at approximately 1800 BP, and the other at 1500 BP (Van der Ryst 2006). These intensification pulses refer to increases in resources which, as a result, changed the demographic and economic patterns of hunter-gatherers (Van der Ryst 2006: 32). The Goergap site on the Waterberg plateau, on the other hand, was occupied intermittently, intensifing only after 750 BP when early farming communities started to move into the area (Van der Ryst 2006: 2). The two sites could represent the movement of groups during seasonal aggregation and dispersal phases (*ibid.*).

A similar pattern was apparently seen in the Limpopo-Shashe Confluence Area (140 km northeast of the Makgabeng). Simon Hall and Benjamin Smith (2000) made use of composite studies of excavations and rock art sequences at Little Muck and Balerno Main Shelter along the South African side of the Limpopo River, and at Tuli Lodge on the Botswanan side. At the time, excavations demonstrated that occupation of these sites fell almost entirely within the last

2000 years (Hall & B. Smith 2000: 34). Moreover, Nicholas Walker (1995: 238) suggested that LSA occupation in the lowveld south of the Matobo on the Zimbabwe side of the Limpopo River may have occurred only within the last 2000 years. He explained the increase in hunter-gatherer activity after 2000 BP in the lowveld by associating it with an exodus of hunter-gatherers from the Matobo Hills south towards the Limpopo River (Walker 1995). Similar findings were shown in the adjacent Tuli Block of eastern Botswana (Eastwood *et al*. 2010: 82). Eastwood and Van Schalkwyk (2002: 39) argued that LSA activity in the Waterberg, as well as in the Limpopo Valley[2], occurred on a *significant scale* only when farmers arrived between 1600 and 1250 BP (cf. Eastwood *et al*. 2010: 83). Apparently, prior to 2000 BP, a regional hiatus in occupation is evident at many sites (Eastwood & Van Schalkwyk 2002: 39). The intensification period after 2000 BP is attributed to hunter-gatherers moving into these areas due to herder and farmer incursions further north (Eastwood & Van Schalkwyk 2002: 39).

Bronwen van Doornum (2005), Sadr (2007) and Tim Forssman (2017) cast doubt on some of these findings. Van Doornum (2005) argues that Hall's and B. Smith's hypotheses are partly incorrect and may not represent an accurate reflection of the whole area. Both Tshisiku Shelter and Balerno Main Shelter, near the Limpopo River approximately 120 km north of the Makgabeng, have significant pre-contact deposits, and "in fact, hunter-gatherer occupation was concentrated in the pre-

[2] The Limpopo Valley consists of the Limpopo-Shashe Confluence Area, the Soutpansberg range, northern Venda and the Makgabeng (Eastwood *et al*. 2010).

contact period at Tshisiku Shelter" (Van Doornum 2005: 189). Balerno Main Shelter was initially occupied between 13070-12840 BP and 8180-8010 BP, and after a lengthy hiatus, between 2290-2270 BP and 2160-2050 BP. After these hiatuses, the site was reoccupied. Although the shelter remained unoccupied during this early phase, this was the period during which occupation at Tshisiku Shelter began, in about 7610–7560 BP. Thus, hunter-gatherers were still present in the Limpopo-Shashe Confluence Area at this time, if only in small numbers, as was the case in Zimbabwe between 8450 and 5950 BP (Van Doornum 2005: 189).

Likewise, in 2004 and 2006, Sadr (2007) excavated Bonne Esperance (BE33), Leholamagoa (LMG), Mphekwane (MPK) and Nieuwe Jerusalem (NJ20) in the Makgabeng and found that LSA hunter-gatherers had inhabited this area since at least the late Pleistocene (the oldest dates being 15250 ± 80 BP (16739-16312 BC) and 14380 ± 70 BP (15744-15248 BC). No hiatus was identified in the sequence. The archaeological data from the Makgabeng suggests a hunter-gatherer sequence with no major changes in the material culture. The next section investigates whether any significant changes accompanied the introduction of herders into the area.

3.3.3. Herders

In the demic diffusion model discussed in Chapter 2, the proto-Khoekhoen migrated through the Makgabeng together with livestock, a movement that would have been likely to have caused significant changes in material culture (Stow 1905; Westphal 1963; Cooke 1965; Elphick 1977, 1985; Ehret 1982, 1998; A.

Smith 1990, 1997; Denbow 2013: 160). To discover whether these changes occurred in the Makgabeng, archaeological research into herder origins has looked at three important types of artefact: thin-walled pottery, livestock remains and lithics. Other types of artefact, such as the diameter of ostrich eggshell beads, are said to be indicative of herder sites, but they cannot directly be associated with herders and the changes in these beads could signify several changes in hunter-gatherer's ways of life (See Sadr *et al.* 2003: 31).

3.3.3.1. Thin-walled pottery

A specific herder presence in the Limpopo Basin is difficult to identify. Ceramics are frequently used as evidence of migrations, mainly appearing suddenly but always occurring in the context of noticeably intrusive traits, such as plant and animal domesticates, settlement patterns, toolkits, lithic and non-lithic material, and raw material changes (Sadr 2013a: 181; cf. Spriggs 2006).

In many of the sites mentioned, excavations have uncovered thin-walled pottery, coined 'Bambata' as it was first described from the Bambata Cave series in Zimbabwe. The debates surrounding Bambata ceramics are significant because the ceramics are associated with early evidence of domesticated sheep (Robbins *et al.* 2005). Some researchers tend to see the ceramics and the sheep as a 'package', entering southern Africa at the same time (Deacon *et al.* 1978; Deacon 1984; Klein 1986; A. Smith 1992; B. Smith & Ouzman 2004). The association of Bambata pottery with livestock remains does sometimes occur. However, the numbers of domesticates at these sites are very low (Sadr 2013a: 184).

Bambata is probably an inadequate umbrella term since thin-walled pottery shows a great degree of diversity. Thus, researchers have divided the pottery into two distinct "supra-regional stylistic 'families': a southern style [called 'Bambata B'] with undecorated burnished pots and no sign of spouts, and a northern style [called 'Bambata A'] with decorated and sometimes spouted pots" (Sadr 2013a: 183; cf. Sadr 2008b). The northern style is decorated with comb-stamping and incisions, which are often found together with more intricate designs, such as broad incisions that are later burnished (Sadr 2013a: 183). The latter designs on some Bambata pottery has been coined ripple ware (Sadr 2013a: 183). Examples of ripple ware have been found in first millennium AD sites such as Buffelskom in the Soutpansberg, Goergap and Skeurkrans in the Waterberg and Blinkklipkop, Northern Cape Province (Couzens & Sadr 2010: 196) (Fig. 3.5, overleaf). All these sites, with Buffelskom closest, 88 km northwest of the Makgabeng, are on the hypothesised path taken by Khoekhoe migrants (Elphick 1977, 1985; Ehret 1982, 1998; Denbow 2013: 160).

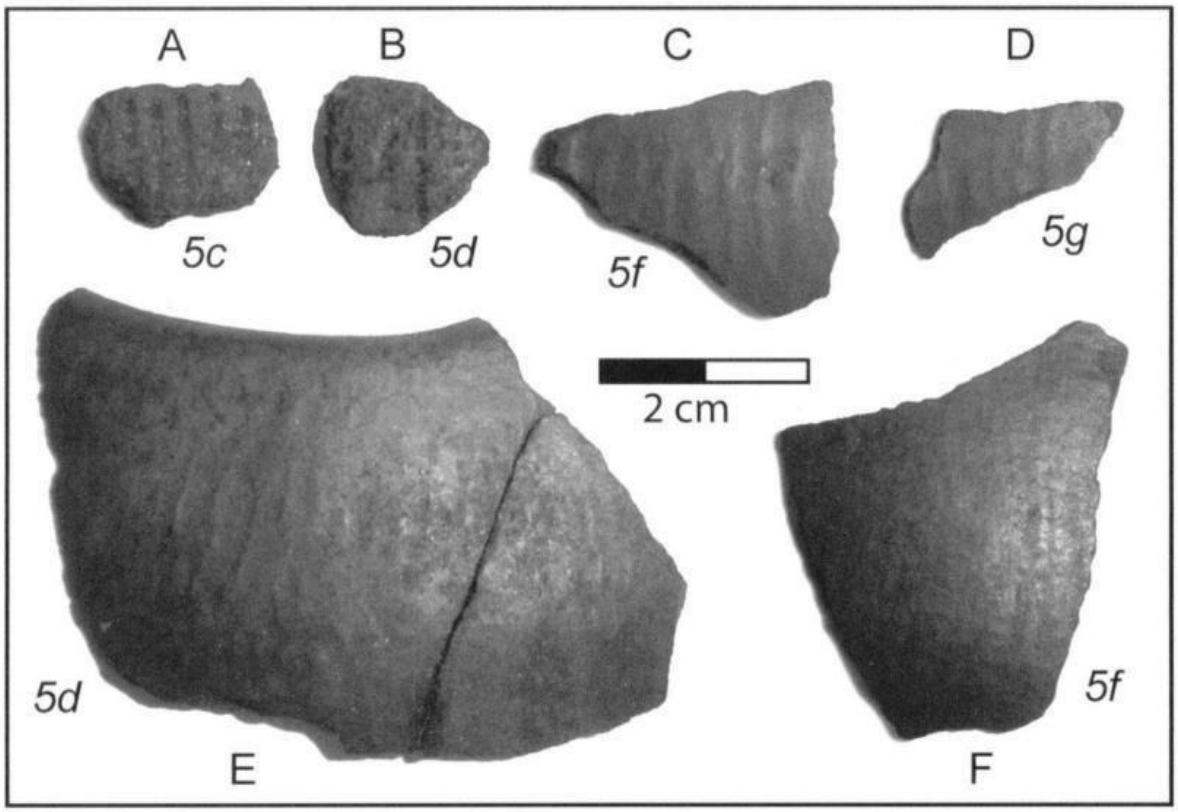


Figure 3.5: Example of ripple-ware pottery with diagnostic incised groves that were administered prior to burnishing found at Blinklipkop, Northern Cape (Couzens & Sadr 2010: 202, Fig. 4)

A. Smith (2006a: 69; 2006b: 120) infers from the distribution that ripple-ware ceramics first spread through Khoe-speaking Bushman groups in the riverine locales of northern Botswana. According to A. Smith (2006a: 69), ripple-ware ceramics, along with herding practices, were passed on by a wandering group of small stock keepers, who in the first few centuries BCE, travelled from the northeast through passages that were free from tsetse fly. It was only with the start of largescale droughts around 2000 years ago when the now Khoe-speaking herders moved south through today's Limpopo Province to the confluence of the Vaal and Gariep (Orange) Rivers, and thence to the Cape.

The variability of ripple-ware casts doubts on this scenario. From their comparative analysis of ripple ware ceramics at Blinkklipkop, Northern Cape Province, with other thin-walled pottery, Raymond Couzens and Sadr (2010: 202) found that ripple ware at Blinkklipkop represents the recurrence of a ceramic decoration style that had fallen out of fashion a few centuries prior, in the north of South Africa (e.g. Buffelskom, Skeurkrans and Goergap).

The ripple ware at Blinkklipkop does not seem to relate either to an early first millennium dispersal of Khoe-speaking herders, as suggested by A. Smith (2006a: 69), nor to the mid-first millennium southward diffusion of ideas, such as filtering of Bambata ceramic traits, as suggested by Sadr (2008b: 114). Instead, Couzens and Sadr (2010) argue that ripple ware is a variety of Bambata thin-walled pottery and is too inconsistent a category to be of practical use.

Geographically, in Botswana, Bambata pottery is found from Lake Ngami along the Boteti River to the Makgadikgadi Pan. Bambata pottery has also been found in the Matobo in Zimbabwe, in Geduld and Toteng in northern Namibia, and in Zambia (Henn *et al*. 2008: 10696). In South Africa, Bambata A is seemingly restricted to the north. The distribution and dates could help to tell "the extent, direction and intensity of interaction networks" of the makers (Sadr 2013a: 183) (Fig. 3.6, Table 3).

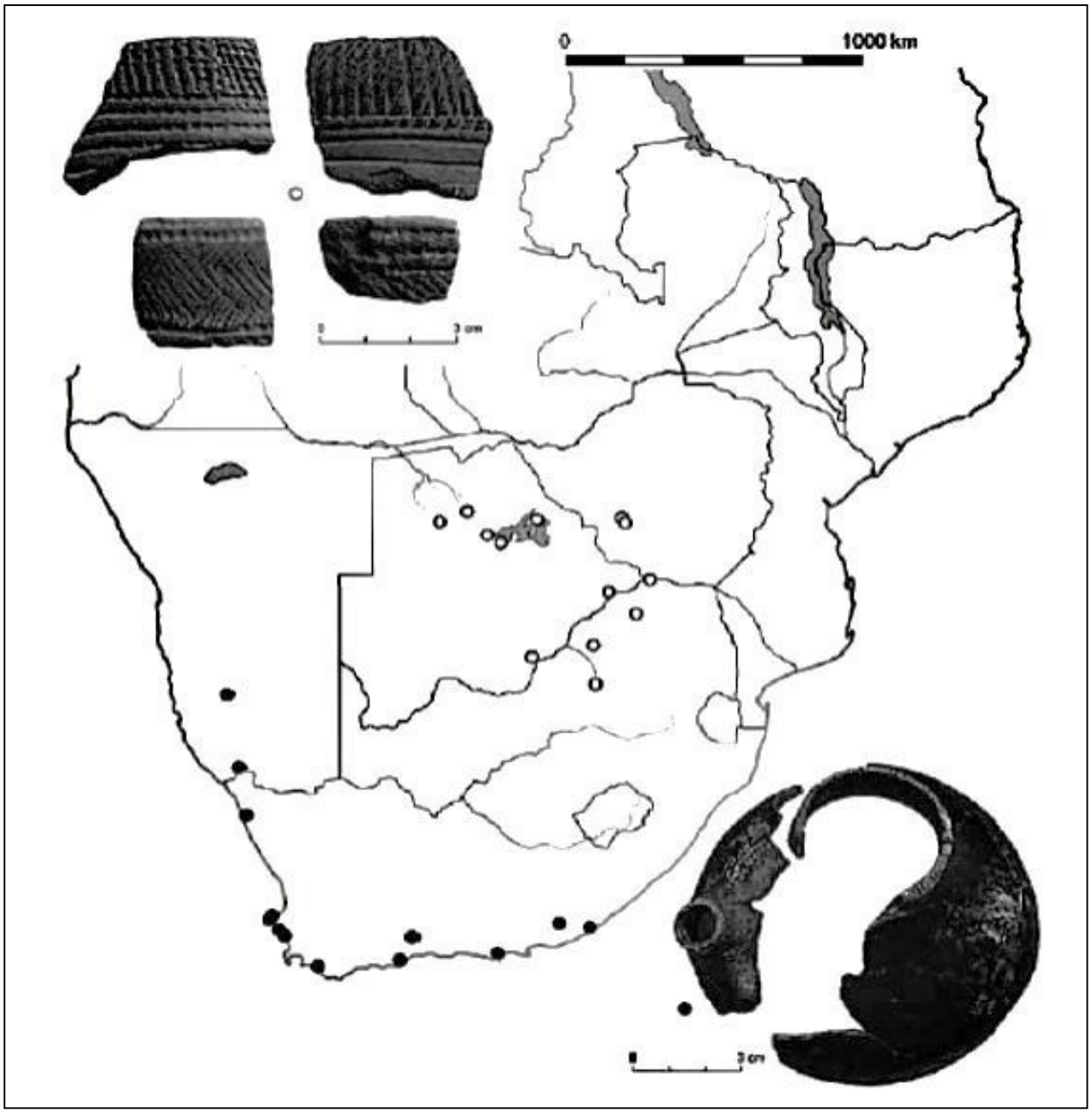


Figure 3.6: Map of southern Africa showing the distribution of sites with Bambata pottery (first half of first millennium AD, open circles) and Cape coastal spouted wares (second half of first millennium AD, filled circles). Sherds from Bambata Cave, Zimbabwe (photograph by R. Burrett) and fragment of a spouted pot from Die Kelders, South Africa (photograph by K. Sadr). (Adapted from Sadr 2013a: 184, Fig. 5.2)

Table 3.2: Radiocarbon dates of Bambata pottery across the sub-continent (Adapted from Sadr 2008b: 122-127; All calibrated dates were obtained using OxCal version 4.3.2 at a 95.4 % probablility (Ramsey 2009). OxCal calibrations used SHCal 13 curve for the southern hemispere (Hogg et al. 2013). * possibly disturbed deposit

Site	Radiocarbon laboratory number	^{14}C yrs b.p.	Calibrated date (yrs BC/AD)	Probability	Material dated	Country
Toteng I	Pta-5534	1820 ± 50	AD 124-370	95.4%	charcoal	Botswana
Toteng III	Beta 44965	1810 ± 60	AD 121-407	95.4%	charcoal	Botswana
Toteng III Skeleton	Beta 44966	1600 ± 50	AD 390-627	95.4%	charcoal	Botswana
Bambata Cave Series	Pta-3477	2850 ± 60	1127-817 BC	95.4%	charcoal	Zimbabwe
Bambata Cave Series	Pta-3072	2140 ± 60	356 BC to AD 23	95.4%	charcoal	Zimbabwe
Bambata Cave Series	Pta-3111	3960 ± 60	2572-2206 BC	95.4%	charcoal	Zimbabwe
Mabveni	SR-43	1770 ± 120	AD 35-579	95.4%	charcoal	Zimbabwe
Jubilee Shelter	Wits 1381	1550 ± 40	AD 440-640	95.4%	charcoal	Gauteng, South Africa
Mphekwane Shelter	Beta 226712	2320 ± 40	407-209 BC	95.4%	charcoal	Makgabeng, South Africa
Skeurkrans Shelter	Pta-5161	1850 ± 50	AD 82-357	95.4%	charcoal	Waterberg, South Africa
Olieboomspoort (weightmean)	Pta-8024; Pta-7414; Pta-7799	2038 ± 18	55-44 BC	95.4%	charcoal	Waterberg, South Africa
Tshangula Cave, Matopo Hills	SR-75	2150 ± 100	390 BC to AD 68	95.4%	Charcoal*	Zimbabwe

Indisputable Bambata A pottery has yet to be found north of the Zambezi River (Sadr 2013a: 184). The supra-regional dichotomy of Bambata A and B disappears around 1450 BP (Sadr 2013a: 184). At approximately this time, Bambata ceramics in Botswana and Zimbabwe were replaced by Early Iron Age thick-walled ware (Sadr 2013a: 184). These changes coincided with the southern thin-walled pots in South Africa beginning to change and resemble the earlier ceramics

in the north, which may be indicative of an influx of people moving from north to south around 1450 BP (Sadr 2013a: 184). Other possibilities include a diffusion of ideas, hybridization through infiltration, and/or new interaction networks.

Bambata-ware traits may have filtered south, representing a diffusion of ideas rather than full-scale migration (Sadr 2008b: 114). These changes could reflect hybridization due to an infiltration of small groups of Bushmen fleeing from the expanding farmer frontier (*ibid.*). These traits identified in Bambata pottery could also signal the fluid interaction networks of the time, that required novel symbolic codes and that "involved new products or ways to use them" (*ibid.*). Lastly, one needs to consider whether this change in thin-walled Bambata pottery in the 1st millennium AD, could link to the migration of the Khoekhoen south (Sadr 2008b: 114). How different forms of material culture, associated with herders, made its way to the southernmost tip of South Africa, is discussed in more detail at the end of this chapter.

However, unlike areas where migrating people arrived with pottery, such as in Polynesia, Micronesia and some areas of Melanesia (e.g., Spriggs 2006), there is no clear 'stylistic chain' which traces the route and rate of migration. Bambata ceramics show no technological links with ceramics north of the Zambezi (P. Mitchell 2010: 80). Furthermore, Bambata pottery of 1450 BP has no local antecedents (Sadr 2013a: 182). The ceramics do appear abruptly, but mostly in the setting of LSA sites whose nature, position and material culture indicate continuity (Sadr 2013a: 182). However, some researchers have found similarities

between the Bambata-ware style and spouted pottery at Ngamuriak in south-western Kenya, which exhibits stone tools and pottery of the Elmenteitan culture (Henn *et al.* 2008: 10696). The Elmenteitan culture is associated with "Southern Nilotic languages" and dates from 2500 BP (*ibid*.). This links to the evidence in Chapter 2, which suggests that "eastern African Southern Nilotic-speaking populations as the most likely source for pastoralism in south-central Africa" (Henn *et al*. 2008: 10697). Bambata pottery may have its origins in "the Pastoral Neolithic of East Africa, with ceramics being part of the cultural knowledge that accompanied the migration of proto-Khoe-Kwadi peoples to Southern Africa" (Denbow 2013: 160). Yet Bambata's similarities with the Elmenteitan culture may merely be superficial. Further studies on the technology and function of Bambata ceramics are needed before accurate comparisons can be made (P. Mitchell 2010: 80).

The quite different ceramic traditions in southern Africa from a little before 2000 years ago cannot securely be linked to anything further north, leaving the possibility of local independent innovation of the pottery south of the Zambezi (Sadr 2008b; P. Mitchell 2010: 80; Denbow 2013: 160).

Alternatively, Thomas Huffman (2005b, 2007) argues that Bambata A ceramics may have a stylistic connection to Early Iron Age pottery, and that whole pots or fragments were traded along existing hunter-gatherer trade networks (Huffman 2007: 346). According to Huffman (2005b, 2007), Bambata pottery came with Iron Age Kalundu people and is closely related to Benfica, the earliest facies of

the Kalundu tradition in Angola. This last hypothesis has fallen out of favour with many researchers, as more secure dates for Bambata pottery predate Iron Age incursions and Bambata ceramics are clearly *in situ* within LSA sites. Many of the dates for early Bambata pottery (Table 3) clearly predate Early Iron Age thick-walled ceramics, which spread rapidly south from AD 600 to 1000 (Sadr 2013b: 646) (See Table 3.3 for a summary).

Table 3.3: Summary of the hypotheses proposed for the origins of Bambata pottery

Hypothesis	Strengths	Weaknesses
Demic diffusion of ripple ware	Fits the proposed migration path of Khoekhoe migrants	Ripple Ware too variable a category to be of practical use
Link to East African Elmenteitan culture	Fits the genetic and linguistic data for an East African origin	The similarilies are based purely on stylistic similarities
Local independent innovation	Provides a potential answer to why there is no stylistic chain in pottery styles from North to South	
Stylistic connection with Early Bantu language speakers' pottery		Dates for Bambata pottery predate Bantu language speakers' incursions by 1000 years

A substantial sample of Bambata pottery has been found in the Makagbeng, which could pre-date Early Iron Age thick-walled pottery by 1000 years. For instance, at Mphekwane Shelter, in the Makgabeng, 40 potsherds were found, of which 25 were thin-walled. Three were tightly comb-stamped Bambata ware (Holt 2009: 37). Another thin-walled potsherd was decorated with incised lines. No direct dates from Mphekwane were obtained, only dating of the strata in which they

were found, but Bambata pottery in the Makgabeng could date between 2320 and 1450 BP (Modikwa 2008: 56).

In the Makgabeng, the sites with Bambata pottery are often found in shelters that have rock paintings of sheep, and red geometric finger-paintings (Sadr 2013a: 185). Whether this is a coincidence, or if possibly it could signify a connection between the sites, the rock art and herders, is yet to be concluded (see Chapter IV).

In conclusion, Bambata pottery is principally associated with LSA sites, but researchers are a long way from understanding how it is related to "economic, social, cultural or linguistic entities" (Sadr 2013a: 184). Another line of evidence considers the origins of sheep and the archaeological evidence of livestock remains, which are not found in great quantities around the time of the arrival of herders.

3.3.3.2. Livestock remains

The African sheep and goat were domesticated outside of Africa, in the Levant, Southwest Asia (Gifford-Gonzalez 2005: 192). But, from mitochondrial DNA analysis, the main ancestral population of fat-tailed sheep, the domestic species most often seen depicted in the rock art of the Makgabeng, originated in East Africa (Muigai & Hanotte 2013: 39). The DNA data from sheep contributes to the growing genetic and linguistic evidence that pinpoints East Africa as a possible origin for migrating groups with sheep (Chapter II).

Unfortunately, in archaeological deposits, domestic animal remains are rare in southern African contexts where they are represented only by adult specimens of *Bos taurus* and *Ovis*/*Capra* in more recent occupation levels, the last 2500 years (Van der Ryst 2006: 198). The fragmented remains, which are common in LSA assemblages, are identifiable only as sheep-sized medium bovids, or ovicaprids, and do not allow faunal analysts to determine specific taxonomic classifications (Pleurdeau 2012: 6). Sadr (2008a: 183) argues that the scarcity of livestock remains could suggest that herders kept fewer livestock, possibly they practiced a casual herding strategy like the one observed "among mid- to late twentieth century Kalahari […] 'hunters-with-goats' [which] may represent […] a distinct 'pastro-foraging' subsistence strategy that is no longer common". Dates and distribution of early domesticates suggest that both sheep and cattle were present on the northern margins of southern Africa, with no known Bantu-speaking agropastoralist sites, not long after 2450 BP (Holt 2009; P. Mitchell 2010: 81; Sadr 2013a: 179) (Fig. 3.7, Table 3.4).

The most convincing excavated evidence for a herder presence comes from Botswana and Zimbabwe (Fig. 3.7). Bambata pottery and livestock appear in archaeological layers dated between 2000 and 1600 BP (Reid *et al.* 1998: 92; Eastwood, Blundell & B. Smith 2010: 83). At Radiepolong and at Ostrich Shelter near Thamaga in Botswana, Sadr and Ina Plug (2001) found that wild game continued to be exploited, while small game, which was probably snared and trapped, decreased when domesticates entered the site.

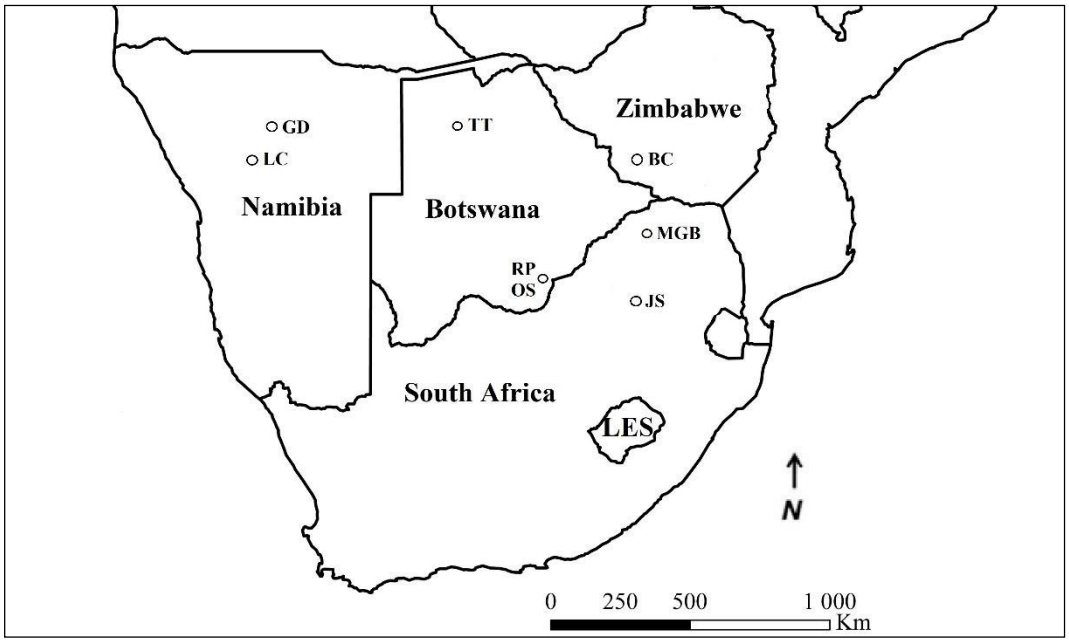


Figure 3.7: Map of southern Africa with the excavated archaeological sites with livestock remains mentioned in the text. GD, Geduld; LC, Leopard Cave; TT, Toteng; RP, Radiepolong Shelter; OS, Ostrich Shelter; BC, Bambata Cave; MGB, Makgabeng; JS, Jubilee Shelter

Table 3.4: Radiocarbon dates and locations of livestock remains across the sub-continent (Adapted from Sadr 2015; OxCal calibrations used SHCal 13 curve (Ramsey 2017) and Hogg et al. (2013)). * AMS dates

Site	Radiocarbon lab number	^{14C} yrs b.p.	Calibrated date (yrs BC/AD)	Probability	Material dated	Country
Bambata Cave	Pta-3072	2140 ± 60	356 BC to AD 23	95.4%	Ovicaprid tooth	Zimbabwe
Geduld	Pta-4419	1790 ± 80	AD 75-470	95.4%	Ass. Deposit	Namibia
Jubilee Shelter	OxA-6039	310 ± 50	AD 1480-1799	95.4%	Sheep ulna	Gauteng, South Africa
Leopard's Cave	Beta-270164	2270 ± 40	394-202 BC	95.4%	sheep bone*	Namibia
Leopard's Cave	Beta-270163	2190 ± 40	358-67 BC	95.4%	sheep bone*	Namibia
Toteng I	Beta-186669	2020 ± 40	61 BC to AD 115	95.4%	sheep collagen and teeth*	Botswana
Kalahari Drainage (Toteng 1)	Beta-1904888	2070 ± 40	144 BC to AD 60	95.4%	cow bone*	Botswana
Toteng III	Beta-186671	1,130 ± 40	AD 889-1022	95.4%	Ovicaprid collagen and teeth*	Botswana
Toteng III Skeleton	Beta-44966	1600 ± 50	AD 390-627	95.4%	Charcoal	Botswana

According to Sadr and Plug (2001), the decline did not radically alter the way of life of hunter-gatherers, which persisted, as domesticates such as sheep fit the category of 'small game' in hunter-gatherer thought and, *contra* the suggestions of A. Smith (1990, 2005). To Sadr and Plug (2001), they did not have to change their ethos of sharing.

Using Sadr and Plug (2001) as a template for the presence of herders, Sharon Holt (2009) analysed the faunal remains in the Makgabeng to ascertain whether any noticeable changes could be seen noted around 2000 BP. Holt (2009) excavated five sites, three of which contain rock art depicting sheep. At two sites, ovicaprid bones representing two sheep/goats were found in archaeological deposits. Ovicaprid bone found in the middle horizon at Mphekwane (MB5) in the Makgabeng dates from 2310 to 6310 BP (Holt 2009: 66–7). Holt (2009: 108) found small changes in faunal remains between the sites. Mphekwane (MB5) and Leholamogoa (BE33) seem to have fewer trapped and snared animals than Seroromeng (NJ8) and Mamaetla (GS8). This could represent two populations, herders and hunter-gatherers respectively, but it could also easily be indicative of differing functions at different times. Whether these animals were herded, or merely eaten, remains unknown until more accurate dates are available.

From the above mentioned data it seems, for the most part, that domesticates did not cause a significant change in hunter-gatherer subsistence and settlement strategies (Sadr 2008b, 2013). Reasons for this have been proposed by Isabelle Parsons (2015) and Thembiwe Russell and Faye Lander (2015).

These authors demonstrate how hunter-gatherers were modifying their niche environments and practicing delayed returns (honey and beehive management) prior to the introduction of sheep.

Parsons (2015) applies niche construction theory to the scenario where domesticates were adopted by hunter-gatherers in southern Africa. Niche construction, in this context, is defined as the mechanism where hunter-gatherers modify or enhance their own or each others' niche environments (Parsons 2015: 37). All hunter-gatherers modify their niche environments. For example, modern hunter-gatherers may remove animals from the gene pool, and/or burn vegetation, to promote useful animal and plant species (Parsons 2015: 38). Parsons (2015) identifies examples of niche construction or domiculture, the selective environmental knowledge and strategies for resource management applied to a specific time (after Hynes & Chase 1982: 38), during the Holocene in southern Africa. The entry of livestock into hunter-gatherers' niche environments does not automatically transform "active niche-constructing hunter-gatherers into food producers" (*ibid*: 38). Rather, she argues, pre-existing niche-construction strategies could provide room to experiment with domesticates. Hunter-gatherers negotiating accumulation and delayed returns may not have been impossible (Parsons 2015: 43).

Likewise, Russell and Lander (2015) argue that the transition to stock-keeping was not as difficult as had previously been supposed (cf. A. Smith 2005). Through their analysis of sheep rock paintings of the northern Drakensberg region of South

Africa, the juxtaposition of images of bees with those of sheep in this area, and using modern East African hunter-gatherers who are also beekeepers as an analogy, they found that bees and honey-gathering may have predisposed hunter-gatherers to ownership of livestock. They provide some evidence for the ownership of bee hives in South Africa in the 19th century (cf. Stow 1905: 86-87) and "today the Khoe-speaking Damara of Namibia mark wild hives as private property that falls within ancestrally owned lands" (Russell & Lander 2015: 334). Thereafter, Russell and Lander (2015: 334) make the interpretative connection between fat, such as the fat in the tail of fat-tailed sheep, and honey.

These two explanations help to describe why there are so few archaeological remains of livestock in the archaeological record. Moreover, they provide arguments against the idea that 'hunter-gatherer' and 'pastoralist' are closed categories that disallows the viewing of these categories on a sliding scale with hunter-gatherers on one side, and pastoralists on the other. The final corpus of material culture I will discuss is widely distributed and better preserved than livestock remains – the lithics or stone tool assemblages.

3.3.3.3. Lithics

Stone tool assemblages in Holocene Late Stone Age sites of southern Africa are diverse in terms of formal tools and use of specific raw materials (Deacon & Deacon 1999; Forssman 2013; Sadr 2013a). There are many possible reasons for this overall diversity in lithics. Some (Goodwin & Van Riet Lowe 1929; Sampson 1972: 205; Parkington 1984a, 1984b; A. Smith *et al*. 1991; Yates & Smith 1993)

argue that it is a sign of distinct cultural groups and/or subsistence ecomonies. Others (Parkington 1980; Schrire 1980; Webley 1997; Sadr 2013a) view varying lithic toolkits in different places as markers of different activities. For example, looking at the role of 'place', or a set of opportunities available at a place, John Parkington (1980: 73) found that the scatter finds of formal tools (adzes and scrapers) at sites in the Western Cape were indicative of different activities at specific locales and that these patterns could not be generalised across space. Spatial factors account for some of this diversity; however, temporal change in lithic assemblages should not be overlooked (Sadr 2013a: 179). For instance, in many LSA sites from 2000 BP, scrapers become more common as backed elements became scarce. Other changes in many sites at this time include the changes of quartz-dominated assemblages to silcrete-dominated assemblages.

In the Makgabeng, 150 km southwest of the Greater Mapungubwe Landscape, Mphekwane Shelter's formal tool assemblage shows a shift from backed tools towards scraping tools from a pre-pottery (14380 ± 70 BP/15250 ± 80 BP) to a pottery phase (2320 ± 40 BP) (Modikwa 2008: 67). A slight increase in blade production in the pottery phase is observed (Modikwa 2008: 80). There is also a shift in raw material towards exotic cryptocrystalline silica, from pre-ceramic to ceramic phases. These changes have previously been interpreted as backed elements, such as bladelets, points and segments, or as points and barbs for arrows. The decline in such artefacts could suggest a decrease in hunting with bows and arrows. Their proportional reduction in popularity parallels the increase

in scrapers, possibly reflecting an increase in hide preparation for trade or exchange (Walker 1995: 254; Sadr 1997, 2013).

However, Tim Forssman (2013) and others (Hall & B. Smith 2000; Van Doornum 2005; Sadr 2013a) cast doubt on these conclusions. Excavating in the Greater Mapungubwe Landscape, researchers have found a variety of site types dating to the 1st millennium AD (Hall & B. Smith 2000; Van Doornum 2005; Forssman 2013: 77, 2014, 2015). For example, Van Doornum (2005) found that Balerno Main Shelter is an aggregation site and that Balerno 2 and 3 shelters are both dispersal camps. Hall and B. Smith (2000) show Little Muck Shelter to be a workshop and trade depot, while Tuli Lodge may be similar.

Analysing the lithic assemblages from these sites, Forssman (2013: 77) argues that with such a diversity of site types, it may be that quartz assemblages form another component of the regional hunter-gatherer settlement pattern. They may be related to cryptocrystalline silcrete assemblages in that they are part of the larger hunter-gatherer system, but represent different occupation phases, such as aggregation, dispersal, or manufacturing camps. Likewise, formal tool frequencies, and the relation between scrapers and backed tools, are comparable in both cryptocrystalline silcrete- and quartz-dominated assemblages, indicating a continuity of affinity between the two assemblage types. This trend of declining quartz-dominated and increased silcrete materials, with a decline in backed elements and an increase in scrapers, is not seen uniformly throughout the Makgabeng. At Leholamogoa Shelter, for instance, Bradfield *et al*. (2009) found a

lithic assemblage comprising 80 to 90% quartz material that pre-dates 2000 BP and shows relative continuity in terms of formal tools production until the 19th century.

Benjamin Smith and Sven Ouzman (2004: 502) attempt to explain this lack of disturbance in the archaeological record by arguing that most "new arrivals tend to bleed into a landscape discontinuously and often adapt to local conditions rather than importing a package of archaeologically distinctive cultural elements and practices".

Similarly, Sadr (2015) uses the concept of lithic infiltration to explain how domesticates entered southern Africa. Alongside demic diffusion and cultural diffusion, Sadr (2015) argues that multiple small-scale population migrations occurred, one or more, of which, infiltrated livestock into southern Africa. Sadr (2015) analysed the distribution of lithic toolkits from 123 Later Stone Age sites across sub-equatorial Africa. The evidence derived from studies of thin-walled pottery and livestock remains was augmented by the data from lithic analyses at LSA sites.

Sadr (2015: 12) divides lithic assemblages at LSA sites of the last two millennia BCE into northern and southern sites. He found that backed-rich assemblages occur mainly in the north, while scraper-rich assemblages are found in the south. On the available archaeological evidence, Sadr (2015: 12) posits a possible scenario for the entrance of livestock into southern Africa. The earliest evidence

for sheep, from Leopard Cave, Namibia (see Table 3.4), and thin-walled Bambata ceramics in southern Africa is possibly linked to northerners, with a backed-rich assemblage that entered southern Africa during two temporally and spatially separate infiltration events. On the western coast, 2200-2000 BCE, "one or more small groups of northern backed-rich toolkit makers infiltrated livestock and thin-walled mineral-tempered" pottery down to the southernmost part of Africa (Sadr 2015: 12). A smaller infiltration of northerners, began introducing livestock, and possibly Bambata ceramics, in the East across the Zambezi/Limpopo watershed (Sadr 2015: 12). From there, Bambata ceramics were diffused, carried by hunter-gatherers north into the Limpopo River basin area, where these groups with scraper-rich assemblages adopted livestock (Sadr 2015: 13). They took both livestock and Bambata ceramics "westwards across the Limpopo/Makgadikgadi watershed and established enclaves as far as Lake Ngami, where they replaced the local backed-rich lithic tradition" (*ibid.*).

These conclusions echo several findings from the genetic evidence discussed in Chapter II. Admixture of Bushman with Khoe immigrants "did not leave evident traces in the maternal genetic material of the local Bushmen, which can suggest that the infiltration from East Africa was mainly by male herders" (Sadr 2015: 14). "The scale of admixture suggests that the East African connection was not due to mass population movement, but rather indicates movement of small groups" akin to what Sadr (2015: 14) calls infiltration. Although the chronology of these events is not precisely known, it does support the idea that livestock and ceramic vessels may have reached the Limpopo River Basin mainly through a

process of individual frontier mobility. Individual frontier mobility is when individuals, connected by friendship, partnership, or kinship, travel between different communities across economic or cultural boundaries (Sadr 2015: 5). For Sadr (2015: 5), exogamy and gift exchange (*hxaro*) "provided ample oppurtunities for such individual mobility across territories". In the ethnographic studies of the modern Ju/'hoansi in the Kalahari, *hxaro* is the term for a process of delayed returns of non-food gifts (Wiessner 2002 :421).

The individual here is not understood as an actual individual in the autonomous western sense of the word, a view that has been problematized by Thomas (2002, 2004) and Agency theorists (Dobres & Robb 2000: 11; Knapp and Dommelen 2008: 15), as attempting to impose the ethnocentric concept of the individual on to the distant past. In this thesis, as in Sadr (2015), the individual or personhood is "produced and performed through networks of relationships in differing […] historical contexts and involving both people and materiality" (Knapp and Dommelen 2008: 15) (Chapter VI). The individual is a social construct that is fluid and always in the process of 'becoming', through inter-personal relations and the material culture with which he/she engages daily (Joyce 2000; Jones 2005).

3.3.4. Farmers

The interaction between hunter-gatherers and herders would have been complicated by the later occupation of agropastoralists in the Makgabeng. The earliest evidence of agropastoralists migrating into the Limpopo-Shashe

Confluence and the Blouberg-Makgabeng areas dates to between 1600 and 1250 BP, and is tied to the appearance of Happy Rest pottery in archaeological deposits (Eastwood & Van Schalkwyk 2002: 39; Eastwood, Blundell & B. Smith 2010: 83). Sites with Happy Rest pottery in this area and dated to between 1600 and 1250 BP include Klein Afika, Icon, Little Muck Shelter, Leokwe Shelter, Balerno, Mapungubwe, Beauley, Bristol and Happy Rest (Hall & Smith 2000: 34). The farmers at these sites found the area populated by hunter-gatherers and possibly herders (Namono 2004: 9).

Farmer and hunter-gatherer interaction is evident due to the co-occurrence of Bambata and Happy Rest pottery during the contact period 1850 to 1050 BP in southern Africa (Van Doornum 2007: 40, 42). At Millbank in the Makgabeng, a radiocarbon date of 1190 ± 40 BP (AD 773-990) was obtained for an Early Iron Age site with Happy Rest/Diamant facie pottery. Microlithic scrapers and many ostrich eggshells and bone tools at Millbank could signify interactions with hunter-gatherers living in the area at the same time. Inversely, fragments of Happy Rest pottery occur at many Stone Age sites in the area, indicating interaction and exchange between farmers and hunter-gatherers (Van Schalkwyk 2004: 26).

At around 1050 BP a new and more intensive wave of agropastoralists entered the Limpopo-Shashe Confluence Area, identified by the introduction of Zhizo pottery (Eastwood, Blundell & B. Smith 2010: 84). Van Doornum (2007: 43) and Forssman (2017:61-62) argue that the proximity of a LSA site to a farmer site impacted the degree of interaction that occurred.

In some areas of the Limpopo-Shashe Confluence Area (i.e. Zhizo, Little Muck Shelter, Shroda and Leokwe Hill), this migration of Zhizo farmers could have caused many herders and/or hunter-gatherers to move out (Eastwood, Blundell & B. Smith 2010: 84). For instance, at the Salt Pan Shelter in the Limpopo Valley, the intensity of hunter-gatherer occupation declines sharply 950 BP. This is inversely correlated with a rise in the use of shelters by food-producers (Hall & B. Smith 2000: 32). The lack of space for hunter-gatherers may have led to their subjugation and their integration into farmer groups (Eastwood, Blundell and B. Smith (2010: 84). However, van Doornum (2007: 43) finds that some hunter-gatherers may have retained a hunter-gatherer lifestyle and identity, despite being increasingly absorbed into a farming way of life. Farmers may have seen their proximity to hunter-gatherers as beneficial. Farmers may have seen hunter-gatherers as inferior but they recognised the hunter-gatherer's 'first people' status and could have used hunter-gatherers' ability to control nature, in the form of rain-making, in exchange for goods (Van Doornum 2007: 43).

There were other areas where hunter-gatherers were not greatly affected by the incursions of farmers. At Leholamagoa Shelter in the Makgabeng, inhabitants were producing as many segments and backed tools during the past 100 years as they were in the last two millennia (Bradfield *et al.* 2009: 181). Moreover, there is continuity in the shape and size of beads through time. This evidence from the Makgabeng suggests continuity in a hunter-gatherer way of life until the beginning of the 19th century (Bradfield *et al*. 2009: 181). Similar conditions

occurred at Tshisiku Shelter in the Limpopo-Shashe Confluence Area (Van Doornum 2007: 43-44).

3.3.5. Known inhabitants

Some of the archaeologists (B. Smith & Hall 2000; B. Smith & Ouzman 2004; Eastwood, Blundell & B. Smith 2010) mentioned above argue that hunter-gatherers moved out of the Makgabeng and surrounds between 300 and 100 BP. But there is evidence to dispute this (cf. Bradfield *et al.* 2009). The oral histories of Bantu-speaking farmers recall Bushmen in the western range of the Soutpansberg about 300 years ago (Eastwood & Eastwood 2006: 190). Travellers crossing the southern African interior, and documents from the late 19th century to the early 20th century, describe numerous peoples around the Limpopo River, Waterberg and south-western Botswana (Baines 1972; Schlömann 1896; Keane *et al*. 1920; Kirby 1940; Breutz 1958).

Several explorers report the movement of hunter-gatherers across Botswana, the Limpopo River, the Waterberg and the Kalahari, as commonplace (Schlömann 1896; Keane *et al.* 1920; Kirby 1940; Breutz 1958). This is consistent with observed mobility across geographical and environmental boundaries. However, Thomas Baines (1872: 33, 1877: 64) wrote that his *Masarwa* (Bushman) guide refused to cross the Limpopo to the Mogalakwena River (see also Wallis 1946: 745–6). The guide explained that he had brought Baines and his assistants outside the confines of his own clan and had entered the country of another (Baines 1877: 64). Another small band of *Masarwa* could not be lured with gifts to escort them

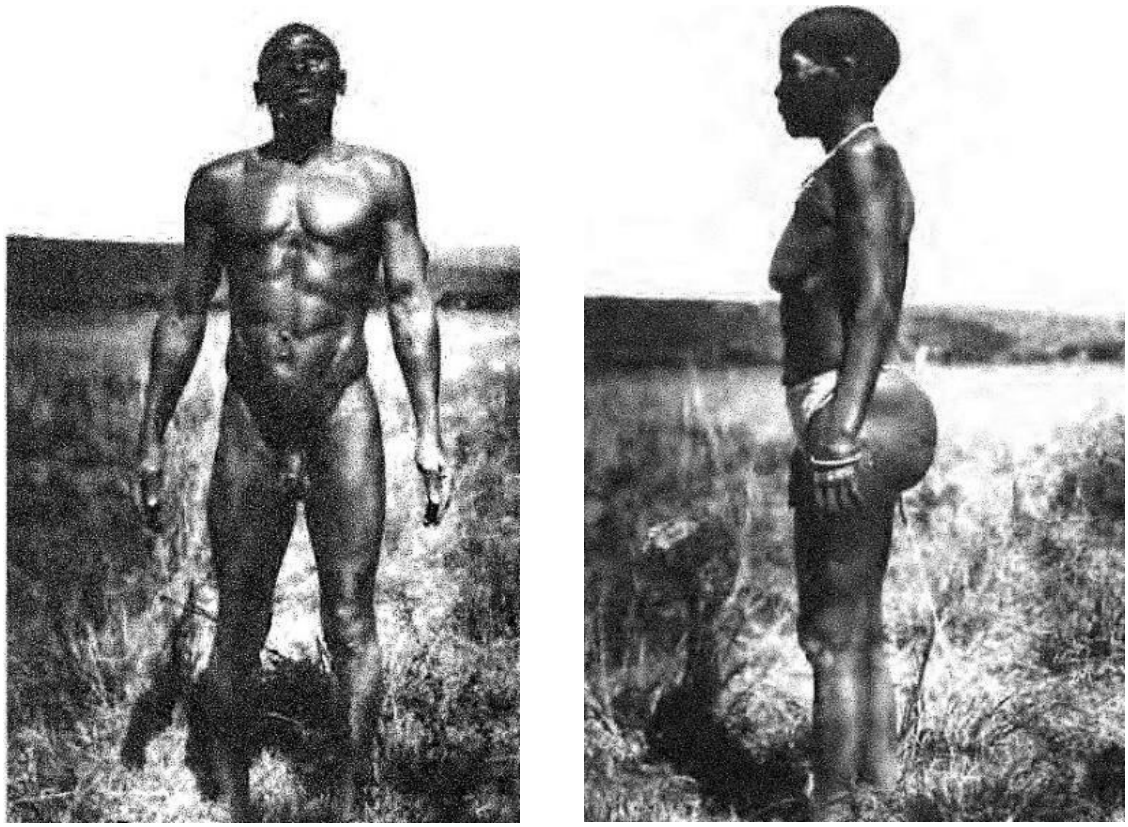
across the Limpopo River. "We gave the *Masarwa* a share of the flesh, and tried to tempt one of them with beads, powder or lead, to become our guide, but in vain" (Baines 1877: 66; see also Van de Ryst 2006: 33). Were similar boundaries present in the distant past?

These boundaries could explain the two groupings that occupied the Limpopo and Shashe areas, as recorded by Samuel Dornan in the 1920s (1925: 66). The first group, known as the '*Mapani Masarwa*', inhabited the mopane woodland area on the border between Botswana and Zimbabwe, and included the *Hietshware*, an eastern Khoe-speaking Bushman group. The second group was known as '*Baduruwane*', '*Vaalpense*', *'Kattea'* or 'Grey Bellies', and inhabited both sides of the Crocodile River (Dornan 1925: 67).

Photographs by Mr Beyer dated 1919 (Figs. 3.8 & 3.9), illustrate a family of *Vaalpense*, the derogative name given by Boer burghers to people of mixed descent who they saw as members of a subordinate class (Van Schalkwyk 1985; Eastwood 2003: 25; Van der Ryst 2003). The linguist and ethnologist Augustus Henry Keane (1920: 120) wrote of the *Vaalpense* near the Limpopo River:

> Along the banks of the Limpopo between South Africa and Southern Rhodesia there are scattered a few small groups of an extremely primitive people who are generally confounded with the Bushmen, but differ in some important aspects from that race. They are the 'Earthmen' of some writers, but their real name is *Kattea*, though called by their neighbours either *Ma Sarwa* ('Bad People') or *Vaalpens* ('Grey Paunches').

Vaalpense comprised a combination of different Bushman groups and people of mixed descent who were displaced by the *Difaqane/Mfecane* and the unyielding spread of Western hunters, travellers and settlers (Eastwood 2003: 25–6; Van der Ryst 2003). After the British annexation of the then Transvaal, government papers from 1879 state that, 3500 Magatees and Vaalpense were living under Chiefs Kibi and Maleboho respectively, in the Blouberg mountains. A further 5000 Magatees and *Vaalpense* were reported under Chief Masebe of the Mokgalakwena River, near the Makgabeng (Eastwood & Van Schalkwyk 2002: 46). Eastwood & Van Schalkwyk (2002: 46) ask what happened to the 8500 people that once lived in the Makgabeng 130 years ago?



Figures 3.8 & 3.9: Jantje Ndei Mochabeng (Left), son of Moklalea Sekoati (Right). Photographs of a Vaalpense family, 1919. Photo: Nasko-Museum (adapted from van Schalkwyk 1985: 149, Figs. 1 & 3)

By the turn of the 20th century, Selous (1908: 331) did not meet or speak to anyone that knew of the Vaalpens in the Soutpansberg, Waterberg or Dwarsberg in the Limpopo Province. They are said to have moved down the Limpopo River to south-west Transvaal (now North West Province) or westwards towards Botswana (Inskeep 2003: 895). The local Bantu-speaking inhabitants of the Makgabeng, the *Hananwa*, recognise the historical presence of the *Vaalpense* in the Makgabeng, but the oral history is silent on what happened to them (Eastwood 2003: 46).

There is little evidence of the existence of another group of people: the *Masetedi,* in the Makgabeng. Adrian Boshier (1972: 207), having lived intermittently in the Makgabeng for several years, found stone terraces that were made by the *Masetedi*. A group was reported to be present in the Blouberg area when Malaboch, chief of the *Hananwa*, and his people arrived in the mid-18th century (Roberts 1916a). Apparently, the *Masetedi* were fair-skinned, long-haired and tall (Boshier 1972: 207). Boshier (1972: 207) asked Moroki Ranyardi, a Venda *ńanga* or traditional healer who spoke fluent Tswana, whether he knew who the *Masetedi* were. Ranyardi stated that they were "those who the Europeans called 'Hotnots' [*sic*]" or the Khoekhoen (Boshier 1972: 207). The fact that these individuals were making stone terraces could signify either creolisation between herders and farmers, or at least interaction between these groups.

Today, in the Limpopo there are no known Khoe place names, but the presence of Bushmen is evident in the new name for the nearby town of Senwabarwana,

which refers to a natural well and means 'the place where the Bushmen drink' (Eastwood & Eastwood 2006: 187; Bradfield *et al*. 2009: 182–3). Furthermore, two members of the Thabananthla community in the Makgabeng told Eastwood (2003: 26) that Bushmen in the Makgabeng were not marginalised and did not leave the area for the Kalahari.

3.4. Discussion

Combining the interpretations stemming from the archaeological and genetic evidence, a clearer scenario is outlined below. A small group of Khoe pastoralists may have migrated from East Africa to southern Africa, reaching South Africa approximately 2000 years ago. From south-central African herding practices, the Khoe language, their lithics, pottery and sheep, spread southwards through a combination of demic and cultural diffusion and through infiltration processes. During one such infiltration event, a small group of northerners could have passed across the Zambezi/Limpopo watershed. The rock art depicting sheep was created at a time when these groups passed by the Makgabeng or were assimilated with local hunter-gatherers. If assimilation did occur in the Makgabeng, certain practices (such as body painting, rock art and decoration on clothing) and appearances remained distinct. For example, the group of people called the Masetedi, identified by a Venda traditional healer in the mid-18th century, were similar in appearance to the Khoekhoen in historical records. In Chapters IV and V, it will be demonstrated that the rock art of the Makgabeng is significant as it was consciously produced and is intertwined with the identity of the past

inhabitants (Eastwood & Eastwood 2006; Mallen 2008; Sanz 2008; Hampson 2011). In Chapter X, the theories reviewed in this chapter will be assessed in relation to the findings from the analysis of the rock art.

IV. The Rock Art of the Makgabeng

This chapter begins by reviewing the past recording of rock art conducted in the Makgabeng since the early 20th century. It traces the methodological foundations and issues through the years that parallel the developments in rock art recording in and around the Makgabeng. The different approaches (early recording, stylistic sequencing, superpositioning studies, shamanism, natural modelling) and research foci (gender, sexuality, ethnographies, handprints) surrounding rock art research in this area are discussed. The second half of the chapter introduces the different rock art corpora (fine-line rock art, farmer geometric rock art and finger-painted geometric rock art) and subject matter found in the Makgabeng. The origins of finger-painted geometric rock art, including handprints and fingerdots, are critically reviewed, together with the reported connection between these motifs and Khoekhoe identity.

Research has been undertaken intermittently in and around the Makgabeng for more than a 100 years (e.g. Roberts 1916b; Battiss 1948; Schoonraad 1960; Denninger 1967, 1971; Eastwood 1999, 2005; B. Smith & Hall 2000; Blundell & Eastwood 2001; Eastwood & Eastwwod 2006). The early fascination with the area stems, in part, from the occurrence of shaded paintings and the high concentration of sites, over 600 of which were documented within an area of 333.56 km². (Eastwood *et al.* 2002; Namono and Eastwood 2005). Apart from paintings, engravings, cupules (cup marks), pockmarks, possible rock slides and gongs have been found in the Makgabeng (Malan 1959: 31; Eastwood & Cnoops 1998;

Eastwood & Eastwood 2006). The area contains many rock art styles (e.g. white finger-painted geometric, brownish-red fine-line naturalistic and chalky white finger painted naturalistic representations) and techniques (e.g. fine-line brushing, finger-daubing, hand printing) with many being exemplified in the same shelters, possibly signifying prolonged interaction between at least three groups (Eastwood & Eastwood 2006: 61).

A focus on recording fine-line paintings began in the early 20th century. Only in the last 10 to 20 years has an interest in other rock art traditions of the Makgabeng emerged (Hall & Smith 2000; B. Smith & Van Schalkwyk 2002; Eastwood, Van Schalkwyk, & B. Smith 2002; Eastwood 2003; Van Schalkwyk & B. Smith 2004; Namono & Eastwood 2005; Moodley 2008). The neglect of these lesser known rock art traditions could be due to the area's remoteness (Schroonraad 1960: 10). The documentation (Hall & Prins 1993; B.Smith and Ouzman 2004; Namono & Eastwood 2005; Moodley 2008) of other bodies of art, such as finger-painted geometric rock art, have shown that rock art corpora are both less common than the fine-line art, and more restricted in their distribution (Fig. 4.1).

For example, there is a rich body of paintings, prevalent in the Makgabeng, created by Northern Sotho groups in the Limpopo Province (Hall & Prins 1993; Hall & B. Smith 2000; Eastwood *et al*. 2002; Moodley 2008). Other motifs that are prevalent in the Makgabeng include finger-painted geometrics: rows and clusters of finger-dots, finger-strokes and circular, oval and rectangular motifs

painted in a range of pigments from red through orange to white and black (Eastwood, Blundell & B. Smith 2010: 76).

These images are large and bold, and follow a range of rock art conventions and subjects different from those of the fine-line paintings (Table 4.1). Early recordings of fine-line rock art in the Makgabeng concentrated on style.

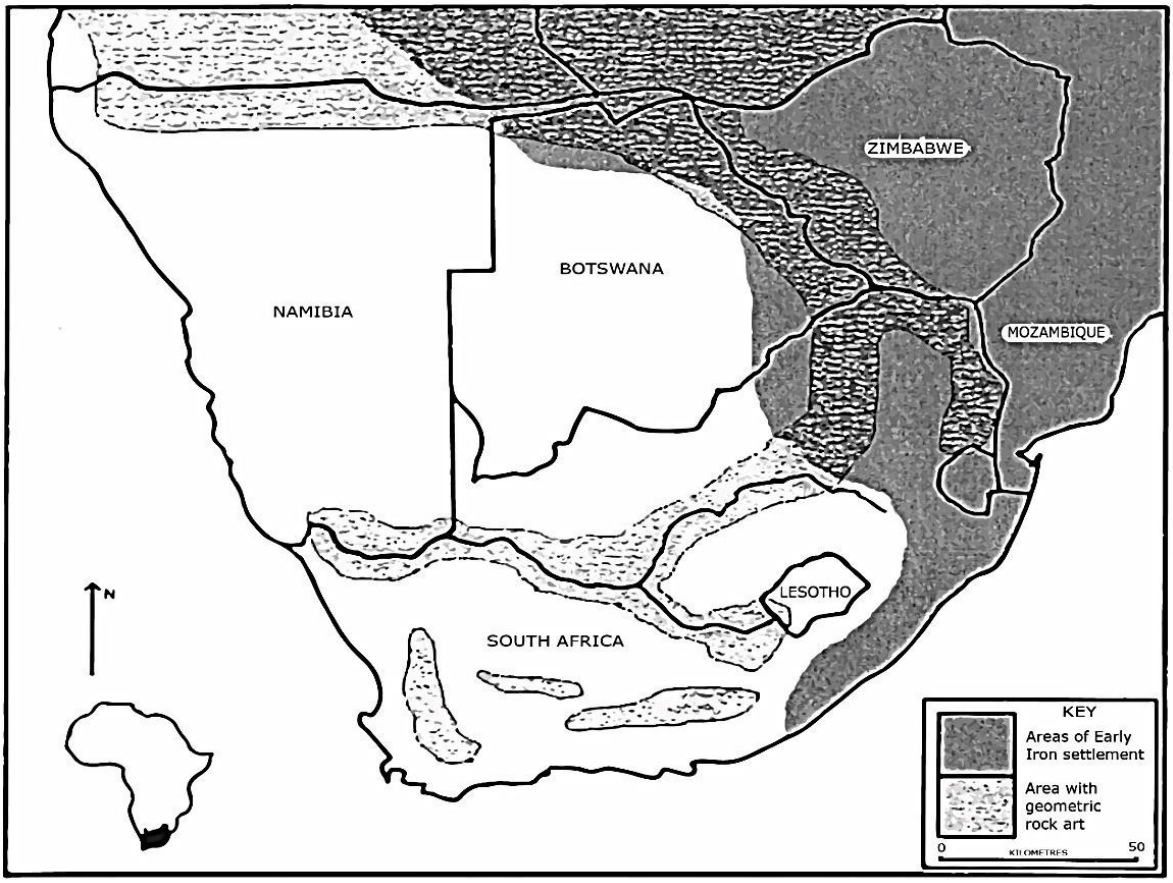


Figure 4.1: Mapshowing the distribution of Early Iron Age and nonentoptic geometric rock art areas (B. Smith & Ouzman 2004: 510, Fig. 9)

Table 4.1: The three broad rock art groupings found in the Makgabeng

Rock art grouping	Description	Distribution	Photograph
Fine-line rock art	Brush-painted fine-line rock art with depictions of anthropomorphic, zoomorphic and occasional geometric subject matter. Brownish-red predominant colour. Monochromatic, bichromatic, polychromatic and shaded polychromatic tecniques used.	Found in rock overhangs, shelters and isolated boulders, throughout the Makgabeng. Concentrated on both sides of the Masebe river gorge.	
Geometric rock art	Finger-painted geometrics: rows and clusters of finger-dots, finger-strokes and circular, oval and rectangular motifs painted in a range of pigments from red through orange to white and black Monochromatic	Divided into an earlier red phase with sites generally occurring in high shelters on summits, sides of hills or cliff faces, and a later white phase in shelters on ground level	
'Late Whites'	Finger-painted crude or highly schematised figurative and geometric rock art. These paintings are often created using thick, pasty white pigment. Often placed over older fine-line rock art paintings. Associated with Northern-Sotho peoples	Found throughout the Makgabeng at secluded initiation sites.	

4.1. Early Recordings of Fine-line Rock Art in the Makgabeng

Analyses of style are not new (Battiss 1939, 1948; Burkitt 1928; Goodwin 1936). They are often part of the methodological foundations, however unstable, of rock art research in southern Africa, for example, the stylistic comparison of one rock art type with another, the distribution of styles within and between corpora and relative dating of rock art using style. In this thesis, style is defined as both an analytical and theoretical tool to understand spatial and temporal variation, as well as a way of gaining insight into what variations could mean (i.e. networks of associations, group intra- and inter-regional identity) to the people that produced them (Chapter V).

Historically, the early period of rock art recording (1910s to 1980s) using style in the Makgabeng and surrounds, can be synthesised into two major research foci. The first research focus centred on the distribution of fine-line art in southern Africa. This arose from the recognition of similarities and differences in styles between art regions. One of the objectives of studies in style was to record and map the geographical distribution of different types of paintings or engravings in relation to other data, such as stone tool industries and faunal remains (e.g. Willcox 1963: 38). Early recorders saw style as providing clues to migrations of peoples and the direction of diffusion of their cultures (Willcox 1963: 37-38). The second focus was on the age of the paintings, style having been used to construct relative chronologies regarding two main factors: the superimpositioning of art and content (Humphreys 1971: 87). Burkitt (1928) inferred that styles can be indicative of social groups and that the stylistic differences were due to the

incursions of separate or discrete groups of people which led to disparities between areas such as the Drakensberg and Zimbabwe. He divided the rock art of southern Africa into three sections: the Southern Rhodesia (Zimbabwe), Central and Southern art groups (Burkitt 1928). Such early studies of different styles superimposed one on top of the other were frequently inaccurate and were not exhaustive, being based on only several rock art sites per region.

4.1.1. Distribution and subject matter of fine-line rock art in relation to the Makgabeng

In the early 20th century, Reverend Noel Roberts, an amateur archaeologist, documented several sites and made drawings of paintings found in the Makgabeng (Roberts 1916b). Of significance are his notes on the complete lack of depicted eland in the Makgabeng in comparison with those seen in the Drakensberg, and the prominence of hartebeest and impala (Roberts 1916b: 566).

The Cambridge archaeologist and historian Miles Crawford Burkitt made an archaeological tour of South Africa and Zimbabwe in 1927. He was the first to attempt to establish sequences in the rock paintings by observing superimpositioning of styles and techniques in relation to excavated lithic artefacts (Burkitt 1928: 110).

In 1935, Clarence Van Riet Lowe founded the Bureau of Archaeology, which collected information over a period of 17 years to produce a thorough distribution map and index of rock art sites (Eastwood *et al.* 1997: 19).

Following Burkitt (1928), Van Riet Lowe's stylistic criteria placed the Makgabeng in a new North-Eastern art group, which included the Limpopo Province, Mpumalanga Province and Zimbabwe (Van Riet Lowe 1956; Schoonraad 1960; Eastwood *et al*. 1997: 3). Burkitt (1928) identified similarities between large bichrome sets of ovoid motifs from Zimbabwe and those from the Makgabeng. The term, 'formlings', coined by Leo Frobenius (1929, 1931), referred to these Zimbabwean motifs, which he grouped with depictions of trees as a defining stylistic feature of the art in the North.

Similarly, South African artist Walter Battiss (1948: 200), who recorded a few sites in the Makgabeng and surrounds, argues that the art shows varied styles and periods, and closely resembled rock art in southern Zimbabwe and Namibia. According to Battiss (1948: 39), "style is an expression of the artist's own personality or school" and does not merely refer to the technique used. Battiss (1948), like Burkitt, argued that change in style was due to outside influence. He was concerned with how styles were cyclical, with archaic beginnings, a stage of transition, a climax and a period of decadence (Battiss 1948.). In the 1950s, the styles were synonymous with trends in artistic practice and followed a Western art history model.

Later, the Makgabeng was investigated by the National Cultural History Museum in Pretoria (Eastwood *et al.* 1997: 30). The museum team's brief visit to the area revealed several unknown fine-line and finger-paintings (Eastwood *et al.* 1997: 30). The team also realised that the Makgabeng fine-line paintings displayed

many similarities with fine-line paintings in the nearby Soutpansberg, 84 km north-west of the Makgabeng (Eastwood *et al*. 1997: 31; Miller 1993: 7-8). Within these art groups, first identified by Van Riet Lowe (1956), there was a distinct regional stylistic choice of which subjects were painted and how often, irrespective of the region's ecology (Hampson *et al*. 2002: 20). For example, depictions of eland are prevalent in the south-eastern Drakensberg, but at sites further north the eland motif disappears. In Zimbabwe, few eland were painted, while a high percentage of kudu and giraffe paintings are seen.

Within Zimbabwe and the Makgabeng, the total depicted tsessebe exceed hartebeest – a trend that may be a factor of the environment (Garlake 1995; Walker 1996). In the Limpopo Province both tsessebe and hartebeest are painted but further south only hartebeest and not tsessebe are depicted. There are no unequivocal paintings of tsessebe in the Waterberg, 115 km south-west of the Makgabeng, but animals that are recognisably hartebeest are depicted (Laue 2000: 59).

The Makgabeng follows the Zimbabwean pattern of a high percentage of painted kudu and giraffe together with impala, and is unique in the presence of more identifiable depictions of females than males (Hall & B. Smith 2000: 39). Zebra paintings are common in the Makgabeng and surrounds, but are rare or absent in the Soutpansberg and Limpopo-Shashe Confluence Area (Eastwood & Eastwood 2006: 102; Figs. 4.2 and 4.3). As we shall see later in the chapter, the selective

choice of iconography is but one of a gamut of stylistic choices, including site selection, the composition of scenes, manner of depiction and superimpositioning. Stylistic studies, although controversial, demonstrate to even the cursory observer overt trends and differences between rock art regions. For instance, painters in all the regions mentioned above, other than in Namibia, used the technique of shaded paintings (Rudner 1975: 46).

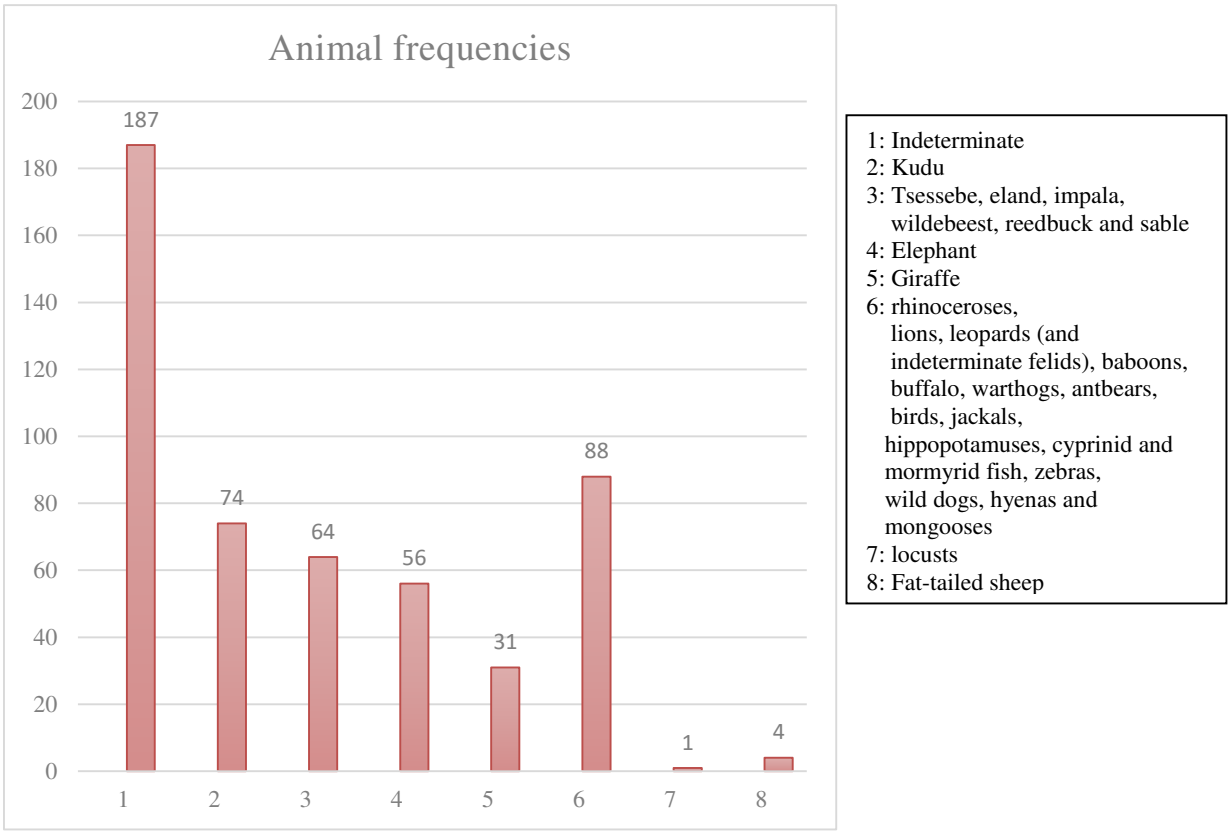


Figure 4.2: Graph illustrating the frequency of animal depictions in the Limpopo-Shashe Confluence Area. 1: Indeterminate; 2: Kudu; 3: Tsessebe, eland, impala, wildebeest, reedbuck and sable; 4: Elephant; 5: Giraffe; 6: rhinoceroses, lions, leopards (and indeterminate felids), baboons, buffalo, warthogs, antbears, birds, jackals, hippopotamuses, cyprinid and mormyrid fish, zebras, wild dogs, hyenas and mongooses; 7: locusts; 8: Fat-tailed sheep (adapted from Eastwood & Blundell 1999: 23, Fig 10).

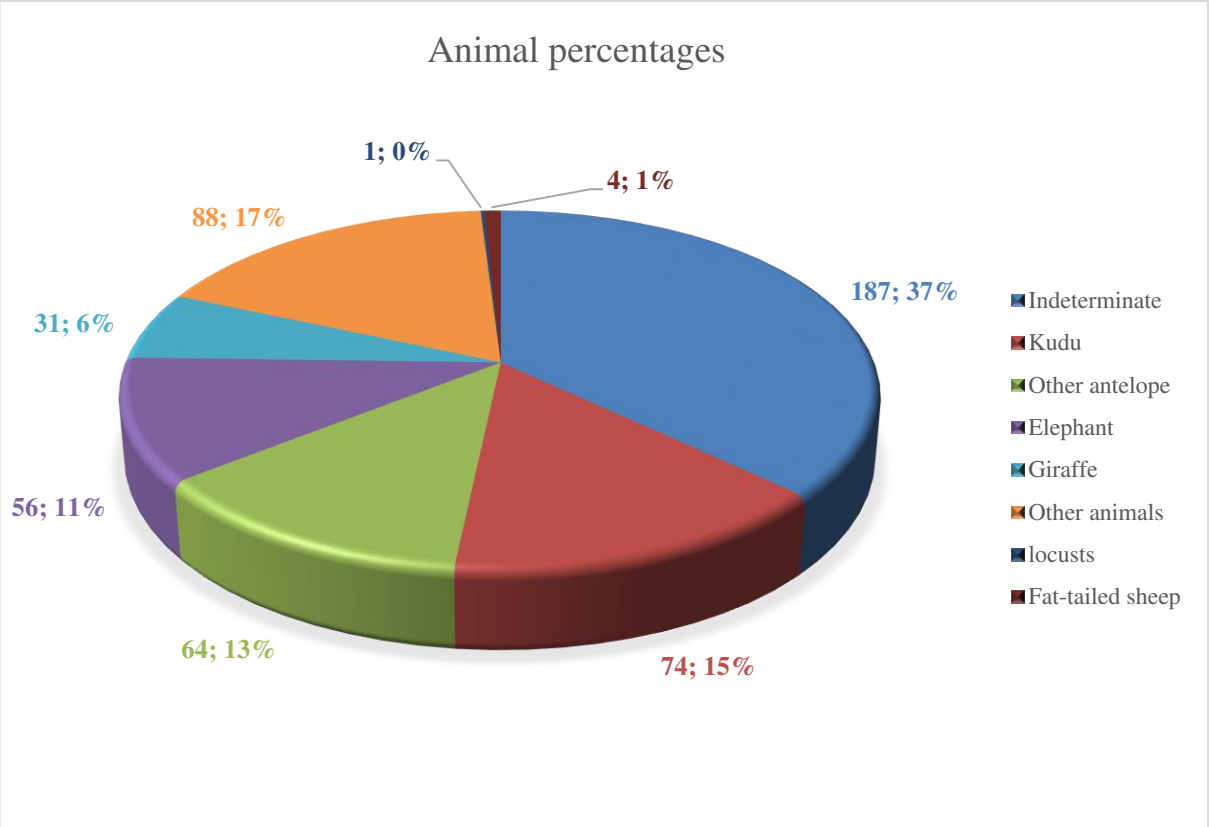


Figure 4.3: Pie graph demonstrating the percentages of animal depictions in the Limpopo-Shashe Confluence Area (adapted from Eastwood & Blundell 1999: 23, Fig 10)

Alex Willcox (1955) and Harald Pager (1973a) have located 'shaded polychromes' or 'shaded paintings' in the Drakensberg area (South Africa and Lesotho), Mpumalanga and the Waterberg, the Makgabeng, the Limpopo Valley and Tsodilo Hills in Botswana (Figures 4.4, 4.5 and 4.6). The shaded paintings in Tsodilo Hills were executed in a simple way, and are completely different from those in the other areas. Lastly, the Matobo Hills in Zimbabwe have both shaded and partially shaded paintings. In relation to shaded paintings, the later researchers were also concerned with the second theme, the preoccupation of dating shaded paintings, as discussed later in the chapter..

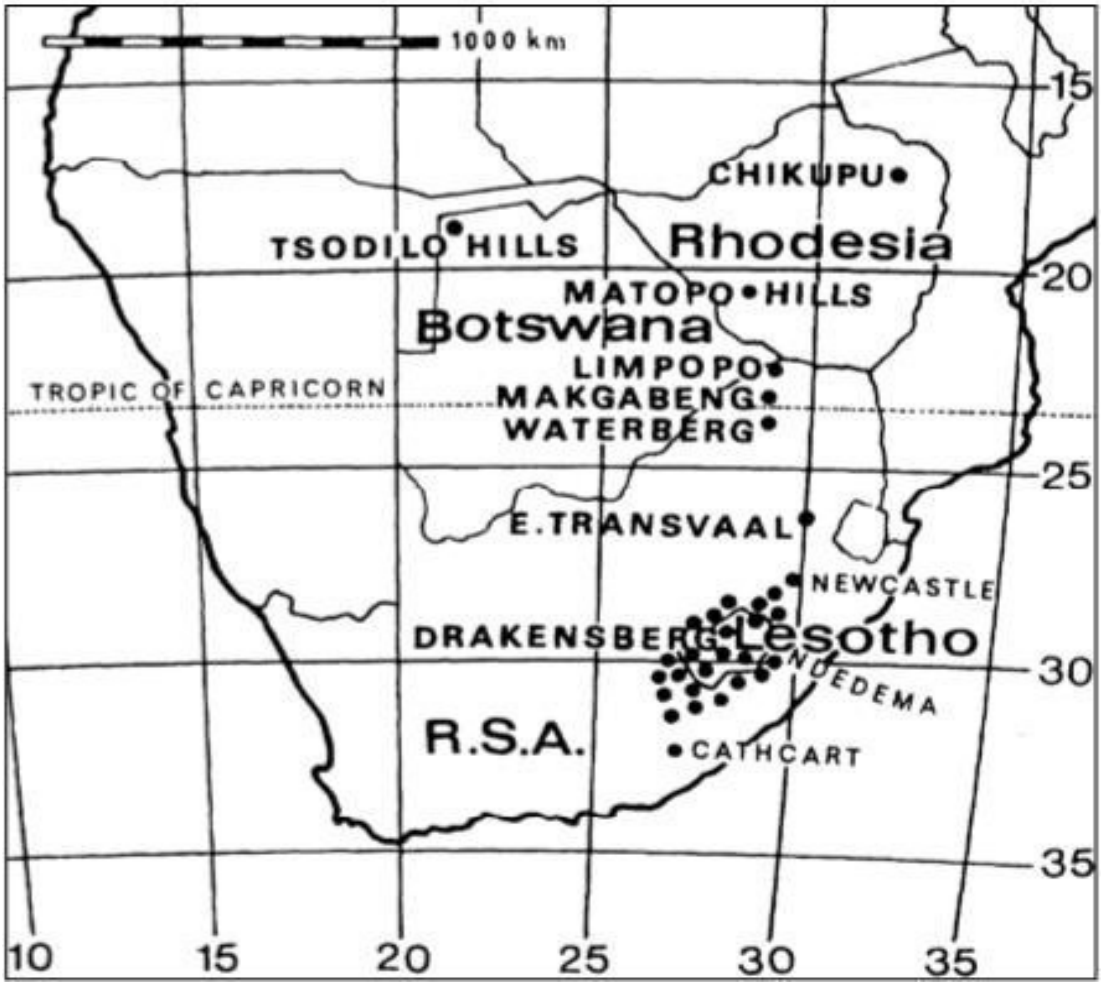


Figure 4.4: Distribution of shaded paintings in southern Africa (Pager 1973a: 39, Fig. 1)



Figure 4.5: Shaded painting from Bonne Esperance 2, Makgabeng

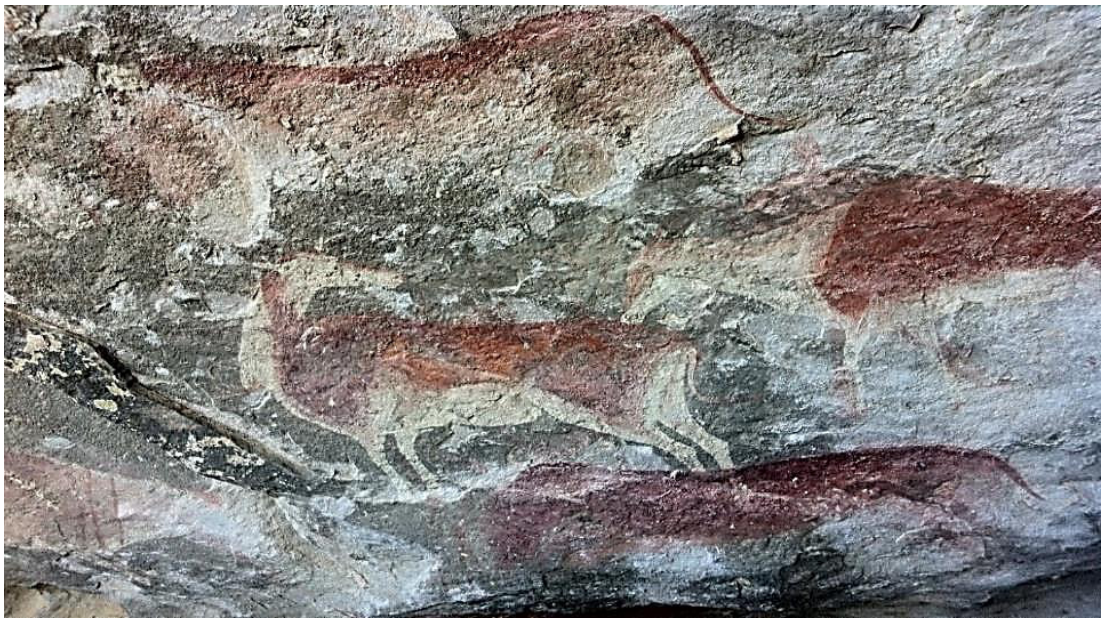


Figure 4.6: Drakensberg shaded painting (Ikanti shelter, Sani Pass, Drakensberg)

4.1.2.1. Style and superimpositioning

In the 1950s, Jean Humphreys and Patricia Vinnicombe visited the Makgabeng and found paintings that they thought represented the final stages of Later Stone Age art (Mason 1962: 27). Their assumption was based on style and contemporary excavations at Makgabeng Shelter, which provided a recent date of 1020 ± 150 BP (see Chapter III). Likewise, Alex Willcox (1955) and Harald Pager (1973a) suggest that the shaded paintings of the Makgabeng date to around the 19th century unrest known as the *Difaqane/Mfecane*. A time of great "demographic upheaval and revolutionary social and political change" (Eldredge 1992: 1, but see Etherington 2001). The dating by Willcox (1955) is based on style and superimpositioning, where shaded paintings seem to overlie most other types of paintings. Stylistic "sequences of superimposed art of varying styles or content have been widely used to provide relative rock art chronologies"

(Thackeray 1983: 21). However, the earlier methods of using a combination of superimpositioning and style were subjective and the chronologies often incorrect.

Anne Thackeray (1983: 21) found that while superimpositioning studies could be used to observe the sequence in which the art was created, this method of dating rock art is not always unequivocal. For instance, there may be no obvious "differences in style or content in a superimposition series, the sequence may [differ] from area to area, or one style may have persisted longer in one area than in another" (*ibid*). Moreover, "there is evidence suggesting that certain paintings were intentionally superimposed according to the colour or subject of the original painting" (Lewis-Williams 1974; Thackeray 1983: 21). Lastly, we can never be sure of the time gap between superimposed styles, unless the paintings have been directly dated. The time between superimposed images could be days, weeks, months or even hundreds of years (Russell 2000).

4.1.2.2. Paper chromatography

A dating technique called 'paper chromatography' bolstered the superimpositioning theories of Willcox (1955), Vinnicombe (1967) and Pager (1973a). Using paper chromatography, Ing Edgar Denninger counted in the paint the number of amino acids apparently derived from albuminous binders (e.g. bird-egg albumen, milk casein, blood) (Denninger 1971). Denninger "contended that the rate of decomposition of amino acids differed and by examining the amino acids percentages [in paint samples, these percentages] could be assigned to paintings" (Bonneau *et al*. 2011: 420). The older the albuminous binder, the fewer

the amino acids (Thackeray 1983: 22). The technique was applied to over 1000 paintings from Germany and South Africa, including a shaded painting in the Limpopo Valley, 80 km west of Musina, and dates were obtained (Denninger 1971: 84). The most recent date was of a shaded painting with a date of 100 ± 20 BP, a depiction of a giraffe (Pager 1973a: 44). The earliest date came from yellow ochre pigment dated to 800 ± 200 BP with no superimpositioning over yellow ochre paintings in six samples (Pager 1973a: 44).

The accuracy of the dating technique, paper chromatography, is considered unreliable, even flawed (Derricourt 1977: 59; Thackeray 1983; Bonneau *et al*. 2011: 420). The technique is insufficiently sensitive to identify the tiny quantities of amino acids remaining in paint samples. Amino acids do not decay at set rates, and bacteria and mould can hasten their degradation (Thackeray 1983: 22). Such decay often depends on local conditions, such as humidity, temperature, sunlight and shade (Thackeray 1983: 22). There is therefore no way of calibrating the process. Furthermore, the source of the amino acids is not clear. Researchers cannot tell whether they derived from protein binders added to the paint, or from some sort of contamination, such as bacteria or lichens on the rock (Pearce 2014; pers. communication).

Many early studies focused on the larger picture: the movements of different groups across the landscape. However, closer attention to the rock art itself is crucial to unpacking the similarities and differences within stylistic categories to discern patterns. This ‘call to the rock face’ has been taken up, and most

researchers no longer support overarching theories, as many researchers did in the early to mid-20th century. Recent studies have shifted from being inter-regional to intra-regional and site- or area-specific in nature.

4.2. The Later Years of Rock Art Recording in the Makgabeng

From 2001 to 2006 Eastwood, a qualified zoologist, horticulturist and rock art researcher, and a team of researchers including Elias Raseruthe, a herbalist, and Jonas Tlouamma, a Sesotho interpreter and guide, conducted extensive field surveys of each property within the Makgabeng. They recorded around 660 sites using a GPS and placed the co-ordinates on a 1:50 000 topographical survey map (Eastwood & Van Schalkwyk 2002: 49; Chapter VII, Figure 7.1). All motifs were counted and recorded using site record forms. The objective of the study was to trace selected images in each site. While recording rock art, Eastwood and colleagues, from the University of Witwatersrand and the National Museum, Bloemfontein, paid special attention to themes such as trance-related imagery, natural modelling, female figures and symbolism, and contact art.

4.2.1. Trance-related imagery

The 'shamanistic explanation', with its foundational tenets conceived by David Lewis-Williams in *Believing and seeing: symbolic meanings in southern San rock painting* (1981), is the current dominant paradigm in South African rock art research and has irrevocably changed the way rock art researchers understand fine-line rock art. The history and explanatory power of the approach is briefly outlined below.

Lewis-Williams made the initial breakthrough by considering art in relation to ritual, with an emphasis on symbolism. He used |Xam ethnohistory from the Bleek and Lloyd archive together with the writings of Joseph Orpen (1874). The second breakthrough was the use of ethnographic analogy – ethnographies from the Kalahari Ju|'hoansi Bushmen (!Kung language family) collected predominantly in the 1960s and 1970s were used. David Lewis-Williams (1990b) argued that the medicine or trance dance of the Ju|'hoansi was key to understanding the paintings. This approach sees ethnographic analogy as a way to understand the meanings of the art from an insider or emic perspective – what the art meant for the artists themselves and for the general community that would have viewed it. However, ethnographies are also limiting, since explanations of paintings are often laden with Bushman idioms and idiosyncratic artists' impressions that are understood only in Bushman society and are often confusing to Westerners (Lewis-Williams 1990a, 1990b). Therefore, researchers try to find common features in the biology of the mammalian brain to better understand the art (Lewis-Williams & Dowson 1989; Lewis-Williams & Pearce 2004b). Neuro-psychology, with a focus on what altered states of consciousness tells us about unusual aspects of the rock art that are not easily recognisable from the ethnography (Lewis-Williams 1990c, 2001, 2002). Much of the research, conducted by Lewis-Williams (1981, 1989, 1998, 2001) and colleagues (Dowson & Holliday 1989; Pearce 2001; Lewis-Williams & Pearce 2004a; Henry 2010; Mallen 2010) has focussed on the south-eastern Drakensberg.

The sites in the Makgabeng are different from the Drakensberg in terms of iconographies and techniques. This may point to different beliefs and groups associated with the rock art. In the Makgabeng, there are images that resemble elements common to the !Kung trance ritual, but no explicit images of the dance have been found like those in the south-eastern Drakensberg and in the Eastern Cape. However, “fragments of the dance”, representations that reference the trance dance (e.g. a flywhisk, therianthrope or a line that meanders in and out of the rock substrate), are widely distributed, albeit with distinct variations, throughout southern Africa (Lewis-Williams & Pearce 2004a: 100). Fragments of the dance are synecdoche, where a part stands in for the whole. Components of the dance are used to stand in for the whole system of interacting with the supernatural realm. Fragments of the dance include nasal bleeding, fly switches and dance postures (Lewis-Williams & Pearce 2004a: 100). Postures identified in the medicine dance are also seen depicted across large tracts of southern Africa. For instance, figures in an arms-back posture and figures leaning on or using dancing sticks are common (Eastwood 1994: 4) (Figures 4.7a and 4.7b). These are common poses recorded in historical and modern trance dances (Marshall 1976).



Figure 4.7a: True-colour image of figures in bending forward postures from site Langbryde 40, Makgabeng

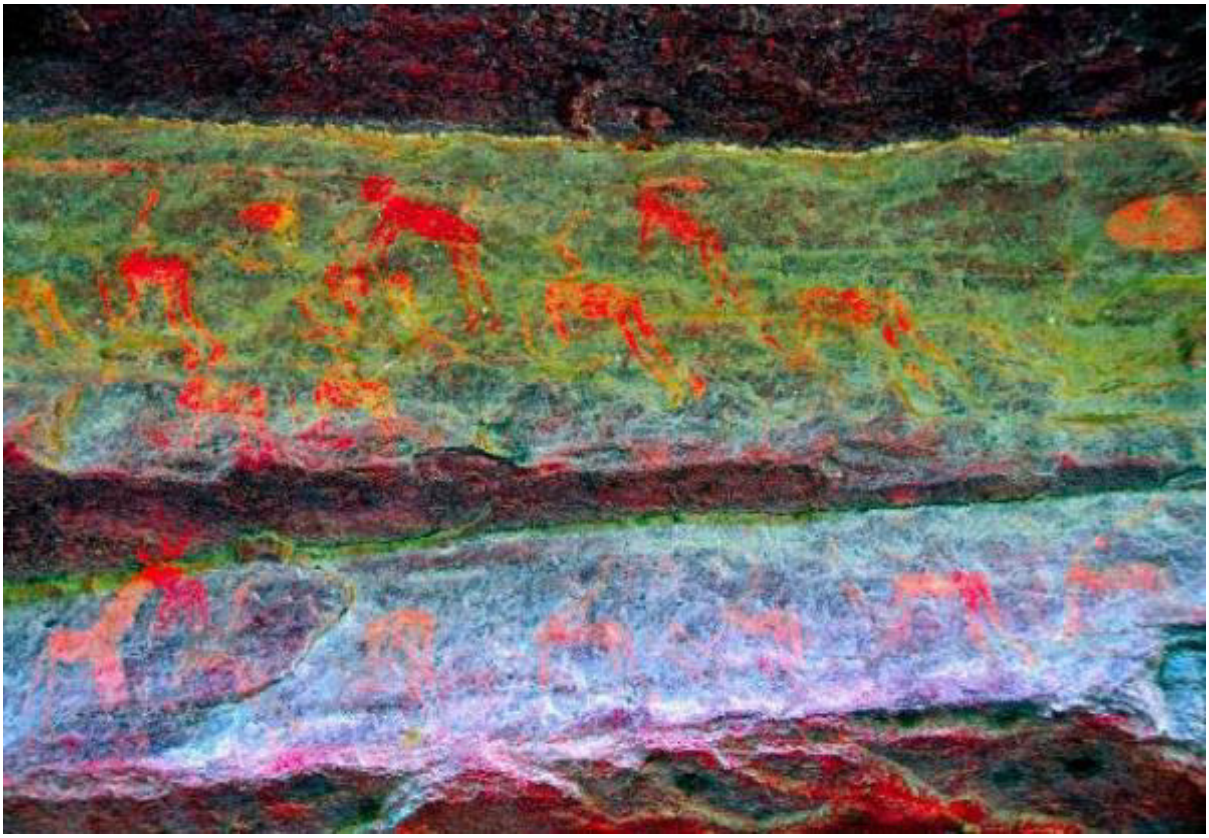


Figure 4.7b: False-colour image using *DStretch*® (lab) of figures in bending forward postures from site Langbryde 40, Makgabeng

Trance-related motifs are common in the Soutpansberg, the Makgabeng, the Limpopo-Shashe Confluence Area and Zimbabwe and include depictions of a red dorsal line seen on large herbivores such as eland, elephants, giraffes and rhinoceros (Eastwood & Cnoops 1993: 2; Miller 1993: 8; Eastwood 1999: 16) (Fig. 4.8). In the Makgabeng, this red line is also often seen on the ventral side of many animals, outlining the stomach as well.



Figure 4.8: Red dorsal line on rhinoceros from Nyamazan Shelter, Limpopo-Shashe Confluence Area. Image courtesy of SARADA (Eastwood 1999: 20, Fig. 7).

Another recurrent trance theme in the Waterberg, Makgabeng, Soutpansberg and Limpopo-Shashe Confluence Area, is a procession of figures holding sheaves of arrows, or often holding arrows neatly concentrated in or piercing the lower abdomen. It has been argued that these representations are unlikely to be literal

depictions due to the danger of holding poisoned arrows in group activities. Arrows are usually stored safely in quivers (Eastwood & Tlouamma 2005: 62). Rather, these images could signify the transference and control of supernatural potency during the trance dance (Eastwood 1999). David Lewis-Williams (2015), drawing on ethnography on the Ju|'hoansi and /Xam Bushmen, has argued that in trance the shaman-dancers drew arrows of sickness out of the bodies of those whom they cured and then expelled the 'sickness arrows' through the back of their neck, the *n//ao* spot. In a different context, shamans shot invisible arrows of potency into novices to increase their powers (Orpen 1874: 10; Bleek 1935: 5,7; Marshall 1962: 251; Lee 1967: 35; Katz 1982: 102-3). Researchers have developed this notion further by arguing that depicted lines of men or individuals of indeterminate sex carrying arrows represent shamans who hold metaphysical arrows of potency (Hampson *et al*. 2002: 22; Eastwood & Tlouamma 2005: 61). Furthermore, the depictions of red dorsal lines and arrows piercing, or concentrated in, the abdomen – which Sydney Miller (1993: 6), drawing on the ethnography of Katz (1982: 46, 168), describes as a lot of thorns in the stomach, could refer to the supernatural potency, starting in the lower abdomen and rushing up the spine, which shamans experienced in altered states of consciousness. Lastly, trance-related motifs in the Makgabeng include figures that have both human and animal attributes (therianthropes) (Figures 4.9a and 4.9b). In trance, shamans experience themselves transforming into animals.



Figure 4.9a: True-colour image of a fine-line painting of therianthropic figure from site, Too Late 42, Makgabeng

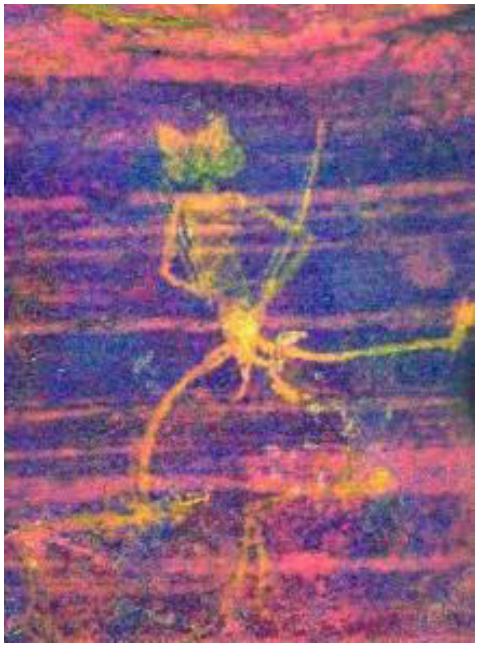


Figure 4.9b: False-colour image using *DStretch*® (ybk) of fine-line painting of therianthropic figure from site Too Late 42, Makgabeng. Note the head of the figure is that of an animal. Notice below we have figures bending forward in a typical trance position

4.2.2. Natural modelling

By employing the natural sciences to elucidate meaning in rock art, several researchers coined the notion 'natural modelling' in rock art. These approaches are "dominated by ecological frameworks, which are inspired by evolutionary biology" (Porr & Bell 2012: 171).

Natural modelling refers to the inclusion of certain features and behaviour of animals in belief systems to elucrigid division idate a variety of social and spiritual phenomena. Following this argument, the art is said to refer to details of animal behaviour that can still be observed today, and offers a link to the past (Whitley 1994; Whitley 2005: 82). David Whitley (2005: 81) argues that among traditional people these natural models, modelled from natural phenomena, like

animal behaviour, served to structure the logic of underlying aspects of religious symbolism and ritual, usually by some form of analogical reasoning.

Natural models have been used predominantly within a shamanistic framework (e.g. Hollmann 1993, 2005; Ouzman 1996; Mguni 2002; Mallen 2005; Eastwood 2006). Bushmen, it is argued, incorporated their keen observations of animal behaviours and attributes into their cosmology and rock art (Mallen 2005: 5). Following this argument, the art may refer to details of animal behaviour that can still be observed today, and this offers a link to the past. However, the subtext in such a case is that symbolism and symbols are empirically derived from peoples' observations of animals in the past (Whitley 1994, Whitley 2005: 82). According to David Whitley (1994: 1-2) the origins of many of these symbols are derived from the physical responses to altered states of consciousness in a certain time and space. In a similar way to the behaviours of certain animals, natural models have been used extensively to understand motifs such as formlings – an enigmatic symbol common in southern African rock art. Siyakha Mguni (2002, 2015), has convincingly argued that these symbols refer to bees and termites and their nests.

Through a survey of the literature on formlings and related imagery, I found that formlings are widespread in Zimbabwe and in northern parts of South Africa. Eleven formlings were recorded at 7 sites in the Makgabeng. Elsewhere they are uncommon or absent, but isolated cases have been reported by Bert Woodhouse (1990) and Jamie Hampson and colleagues (2002) as far south as Mpumalanga,

Estcourt, Uitenhage and Calvinia (Woodhouse 1990; Hampson *et al.* 2002).

Though painted in various forms and sizes, formlings commonly

> comprise regular oval or rectangular cores, each with its own white semi-circular cap at one or both ends. […] The cores – usually dark in colour – are often depicted vertically and side-by-side, or stacked horizontally; sometimes they are outlined or enclosed by a circular line. Their surfaces are usually covered with grids or lines of white dots (Hampson *et al*. 2002: 23).

Early researchers interpreted these images as beehives or honeycombs (Pager 1973b, 1976; Woodhouse 1994). Expanding on these interpretations, Siyakha Mguni (2002, 2005, 2015) convincingly argues that formlings depict termite nests and bee hives (Fig. 4.10).



Figure 4.10: Examples of formlings in red from farm, Bonne Esperance 5 in the Makgabeng. Image courtesy of SARADA

Both subjects are receptacles for fat, termites and honey having been an important source of dietary fat for the Bushmen. These substances are powerful, and possess supernatural potency used in trance (Mguni 2002: 141; Russell & Lander 2015). Hartebeest, giraffe, kudu, roan or sable antelope and tsessebe are often found together with formlings. Ethnographies highlight these animals as the 'great meat animals', which possess significant, even dangerous, potency (Lewis-Williams & Biesele 1978: 123; Lewis-Williams 1981: 57). Another regional shamanistic aspect that incorporates natural models is the animal behaviours of specific species. Bushmen in the Makgabeng painted kudu in diverse postures, colours and positions. Almost all the depicted kudus are cows, but some rare depictions of bulls with large corkscrew horns have been identified (Eastwood & Cnoops 1999: 110). Images of kudu are often larger and more carefully painted than other animals in the same panel. Kudu are shown in several colours with yellow bodies, red ears, and shoulder, hump, belly and legs outlined in white, sometimes with white stripes (Eastwood & Eastwood 2006: 102-103). In the Central Limpopo Basin, a quarter of all paintings of kudu cows depict them in specific mating postures, often in rows of two or three. Their heads, low with chins pointing outwards, are usually in the position cows adopt to show a readiness to be mounted by bulls. Some of these paintings have a red patch or line of pigment on the cows' underbelly, reflecting the real-life situation of the cows' genitals being swollen and tinged pink when the cows are in oestrus (Eastwood & Eastwood 2006: 103). Eastwood and Eastwood (2006: 103) argue that the "mating posture and red genitals may be a metaphor for women's sexuality and may relate to ideas of female potency".

Other aspects of the paintings reflect non-literal elements. In nature, kudu cows in oestrus would not follow each other in this submissive position (Eastwood & Eastwood 2006: 138). The juxtaposition of kudu cows in mating postures with female human processions is significant. The cows are all facing the same direction as the women (Eastwood & Eastwood 2006: 138). This may be due to handedness, but for Eastwood and Eastwood (2006: 138), the convention is clear: they symbolise "animals behaving like humans". Using ethnography from the Ju|'hoansi gathered by Megan Biesele (1993), Eastwood and Eastwood (2006) demonstrate how, in Bushman thought, the metaphor of women as meat is so entrenched that the two have become blurred.

Although the shamanistic explanation aids our understanding of some motifs, there are others that it has not adequately explained. Many motifs (e.g. females in procession and motifs associated with puberty rites) are unique to the Makgabeng and surrounds. For examples, the Makgabeng have the greatest number of female images of any region in South Africa (Eastwood & Eastwood 2006). The next section focuses on some of these motifs.

4.2.3. Female figures and symbolism

In Limpopo, female figures appear to be far more common and are often painted in a stylised way (Eastwood & Cnoops 1994: 10). The depictions of females and their actions (e.g. females in procession, females in specific clothing and females seated in a shelter) in the Makgabeng suggest that the symbolism is associated

with gender rites. These rituals, defined by Arnold van Gennep (1960) are rites of passage, where the boy or girl initiate transitions from childhood to adulthood.

According to Eastwood (2005: 1), there are two approaches to women's gender rites – seeing these rites either within or outside a shamanistic framework. Both approaches have relevance to the rock paintings of the Central Limpopo Basin and Eastwood, in many respects, uses both approaches – seeing certain images as part of shamanistic rituals, but also identifying others for their uniqueness and frequency.

Prior rock art research has tended to separate shamanic and gender processes to the impoverishment of both, but symbolic connections between the two spheres are inseparable (Stevenson 1995). Several researchers have approached women's and gender issues from a shamanistic perspective (Lewis-Williams 1981, 1998; Stevenson 1995: 47; Ouzman 1997a; Lewis-Williams & Pearce 2004a; Eastwood 2005). These authors see the rock face as constituting a shamanistic context for all paintings, much as a stained-glass window in a church is firmly positioned in a religious setting (Lewis-Williams & Dowson 1990: 15). To them, even girls' puberty rites are depicted within a shamanistic context.

Depictions of puberty rites are shamanistic but not shamanic, in that they do not deal directly with the activities of shamans in altered states of consciousness but, instead, allude to the broader shamanistic context of the paintings. In the Makgabeng, Eastwood (2005: 1; 2006: 31) examines figures in terms of age

categories, body representation and grouping. To understand these motifs, Eastwood uses Kalahari ethnography, including oral testimonies of women from three Central San groups. He also looks at the function of the paintings and the primary contexts in which they were made: the rock face and the landscape.

The female figures' breast shape, size and position on the thorax could represent a rough continuum, an age range from girl through to old woman (Eastwood 2005: 6). Eastwood (2005: 6) argues that figures with small breasts placed high on the thorax may be representations of girls, who may represent the uninitiated in certain instances. A common scene is a row of three to seven figures (women and girls) (Figs 4.11a and 4.11b).



Figure 4.11a: True-colour image of a procession of girls and women from site, Millbank 3, Makgabeng. Note the size of breasts and height possibly indicating maturity. Image courtesy of SARADA



Figure 4.11b: False-colour image of a procession of girls and women from site, Millbank 3, Makgabeng. Note the size of breasts and height possibly indicating maturity. Image courtesy of SARADA

In the context of rites of passage, 'women' are defined as post-puberty females who officiate the puberty ceremonies, while 'girls' are defined as pubescent females or initiates undergoing the ritual puberty ceremony. In Figures 4.11a and 4.11b, all females face in the same direction and appear to be doing the same thing. While these processional rows could depict non-puberty celebratory dances, such dances are generally danced by women of the same age-group, while the girls clap and sing (Eastwood 2005: 10). Figures of the same age-group are not common in the paintings. Many of these processional dances have a single young girl in the row and therefore could point to girls' initiation or puberty rites.

Similar processions of females are painted in the Western Cape and are considered by John Parkington (1996) to represent rites of passage of young female initiates (Eastwood 2005: 10). The assumption that these females in processions represent gendered rites of passage is problematic. Stevenson (1995: 37; see Ouzman 1997a; Lenssen-Erz 1998), reminds us that a rigid division of labour should neither be uncritically applied nor assumed, but should rather be considered a feature of social structure (See Chapter VI). Too often researchers have assumed its existence uncritically. Although Eastwood (2005) assumes gender roles from the paintings, he does not do so uncritically and avoids reductionist ways of thinking by using the ethnographies and oral testimonies of the relevant groups in the area.

The paintings do seem to show different phases of female puberty rites. The juxtaposition of girls and women in procession with kudu, some with red patches or lines in the animal's genital region, signifies sexual potency and serves as a metaphor for girls who have undergone initiation and are ready for matrimony and motherhood (Eastwood 2005: 13).

Metaphors of sexual potency are reinforced by the non-naturalistic behaviour depicted in paintings of kudu in mating postures (Eastwood & Cnoops 1998: 9; Eastwood 2005: 13). Eastwood and Cnoops interviewed women from the *Khwe* from Namibia and Angola, *Nharo* of the western Kalahari and *Khwe* from the Okavango, Botswana. These groups are linguistically related to the *Hietshware*, and the *Khwe* have a long history of interaction with Khoekhoen and Bantu

language speakers. Women from the three groups stated that images representing women in processions depict a girl's */ava* or puberty rite, such as the Eland Dance (Eastwood & Cnoops 1998) (Fig. 4.12).

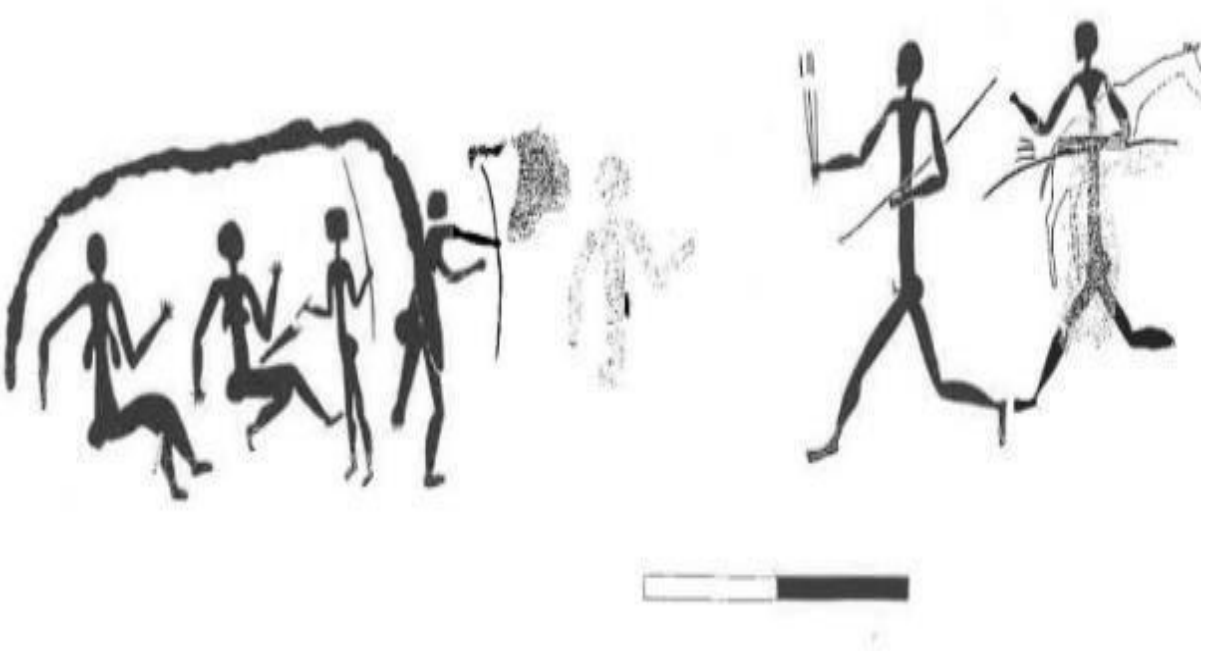


Figure 4.12: Re-drawing of painting at Lehaha-la-Basadi (Women's Cave), Makgabeng

In Figure 4.12**, the re-drawing for site, Lehaha-la-Basadi (Women's Cave), illustrates a** thick overarching line**, which** signifies the ritual house of seclusion, and the large-breasted woman, the interviewees explained, could be an aunt. The girl with the quiver and arrows near or on her lap is called the 'keeper of arrows' (Eastwood 2005: 18). At the end of the ritual seclusion, the initiate holds her new husband's quiver, thereby infusing the arrows with hunting power (Eastwood 2005: 18). "The girl's future husband would take a single arrow from the quiver,

[and] set off with hunting companions […] to demonstrate his hunting skills and ability to supply" his new wife with meat (Eastwood 2005: 18).

Individuals in transitional states were powerful. "The girl undergoing the rites […] has many of the powers of a shaman even though she may not be in altered states of consciousness. She is infused with *tsau n/om* (a [Ju|'hoan] term for the spiritual force that is activated by menstruation)" (Eastwood & Eastwood 2006: 144). She must control *tsau n/om* "in order to ensure good hunting, the well-being of the land and congenial social relationships" (*ibid.*). The main painted associations of girls' puberty rites, besides female kudu in mating postures, are depictions of male loincloths and female aprons (Eastwood 2005: 19). Eastwood (2005: 22) argues that it may be that "young neophytes touched these paintings to enhance their liminal powers and so bestow these beneficial effects upon their communities".

These paintings of rows of females, with or without kudu and/or juxtaposed with aprons and loincloths, occur far away from site-clusters that contain other subject matter. Based on the secluded nature of the sites, Eastwood and Eastwood (2006: 146), suggest they "may have served as venues for successive groups of initiates and prospective couples to access this power". It is also suggested that an association between female potency and sheep occurs in the Makgabeng (Eastwood & Eastwood 2006: 131). These motifs and their relation to other motifs (e.g. finger-dots, handprints, geometrics and sheep) in the Makgabeng is assessed in the analysis section of Chapter VIII.

The focus on the shamanistic nature of the art has not gone unchallenged (Solomon 1992; Stevenson 1995). To these authors, certain gendered rites stand outside of the shamanistic explanation. First, Stevenson (1995: 46) criticises David Lewis-Williams's, '*The rock art of Southern Africa*' (1983), Chapter 2 "Hunters and artists", where he links the rock art firmly to male experience and control, even though his work with Dowson, clearly refers to 50% of Bushman men and 30% of Bushman women becoming shamans. Yet they continue to emphasise the male experience in trancing.

Second, Anne Solomon (1992) treats gender issues as being separate from a shamanistic explanation. She pays attention to the body form, postures and other features of female animal and human imagery, and argues that certain motifs are linked to girls' puberty rites and the idea of *n!ao*. *N!ao* refers to a set of concepts and practices that pertain to weather conditions and the way in which bodily fluids spilled during childhood or hunting can affect the weather (Solomon 1992; Biesele 1993; Power & Watts 1997: 546). However, these approaches do not adequately explain how the rock art is not shamanic, and rather that these elements of gendered rites can be seen within a shamanic perspective. In the future, the link between trance-related imagery, uniqueness of females in the Makgabeng and, say the Drakensberg, may better be understood with the advancement of techniques in dating, which have developed since Denninger's investigations in 1967.

4.2.4. Dating

One of the major challenges in rock art studies is the dating of rock art. Few direct dates have been ascertained from sites in southern Africa, and the Makgabeng area is no exception (Mazel & Watchman 2003; Bonneau *et al*. 2011; Table 4.2).

Table 4.2: Table with techniques and dates dicussed in text

Dating technique	Date range	Location	Comments	References
Style (1950s)	19th century	Makgabeng	Relative. Largely subjective and inconsistent. Superimpositioning imprecise	Mason 1962: 27; Willcox 1955; Pager 1973a
Paper chromatography (1970s)	100 ± 20 BP; 800 ± 200 BP	Limpopo Valley	Relative. Inaccurate technique	Denninger 1971
Spalls with pigment in radiocarbon dated deposit (1980s)	12,500-15,000 BP	Cave of Bees, Southwestern Zimbabwe	Absolute. Traces of pigment found on 16 spalls in dated deposit thought to be associated with rock art at shelter	Walker 1980
Painted slab found in radiocarbon dated deposit (1979)	~20,000 BP – 40,000 BP	Pomongwe Cave, Southwestern Zimbabwe	Absolute. Problematic C14 dates. Probable mixing from below	Walker 1987
Painted slab found in radiocarbon dated deposit (1988)	1800-1900 BP	Collingham Shelter, Central Drakensberg	Absolute. Found in dated deposit. Marked a turning point in the dating of rock art as rock art in the Drakensberg was thought to be around 1000 years younger than this date	Mazel 1992, 1994
Pieces of painted wall found in radiocarbon dated deposit (1990s)	4000-5000 BP	Maqonqo Shelter, Biggarsberg Mountains, 150 km northeast of the Drakensberg	Absolute. Raised the possibility that rock art in the Drakensberg and surrounds may be of greater age than the Collingham slab	Mazel 1996
Direct Accelerator mass spectrometry (AMS) radiocarbon dating (1990s)	330 ± 90 BP; 2900 -2760 BP	Northern and Central Drakensberg	Absolute direct date and seven AMS C14 determinations of carbon in salt-rich crusts that under and overlay the paintings	Mazel & Watchman 1997, 2003; Mazel 2009b

Accelerator mass spectrometry (AMS) radiocarbon dating (2010s)	962– 5723 BP	Thune Dam, Botswana	Absolute. With enhanced protocol. Accurate technique. Dating the rock art directly	Bonneau *et al.* 2011
Accelerator mass spectrometry (AMS) radiocarbon dating (2010s)	2900 –2760 BP	Northern and Central Drakensberg	Absolute. With enhanced protocol. Accurate technique. Dating the rock art directly	Bonneau *et al.* 2011

An advantage of having specific accurate dates is that archaeologists can correlate data from dated deposits with the dated rock art paintings and other temporal indicators (e.g. palaeoenvironments and oral histories). Prior to the advent of radiocarbon dating, such correlations were difficult. Style was used alongside other relative dating techniques, such as superimpositioning and associations with excavated material (Willcox 1955; Mason 1962; Pager 1973a). Since Denninger's investigation, there have been major advances in relative dating, radiocarbon dating and further thorough superimpositioning studies have been conducted.

4.2.4.1. Relative dating and contact imagery

A relative dating technique used is comparing the rock art with known historical contact events. For instance, the introduction of sheep, cattle and horses occurred at known dates. Moreover, the appearance of colonialists and ships provide the rock art researcher with a relative date of the depictions of these subjects (Thackeray 1983: 22; Lewis-Williams 1990b: 11; Mazel & Watchman 1997; Mazel & Watchman 2003; Leggatt & Rust 2004). Knowing the relative date for contact imagery allows researchers to create a datum line for the appearance of people, objects and/or animals in the area. These dates are not as precise as absolute dating through radiocarbon dating.

4.2.4.2. Direct dating and superimpositioning

Accelerator mass spectrometry (AMS) radiocarbon analyses of carbon rich mineral crusts, both under and over paintings returned dates of between 2900 and 2760 years ago (Mazel 2009b: 91). Shaded paintings are suggested to have persisted until around 1600 BP in the northern Drakensberg (Mazel 2009b: 92; Table 4.2). For example, specific shaded paintings from sites in northern and central Drakensberg, originally thought to be around 650 years old, have been found to be considerably older (Mazel 2013: 51).

These dated paintings fall in the middle of three superimpositioning sequences for northern and central Drakensberg (Pager 1971; Vinnicombe 1976; Russell 2000; Table 4.3). Systematic superimpositioning studies began with Pager (1971) and Vinnicombe (1976), where they created superimpositioning sequences for many parts of the Drakensberg. Following their work, Russell (2000; Table 4.3, overleaf) has created another superimpositioning sequence using Harris Matrices for Main Caves North.

Table 4.3: The collated table of three superimpositioning studies (Reproduced from Russell 2000; Table 6)

Pager	Vinnicombe	Russell (Main Caves North)
Style 1: **Monochrome dull red.**	**Phase 1:** Dark red/maroon stain. Possibly monochrome. Horizontal blacks (animal).	**Layer 1:** Monochrome dark purple bovids and human figures. Monochrome orange paint and monochrome brown human figures. Bichrome dark purple and white bovids. Paint is stained into rock face.
Style 2: **Bichrome dull red and white.**	**Phase 2:** Human figures and animals in shades of red and white details. Stain or thin film of paint. Some blending.	**Layer 2:** Bichrome human figures (red and white). Polychrome eland (purple/maroon, white and black).
Style 3: **Shaded in two colours: dull red and white. Black introduced for human figures.**	No equivalent	No equivalent
Style 4: **Shaded polychrome only. Black used for horns, hooves and back stripe.**	**Phase 3**: Shaded polychromes (rhebuck and eland). Use of perspective. Fine details on human figures. Unshaded monochromes, bichromes and polychromes persist. Paint is thick and brush-strokes show. Lots of colours and blending. Black for details.	**Layer 3:** Polychrome shaded eland and bovids (pink, brown, purple, orange, black, white). Human figures bichrome (orange and brown). Black for details. Thick paint and brushstrokes.
No equivalent	No equivalent	**Layer 4:** Monochrome white (rhebuck)
Style 5: **Shading continues with the addition of yellow and orange.**	**Phase 4:** Shaded polychromes decrease. Black, yellow and orange increase. Red less common. Paint is powdery and lacks binding medium. No brushstrokes show. Eland are stylised (stiffer, more block-like representations), polychrome or bichrome in yellow/orange with white heads, necks and bellies.	**Layer 5:** Shaded polychromes.
Style 6: **Unshaded polychrome eland in bright yellow, red and orange with black and white. Black and dull red are combined.**	Equivalent to Phase 4.	**Layer 6:** Monochrome pink (rhebuck, finger-painted dots) and monochrome brown-red (therianthropes).

Style 7: **Unshaded monochromes and bichromes in white, black, bright red, yellow and orange. A few shaded motifs.**	Equivalent to Phase 4.	**Layer 7:** Bichrome (yellow and white) and polychrome (yellow, white and black) eland.

Encouragingly, some of the proposed stylistic sequences based on detailed superimpositioning studies can be supported by accelerator mass spectrometry (AMS) radiocarbon dates (Mazel 2009b: 96) (Table 4.2).

In the Drakensberg, superimpositioning sequences also point to new subject matter and techniques emerging at this time, including "rhebuck, hartebeest, and felines and the increased use of perspective" (Mazel 2013: 53). Mazel (2013: 52) argues that shaded paintings emerged here, around 2000 years ago, due to stress related to contact with agriculturalists. During this time, hunter-gatherers' ritual activities were elaborate and frequent (Mazel 2013: 52). This could explain the care with which many of the shaded paintings at this time were created (Mazel 2009b).

While relative dating methods have been conducted since the early days of rock art research, the direct dating of rock art is still in its infancy. Adelphine Bonneau and a team of experts have added to the number of confirmed direct dates. They have established the oldest directly dated rock art in South Africa at RSA TYN2 in the Eastern Cape (Bonneau *et al*. 2011). Using a pre-treatment protocol on carbon black paint, they have eliminated most of carbon contaminants, such as calcium oxalates, which form through the process of lichen and bacterial build-up

on the rock substrate (Bonneau *et al*. 2011). Over long periods, this process "can incorporate carbon of a younger age into the pigments", giving skewed radiocarbon dates (Bonneau *et al*. 2011: 419).

The same protocol has been used closer to the Makgabeng. The Thune Dam, near the town of Mathathane in Botswana, approximately 110 km, as the crow flies, from the Makgabeng, included 24 sites, some of which revealed LSA material. Six rock art sites were flooded and the rock art of these sites included finger-paintings and fine-line paintings of sheep, the only example of sheep currently known in Botswana (Bonneau *et al*. 2017: 324). The finger-paintings are superimposed over the fine-line paintings. Unfortunately, no archaeological deposits retrieved suitable material for radiocarbon dating in the shelters of the dated paintings.

The Botswanan sites from Thune Dam provide date ranges from 962 to 5723 BP for fine-line paintings. Dates were obtained from carbon black representations of humans, fish and animals from nine images across three sites in the Thune Dam area (Supplementary material Section B ((Bonneau *et al*. 2017: 5-12)) (Fig. 4.13, overleaf).

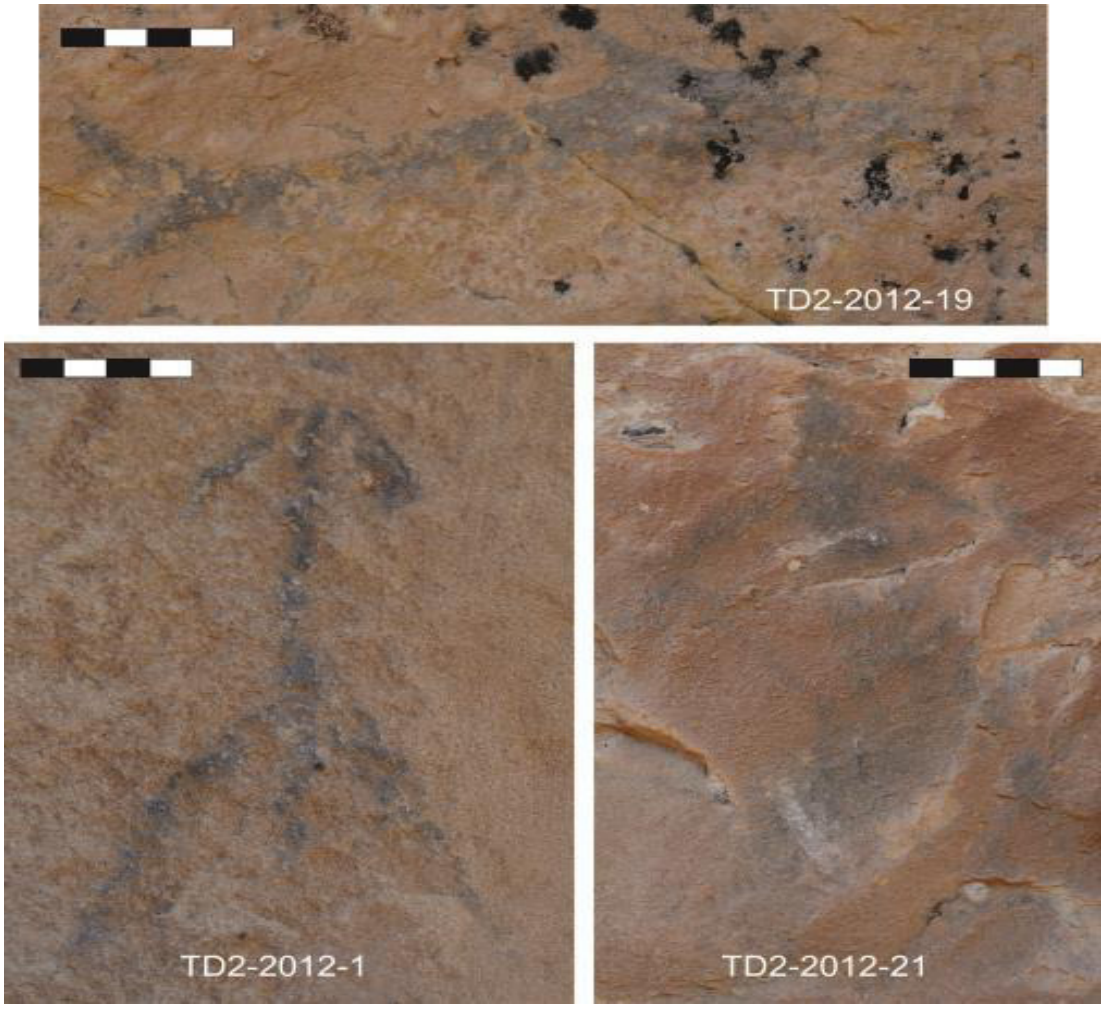


Figure 4.13: Sampled carbon black images from site, Thune Dam 2 (TD2), Botswana. Supplementary material B.1.b Fig. S2 (Bonneau *et al.* 2017: 7)

These dates represent the oldest evidence for extant paintings on rock shelter walls anywhere in southern Africa. Their study also demonstrated that the same rock shelter wall was used continuously for two to three millennia (Bonneau *et al*. 2017: 331).

However, methodologically, it is neither economically nor physically feasible to date every motif directly. Relative dating, thus, could help to provide dates for similar rock art.

4.3. Fine-line rock art and interaction

Contact imagery with domesticates and contact images of other groups are essential if we are to discover the nature of interaction between peoples and things in the past. In this section, contact rock art motifs as well as cross-cultural motifs are examined.

4.3.1. Sheep

Fine-line paintings of sheep are found scattered throughout southern Africa, from Zimbabwe to the southern Cape (Cooke 1957; Rudner & Rudner 1959; Manhire *et al.* 1986: 22, A. Smith 2000) (Fig. 4.14).



Figure 4.14: Sheep paintings (shown by the grey dots) and engravings (black outlined square) are restricted to these broad locales (after Lander 2014:48, Fig. 3.1), with over 40 sheep paintings being in the Limpopo-Shashe Confluence Area (encircled in red). The red dot indicates the location of Thune Dam in Botswana, where a painting of a sheep was found but not dated

Commonly, sheep are painted in a naturalistic style, much like the depiction of fine-line wild animals. Sheep depictions have characteristic floppy ears and often a distinct fat tail. Focusing mainly in the Western Cape, Tony Manhire and colleagues (1986) argue that most sheep paintings are of ewes or sheep of indeterminate sex. This could be due to the selective culling of males in proper sheep herd management (*ibid*.). However, it is difficult to discern the sex of the sheep from the paintings in the Makgabeng. Adrian Boshier (1972) documents depictions of fat-tailed sheep from the Makgabeng, for example of mating sheep and of an ewe suckling its lamb (Boshier 1972). Since Boshier's (1972) study, over 40 sites with fat-tailed sheep have been found in the Central Limpopo Basin (Eastwood & Eastwood 2006: 181). Fine-line depictions of fat-tailed sheep are common in the Makgabeng,[7] with few examples of thin-tailed sheep (Fig. 4.15).



Figure 4.15: White fine-line fat-tailed sheep from site, Too Late 11, Makgabeng

[7] No fine-line depictions of cattle were recorded from the Makgabeng . A similar scenario occurs in the south-western Cape, where many sheep but no cattle are depicted (Manhire *et al*. 1986). This is surprising, as for herding societies cattle are often seen as more important than sheep. It is possible that cattle arrived later or were lost after arriving in the Makgabeng.

Interestingly, in the Soutpansberg only paintings of thin-tailed sheep occur, while other areas within the Central Limpopo Basin feature paintings of mostly fat-tailed sheep.

Eastwood and Warren Fish (1996) speculate whether these differences are due to hunter-gatherers in areas to the west and north of the Soutpansberg obtaining their fat-tailed sheep from the Khoekhoen 2000 years ago. Thereafter, Soutpansberg hunter-gatherers procured thin-tailed sheep from Bantu-speaking agropastoralists. However, genetic research on sheep DNA suggests that both thin- and fat-tailed sheep were brought by herders into southern Africa roughly 2000 years ago (Eastwood *et al*. 1995b: 2; B. Smith 1995). A higher percentage of sheep paintings occur in the north of Limpopo compared to other areas further south. In a study done in the 1990s, sheep depictions in the broader Central Limpopo Basin were found to make up 8.9% of all animal depictions, in contrast to the Drakensberg area, where sheep comprised only 0.3% of all animal depictions (Eastwood *et al*. 1995a: 5). Similar low percentages occur in the south-western Cape (11 sites) and southern Cape fold belt (12 sites), Namibia (1 site), the Free State, the Waterberg and the Matobo Hills, Zimbabwe (Manhire *et al*. 1986). Exact numbers for these regions are yet to be published. The high frequency of sheep paintings in the broader Central Limpopo Basin marks this area as a key to our understanding of the interaction between hunter-gatherers and herders (*ibid*.). Three important research questions arise from the study of sheep paintings in terms of the nature of interaction between groups in this area.

First, which migration route(s) did herders pursue? In the 1960s and early 1970s some authors regarded the "distribution of domestic animal paintings as evidence for the spread of a pastoralist economy" (e.g. Walker 1991: 187). The literal interpretive framework of these studies saw "contact images as reflecting the trappings of a pastoral economy in terms of the use and control of domesticated stock" (Hall 1994: 62). Depictions of sheep were argued to represent a fully-fledged pastoralist way of life. However, if sheep paintings were literal markers, we would expect to find them painted in areas where the Khoekhoen were known to have been seen (Manhire *et al*. 1986: 24). This seems not to be the case. While sheep paintings are rarely found in the coastal zone, researchers argue, their appearance might not have been uncommon in the past and the paintings may have been lost to weathering (Van Rijssen 1984: 128; Mguni 2015: 151).

In areas such as the south-western Cape, sheep were painted in the mountains, where historically sheep were not observed and where grazing would have been difficult (Van Rijssen 1984: 128; Manhire *et al.* 1986: 24). Furthermore, these early distribution approaches were based on scant evidence, and revealed little about why the images were painted (Hall 1994: 61). Additionally, the historical sources, on which such literal interpretations are based, were created by travel writers and naturalists writing during European economic and political expansion (Pratt 1992: 4). The ideological underpinning of Euro-imperialism influenced what and how early travel writers wrote about the interior of southern Africa (Pratt 1992). A critical reading of travel writing and natural classification schemes is necessarily.

Due to the scant and biased European literal interpretations, recourse was taken to more conventional archaeological methods using historical, linguistic and ethnographic sources. These methods were useful in determining possible migration routes herders undertook (Manhire *et al*. 1986: 22) (see Chapter II).

Second, which people painted fine-line sheep? In the late 1950s, Ione and Jalmar Rudner (1959: 106) argued that the Khoekhoen created paintings of sheep in the south-western Cape. Using a literal narrative interpretation, Bill van Rijssen (1984) disagrees, as many of the shelters displaying sheep paintings were relatively inaccessible and without good grazing and water. Furthermore, he argues that the shelters would have been inadequately small to kraal and protect large herds of sheep (Van Rijssen 1984). The physical sheep need not have been in the same shelters in which the artists painted, or even in the same vicinity. Formally, the work is representational and in the same general fine-line style, suggesting that Bushmen more than likely made them (Cooke 1957, 1965; Willcox 1960; Van Rijssen 1984: 128). In the Makgabeng, sheep are often seen depicted with men with bow and arrows, in the same overall style as other Bushman rock art.

Lastly, and most importantly for this project, how did the appearance of domesticates affect the Bushmen, and how did they interpret it? The meaning of the sheep in the paintings could not be gleaned from the paintings alone, and archaeological data together with historic and ethnographic sources has given rise to many theories. As opposed to the literal interpretations and narrative

descriptions of 'other' people moving through the landscape, several authors see sheep, and their fat tails, as a highly significant trance metaphor associated with potency (Huffman 1983; Eastwood & Cnoops 1998: 9; B. Smith & Hall 2000; Eastwood & Eastwood 2006; Lander 2014).

Ethnographies from the Kalahari mention how animal fat, especially from eland, was used in many rites. Unlike eland fat, which had to be shared, domesticated sheep could be owned and controlled. This sustainable source of fat, coined "power on tap" (Huffman 1983), could have had a huge impact on the hunter-gatherer way of life, depending on how one assesses the fixity or permeability of economic roles (see Chapter II). It is likely that sheep and sheep fat were incorporated in rites, and this would have motivated the artists to depict them (Huffman 1983; Eastwood & Cnoops 1998: 9; Lander 2014). The Bushman girls' puberty rites were similar in some respects to Khoekhoe girls' initiation, especially regarding the use of fat (Chapter IX).

In the northern Drakensberg, Faye Lander (2014) found that the few examples of sheep paintings there appear within a spiritual world context with overt trance imagery. According to Anderson (1996) depictions of sheep in the south-western Cape do not occur juxtaposed with overt trance imagery. However, Hollmann (1993: 20) illustrated a clear example of a fat-tailed sheep in the centre of a dance scene with a figure in an 'arms back' posture, signifying trance, in the Koebee area, Western Cape Province.

Still within a shamanistic framework, other authors suggest that hunter-gatherers felt threatened by the arrival of herders (Manhire *et al*. 1986; Anderson 1996; Hall & B. Smith 2000). Foragers may have seen sheep as an easily obtainable source of meat, and conflict situations likely erupted (Manhire *et al*. 1986: 7). Related to this idea, is the theory that sheep depiction symbolised ritual stress (B. Smith & Hall 2000). Sheep may have been the 'intentional' depiction, in ritualistic response to incoming peoples in the Limpopo region, of other groups by Bushman hunter-gatherers (B. Smith & Hall 2000). The paintings of sheep functioned as a possible way of alleviating stressful and competitive circumstance.

Conversely, sheep may represent stereotypic expressions of identity. Anderson (1996) proposes that the arrival of sheep was less about assimilation and acculturation than about the differences of identity between the two groups. Anderson (1996: 87) further proposes that contact enhanced the maintenance of Bushman hunter-gatherer salient inter-group identity.

Female figures are commonly associated with sheep in Limpopo as well as in the Western Cape Province (Hollmann 1993; Eastwood & Fish 1996). An association between females, what they are depicted as wearing, and sheep is observed in the Makgabeng. In a few paintings, females wear a back apron reminiscent of the sheep's fat tails (Eastwood & Fish 1996: 62) (Fig. 4.16). Eastwood and Fish (1996: 63) "argue that this feature may represent a conflation of visual and somatic hallucinations".

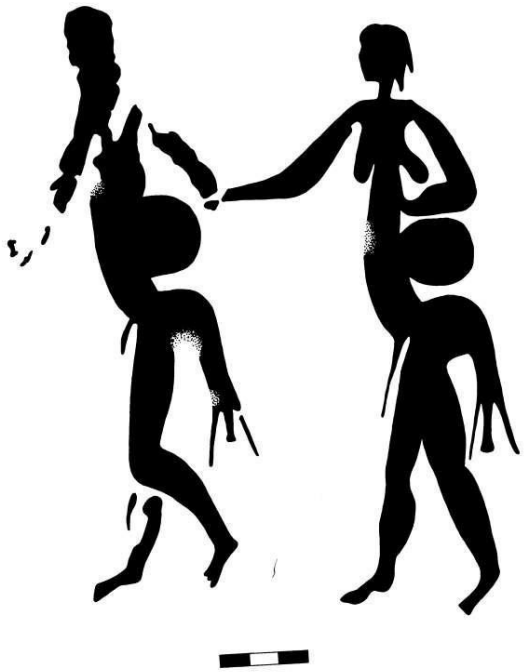


Figure 4.16: Back apron reminiscent of a sheep's fat tail. Image courtest of SARADA.

Examining the role of sheep offers an excellent platform for understanding the relationship between herders and hunter-gatherers, as well as the impact that these animals may have had on hunter-gatherers concerning gender, clothing, initiation and potency. Another regional motif common in the Limpopo Basin area are the depictions of clothing, in particular, aprons and loincloths, which are shared by several cultural groups in this area. Depictions of clothing are either depicted as worn by individuals or as geometrics (disembodied and in plan view); what Jeremy Hollmann (2011: 200) describes as a piece of clothing laid out flat on a surface and viewed from above. These disembodied clothing motifs have been linked to aprons and loincloths.

4.3.2. Aprons and loincloths

The meaning of the Y-shaped motif has eluded researchers for some time. It was first identified in the 1930s by D. S. van der Merwe (1936). In the early 1960s, Murray Schoonraad (1960) found several examples of this motif painted in dark red and grey in the Limpopo Valley. Interpretations vary from Buddhist missionaries travelling to the Limpopo in 2200 BP leaving the Y-motif as a symbol of well-being, to Christian symbols and representations of the vulva signifying fertility (Pager 1975: 119). Frobenius documented a Y-shaped motif in the Macheke District, Zimbabwe, calling it 'the magical pole' (*ibid*.).

In the 1970s, Pager travelled to 32 sites in the Limpopo valley. In 18 of these sites, 85 Y-shaped motifs were found. They vary in form, with some being thin and others heart-shaped. Some Y-shapes have lines or ovoid shapes attached to their branches; most are solid monochrome in red or white. Pager (1975) compares these Y-shaped motifs with a few objects and other rock art images. He toys with the idea that these motifs might depict Khoekhoe aprons and/or bags, but decides that they most resemble fish traps (Pager 1975). The interpretation is framed by a specific image: on the farm Modena, south of the Limpopo River, a panel apparently depicts a 'fish' diving down into the centre of a Y-shape motif (Fig. 4.17).

Subsequent research and a close look at the panel under different light conditions showed that the 'fish' is an inverted U-shape superimposed over the Y-shape

(Blundell & Eastwood 2001: 306). Similar U-shaped motifs have been interpreted as zebra spoor (*ibid*.).

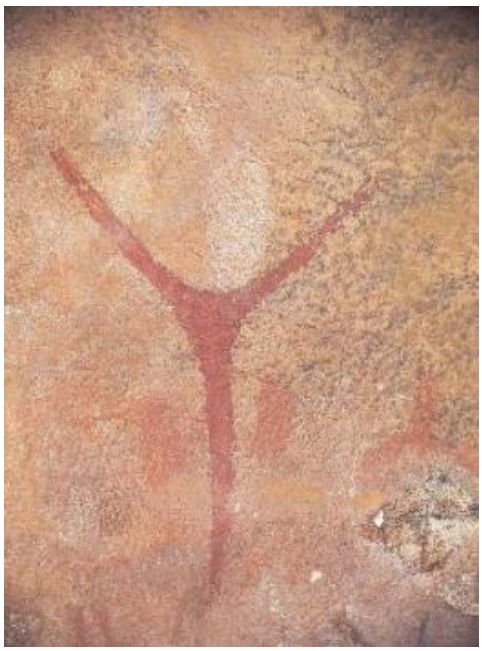


Figure 4.17: Y-shaped motif of a fish trap, farm Modena, south of the Limpopo River. Image courtesy of SARADA

The understanding that these motifs represent enigmatic fish traps remained unquestioned until a breakthrough occurred when Y-shapes and images resembling animal skins were identified as loincloths and aprons respectively (Blundell & Eastwood 2001) (see Chapter VI). Blundell and Eastwood (2001) compared these apron and loincloth motifs of the Makgabeng and the LSCA with museum specimens of clothing (Fig. 4.18).



Figure 4.18: Museum artefact of Bushman loincloth (from old NASCO collection (today Ditsong))

This was followed by an identification of apron motifs in the finger-painted geometric tradition as well. The authorship of these images was posited using four lines of evidence.

First, these motifs were found in the Limpopo-Shashe Confluence Area and Tsodilo Hills in Botswana, which led Eastwood and B. Smith (2005: 74) to identify the authors as Khoe-speaking hunter-gatherers, in particular, the Hietshware – Eastern Khoe-speaking hunter-gatherers. Second, archaeo-linguistic models (cf. Westphal 1963; Ehret 1982, 1998) were used by Eastwood and B. Smith (2005: 74) to conclude that the apron and loincloth motifs stem from Eastern Khoe-speaking Bushmen. The distribution of these motifs correlates to the distribution of these peoples. Third, the ethnography of the Hietshware and other eastern Khoe-speaking Bushmen (e.g. Dornan 1925) helps to elucidate the

meaning of these motifs. Last, the virtual absence of these motifs in areas such as the Matobo Hills, Zimbabwe, and the Brandberg, Namibia suggests that rock art in these areas predated herder incursions (Pager 1989; Walker 1996). Subsequently, apron depictions have been found in the Tsodilo Hills of Botswana (Eastwood & Green 2007: 10-11). Similar depictions of aprons have been identified in northern South Africa, but these are created using different techniques and pigments. They are linked to Northern Sotho groups and their rites.

4.4. Farmer Geometric Rock Art

Apron depictions are also found in the Northern Sotho rock art. Unlike fine-line rock art, this art is made using the finger. A thick application of paint or paste is used, which disallows the attention of detail seen in brush-painted rock art (Fig. 4.19).



Figure 4.19: A finger-painted antelope (sable) in characteristic pasty white paint associated with the Northern Sotho peoples ('Late Whites')

Moreover, the thick application of paint often leaves images with filled silhouettes (Namono 2004: 20). Researchers (B. Smith & Van Schalkwyk 2002; Namono 2004; Van Schalkwyk & B. Smith 2004) have discerned younger and older Northern Sotho rock art.

The younger rock art includes subject matter of outsiders (Europeans) – "men on horseback with guns, gun wielding foot soldiers, figures akimbo [with their hands on their hips or in their pockets] and abstract trains" (Fig. 4.20).



Figure 4.20: Train Site. Notice the figure with arms akimbo, men on horseback and the train (Bonne Esperance 16, The Train Site). Image courtesy of SARADA

This art was the first 'protest' art and acted as pointed humour with a strong political message (B. Smith & Van Schalkwyk 2002). The older art is associated with boys' and girls' initiation ceremonies. The initiation art includes subjects of

spread-eagle designs, abstract images of dots in clusters, variations of circles, divided rectangles, squares, dots in circles and animals – elephants, kudu, giraffe, zebra, hyena and baboons (Namono 2004: 24-25) (Fig. 4.21).



Figure 4.21: Site ,Too Late 74, illustrating initiation art, Makgabeng. Image courtesy of SARADA

Using the ethnographies and oral testimonies from the current inhabitants of the Makgabeng, Eastwood (2003) and Catherine Namono (2004) found that certain geometric rock art motifs are associated with female back- and front-aprons. These motifs and their designs serve a didactic function during the school ceremonies.

The farmer geometric rock art contextualises the region, the art and known people extant in the Makgabeng. These motifs were not included in the stylistic study as the intention was to uncover the relationship between the finger-painted geometric rock art, that has been previously associated with Khoekhoe herders, and the fine-line rock art. Ongoing studies on farmer geometric rock art are being undertaken by Catherine Namono and several postgraduate students at the Rock Art Research Institute.

4.5. Finger-painted Geometric Rock Art

Along with the developments in fine-line art recording and the pasty finger-painted Northern Sotho rock art came the recognition of an altogether different type of rock painting and engraving: geometric art. Geometric rock art is found from the Western Cape to the Free State, from Limpopo to neighbouring Botswana, Namibia and Zimbabwe (Rudner & Rudner 1959; B. Smith & Ouzman 2004). The authorship of these geometrics has long been debated (Hahn 1879; Vedder 1938; Cooke 1957; Rudner & Rudner 1959; Rudner 1975; Dowson *et al.* 1992; Hall & B. Smith 2000; B. Smith & Ouzman 2004; B. Smith 2006; Eastwood & Eastwood 2006). Likewise, the interpretations of paintings and engravings of geometrics in southern Africa have varied from the sacred to the secular.

For instance, one of the earlier reports of geometric paintings found near the Makgabeng was in Zimbabwe. Cooke (1957: 65) recorded many circle-and-dot motifs in southern Matabeleland, Zimbabwe and argues that they were the work of

people of "Bush stock", not the Khoekhoen. He refers to the paintings as being in a very late style, contemporaneous with Bantu-speaking peoples' occupation of the area (Cooke 1957: 62). The two shelters recorded by Cooke (1957: 63) were high up in the Matobo Hills, some 91 to 122 metres above the valley of the Tuli River, where water was always available. Using this topographical information, Cooke (1957: 65) suggested that the circle-and-dot motifs mark waterholes, and although he found evidence for sheep or cattle herders passing by these shelters, he is uncertain whether they stayed long enough to influence the art or the Bushmen.

In 1959, the Rudners found geometric engravings near Aus, Namibia. These engravings – mostly of circles, spirals, lines and plant forms – were pecked. Although the Rudners (1959) did not find any painted circle-and-dot motifs in this area, in 1879 Theophilus Hahn reported Bushmen still painting in the neighbourhood of Aus and Bethanie. Dr Hahn refers to 'Hottentot' [sic] women painting ritual marks on stones, but in another publication, he calls the same people 'Bushmen' (Rudner 1982: 6). He could have meant Khoe-speaking Bushmen or the Saan.

According to Hahn (1879), these painters included the circle-and-dot motifs in their repertoire. Hermann Heinrich Vedder (1938), a German missionary and linguist, refers to these people as the 'Saan'.[10] He distinguishes this group as being physically different from Khoekhoe herders and the Kalahari Bushmen

[10] Not to be confused with the San.

(Vedder 1938). Moreover, the Saan spoke Nama, while their subsistence strategies, social groupings and forms of leadership were like that of the Bushmen (Vedder 1938: 125).

The language of the Saan consisted of the *Namib*, a now extinct Khoekhoe language, and the *Hai-||om*, another Khoekhoe language (Vedder 1938: 124). Vedder argues that they belonged to an initial migration of Khoe-speaking Bushmen, prior to the migration of Khoekhoe herder stock. Once in South Africa, the Bushmen, the Saan and the Khoekhoen may have lived alongside each other (Vedder 1938: 124). Following Vedder (1938), the Rudners (1959) propose that the geometric paintings of the south-western Cape were created by the Saan, and that paintings of fat-tailed sheep are evidence of their migration.

Later research on geometric paintings found that throughout South Africa, geometric paintings are somewhat common and that a thin scatter of geometric imagery occurs with some areas rich in geometrics. For instance, the Harts River Valley, Northern Cape has many geometric paintings, such as grids, combs, dots, circles, ladders, crosses, cross-in-circles and sets of parallel lines (Dowson *et al*. 1992: 27; Hollmann & Hykkerud 2004). Researchers have made a connection between these geometric paintings from the Tsodilo Hills and Savuti Channel, Botswana, and the schematic art found throughout southern and Central Africa (Rudner 1975: 44; Dowson *et al*. 1992: 30; B. Smith & Ouzman 2004). There is less geometric rock art in other areas such as the Drakensberg, where Aaron Mazel (2013: 53) found only 15% out of 338 sites containing handprints, finger

smears, smudges and daubs. The exact authorship of these paintings and engravings is unknown (Dowson *et al.* 1992: 31).

It is strange that, among all this uncertainty, clarity of expression emerges. Unlike the tentative conclusions of prior researchers, authors working in the Limpopo Basin, where geometric rock art abounds, describe painted geometrics, including handprints, finger-dots and clothing motifs (disembodied and in plan view), as a unified whole, under the broad label 'the geometric rock art tradition', for reasons outlined below (B. Smith & Ouzman 2004; Eastwood & Eastwood 2006).

From 1997 to 2004, B. Smith and Ouzman (2004: 503) surveyed over 900 000 square kilometres of South Africa. They found 2921 sites with only fine-line art, 345 sites with only finger-painted geometrics, and 489 sites with both fine-line and geometric rock art (B. Smith & Ouzman 2004: 503). They argue that throughout South Africa and its surrounds, instances of geometric art are similar in iconography and site preference (B. Smith & Ouzman 2004). Strikingly different from fine-line art, the tradition has large and bold red and/or white motifs. Like Bantu-speaker rock art, this art was applied using the finger. However, unlike the mostly pasty white paint, which can include red and black colours, associated with Northern Sotho girls' and boys' initiation, this art was commonly created using red ochre and white minerals that were finely ground and mixed with binders (Eastwood & Eastwood 2006: 61). This is inferred by the way the paint penetrated and adhered to the rock and was not easily washed away by water seepage (Eastwood & Eastwood 2006). It is further argued that fine-line

geometric rock art was created near water and within cave-like shelters (B. Smith & Ouzman 2004).

The relative age of the geometric rock art at several sites in the Central Limpopo Basin and surrounds, is deduced from its position in the overlay sequence and from associated archaeological evidence, such as Bambata pottery in ground deposits (Hall & B. Smith 2000; B. Smith & Ouzman 2004) (see Chapter II). In particular, B. Smith & Ouzman (2004: 509) refer to the date Garth Sampson (Sampson & Sampson 1967: 28), obtained in the central Karoo, associated with a finger-painted flake scar with geometric designs that was found in pottery-bearing deposits dating to the last 1000 years.

This date coupled with one of the first direct rock art dates by researchers, Nikolaas van der Merwe and colleagues (1987), from a finger-painted black human finger superimposed over an eland, allowed B. Smith & Ouzman (2004: 509) to argue that the art dates to around 2000 to 1450 BP.

From the overlay sequence, B. Smith and Ouzman (2004: 508) suggest that the duration of the geometric rock art tradition was relatively brief but intense and perhaps lasted several centuries, with hunter-gatherer rock art both underlying and overlaying it.

According to Hall and B. Smith (2000: 39), the differences in the style conventions of fine-line and geometric rock art are so marked that they describe

each as a separate tradition. According to these authors, it is likely that the styles had different origins or developed independently for some millennia (Hall & B. Smith 2000: 39). If the latter, then the development of the geometric corpus of rock art most probably occurred outside South Africa in 2000 BP or earlier, because, they argue, an antecedent is yet to be found within South Africa (Hall & B. Smith 2000: 39; B. Smith & Ouzman 2004: 521).

4.5.1. The origins of the geometric rock art

According to these authors, the finger-painted rock art 'tradition' was introduced by early herders 2000 BP migrating southward from Central Africa (B. Smith & Ouzman 2004: 521; Eastwood & B, Smith 2005; B. Smith 2006).

In Central Africa, the red geometric rock art or what Desmond Clark (1959) calls the schematic rock art zone, stretches from northern Mozambique, Malawi, Zambia, Uganda, the south-eastern Katanga region of the Democratic Republic of Congo, eastern Angola, Zimbabwe, southern and western Tanzania and the environs of Lake Victoria (B. Smith 2006: 87). The red geometric rock art is made up of over 90% geometric forms, with very rare zoomorphic forms (*ibid*.). The geometrics vary from region to region but there is a finite set of core diagnostic "boundary shapes and almost all motifs are variations based on additions to these" (*ibid.*). An in-depth study of these geometric shapes was conducted by B. Smith (1995, but see 1997, 2006) in south-central Africa. He found that paintings and painted engravings are commonly found in the colour red (Fig. 4.22). However, white is often used as a form of filling.



Figure 4.22: Red finger-painted geometric rock art for Mpika District, Zambia. Image courtesy of SARADA

The red geometric rock art is found in the same area as the red naturalistic rock art, which is found superimposed over, and underlying, the red geometric rock art. This suggests a period of contemporaneous occupation between the two art bodies. From the archaeology, B. Smith (2006: 88-89) argues that the central African art predates Bantu language speakers' occupation and is thus attributed to the Later Stone Age (B. Smith 2006: 88-89).

In terms of authorship, Desmond Clark (1950) and James Chaplin (1962) found evidence in Zambia of red geometric paintings that could be attributed to 'pygmy'

or ‘pygmy-like’ peoples (but see Phillipson 1969: 199 for an alternative explanation). The pygmy peoples of Central Africa are said to be connected to the Batwa. B. Smith (1997) makes an analogy between the Batwa of the DRC and the Mbuti Pygmies, due to the remarkable similarities between the two peoples. This he infers from several associations between the rock art, material culture and past rituals.

First, Mbuti Pygmies decorate their bark cloth, and skin through body scarification, with designs that follow the same shapes and forms in the art. Second, the local Bantu-speaking peoples of Malawi and Zambia, the Chewa, have shrine sites with women who control the primary weather divination ceremonies (B. Smith 1997: 49). Originally, this tradition is said to stem from the Batwa. Third, there is the belief by modern Zambians that a tradition existed relating to bored stones which Twa women used as digging stick weights to assist in their collection of roots and tubers. Digging sticks are said to hold great power in weather divination (B. Smith 1997: 49). Last, among the Pygmies, there are separate art traditions for men and for women (B. Smith 1997: 47). B. Smith (1997: 47) argues that only women painted the red geometric tradition, while the men created the red naturalistic rock art (Figures 4.23 and 4.24).

Namono further advances B. Smith’s interpretation by analysing the *Mbuti* ethnographies to understand the meaning of the geometric rock painting in Uganda.

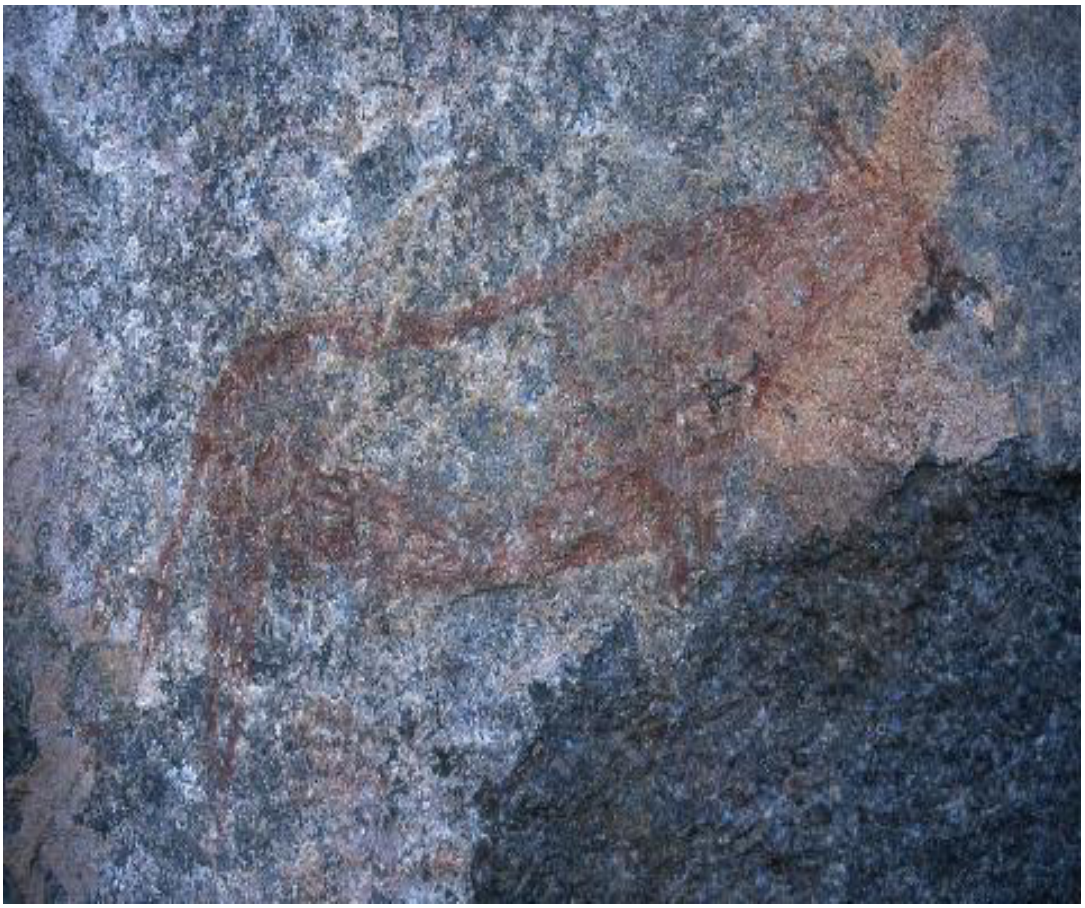


Figure 4.23: Red naturalistic rock art, Zambia. Image courtesy of SARADA



Figure 4.24: Red Geometric rock art, Zambia. Image courtesy of SARADA

The important difference between B. Smith and Namono is that B. Smith does not state the Mbuti Pygmies or their ancestors created the rock art, rather he used them as an analogy to suggest the BaTwa painted while Namono used the Mbuti Pygmy ethnography and suggests that the Mbuti Pygmies painted (Namono 2010; but see Willcox 1984 for an alternative explanation). Namono draws on the Mbuti ethnography mainly documented by Colin Turnbull in the 1950s and 1970s (Namono 2010: 165).

Even though there is no ethnographic record of the Mbuti Pygmies making rock art, she argues that it is probable that, by the 1930s, the traditions of creating rock art may have ceased. Namono analyses the symbolism within these ethnographic accounts of the Mbuti Pygmies. She discerns that the forest or *ndura* is central to Mbuti cosmology. Using this symbolism, she develops a broad cosmological model, derived from the *molimo* and *elima* rituals to ascertain the broad meanings surrounding Ugandan geometric rock art in Mbuti cosmology (Namono 2010: 200).

Namono (2010: 149) suggests that, even though Uganda lies in the geometric rock art zone, it is likely separate from what B. Smith has interpreted for Malawian and Zambian geometric rock art.

Closer to southern Africa, B. Smith and Ouzman (2004: 521) argue that the BaTwa of Zambia encountered livestock before 2500 BP. They adopted domesticates and became herders before moving south into the Limpopo. The

route they took was possibly via north-eastern Botswana. During their time in Limpopo, or possibly before, the restrictions over the separation of male and female rock art relaxed and the geometric rock art was painted by both sexes. As they continued southward, eventually, reaching the southern Cape coast, they managed to maintain the original expression of their geometric rock art visually intact, even though extensive admixture with indigenous peoples occurred (B. Smith 1995; Olivier 2011: 22). This view should be discredited from the available genetic and archaeological evidence (Chapters II and III).

4.5.2. Khoekhoe identity and geometric rock art

Another contentious issue is the establishment of Khoekhoe identity and its association with geometric rock art. B. Smith and Ouzman (2004) propose that the advent of the geometric 'tradition' marks the origins of Khoekhoe identity. To substantiate this claim, they use four lines of evidence. First, shelters showing the geometric rock art 'tradition' are scattered, band-like, along watercourses from southern Angola to northern Botswana, western Namibia to northern South Africa, the Central Limpopo Basin, through the central interior to the Western Cape (B. Smith & Ouzman 2004: 512). They use the distribution of these geometric rock art sites as proxy evidence for the migration routes of the immigrant Khoekhoen proposed by Westphal (1963) and Ehret (1982) (see Chapter II).

Second, B. Smith and Ouzman correlate instances between observable recent changes in the distribution of geometrics and the recorded historical Khoekhoe migrations. For instance, younger geometric rock art exhibits greater variability

on the peripheries of the primary Khoekhoe settlement. The Richtersveld, in South Africa's Northern Cape, and southern Namibia has extensive engraving assemblages with a mainly young and fresh appearance, which could be related to recent Khoekhoe (Nama) migrations (B. Smith & Ouzman 2004: 512). Similarly, in the Eastern Cape, geometric rock paintings become scarce, but those that are in existence show elaborate geometrics in bright colours, with a freshly painted look (Derricourt 1977: 42-43) (Figures 4.25 and 4.26).

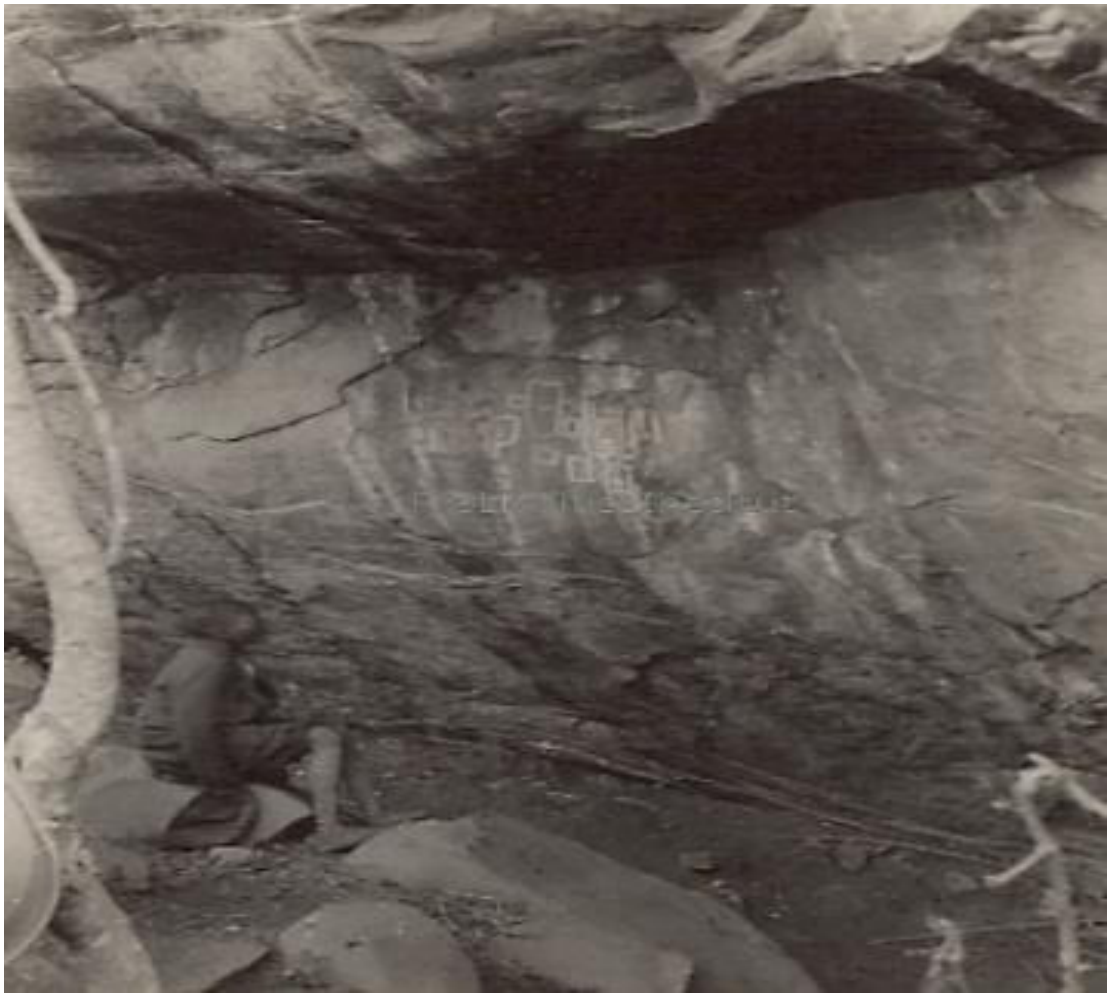


Figure 4.25: Frobenius's photograph of the 'junge malerei' (young painting) at Oakleigh Farm (Rockwoods), Eastern Cape Province, during his expedition into the South African interior from 1928 to 1930 (courtesy of the Frobenius Institute)



Figure 4.26: Geometrics from Oakleigh Farm (Rockwoods), Queenstown, Eastern Cape Province. Copied by Frobenius. Image courtesy of SARADA

Although not directly dated, the art and its distribution are argued to match the historically known locations of Khoekhoe herder homesteads in the Eastern Cape in the 16th century (B. Smith & Ouzman 2004: 512).

The conclusions that B. Smith and Ouzman (2004) reach from this example of a cluster of painted red, black and white squares at Oakleigh Farm (Rockwoods) near Queenstown, are problematic. Robin Derricourt (1977: 43, 206-211) does not directly connect these paintings to the Khoekhoen, but hints instead at the possibility that farm labourers painted the geometric rock art at the farm some years prior to 1920.

Third, B. Smith and Ouzman (2004) compare at least two ethnographic reports (Rudner 1982:112–14; Waldman 1989:33) of Khoekhoe groups creating geometric art with the older geometric rock art (Eastwood & B. Smith 2005: 64). The Khoekhoen and Khoekhoe subgroups such as the Griqua, Korana and "Nama retained aspects of their distinctive way of life" into the 20th century, for example their herding practices and painting of geometric imagery upon their bodies during ceremonies (B. Smith & Ouzman 2004: 512).

Last, Eastwood and B. Smith (2005: 65) show that Bushman artists responded to the "intrusion" of geometric rock art, and represented it and its artists as "other". For example, these artists painted figures with fat-tailed sheep. In certain places, geometric rock art and fine-line rock art occur at the same sites. B. Smith and Ouzman (2004: 512) document 489 sites that have both 'traditions'. They explain:

> The accommodations that each rock art tradition makes to the other are [crucial] in understanding how people constructed and adjusted their identities. These connections shape our understandings of [Bushman-ness] and Khoekhoen-ness as identities with distinct core values that nonetheless engaged with each other to create the conditions of possibility for cultural coexistence, innovation, challenge, continuity, and even new cultural formations (B. Smith & Ouzman 2004: 513).

"Even numerically insignificant newcomers and/or their [artefacts] are disruptive," they point out, "causing people to examine who they are in order to understand who the other people are" (B. Smith & Ouzman 2004: 502). Moreover, identity "is potentially always in flux, but there are moments when [it] crystallizes into definitive statements" (B. Smith & Ouzman 2004: 514). Rock art represents one such statement. B. Smith and Ouzman (2004: 515) argue that the identities retained "strong and culturally specific core values". These core values, which

differentiated the two groups, would have been far more marked when the temporal and spatial origins of the groups were considered. The linguistic and genetic evidence positions herders around 2000 years ago in the Limpopo Basin (see Chapter II). According to this model, it is here that they first encountered the local indigenes of South Africa, and it is at this time that the geometric rock art tradition was painted. As time passed, aspects of the two ethnicities' cultures blurred, making it hard to differentiate between them.

Marcelle Olivier (2011) finds several inconsistencies in B. Smith's argument. First, it is unclear how the BaTwa and the Khoekhoen are related. She asks, "are the authors investigating the origins of South African Khoe-speaking herders, or of the south-central red geometric rock art, or of the historical 'Batwa' peoples?". This is uncertain. Her second critique is the lack of excavated evidence that can firmly be associated with the rock art (Olivier 2011: 22).

Last, she argues that the idea that the rock art remained visually the same after the migrating group crossed a vast stretch of terrain, which included "ecological and environmental extremes" and involved such "diversity in the genetics, cultures, languages, and economics of populations both past and present", is untenable (Olivier 2011: 23). On closer reading, B. Smith and Ouzman (2004: 512) suggest that the geometrics become more angular as herders moved to the central interior. Additionally, B. Smith and Ouzman (2004: 512) argue that representational forms – people, animals, aprons and loincloths – increased as they moved from the southern Cape to the Western Cape. Similar studies, such as this one, need to be

undertaken to quantify and situate these changes per region, before researchers can assume continuity and change over great stretches of the southern African landscape. The seemingly visual divide recognised in B. Smith and Ouzman (2004) between fine-line rock art and finger-painted geometric rock art is not easily discernible in the Makgabeng.

In the Makgabeng, it is not simple to divide finger-painted geometric rock art and brush-painted fine-line rock art as the diversity of forms finger-painted and engraved rock art takes is large and is superimposed over and under fine-line paintings. A high concentration of such forms occurs, consisting mostly of simple geometric forms such as monochrome dots and strokes (Eastwood & B. Smith 2005: 63).

Edward and Cathelijne Eastwood (2006: 61) subdivide the geometrics into two phases recognised by the predominance of colour, subject choice and preference of site. The sequence is determined by superimpositioning. The earlier, predominantly red phase, rock art includes subjects such as handprints, simple geometric forms, finger-dots on vertical surfaces and a small percentage of aprons. This phase generally occurs in high shelters on summits, sides of hills or cliff faces. Where fine-line rock art occurs with red phase rock art, the latter underlies the former (Eastwood & Eastwood 2006: 61). The later white phase rock art includes finger-dots on vertical and horizontal surfaces, a range of handprint motifs, elaborate geometric forms and a high percentage of aprons. Occasionally the white phase rock art is painted high up in the hills, but the site preference

seems to have been shelters at ground level[11]. White phase paintings are frequently found with fine-line and Northern Sotho paintings. Unlike the red phase, white phase paintings often overlie fine-line paintings (B. Smith & Ouzman 2004; Eastwood & Eastwood 2006: 61).

When analysing the superimpositioning sequences, the finger-painted geometric art tradition, made up of the two phases mentioned above, most often overlies the fine-line tradition, but it is not unusual for the reverse to be observed (Hall & B. Smith 2000: 39). This overlap is indicative of a contemporary occupation in time and space of the makers of these two art traditions.

According to some, the finger-painted tradition has characteristic site preferences (Hall & B. Smith 2000: 39; Eastwood *et al*. 2010: 76). For instance, motifs are described as often being painted on ceilings, or high up, and occur close to major water sources (B. Smith & Ouzman 2004; Eastwood & Eastwood 2006). Whether site preference was an overt choice and/or had some specific meaning is still to be discovered.

Using style is a way to break down these 'traditions' and possibly discern meanings and interpretations of such choices. Unlike the approaches mentioned above stylistic analyses are both analytical and theoretical. Such analyses are able to discern nuanced continuities and discontinuities in the rock art spatially and temporally (Sanz & Fiore 2014: 7104; Conkey & Hasfort 1990). Moreover, style

[11] From field observations, these observations do not relate to altitudes.

has been used by contemporary peoples to actively negotiate social strategies and are thus meaningful in these societies. This was likely the case in the past (e.g. Barton *et al.* 1994; C. Smith 1994: 7; Wiessner 1990: 107; Hegmon 1992; Sanz 2008: 103; Davis 2011: 96) (Chapter V).

One of the lines of evidence for herder authorship mentioned above is the lack of ethnographic evidence from the extensive testimonies of Bushman informants (B. Smith & Ouzman 2004). Using ethnographies to interpret rock art has generally become known as the 'ethnographic method'. Founded and used extensively in southern Africa, this method has aided researchers to interpret fine-line rock art. This process commonly involves the use of 'ethnographic analogy'. Ethnographic analogy comprises of the painted data on one hand, and the ethnographic instance on the other. The argument then proceeds by induction and probability statements to suggest that the two may have correlations (Wylie 1982). In all analogies, a causal underlying principle needs to be discerned in order to strengthen a weak analogy (Wylie 1982). Likewise, Lewis-Williams (1987: 98) argues that researchers need to establish the meaning of the features being compared. In areas where the original artists have now gone, ethnographic analogies have been crucial in moving rock art studies beyond mere descriptions and speculative explanations.

David Lewis-Williams (1981,1991,1992), for example, took San rock art studies to another level of interpretation using ethnographic analogy. Unprecedented at the time, Lewis-Williams (*ibid.*) used recent northern *!Kung* Bushmen

ethnographies from the Kalahari to interpret the rock art of the extinct */Xam* in southern Africa. Recently, Catherine Namono (2010) has used methods including ethnographic analogy *inter alia* to interpret the geometric rock art of Uganda. Namono (2010) uses the relatively recent *Mbuti* ('Pygmy') ethnographic material in what was Zaire, now the Democratic Republic of Congo, to aid interpretation of the rock art of the hunter-gatherer *Twa* people in Uganda, which could date back hundreds, if not thousands, of years.

4.5.3. Using ethnographies critically

Although contested (*see* Gould & Watson 1982), ethnographic analogy, as part of the ethnographic method has become the mainstay of archaeology and rock art studies around the world. However, the use of ethnographies is problematic for several reasons.

First, the ethnographers that write ethnographies are not neutral observers but rather, subjectively, select information that is essential to their research and ignore information that they consider irrelevant. James Clifford (1986: 10) argues that researchers cannot seek out one truth, only partiality. Second, anthropologists and the people or things under study are polysemic. Within a given context, there are many voices of representation and explanation. In many cases, ethnographers, as social and cultural agents, have pre-conceived ideas of what they will find in their fieldwork and thus report only those events or particularities that correspond to their pre-conceived ideas. In many cases another ethnographer who conducts similar fieldwork will have completely different conclusions. Last, Clifford (1986:

10) refers to how cultures can be captured within a single frame or moment, but this ultimately contains with it a process of exclusion, simplification, selection of a temporal focus, and the creation of a specific self-other relationship.

In rock art studies these problems are commonly overt, since many researchers attempt to forcibly 'fit' the ethnography to the data, particularly when a direct link between the painters and the people ethnographers study is not explicitly apparent. These researcher's arguments are often weak since they use a form of 'ethnographic snap' and thus utilise ethnographies without critical reflexivity. Anne Solomon (1998: 281) argues that as a result, the use of ethnography in rock art studies typically emphasises commonalities and downplays "differences in the rock-art and its contexts over time and" in space. This is further problematised, because many of the older ethnographers were written 'out of time' or in an ethnographic present. This, in effect, immortalises one ethnic group or people in time and space. Rock art researchers should not uncritically apply such ethnographies to their data, without taking into account the extent to which time and space have been disregarded.

4.5.4. Interpretations of finger-painted geometrics in South Africa

The ethnographies of Bushman informants do contain information on finger-painted geometrics but, as mentioned above, the interpretations reached were influences by the social mileu of informants and translators (i.e. the Victorian era) and within specific assymetrical self-other relationships.

George William Stow wrote a letter to Wilhelm Bleek in 1874 regarding the religious significance of geometric rock art in the Northern Cape. He wrote:

> There [sic] diversity is astonishing and what is more surprising is the great similarity which some of them bear to the religious symbols used by some of the most ancient but more civilized nations. The meaning[s] of these symbols were no doubt kept sacred – and it was only the initiated who would have been able to have explained them. These emblems and symbols have astonished me more than anything else I have previously discovered for amongst them we find the circle – the crescent – the cross – and several others that appear like mystic emblems (Skotnes 2008: 48-51).

Ironically, when Lucy Lloyd, showed a copy of some of Stow's drawings of geometric rock art to |Han≠kass'o, a |Xam man, rather than seeing 'mystic emblems' he identified the square-shaped geometrics as resembling everyday domestic mat sieves. Mat sieves were containers used by women for sifting grains such as rice (Skotnes 2008: 49). Additionally, |Han≠kass'o identified the dots in the middle of the line as resembling dots placed on the forehead with the forefinger that made the individual resemble a hunting leopard (Skotnes 2008: 49) (Fig. 4.27).

With regard to rows of finger-dots, Bleek and Lloyd's |Xam informants expressed no knowledge of what they could mean when shown Stow's copies of various examples from rock art sites in the Eastern Cape Province and the south-east of the Free State (Stow & Bleek 1930, plates 23, 48; Fig. 4.28).



Figure 4.27: Watercolour on board of engravings of symbols found near Pniel, Northern Cape. "Ancient Bushman Emblems from Striated Rocks near the Great Bend of the Gy-Gariep above the Pniel Mission Station" recorded by Stow (Skotnes 2008: 48-49)



Figure 4.28: Morgenzon, Ghariep River, Free State. Explanation by a Bushman. - 'Bushmen to left shooting. …In lower right Bushmen hunting. Spots unknown' (Stow & Bleek 1930, pl. 48)

Another suggestion for the interpretation of geometrics is that they are representations of entoptic phenomena. In the ethnography of the Ju|'hoansi, medicine men enter into trance through the rhythmic dancing and clapping observed in the medicine dance. In terms of the three-stage neuropsychological model put forward by Lewis-Williams and Dowson (1988), in the first stage of the trance the men experience entoptic phenomena. These are reported by subjects to be geometric forms – including grids, sets of lines, rows of dots, zigzags, undulating lines and catenary curves – that float around in their visual field and are usually projected onto surfaces (Lewis-Williams & Dowson 1988: 204; Lewis-Williams & Dowson 1990: 12; Lewis-Williams 2001: 339). These percepts constantly move and change form, and they cannot consciously be controlled.

To B. Smith and Ouzman (2004: 505-506), entoptic imagery is restricted to a finite set of motifs and has a distinct iconography with motifs often painted or engraved representationally. They "seldom occur as free-floating image isolates because their meaning relates to specific contexts known to have been supernaturally potent" (B. Smith & Ouzman 2004: 506). Geometric rock art, on the other hand, is made up of a different set of shapes and is seldom found in the same panels with naturalistic rock art (*ibid.*).

As opposed to entoptics, finger-painted geometrics are superimposed over and under fine-line naturalistic rock art. This was seen extensively in Salt Pan shelter on the western edge of the Soutpansberg, 66 km to the northeast of the Makgabeng. In a rare find, Hall and B. Smith (2000: 42) came across this site,

which they believe provides evidence of conflict over resources between the hunter-gatherer and herder populations. At Salt Pan Shelter, two groups creating two distinct rock art corpora allegedly competed for space. Looking at the sheer number of images and the large coverage of geometric art, Hall and B. Smith (2000: 42) demonstrate that while superimpositioning of fine-line art over and under geometrics occurred, there are no fine-line paintings within the layers. They correlate the rock art sequence with the material culture found in the deposit to suggest that at one point the Bushmen were painting and then moved, or were shut out, and the artists of the geometric rock art painted over, but that they did not share the space. This absence suggests to the authors that the hunter-gatherers responsible for the fine-line paintings had to compete for space to paint in this shelter and were not allowed to paint on its walls. To outside observers, there would be little doubt as to which group now controlled what happened in the shelter and who owned "whatever residual spiritual or other powers the place may have been perceived to contain" (Hall & B. Smith 2000: 42). A small number of fine-line images, including depictions of fat-tailed sheep, are seen superimposed over the thickly painted geometric art, reflecting a reoccupation after the period of geometric painting in the second half of the 1st millennium AD (Hall & B. Smith 2000: 42). According to Hall and B. Smith (2000: 43), within this contested space, fine-line paintings of fat-tailed sheep may represent a last-ditch attempt to neutralise or overcome the power of the herders. To them, they reflect the extent to which the new herder population threatened the hunter-gatherer way of life (Hall & B. Smith 2000: 43).

Certain critiques can be raised against Hall and B. Smith's argument, such as their limited use of ethnography and their use of distribution maps inferring the possible routes herders took across large tracts of land in southern Africa. The relation between ground deposits and paintings is not assured. Moreover, the theories mentioned above are not mutually exclusive and multiple scenarios probably took place in different areas at differing times. Hall and B. Smith (2000) present an interesting interpretation, but the question of whether there are more shelters like Salt Pan Shelter is further to be examined. Intra-stylistic analysis of the two bodies of rock art may provide a more nuanced understanding of the site that avoids equating one corpus of rock art with one ethnicity. Cross-cultural motifs such as handprints disrupt interpretations of one motif associated with a specific people.

4.6. Handprints

The handprint is another ubiquitous motif that is considered a part of the 'geometric rock art tradition'. Hand- and footprints painted and/or engraved are among the oldest, and geographically most widespread, motifs in rock art (e.g. Clottes 2002; Aubert *et al.* 2014). The distribution pattern and site preference of handprints reveal specific choices and decisions on the part of the makers. Their meanings and forms are as diverse as the countries in which they are found.

4.6.1. Techniques and distribution

Burkitt (1928: 152) proposes that handprints were restricted to certain areas in southern Africa. He divides rock art into Southern Rhodesia (Zimbabwe), Central

and Southern Art groups (Burkitt 1928: 152). At the time of his study, handprints were absent in the Central and Southern Rhodesia art groups (Burkitt 1928). Since then handprints have been found in Zimbabwe, though none have been discovered in the Central Art group.

Unlike the negative hand stencils often associated with west European Upper Palaeolithic rock art, the recorded handprints in southern Africa are positive (Yates, Manhire & Parkington 1994: 35). There are no accounts of how handprints were created, but Alex Willcox (1959: 292) suggests that hand painters could have used one of four methods. The first method could have been to apply paint to the surface of the hand and then firmly press it against the rock, giving a partial print (Willcox 1959: 292) (Fig. 4.29, overleaf).

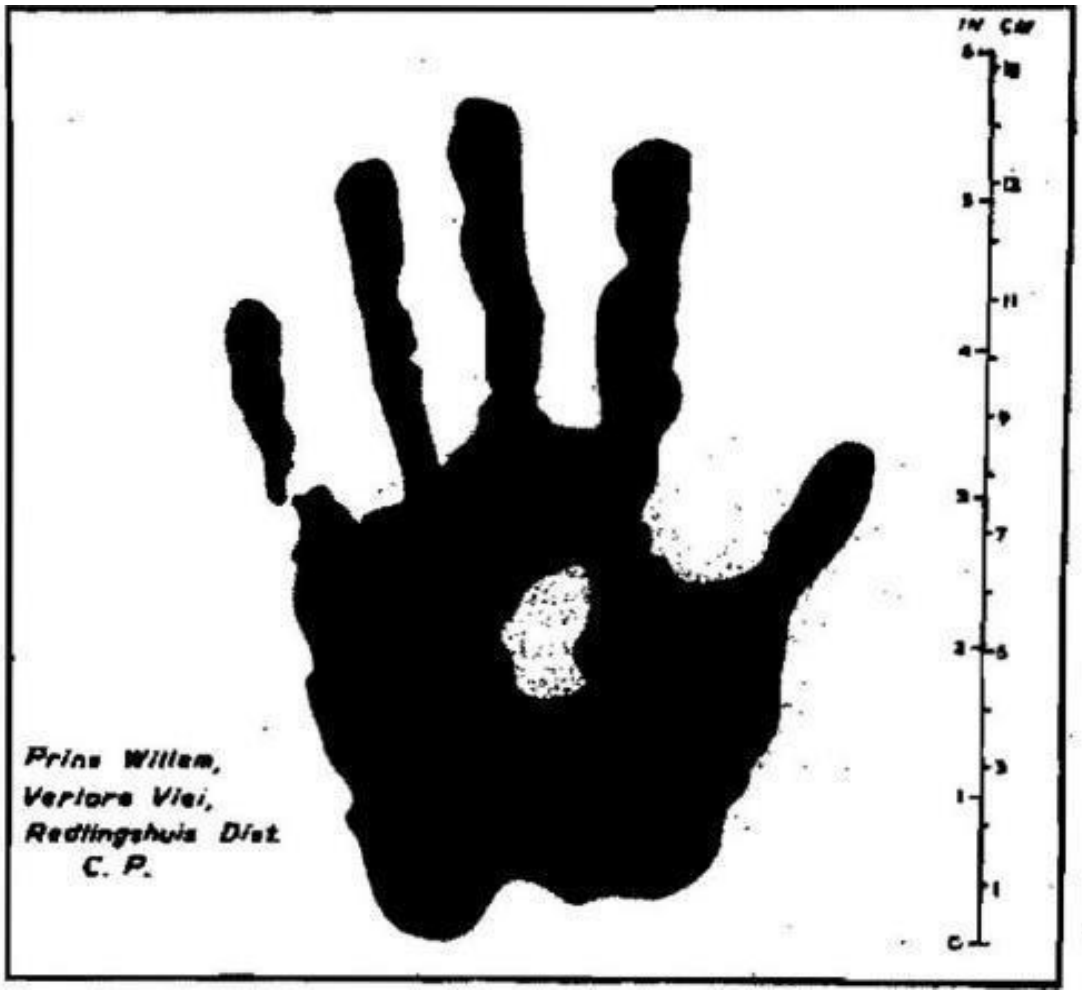


Figure 4.29: Applying paint to the surface of the hand and pressing it against the wall making a full or partial print (Willcox 1959: 292, Fig. 1.)

Second, the hand could be rolled on the rock to achieve an almost full print (Willcox 1959: 292). A third method could be to place the hand against the rock and outline it with a brush and then paint in the outline (*ibid*.). Lastly, patterns, such as a series of lines, often in nested curves or U-shapes, could be painted on the hand before pressing it against the rock (*ibid*; Yates, Manhire & Parkington 1994; Manhire 1998). An alternative to this fourth method could be where the painter draws the pattern on the wall before impressing a painted handprint over it. Patterned or decorated handprints are common in the southern and Western

Cape, and range in colour from red to orange and, very occasionally, white or black (Van Rijssen 1984; Yates, Manhire & Parkington 1994). Areas of handprint concentration include the Limpopo, Zimbabwe, the Western and Eastern Cape, and Namibia (Fig. 4.30).

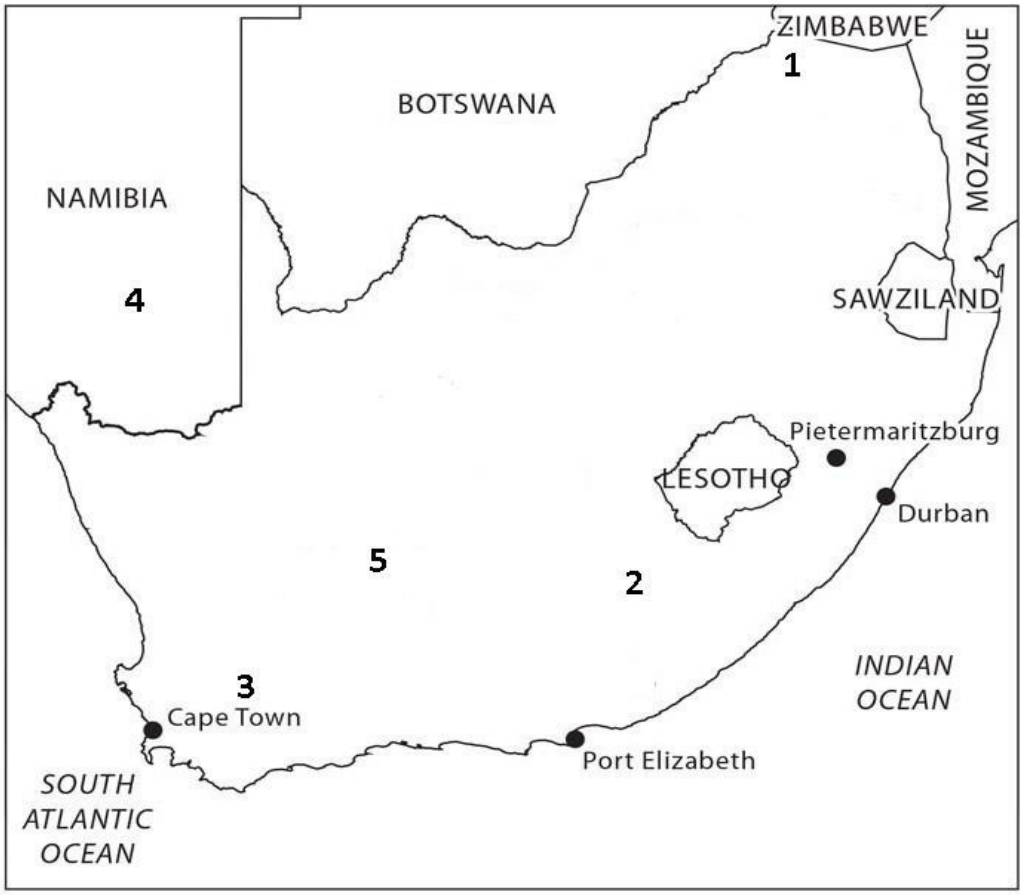


Figure 4.30: Distribution of type one hand imprints (Redrawn from Willcox 1959: 293. Fig. 2)

Since Willcox's distribution map, additional sites with handprints were found. For instance, lower concentrations were found in the Drakensberg, Willcox's zone two, by Mazel. From his survey, conducted from 1979 to 1981, Mazel (2013: 53) found 338 painted shelters and only seven handprints. In contrast, in the Central Limpopo Basin, B. Smith and Ouzman (2004: 503) found that 12 out of 48 sites

(25%) had finger-painted motifs that included handprints. On the other hand, of 305 sites with fine-line rock art, only four (1.3%) sites have handprints not associated with finger-painted motifs (B. Smith & Ouzman 2004: 503).

4.6.2. Authorship

Handprints leave a residue, which partly enables the identification of the maker by his or her physical attributes. A few researchers have attempted to use biometric data to identify the makers, their sex, and/or if the act of producing handprints was the action of a group, or individual activity, and to which 'ethnic grouping' they belonged (Willcox 1959; Maggs 1967; Van Rijssen 1984; Manhire 1981, 1998; Meister 2003).

The Western Cape has the highest percentage of handprint motifs and therefore it is not surprising that research on their authorship has focused in this area. Willcox (1959: 293) studied 12 rock shelters in the southern and Western Cape. Both paintings and very small handprints co-occur in shelters with a single stone tool industry (the Wilton industry) in ground deposits. According to Willcox (1959: 293), the height of the maker can be deduced from the measurement of his or her handprints. Willcox (1959: 293) compares hand and height measurements taken from painted handprints with samples from Bushman and Khoe populations, including a sample of handprints taken by Leonhard Schultze, a German zoologist and physical anthropologist. Schultze's sample, recorded in the early 20th century, consists of measurements of hands from 73 adult male Nama. Willcox (1959) concludes that the handprints in his sample sites were not created by the larger-

handed Khoekhoen, but rather by the Bushmen. The conclusion correlates with the archaeological evidence of lithics from the Wilton industry.

Using the same biometric measurements as Willcox (1959), Tim Maggs's (1967) quantitative study of rock art motifs from 46 rock art sites in the south-western Cape yielded similar results to those of Willcox (1959), where Bushman adults, and possibly children, were considered the painters.

In contrast to Willcox (1959) and Maggs (1967), Van Rijssen (1984: 25) deduced that geometrics and handprints were the work of Khoekhoe painters, and question certain aspects of Willcox's statistical analysis. For example, biases regarding the age and sex of the sample populations exist with the analogues used (cf. Anderson 1996: 93). Van Rijssen (1984: 125) queries Willcox's method of comparing the length of handprints only with those of adult male Bushmen and Khoekhoen. Moreover, the size of the hands in the past may not be the same as the handprints from modern analogues. Lastly, Van Rijssen (1984: 125) questions why the Ju|'hoansi of the Kalahari were excluded from the study, given the vast distance between the Kalahari and the Western Cape, while samples of the Khoekhoen from Central Botswana and Namibia were included.

Casting a wider net, Anthony Manhire (1981, 1998) and Van Rijssen (1984) studied handprints in 120 sites in the Western Cape. Within the shelters, paintings of handprints are often juxtaposed with smears and finger-dots (Manhire 1981: 48; Van Rijssen 1984: 128), the distribution of which indicates a preference for

specific locales. Eighty of these sites are 300 metres or less above sea level, with a few other sites being in the mountains (Van Rijssen 1984). These few sites are mainly in valleys, that likely acted as access routes to other regions.

A disparity exists between decorated and undecorated handprints. Undecorated handprints are not restricted to any single locality but rather match the distribution pattern of fine-line paintings (Manhire 1998: 106). Van Rijssen (1994) plotted the geographical distribution of domesticated animals and handprints across southern Africa. He argued that since certain paintings such as handprints and geometrics are confined to localities with good pasturage they must have been done by herders.

Controversially, looking at superimpositioning in the Western Cape, Manhire (1981) proposes that undecorated handprints were made after fine-line paintings. To Manhire (1981), this suggests that the image-making process shifted its focus from fine-line to handprint paintings. This was corroborated with the material culture in which "the changes in the patterns of bead making and formal tool use and discard which accompany the inclusion of sheep and pottery in the economy are plausibly linked with the appearance of hand printing as a phase of image making which succeeded representational painting" (Yates, Manhire & Parkington 1994: 55).

Manhire (1998: 103) concluded that the makers of undecorated handprints were either adults of small stature, or children. Most of the recorded heights,

reconstructed from handprints, fall below the range of the Khoekhoe samples. Therefore, it is doubtful that the handprints were made by Khoekhoe adults in the Western Cape. Comparing these measurements with a sample of handprint measurements from a range of young schoolchildren from Calitzdorp in the Klein Karoo, Western Cape, Manhire (1998: 104) argues that the handprints were created either by boys between the ages of 12 and 14, or girls between 14 and 16 years of age. Moreover, the choice of large shelters signified, to Manhire (1998: 106), that a special event focusing on a specific age group may reflect a group activity.

For Manhire (1998: 106) and Van Rijssen (1985: 146), a more convincing case for Khoekhoe authorship can be made for decorated handprints. The distribution of decorated handprints and geometrics is largely restricted to areas that would seasonally have been attractive to the Khoekhoen, who needed adequate pasturage and water for their livestock. Thus, it is improbable that the undecorated handprints in the interior mountains were created by the Khoekhoen. Furthermore, most of these handprints occur alongside fine-line paintings (Manhire *et al.* 1983).

In the Western Cape, sites with handprints tend to occur where few or no fine-line images are present. Superimpositions invariably indicate that they are recent (Anderson 1997). Manhire (1981: 48) also noted that handprints are sometimes associated with boldly executed grids, circles and cross-in-a-square motifs and/or finger-dots. These results were later correlated with data from the Central Limpopo Basin and similar conclusions reached (Eastwood & B. Smith 2005).

The problem with the above studied conclusions is the uncertainty of these measurements, and the bigger question of whether biometric statistical analyses can, in fact, differentiate sex, age and/or ethnic group (Meister 2003; Wiltshire 2011). Meister (2003) set out to answer this by conducting thorough biometric handprint analyses and a photogrammetrical recording system using experimental prints. While the age of the maker could be discerned, Meister (2003: 153) found the sex of the marker could not conclusively be discerned by classification methods derived from living human analogues. Using datasets from schoolchildren in Calitzdorp, Clanwilliam and his own prints, Meister (2003: 150) deduced that it is unlikely the same individuals made the prints, rather that prints were involved in group activities. Dissimilar groups or individuals, possibly even divided by sex, might have made hand prints in different parts of the shelters (Meister 2003: 150).

Nick Wiltshire (2011: 91), consolidating records of over 5000 sites with handprints throughout the Western Cape Province, argued that the handprints in the province were likely associated with aggregation events such as initiation rites. If we assume that they occurred after the advent of pastoralism in the south-western Cape (after Van Rijssen 1984, 1994; Manhire 1998; Meister 2003), and that they spread relatively quickly and had to do with aggregation events, then researchers need to treat handprints differently from other rock art motifs. They are probably the cultural product of a society that had a different approach to the "landscape than the hunter-gatherers before them" (Wiltshire 2011: 91). Wiltshire (2011: 95) found that the high number and concentration of decorated handprints

points to a strong connection between the coast and the Cape Fold Belt after the advent of pastoralism (Wiltshire 2011: 95). In terms of interpretation, he concluded that if it is a group activity it is unlikely to be trance related as that is more individualistic (Wiltshire 2011: 95).

4.6.3. Interpretations of handprint motifs

The interpretations of handprints range from entoptic phenomena seen in altered states of consciousness (Lewis-Williams & Dowson 1989), to motifs made during female puberty rites (Anderson 1996, 1997). Furthermore, handprints could have arisen out of a reaction to intruding pastoralists around 2000 BP as a likely component of self-realisation of the Bushmen, or as a statement of the Khoe pastoralists asserting and articulating their identity (Anderson 1996, Meister 2003: 150).

Handprints have been interpreted as entoptic phenomena experienced in altered states of consciousness. According to the neuropsychological interpretation, shamans experience entoptics, geometric forms that float around in one's visual field, and are usually projected onto surfaces, while in a trance state. To Dowson (1989) and Lewis-Williams and Dowson (1989) handprints, especially decorated ones and finger-dots, were the symbolic reification of a shaman's potency, obtained and manipulated while in altered states of consciousness. The decorated U-shapes in the prints represent the tingling sensations or the 'weak' hands of a healer in Dia!kwain's story told in the 19th century to Bleek and Lloyd (Lewis-Williams & Dowson 1988: 210; Bleek and Lloyd MS. L.V.4.4224).

Other researchers (Anderson 1996; B. Smith & Ouzman 2004) argue that they are not trance-related, for several reasons. Gavin Anderson (1996: 68-69) points to the unequal distribution of handprints across the country. The south-western Cape has over 5000 handprint sites whereas the Drakensberg has less than a dozen. His argument is if they are related to sensations associated with altered states of consciousness, would they not be present in locales with overt trance imagery, like the Drakensberg? Rather, Anderson (1996) demonstrates how handprints can be better explained in terms of female menarche rites and seclusion caves.
Following Van Rijssen (1984), Anderson (1996: 90) argues that handprints were made by Khoe pastoralists who are physically larger in stature than Bushmen. Using the handprint measurements supplied by Manhire (after Maggs 1967), Anderson (1996: 93) concluded that "small and medium size handprints fell within the range of [Khoe] female height". Using Khoekhoen ethnographies past and present, he suggests that the female menarche ritual, with its taboos and periods and areas of seclusion, was key to understanding the handprint imagery (Anderson 1996: 94). He makes the connection between red colour symbolism, blood, menstruation, female status positions and red ochre used in caves (ibid: 96). "Hand-related images may be viewed as symbols, or metaphors, signifying areas where the menarche and/or menstruation rites occurred, and the symbols of the rite itself" (Anderson 1996: 97).

From archaeological and superimpositioning studies in the south-western Cape, Anderson (1996) created a relative chronology for hand-related imagery. He found that handprints likely occurred in contact situations, which influenced the

maintenance and/or transformation of identities. The colonists aimed to subjugate the indigenous people of the area. “This could be seen by [indigenes] as [an] attempt to decrease group distinctiveness” (Anderson 1996: 97). However, we know from the past and present ethnographies, that the Khoekhoen retained certain rites. “Females were more likely to retain their roles and thus those practices which defined their roles, although some form of change would occur” (Anderson 1996: 97). One way of reasserting their identity during times of stress was to paint.

4.7. Discussion

This chapter reviewed the early and later recordings of rock art in the Makgabeng and beyond, concentrating on what has been the major focus of research and some methodological challenges researchers have encountered.

Few stylistic analyses of South African rock art focusing on single areas have been conducted. With few exceptions (Hampson *et al.* 2002; Challis 2008; Henry 2010), rock art researchers have neither comprehensively distinguished differences, nor made connections between the rock art of different regions. Both the dominant neuro-psychological model, and the geometric rock art tradition, demonstrate generalisations and not specifics. The use of the neuro-psychological approach, natural modelling in fine-line rock art and the assignment of geometric motifs, including handprints and finger-dots to the geometric rock art tradition, tends to highlight similarities in bodies of art over large areas, rather than in specific regional patterns.

On the other hand, studies of female figures and symbolism including studies conducted on handprints in south-western Cape, have managed to combine the archaeological evidence, superimpositioning and relevant ethnographies particular to the area. “Each region has had different levels of interaction with various […] groups, and these levels may influence the ways in which paintings were given meaning” (Anderson 1996: 69).

In terms of authorship, the sheer difference between fine-line representational art and the loosely defined corpus of geometric rock art alone does not lead to the conclusion of separate origins and authorship. It is therefore uncertain whether these two bodies of art can be considered as distinct traditions. Moreover, the geometric rock art tradition has not been clearly delineated. Which motifs are consisted a part of the corpus and which are not?

Chronology is another sticky subject. Many advances have been made since the earliest attempts at dating rock art. Dating will still need to use a form of stylistic comparisons to understand regional differences as it is unfeasible to date every site or every motif. Rather, the study of motif styles and inter-image relationships and overlap in common imagery provides a means to track the changes and influences of peoples and traditions. Studies of inter-tradition painted sequences, using style, might contribute toward knowledge of the timing and extent of interaction in the landscape. This is the focus of Chapter V.

PART 3

V. Enduring Style In Rock Art Studies: A New, Durable Definition

This chapter relays all the different manifestations of style and stylistic practice in the history of southern African rock art studies, before settling on a useful definition of style for future rock art studies. The working definition used in this thesis is style as spatial and temporal variations that originate through choices, ways of doing and praxis. Studies in ethno-archaeology have convincingly theorised and shown how styles are capable of actively negotiating social strategies. Moreover, style may be an indicator of group intra- or inter-regional identity and is implanted in broader networks of associations and meanings.

The often vexatious, and much contested, concept of style is actively avoided by many contemporary authors in southern African rock art studies. Authors have criticiqued it for being too broad a term to be of any use. Furthermore, the term is difficult to define (e.g. Lewis-Williams 1986; Bednarik 1995; Boast 1997; Hampson *et al*. 2002). However, style has been used successfully in many parts of Australia (Chaloupka 1993; Franklin 1989; Chippindale *et al*. 2000), North America (Lee & Hyder 1991; Boyd 1998) and Europe (Clottes 1993; Sieveking 1993; Sanz 2008). The use of style in southern Africa has a long history, beginning in the 1920s.

5.1. Style in southern Africa: The early years (1928–1948)

In the early 20th century, many researchers (Burkitt 1928; Goodwin 1936; Battiss 1939, 1948) began visiting and describing a handful of sites, jotting down information about colour and the deterioration of pigment, to identify chronological and stylistic sequences.

Miles Crawford Burkitt (1928) suggested that similarities in style occur between Spain's Palaeolithic rock art and South Africa's Bushman rock art. With no dates or direct association, however, Burkitt (1928: 110) problematically matched these rock art styles to excavated stone tool industries. As early as 1928, he attempted to use superimpositioning of styles and techniques to provide relative dates of the rock art (Burkitt 1928). He inferred that styles can be indicative of social groups and that changes in style were possibly due to the migration of other, similar groups into the area (*ibid.*). He noticed broad regional differences in areas such as between the Drakensberg and further north, such as Zimbabwe (*ibid.*).

Twenty years after Burkitt, Walter Battiss, with an art historical approach, saw supposed striking similarities between European Upper Palaeolithic rock art and southern African rock art (Battiss 1948: 23). Following this approach, style is an expression of the artist's personality or school of thought and, therefore, is separate from the technique employed to make the work (*ibid*: 39). Battiss, like Burkitt, argued that changes in style were due to people influencing artists externally. Battiss (1948) was concerned with how rock art styles or trends are cyclical, with archaic beginnings, a stage of transition; an apogée, in which the art

reached its highest form of development; and a period of decadence, in which the art regressed. This deterministic model, or cultural system ontogeny, was adopted from American anthropology and formalised in archaeology in the 1960s (Butzer 1980). Janette Deacon (1972) interpreted variations in the excavated data, from the Wilton Cave site in the Cape Folded Belt Mountains, Eastern Cape Province, using a cultural ontogenetic framework. Similarly, Vinnicombe (1976) used the ontogentic model to interpret styles in the rock art of the Drakensberg and environs.

Prior to Battiss (1948), Deacon (1972) and Vinnicombe (1976), the popular historian Gustav Preller (1875–1943) described the Bushmen as the living evidence of degeneration within an evolutionary model (Hofmeyr 1988: 535). This was based on a supposed trajectory of human evolution that has periods of retrogression (Dubow 1995: 56). It was believed that Bushmen were the degenerate descendants of an older, superior race. At this time, Bushmen were considered to be responsible for the more recent 'decadent' phase in rock art and not the earlier art. This evolution-based thinking influenced many researchers working on style, and it is through such fallacious theories that the autochthons of South Africa were denied their claim to their rich heritage.

5.2. Issues arising from early and mid-20th century findings

Earlier stylistic sequences were based on superimpositioning, colour and the degree of deterioration of pigment in a relatively few sites (Burkitt 1928; Goodwin 1936; Van Riet Lowe 1956; Willcox 1963). This is problematic for

various reasons: one can never be sure of the temporal framework between superposed styles, unless they are directly dated. The time between superimposed images could be days, weeks, months or hundreds of years. The use of colour as a relative dating technique is also challenging, since a pigment may change colour over time due to ecological factors – such as white kaolin turning yellow when oxidised. Lastly, stylistic sequences based on art found in two or three sites cannot be regarded as representative of an entire region.

In terms of the art historical approach, many of the stylistic criteria used were the result of the filtering the art through a Western formal perspective, rather than an informed perspective using ethnography (Hampson *et al*. 2002: 17). Battiss, together with researchers abroad such as Breuil (1930) and Leroi-Gourhan (1968), placed styles in an evolutionary trajectory that was often determined by the researcher's own expectations and not by empirical data (Sieveking 1993: 34).

5.3. Style in southern Africa: The later years (1955–1995)

Alex Willcox (1955, 1963), studying the distribution of several sites across a vast area, found regional similarities between styles in his attempt to record and map the geographical distribution of various types of paintings and engravings. He was interested in the migration of peoples, or the direction of diffusion of their cultures (Willcox 1963: 38). For example, from superimpositioning studies, early researchers have suggested that the shading technique was likely a local invention in the Makgabeng that spread southwards, reaching the Drakensberg between 250 and 120 BP (Willcox 1955; Schoonraad 1960: 11). The reason given for so few

shaded paintings between the Makgabeng, and the large area of shaded paintings around the Drakensberg and Eastern Cape, is that the artists were supposedly cut off by wide areas being occupied by hostile groups (Willcox 1955). However, looking at the map, the availability of suitable rock shelters in which to paint was, in all probability, the main factor.

Conversely, Pager (1973a) argued that the shaded paintings were a local invention in the Drakensberg and that the shading technique spread northwards. According to Pager (1973a), the Drakensberg style had a precursor and developed into the later style that is seen in the other areas. The similarities in style between these areas were due to cultural contact that may have been unintentional, rather than intimate – an unconscious diffusion of ideas rather than intermarriage and prolonged contact between peoples (Pager 1973a: 45). Both positions above are speculative and do not consider that two areas that share a similar art technique need not be related at all.

Far more explicitly than his predecessors, Willcox viewed differences in technique (bichrome, polychrome, shading, foreshortening, detail, level of crudity) and iconography (presence or absence of hand imprints, scenes of fighting) as specific stylistic criteria (Willcox 1963). These criteria connected the way an object was made and the choice of subject matter, a topic that has become so important in contemporary stylistic studies of rock art.

5.3.1. New or Processual Archaeology

In the 1960s, New Archaeology was in full swing – quantification and objectivity was the order of the day. Archaeologists shifted the discipline away from cultural history towards science (Johnson 1999). The need arose to look at the variability of data using methods such as statistics, punch-card systems, principles of numerical taxonomy and seriation (Vinnicombe 1967: 129). Style was heavily critiqued as a concept that was difficult "to reduce to objective terms" (*ibid.*). Still, the use of the term persisted, in much the same way as Willcox (1963) used it to denote technique – that is, whether a painting was monochrome, bichrome, polychrome or shaded polychrome (e.g. Vinnicombe 1967: 129). Systematic superpositioning and stylistic sequences were created at this time (e.g. Pager 1971; Vinnicombe 1967) (Chapter IV, Table 8).

By the late 1970s, it was clear that the methods of New Archaeology would not elucidate the meaning of the art. Many researchers put aside the objective methods they were using and began searching the ethnographies on the Bushmen for a more emic understanding of the art (Vinnicombe 1967; Lewis-Williams 1981). At this time, most researchers abandoned the easily misunderstood concept of style (e.g. Pager 1971; Vinnicombe 1967; Willcox 1978; Woodhouse 1979). Elsewhere, however, such as in Lesotho, quantification and, later, style, continued to be used (Smits 1983, 1992). Lewis-Williams (1992: 7) argues that to understand the meaning of Bushman art, researchers need to go beyond quantitative generalisations toward a more particularist position that considers panels in their own right. The impact of quantitative studies (e.g. Maggs 1967; Vinnicombe

1967; Pager 1971; Lewis-Williams 1972, 1974) and their value was questioned. The large datasets, number-crunching and punch-cards did little to elucidate the meaning of the rock art and many researchers abandoned these methods in favour of using ethnographies (e.g. Huffman 1983; Lewis-Williams 1984). It did, however, confirm the shamanistic nature of the art. For example, the frequency of subject matter was restricted to certain animals in some areas (Lewis-Williams 2008).

By the 1980s, it was argued that quantitative studies were a waste of time and that researchers should rather understand what categories mean, guided by theory, before blindly counting (Lewis-Williams 1984; Lewis-Williams 1998; Lewis-Williams 2002: 49). The search for meaning and interpretation of rock art using ethnography took centre stage.

Referring to Lewis-Williams's work in South Africa, Jean Clottes (1993: 19) suggests that style loses much of its relevance when we understand "what the art is all about through well-documented ethnographic sources". According to the ethnographic interpretation, most of the rock art is the result of individual shamans or artists recalling their own, individual visions experienced in altered states of consciousness (Lewis-Williams & Dowson 1989). However, how the imagery experienced in trance is later selected and what is painted and what is not is largely unknown. This process is a culturally informed one and likely entailed much socialisation and/or ritual between the shamans' direct access to the spirit world and the production of the rock art.

If a rock art panel was solely the result of one shaman's individual experiences, the differences in form and manner would be symptomatic of local or personal idiosyncrasies (Clottes 1993: 19). If this were the case, a stylistic analysis would not be possible. Instead, forms of idiosyncrasy are expressed within a socio-religious framework. Similarities and differences exist within and between sites, with measurable patterns emerging. In part, local and personal idiosyncrasies became conventions.

Another issue that arose from criticisms of the ethnographic approach was that the ethnographies used as analogies that directly relate to rock art are few, and may be applicable to particular groups and locales (Solomon 1998, 1999). A few of these concerns were raised in a conference held in the early 1990s (Lorblanchet & Bahn 1993).

5.3.2. The post-stylistic era

In 1992, an international conference was held called 'Rock Art Studies: The Post-Stylistic Era, or Where Do We Go from Here?' The proceedings (Lorblanchet & Bahn 1993) reflected the dissatisfaction with traditional stylistic chronologies. New innovations in rock art dating and the establishment of absolute chronologies forced researchers to question chronologies based on style (Clottes 1993: 19; Bednarik 1995). With regard, for example, to Palaeolithic caves in Europe and the Côa petroglyphs in Portugal, where stylistic dating estimated that the Côa petroglyphs were of Upper Paleolithic Solutrean age (20 000 years old) (Bednarik 1995). However, using a range of scientific dating techniques (e.g. AMS

radiocarbon dating, micro-ersoion studies, luminescence) it was established that the petroglyphs were probably less than 3 000 years old (*ibid*.).

Nevertheless, the conference on style did not intend to portray style as useless and irrelevant. On the contrary, the organisers and participants considered style to be very relevant – just not in the way that it had previously been used with regard to chronologies. In the conference proceedings, one paper from southern Africa featured.

Lucas G. Smits (1993: 127), using a case study from Lesotho, questioned whether a particular interpretation of Bushman rock art – the shamanistic explanation – can be used when researchers do not know if the corpus of rock art is homogeneous, or if it is made up of separate sets or types of paintings with particular formal attributes (Smits 1993: 127). Although Smits (1993) did not explicitly use the term style, he conducted a stylistic analysis of formal characteristics in the rock art at the site of Ha Baroana, Lesotho. He attempted to determine whether "statistically significant subsets or clusters can be recognised", which are made up of paintings that are more similar to each other than to others (Smits 1993: 128). He concentrated on the similarity in the way subjects have been depicted in terms of formal characteristics, rather than on the subject matter itself (Smits 1993: 128). Looking at the formal characteristics of human and eland depictions, Smits (1993: 139) proposed a dichotomy between male/trance and female/non-trance features. In this preliminary study, Smit's intention was not to

find meaning or the function of the art, but to explore quantitative patterns and how these could be a step towards interpreting meaning (Smits 1993: 128).

Similarly, Anna Steyn (1995) researched five sites in Mpumalanga, South Africa. Her intentions were two-fold. One was to "study the production process through which the art was made" in order to ascertain what particular meaning or purpose the artist/s sought. Second was to build "a framework of stylistic variety for the area", based upon the premises of formal design (Steyn 1995: 101). She summarised her research as a

> "study of the articulation between subject and manner of depiction, formal production process and product, where form informs content in a dynamic interaction each step of which, if understood, would bring us closer to a true understanding of that which the artists wished to express" (Steyn 1995: 101).

So, unlike Smits (1993), Steyn (1995: 101) explored formal aspects and subject matter. She used quantitative methods to identify several styles, and compared these styles within and between sites in different environments in a small area (Steyn 1995).

5.4. Style in southern Africa in the 21st century

In the 2000s, style re-emerged, briefly, in stratigraphic analyses to show the temporal sequence of archaeological contexts using Harris Matrices. Following the works of Johannes Loubser (1993, 1997) and Christopher Chippindale and Paul Taçon (1993), Thembiwe Russell (2000: 61; for a critique, see Pearce 2006: 177), like Willcox (1963) and Vinnicombe (1967), used the term 'style' to refer to

paint colour and technique. The studies in rock art superpositioning using Harris Matrices compared favourably with direct radiocarbon dates and were used with relative success in aiding interpretation and condition assessment (Loubser 1997: 17, 1997; Russell 2000).

In these studies, motifs that share the attributes of paint colour and technique are argued to have the same style (Russell 2000: 61). Russell's study (2000) aimed to provide a chronological sequence of different styles using the superpositioning of rock art compared to past stylistics sequences constructed by Vinnicombe (1967) and Pager (1971) for the Drakensberg rock art (Chapter IV, Table 8). Their approaches are different from the art historical approach, in which style was linked to an artist or group of artists. In stratigraphic analyses, a style is merely an unknown period of time in which an artist painted, overlapped by another period, and not a reflection of group identity.

Recently, in southern African rock art studies, style is discussed by authors only when it has formed part of a method (e.g. Flett & Letley 2013). A few recent studies in regionality (Hampson *et al*. 2002: 18; Mguni 2002) focus on the occurrence or absence of motifs in regions, rather than on the supposed subjective criterion of style.

Local criticisms against its use include the idea that there is no agreed to regional taxonomy using style as a criterion (Eastwood *et al*. 1997: 2). For some, the existence of so many paintings in many diverse environments makes them

question how possible it is to analyse the sheer number of styles that would be found (Eastwood *et al*. 1997: 3). This study attempts to address these concerns by beginning a stylistic analysis for a particular area, which can be compared to other areas in future studies.

Since the 1960s, there has been no attempt to create a regional taxonomy using style. Rather, researchers assign three broad rock art 'traditions', not styles, to three broad socio-economic terms: 'hunter-gatherers', 'herders' and 'farmers'. According to this classification, each art tradition is made using a specific technique. For instance, Bushman rock paintings are created with a fine-line brush, giving an accurate naturalistic style, while the rock art of Bantu-speaking people is finger-painted and is therefore less detailed and more abstract (B. Smith 2006; Le Quellec 2008).

This broad classification is problematic. First, some authors have identified the co-occurrence of traditions and the presence of shared motifs (e.g., B. Smith 1998; Eastwood & Eastwood 2006; Blundell 2004; Ouzman 2005). These researchers argue that southern Africa has had a long history of interacting peoples. Over time, groups creolised and/or hybridised, making it difficult for authors to argue that traditions are culturally bound (Challis 2008, 2012; Mallen 2008; Pinto 2012). This avoidance of primordial essentialism allows researchers to see groups, as well as their material expression, as interacting and fluid in their formations.

Second, the classification is a simplification of the diversity of peoples that lived in southern Africa (Parkington 1984a; Humphreys 2005; P. Mitchell 2005; Pargeter 2014; Pargeter & Duke 2015). Most Bushman languages are extinct, but a great variety existed in the past (Humphreys 2005: 38). There is a rich ethnographic record that archaeologists may consult, but its use is limited to specific language groups: what Peter Mitchell (2005: 67) calls the "holy trinity" of Ju|'hoansi, G|wi and |Xam. Therefore, archaeologists emphasise a small portion of the spectrum of Bushman cultural diversity (P. Mitchell 2005: 67; Pargeter 2014: 4; McGranaghan 2017: 21). A corpus of rock art need not be related to a single ethnic group, whose meaning can be elucidated from ethnographic records or analogues of that ethnic group.

The more we research rock art traditions, the more researchers can ascertain stylistic differences between them. I suggest that this is the next step, since such traditions essentialise inter-regional identities. It is therefore incorrect to argue that these traditions are essentially connected to subsistence strategies and not to a myriad of other choices, coinciding with changes in the environment or technology, and/or identity markers such as age, sex, initiation and gender.

It is with these concerns in mind that a clear definition of style was sought through the synthesis of the changing definitions of style within multiple academic disciplines such as art history, archaeology, ethno-archaeology and visual studies. Within the inadequacy of the term 'tradition', as used by rock art

researchers, a lacuna emerges and 'style', if well defined, may be a more appropriate term.

5.5. Style in the archaeology of art: towards a new working definition

Lengthy debates over definitions of style have filled academic books, journals and conference proceedings for the past 90 years. In these discussions, many researchers have argued that style is poorly defined, too wide-ranging in the meanings placed upon it and far too subjective a concept (Bednarik 1995; Boast 1997; Hampson *et al*. 2002). There are even suggestions that style is passé and should be discarded (e.g. Boast 1997). Others, however, agree that style is a pivotal concept in any archaeological analysis of the material world (Conkey & Hasfort 1990: 1; Layton 1992; Wobst 1999; Solomon 2011; Sanz & Fiore 2014). Moreover, style is a specific analytical tool used to probe the processes involved in the production and consumption of material objects. It is inherent to all archaeological studies, regardless of researchers explicitly using the term, or not (Conkey & Hasfort 1990: 1; Layton 1992; Solomon 2011: 52). For Wobst (1999: 119), style is the most fascinating and erudite feature of material culture to study. For as long as stylistic theory and method have merely skimmed the surface, there is no legitimate reason to throw out the concept (Wobst 1999: 120; Sanz & Fiore 2014). This is especially true concerning southern African rock art studies, in which so few contemporary stylistic analyses have been conducted to date.

Style is a two-fold concept. First, it refers to the quality of past human actions that is perceptible in material culture embedded in a broader social milieu, which

provides archaeologists with insights into society. Second, it is an analytical and chronological tool that helps archaeologists to see "continuities and discontinuities in the archaeological record which are relevant to answering questions about the spatial and temporal distribution and qualities of cultural practices" (Sanz & Fiore 2014: 7104). The chasm between what material culture meant to individuals in the past, and what archaeologists interpret it as in the present, is mediated by a reflexive perception of our practice (Conkey & Hasfort 1990: 3). Both aspects "are part of, are embedded in, and define wider debates and tensions in archaeological theory and method" (*ibid.*; e.g. Boast 1997).

The concept of style has been applied in diverse ways in anthropological and archaeological writings (e.g. Schapiro 1952; Sackett 1977, 1982; Wobst 1977; Wiessner 1983; Clegg 1987, 1993; Conkey & Hasfort 1990; Gosselain 1992). Early approaches treated it as a temporal and spatial marker, but later approaches focused on establishing "an understanding of the ways in which style can encode social, economic and political information and [of] how style can be used in the negotiation of social strategies" (C. Smith 1994: 7). The later approaches "either consciously or unconsciously drew upon semiotic notions of style as an integral component of all information systems" (C. Smith 1994: 7). This general approach has been integrated with the notion of social praxis (Bourdieu 1977; Giddens 1984). From this perspective, style is viewed as being not only capable of encoding and communicating information, but also as an active tool in the negotiation of social strategies. For example, in Australia, George Chaloupka (1993: 92) illustrated how style provided an insider's view into the artists' way of

life. The Arnhem Land, Northern Territory, Dynamic Figure Style grouped figures in compositions of a narrative nature (*ibid.*). The artists using this style configured fauna, composite beings and human figures in intricate narrative compositions embodying his/her existential experience, describing the world around him/her and his/her relationship with others (*ibid.*). Many of the theories mentioned above, and their application regarding style, emerged from earlier ethno-archaeology studies.

In the late 1970s and 1980s ethno-archaeologists, conducting ethnographic studies to understand the past through material remains, began to explain the behaviour underlying stylistic patterning of material culture. No longer were archaeologists merely describing the product or outcome of this behaviour. Rather, they saw objects as transmitting social information at various levels and degrees during the process of making objects (Wobst 1977: 321). In information exchange theory (Wobst 1977), style is non-verbal communication, which negotiates identity (Wiessner 1990: 107).

Moreover, style can be seen as that part of the formal variability in material culture that can be related to the participation of rock art in the processes of information exchange (Wobst 1977: 321). In other words, differences and similarities between styles in rock art can show how groups interacted with one another.

Thus, style is helpful, since it is situational and functions to "transmit information about group affiliation, individual status and ownership" (Barton *et al*. 1994: 186). The metalanguage of style makes social intercourse more predictable (*ibid.*). Stylistic comparisons mirror social comparisons. Social groups decide to negotiate their relative identity *vis-à-vis* other identities (Wiessner 1990: 107; Hegmon 1992). In this way, style may be discerned through choices, ways of doing and praxis (Dietler & Herbich 1998). Furthermore, different information is being communicated, both actively and passively, through style, in different contexts (C. Smith 2008: 238). Different objects present different messages and objects that reflect group or individual identity have intentional messages.

For instance, Polly Wiessner (1983, 1984) suggests that specific objects among the Kalahari Bushmen (mainly the Ju|'hoansi, but also G/wi and !Xõ groups) negotiated differing forms of identity through information exchange. She argues that Bushman arrowheads transmitted information about conscious affiliation or identity (Wiessner 1983, 1984). Arrows served to demarcate language groups, but did not provide information regarding the degree of interaction within or between groups (Wiessner 1983, 1984). This she terms "emblematic style" (Wiessner 1983: 257). Coupled with emblematic style, the arrows held some elements of personal expression, which Wiessner (1983: 269) calls "assertive style", that partly assisted some owners to identify their arrows. However, the Ju|'hoansi did not use style assertively to mark personal ownership of arrows (Wiessner 1983: 269).

Bushman beaded headbands, by contrast, played an essential role in the negotiation of personal and social identity, according to Wiessner (1984: 207). She proposed that people compared their ways of doing something with the ways of others. Observing what others did in turn made an individual or group decide, through a number of choices, on whether they wanted to emulate, simulate, differentiate their own ways from, or ignore the particular ways of doing, of others. They thereby decided to negotiate their relative identity (Wiessner 1990: 107). Importantly, the formal stylistic analyses need to be coupled with ethnographic studies in order to move beyond superficial comparisons of styles (cf. Brady & Bradley 2014: 371 and The Southwest Gulf Country Rock Art Project). This is seen in Chapter IX as part of the discussion on clothing and ethnography. In comparison to Wiessner's conceptualisation of emblematic and assertive style (Wiessner 1983) as active, James Sackett's model of isochrestic and iconological style (1982; 1990) posits that style is passive and resides in functional or decorative features. It is possible for style to incorporate both these qualities.

Similarly, in art as well as the study of its history, style "refers to the individual character an artist imbues into the work of art, combining personal interpretation and choices within the rules regulating the artistic expressions of a specific period and context" (Sanz 2008: 103). Inés Domingo Sanz (2008: 99), using examples from Levantine rock art in Spain, illustrates how the art holds characteristic marks of its maker/s. These characteristic marks can be compared to what B. Smith (1998) calls choices in his notion of the inverse picture problem (B. Smith 1998).

Certain wishes or solutions to the picture problem are commonly, even invariably, adopted with regard to similar picture problems when they are repeated. How the painters of rock art created these images is referred to as the 'picture-making problem', and archaeologists are correspondingly faced with the 'inverse picture problem' (B. Smith 1998). An archaeologist attempts to find which decisions were made by the artist/s by analysing the image itself. For example, the archaeologist needs to ask why was the image placed at that location in the landscape, or on the rock surface? What pigments, if any, were used? What implement and method did the artist(s) use?

In the inverse picture problem, if a picture is naturalistic, as is most of fine-line rock art in southern Africa, then the form of the picture, generally "follows the form of the subject it represents" (B. Smith 1998: 212). The many characteristics of the three-dimensional subject are reduced to the fewer characteristics of the two-dimensional picture. Insofar as picture-making entails the representation of three-dimensional things by two-dimensional images, those absolute rules of geometry include an unchanging range of possibilities (Steyn 1995; Chippindale 1996: 13; B. Smith 1998). With regard to geometric rock art, the possibilities are fewer still. The picture-making process involves decisions that are informed by one or more actions. With each step, the number of choices in each decision is limited and limiting (B. Smith 1998: 213). How the artist explores this process is prescribed by her or his awareness of how past artists have treated the same problem.

This creates complexes of locally interacting groups of artists, in time and space (B. Smith 1998: 214; Lesure 2005: 244; cf. Davis 2011: 96). These groups create art that will visually look alike and therefore can be identified stylistically. It is this identification of style, that Davis (2011: 96) calls stylisticity, which allows the researcher to see the same stylistic elements as the artist saw them, and represented them to other groups.

5.6. Discussion

The historical background of stylistic analyses in southern African rock art helps us to see the bigger picture – which is that style and stylistic analyses have actively been avoided. Casting a wider net, the international debates over style have provided interesting ideas and applications of style in rock art.

Style is used as both a theoretical and analytical method. In terms of the analysis of style, style compares stylistic elements, looking at similarities and differences in motif characteristics, both temporally and spatially, and groups these elements into categories. Theoretically, these styles were likely meaningful to the peoples of the past, indicators of group intra- or inter-regional identity, and implanted in broader networks of associations and meanings. Using ethnographies researchers can attempt to piece together interpretations of these styles.

The interpretative turn in southern African rock art studies, in terms of the shamanistic explanation, has led researchers to avoid preoccupation with the concept of style. By advocating for style, one is not attempting to diminish the

wealth of insight into the meanings of Bushman rock art that the shamanistic approach has unveiled. The study of style is rather an alternate or parallel, approach, that allows researchers to understand the differences and similarities within areas containing rock art, with the intention of replicating similar studies in other areas, and later to make comparisons between styles. The benefits have outweighed the criticisms, and there is no legitimate reason not to use stylistic analyses in southern African rock art. In the next chapter, style as method and theory is combined with the theory of embodiment, the better to illuminate the link between the body, clothing and interaction in the rock art of the Makgabeng.

VI. Embodiment Theory: The Body And Style

In the previous chapter, the feasibility of conducting a stylistic analysis of rock art in southern Africa was discussed. Embodiment theory supports stylsistic analyses, in that it provides further theoretical weight to the study, which underlies interaction with regard to specific cross-cultural motifs in the Makgabeng. These cross-cultural motifs – stand-alone aprons and loincloths, geometrics, finger-dots, finger-strokes, rubbings and handprints – comprise depictions of repeated subjects and actions, using different techniques. The motifs facilitate our understanding of how various groups were interacting. All the motifs concern the body – the body adorned and the body in space.

6.1. Body theory

There is no single comprehensive social theory or model for the conceptualisation of the body. Needless to say, inter-related positions (e.g. embodiment, phenomenology, biopolitics and biopower) exist which consider the theorisation of the experience of the physical body within the social constraints of society (Blacking 1977; Viveiros de Castro 1998; Blundell 2004; Agamben 2005; Cisney & Morar 2015).

According to postmodern thought, of which deconstructionism is a subset, the body can be conceived of as a system of signs that act as the bearer of social meanings and symbolism that express relations of power (e.g. Foucault 1977, 1978). For instance, in many cultures the female body is seen as ‘impure’ due to menstrual blood, which is considered threatening to society at large (cf. Douglass

1966). Such readings also involve power relations. In this example, the 'polluted' female body reflects the inequality between the sexes and the subordination of women. In the same vein, historically sex and sexuality were subject to systems of power during Freudian repression in the West (Foucault 1977, 1978). Systems of power were seen in institutions like prisons that operated in terms of laws, procedures and policing that were disseminated within a web-like network, as part of discursive regimes (Foucault 1977).

Drawing from semiotics, these deconstructionist approaches are typically unconcerned with the phenomenology of experience (Turner 1996: 28). Phenomenological approaches attempt to understand and describe things as they are experienced by the subject (Tilley 1994: 12). The phenomenology of the body pertains to "the environment of the self […] and therefore something acted upon as part of the experience of selfhood" (Entwistle 2000: 332).

Phenomenological aspects of the body are commonly rejected, or criticised, as being individualistic and subjectivist (Turner 1996: 28). The irony of such a critique is that in recognising the body as a critical topic of contemporary thought, deconstructionists "deny the facticity and givenness of the body" (Turner 1996: 28). The lived body is side-lined while the text is privileged as the pervasive topic of research (Entwistle 2000: 332; Waskul & Vannini 2006). Michel Foucault (1977, 1978), for instance, focuses solely on what is done to the body, what is symbolically inscribed on the body, rather than on what the body does.

Similarly, until recently most archaeology of the body has viewed the body as inscriptive (Joyce 2005: 152). For instance, Tim Yates (1993) conducted a quantitative study of 2 500 individual panels of rock carvings thought to have been produced in the Bronze Age on the west coast of Sweden. He found that the second most common motif is the male body (Yates 1993: 32). Within the corpora of male figure motifs, certain physical features (such as calf muscles and phalli) are repeated and isolated, detached from other imagery. For Yates (1993: 64), the isolated body parts signify symbols of masculinity and were conceptualised by Bronze Age engravers as achieved rather than ascribed (Yates 1993: 64). Yates (1993) does not provide information on how such features changed across time and space.

Clothing, or costume, in artworks has also been viewed by archaeologists as confirmation of particular status, with the implied understanding that the surface of the body is public (Eastwood 2005: 6; Joyce 2005: 142; Fortis 2010). Eastwood (2005: 1; 2006: 31) examines figures in terms of age categories, body representation, clothing and grouping in an attempt to understand human female motifs (Chapter IV).

In these two examples, masculinity and age groups are read off the body, which assumes that the body is a public, inert object waiting to be marked with meaning (Entwistle 2000: 333; Joyce 2005: 144). Some authors (Entwistle 2000; Fisher & Loren 2003; Joyce 2005) have shifted attention away from the body as passive, towards the body as embedded in daily perceptions and practices (Entwistle 2000:

333). “It is the experiences of the body in the landscape, constituted through material culture in [everyday] praxis and [located] in the discourse of bodily representation, that [outlines] the lived experience of the body and that informs us about constructions of identity” (Fisher & Loren 2003: 227).

A sociological notion of the body embraces the idea of phenomenological experience of embodiment and the facticity of our place in the world (Turner 1996: 33). An embodied notion of the ‘social actor’ and a comprehensive perspective of how the body image functions in social space, are crucial elements in an authentically sociological appreciation of how images of the body and clothing enhance the occupation of social space and interaction with others (Turner 1996: 33). Contemporary theories view the body as a second skin, a layer between the physical and the social body – not simply a reflection of the social structure, but manipulating and recreating identity through time and in space (Joyce 2005: 143; Lesure 2005: 241; e.g. Meskell 1999; Cisney & Morar 2015; Weismantel 2015).

A good example of phenomenological experience of embodiment applied to rock art is Geoffrey Blundell’s *Nqabayo’s Nomansland: San Rock Art and the Somatic Past* (2004). Between 1992 and 2004, Blundell visited over 134 sites in Nomansland in the south-east Drakensberg as well as 16 sites in adjacent areas. In his book, Blundell (2004) uses ethnographic and historical sources, together with the formal aspects in the rock art from Nomansland, to make conclusions regarding specific enigmatic representations of the body. These, he argues, were

more prevalent during the turbulent colonial period when Nomansland became one of the last refugia of the southern Bushman groups (Blundell 2004: 29).

In his search for changes in represented somatic experiences in the rock art of Nomansland, Blundell (2004) neither viewed the rock art with a preconceived model, nor ascribed *a priori* meaning, to the body.

Blundell (2004) used the notions of embodiment and somatic experience effectively to distinguish between shamans in trance and other bizarre figures, mainly *//gauwasi* or spirits of the dead. From the ethnographic reports, these spirits, which are seen by shamans in trance, can be extremely dangerous, since they are believed to usher in disease, malnutrition, disorder and death (Blundell 2004: 97). It is the task of shamans in trance to dissuade spirits of the dead from bringing disease or entering camp to kill the living (Marshall 1999: 87). The functions of living shamans and shamanic spirits of the dead "are thus inverted and it is in the embodiment of these opposite functions", such that we discover the criteria with which to discern images of living shamans and of spirits of the dead in rock art (Blundell 2004: 97).

Another convention that arose in the final period of the Drakensberg paintings is a nuanced depiction of shamans. Blundell (2004: 156) suggests that an evolution in somatic depiction occurred, passing from significantly differentiated figures (SDFs), seen in Figure 6.1, to large-headed, significantly differentiated figures (LH-SDFs) and ending with images of heads without bodies.



Figure 6.1: Significantly Differentiated Figure (SDF) in the centre of a trance dance. Notice the prominent facial features and size of head painted in intricate detail (Blundell 2004: 137, Fig. 59)

Blundell (2004: 156) links these somatic changes to the increasing creolisation of groups of people in the area of Nomansland, commensurate with the arrival of peoples such as Bantu language speakers, escaped slaves, travellers and shipwreck survivors.

Agency through the body shows how, during intense social interaction and stress in Nomansland, the body depicted changed from full-size paintings to depictions of only the post-cranial body, with cranial and facial features enlarged and emphasised (Blundell 2004: 156). This form of 'portraiture' arose as shamans gained power. These changes in representation reflect social changes over time

and across space, which allowed powerful shamans to represent themselves in new ways, mirroring their rising social status (Blundell 2004: 156). Thus, shamans were attributing a type of personal and individualistic authorship to the art.

In rock art depictions, outside of Nomansland, self-fashioning and agency does not only concern somatic experience, but also includes how clothing shapes one's understanding of the self and others. In the Makgabeng, representations of clothing, worn and represented in plan view (as if seen from above), are prevalent. Moreover, clothing motifs are seen across the landscape in different styles. This suggests that interaction between peoples inter- and/or intra-groups and material occurred. Humans are social "actors and makers that co-create the world with other beings and things" (Weismantel 2015: 142). Theories around clothing and the body, adorned and in space, proved useful in conceptualisulising specific encounters of interaction between groups.

6.1.1. The body adorned

In the Makgabeng, clothing forms a substantial portion of repeated cross-cultural motifs. Currently, the research on finger-painted standalone loincloth and apron motifs demonstrates that their occurences are specific to certain regions (e.g. the Northern Cape Province and the Central Limpopo Basin) (Hollmann & Hykkerud 2004). In the fine-line art, they are largely confined to the Central Limpopo Basin and the Tsodilo Hills in Botswana – regions where the art comprises a numerically significant image class (Eastwood & Van Schalkwyk 2002: 33;

Eastwood & Eastwood 2006). In both regions, the motif is said to be directly associated with finger-paintings of aprons. Moreover, it is argued that the Central Limpopo Basin, fine-line paintings overlie and underlie finger-painted paintings, thereby suggesting a long period of co-existence between groups in the landscape.

Why are motifs of clothing used by these two groups? The role of self-fashioning and clothing in society is so pertinent that it would not be surprising to see a clothing motif acting as a mediatory motif between, or within, groups. The two groups may share clothing imagery as a result of the identity-constructing qualities of clothing; the ways in which clothing can be used to conform, oppose, emulate and mark seminal events in life (cf. Wiessner 1990: 107). Erving Goffman (1959) makes a similar argument about non-verbal communication between strangers. Strangers' perceptions of each others' character are influenced by their perception of another's clothing. Human behaviour is thus reflexive and self-monitoring.

In terms of interaction, clothing is considered an extension of the body (Schilder 1935: 203). It is situated "at the margins of the body and [delineates] the boundary between self and other, individual and society" (Entwistle 2000: 327). Clothing at the margins communicates social identity and signals to others their social roles, which could correspond to crucial differences, or similarities, in class, status, sex, age, wealth or ethnicity (Entwistle 2000: 337). The signifying capacity of dress can help bind identities together, but it can also differentiate (*ibid.*). However, the social roles signified through dress are always contextual, which often constrains

how appropriate, or inappropriate, something is to wear (Entwistle 2000: 328). As much as we would like to think we dress as individuals, clothing is rather a reflection of social structure (Waskul & Vannini 2006: 26). Much "of the information that we have about ourselves is arrived at by way of communications of others" (Waskul & Vannini 2006: 27). "The I does not see itself and we are therefore reliant upon others to reflect back information about ourselves" (*ibid.*). It is with the production and maintenance of bodies in everyday life practices that the social structure is recreated and sustained over time (Turner 1996: 25).

6.1.2. The body in space

In rock art sites the viewer's vantage point is commonly presumed to be solely a matter of vision (Achrati 2007: 49). Vision in Western post-Enlightenment thought is often upheld as paramount, but this overlooks the non-visual and the importance of touch and haptics (Achrati 2007: 49; Ouzman 2001). With vision, one's awareness of self "is one of location in space" while with touch, one's awareness is embodied (Hopkins 2004: 160; Achrati 2007: 49).

Likewise, viewing an artwork involves the separation of space as we stand looking at a rock panel, but with touch, the space between the rock art and ourselves collapses and we are left with spatial contiguity – the art is "in the same place as part of ourselves" (Hopkins 2004: 149; cf. Weismantel 2015). "In rock art, the layers of sensing between the artist's body and the surface of the rock becomes the medium wherein sensory exchanges take place, and the equivalency between the skin (hand) and the surface of the rock is established" (Achrati 2007:

53). These ideas have been applied to rock engravings in South Africa, where many instances of rubbing and touching the substrate have occurred (Hollmann 1993, 2011; Ouzman 2001).

Many engraved and painted images on rocks in southern Africa show residues or marks of intentional touching, cutting and rubbing (Yates & Manhire 1991; Hollmann 1993; Lewis-Williams 1995). Some engravings even look as if they have been rubbed repetitively for generations (Ouzman 2001). Sven Ouzman (2001) has studied such engravings authored by the Bushmen. As the rock surface represents a veil between this world and the spirit world, so "the engraved image resides either in the spirit world or in an ambiguous space between worlds", making it a potent object (Ouzman 2001: 245). By rubbing them, people could acquire the potency they embody (Ouzman 2001: 245). This process enabled a "powerful and visceral engagement with image, rock and spirit world beyond" (*ibid*.). Such touching of the engravings is reminiscent of another example of harnessing potency, but from paintings.

'M', or Maqhoqha, a first-generation *!Ga !ne* descendant from the Tsolo district in the Eastern Cape is the daughter of Lindiso, who is thought to be a painter and a rain-maker (Jolly 1986: 8). In her testimony to Pieter Jolly (1986) and David Lewis-Williams (1986), M describes how her ancestors, the Bushmen, would approach rock paintings with arms and flat palms outstretched to harness their potency (Jolly 1986: 8). Based on this testimony, Thomas Dowson and Anne

Holliday (1989: 47) argue that dancing shamans would face the art and potency would be transferred to them.

Finger-dots, finger-strokes, rubbings and handprints are motifs and actions that are common phenomena in the Makgabeng, with many of the larger sites having hundreds of finger-dots and strokes in different arrangements. The importance of the non-visual and touch in rock art can provide insight into the function of rock art sites and their ritual connection to place. The body in space (spatial embodiment) and the experience of that space through the senses and actions (sensorimotor schema) are key to understanding the meaning of these motifs in the the rock art of the Makgabeng (cf. Hopkins 2004: 160; Achrati 2007: 49). Travelling between rock art sites would have required sustained bodily and mental engagement with others, their beliefs and the landscape (Ouzman 2001). The authorship of motifs that involve touching (i.e. handprints) can reveal something about the nature of a group's interactions with others on the landscape. Moreover, because of their documentary nature, the motifs may provide the researcher with information concerning the physiological features of the makers (Lahelma 2010: 55). "In vision we are aware of ourselves as located, occupying a position in space, but in touch, we are aware of ourselves as embodied" (Hopkins 2004: 160 as cited in Achrati 2007: 53).

6.2. Style as middle-range theory

In the previous chapter, examples were provided of how style can be conceived of as 'ways of doing', which often became second nature to the makers (Lesure 2005: 241). Ways of doing can move "contextually from conscious to unconscious, thus creating a tension between active and passive use of style" (*ibid*.). These themes, so salient in the style literature, are also pertinent to embodiment theory, where the discourse on style acts as a middle-range theory, linking human behaviour or ways of doing, and the theoretical and interpretative field of the body and clothing to the physical remains in the archaeological record (Lesure 2005: 242).

Like style, adornment is communicative and this serves crucial functions in human lives (Roach & Eicher 1979: 20). Dress is used as a "facility in social rituals and as a reinforcement of beliefs, customs and values" (Roach & Eicher 1979: 21). The way people do things, in terms of art or dress, is as a result of practice. How they negotiate their realities in much the same way as style is actively negotiated. For instance, the stylistic signals in making clothing in Wiessner's studies (1983, 1984) are similar to how the creation of rock art motifs, depicting clothing, would be painted with specific choices made and in negiotation with others. A link between the creation of art and the adornment of the body is evident within the reviewed ethnographies (see Chapter IX).

Following Pierre Bourdieu (1980) and Tim Ingold (2000), cognition may be conceptualised as something that does not occur in the brain, where outcomes are

"representations that bear some complex relation to the world outside, but rather [cognition can be seen as] a social activity that is situated in the nexus of ongoing relations between persons and the world, and that plays its part in their mutual constitution" (Ingold 2000: 162). Therefore, the Cartesian dualities between body and mind, subject and object, do not exist. This is likely the case in indigenous non-Western understandings of the self (*ibid.*). The self has been theorised by Ingold (2000: 103) as relational. The self exists, or rather, becomes, through the relations of a being's positioning in the world, 'being in the world', its encounters with the environment and other selves along these relational pathways (Ingold 2000: 103). Building on this foundation, Ingold (2000: 90) argues that all organisms in the environment, both human and non-human, are beings and not things. We are not outsiders looking in at nature but participate within and form part of it. Furthermore, style and the body are involved in the physical touching of the rock surface to form handprints, finger-dots and other markings. These acts of 'leaving a mark' on stone, creating a bridge between the symbols on the body and those on the rock art, are stylistically significant.

6.3. Discussion

In this section, it has been illustrated that embodiment theory is useful and provides examples on the sociological notion of the body adorned and in space. First, the phenomenological experience of embodiment and our conceptualisation of 'being in the world' was discussed. Embodiment theory is used to understand interaction between groups and how the body is used in identity negotiation and formation. Second, clothing is understood to be at the margins of the body and

thus, a way people communicate identity and differences and similarities in class, sex, age, status, wealth and/or ethnicity. Third, the physical experience of rubbing and touching the rock surface and the importance of the non-visual is important, in that it provides insights into the function, authorship and meaning of the rock art within specific contact zones.

When attempting to understand these contact zones, style as defined as 'ways of doing' can provide evidence, as well as bolster, the theoretical underpinnings of embodiment theory.

A valuable feature of stylistic analysis is that it can act as a middle-range theory, bridging the gap between theory, on the one hand, and the physical data, on the other. This is particularly relevant when the definition of style comprises 'ways of doing' and praxis, which are similar in outcome to the way people experience the body and dress. Both are used in social interaction and as social strategies to negotiate social space.

The next chapter will unpack the methodological and technical aspects of conducting a stylistic approach. In particular, previous research, surveying techniques, data collection and processing, statistical analyses, geographical information systems (GIS), superimpositioning studies and the use of ethnographic analogies, are discussed.

PART 4

VII. Method: Stylistic Analysis – Variations in Time and across Space

This chapter focuses on the research methods used in this thesis. Whereas Chapter VI discussed the theoretical aspects of style, this chapter examines style as an analytical tool – in other words, it deals with the way style is used to analyse the differentiated distribution of sets of variables within and between sites in time and across space. How the corollary methods of statistics, geo-spatial (GIS), superimpositioning studies and ethnographic analogy have been used to support the stylistic analysis is detailed.

7.1. Previous surveys

Eastwood extensively surveyed the Makgabeng area, a process which he documented and interpreted in 10 unpublished reports. His surveys of 20 farm properties were conducted between 2001 and 2006, with more than 660 sites found (Eastwood 1994,1999, 2002a). Eastwood also drew up typologies of common imagery and traced selected images (Eastwood & Van Schalkwyk 2002: 10).

7.2. Sampling strategy

Using these reports, 44 of the sites were visited, during two field seasons (5-15 April, 8-15 June 2013), 35 of these sites mapped and analysed (Fig. 7.1; Table 7.1). The sample was chosen using a stratified random sampling strategy (Renfrew & Bahn 2004: 81). The sample evenly covered the whole of the

Makgabeng. More sites were chosen in the gorge, due to that area having a larger concentration of sites compared to other areas (Fig. 7.1). Only sites with a combination of finger-painted and fine-line paintings were included in the sample. Each property is, on average, 30 km². These properties occur on either side of the central gorge that divides the Makgabeng plateau and provides sheltered places, ideal for rock paintings.

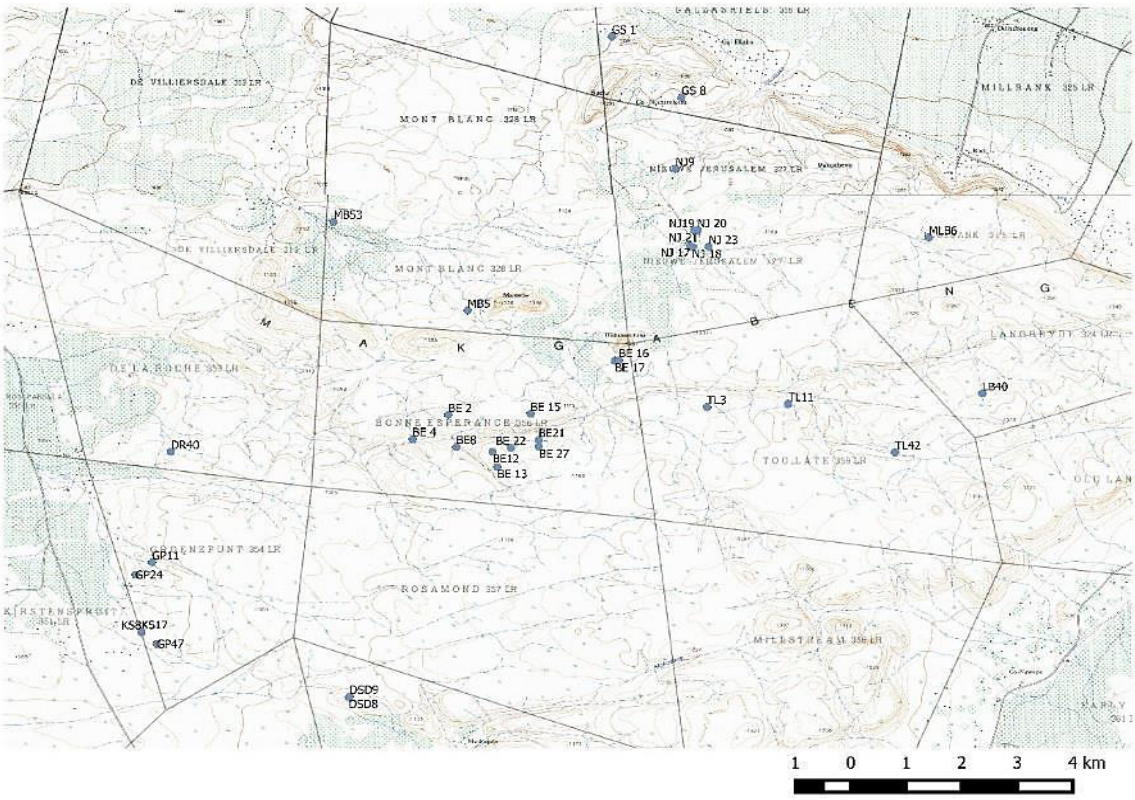


Figure 7.1: Map of sites with property names

Table 7.1: Tabulated list of sites analysed with site ID, farm name, co-ordinates and bearing

Site ID	Farm name	Co-ordinates	Bearing
BE2	Bonne Esperance	23° 17' 26.88''S 28° 49' 45.06''E	West
BE4	Bonne Esperance	23° 17' 42.72''S 28° 49' 22.44''E	West
BE8	Bonne Esperance	23° 17' 47.82''S 28° 49' 50.16''E	West
BE12	Bonne Esperance	23° 17' 51.00''S 28° 50' 13.26''E	West
BE13	Bonne Esperance	23° 18' 0.96''S 28° 50' 16.14''E	North-west
BE15	Bonne Esperance	23° 17' 26.16''S 28° 50' 37.20''E	South-east
BE16	Bonne Esperance	23° 16' 51.18''S 28° 51' 33.18''E	South
BE17	Bonne Esperance	23° 16' 51.48''S 28° 51' 30.72''E	South
BE21	Bonne Esperance	23° 17' 43.32''S 28° 50' 42.36''E	South
BE22	Bonne Esperance	23° 17' 48.42''S 28° 50' 24.72''E	North-east
BE27	Bonne Esperance	23° 17' 47.70''S 28° 50' 42.60''E	South-west
DSD8	Disseldorp	23° 20' 31.26''S 28° 48' 42.00''E	North-west
DSD9	Disseldorp	23° 20' 31.08''S 28° 48' 42.42''E	North-west
MB5	Mont Blanc	23° 16' 18.66''S 28° 49' 57.36''E	North-east
MB53	Mont Blanc	23° 15' 20.70''S 28° 48' 32.30''E	South-west
KS8	Kirstenspruit	23° 19' 48.90''S 28° 46' 30.30''E	North
KS17	Kirstenspruit	23° 19' 48.66''S 28° 46' 30.36''E	West

GP11	Groenepunt	23° 19' 3.24''S 28° 46' 37.14''E	South-west
GP24	Groenepunt	23° 19' 11.40''S 28° 46' 26.64''E	East & West
GP47	Groenepunt	23° 19' 56.70''S 28° 46' 40.08''E	South-east
DR40	De la Roche	23° 17' 51.00''S 28° 46' 49.20''E	East
GS1	Gallashiels	23° 13' 19.68''S 28° 51' 28.80''E	East & West
GS8	Gallashiels	23° 13' 59.40''S 28° 52' 13.02''E	East & West
NJ9	Nieuwe Jerusalem	23° 14' 46.02''S 28° 52' 9.02''E	North
NJ17	Nieuwe Jerusalem	23° 15' 36.24''S 28° 52' 18.36''E	North
NJ18	Nieuwe Jerusalem	23° 15' 37.32''S 28° 52' 19.92''E	East
NJ19	Nieuwe Jerusalem	23° 15' 26.28''S 28° 52' 21.24''E	West
NJ20	Nieuwe Jerusalem	23° 15' 26.22''S 28° 52' 22.98''E	West
NJ21	Nieuwe Jerusalem	23° 13' 26.46''S 28° 52' 23.14''E	West
NJ23	Nieuwe Jerusalem	23° 15' .16.50''S 28° 52' 29.40''E	North
TL3	Too Late	23° 17' 21.78''S 28° 52' 29.16''E	West, North-east, South-east
TL11	Too Late	23° 17' 19.68''S 28° 53' 20.58''E	East
TL42	Too Late	23° 17' 51.36''S 28° 54' 28.38''E	South
LB40	Langbryde	23° 17' 12.90''S 28° 55' 23.76''E	North-east
MLB6	Millbank	23° 15' 30.96''S 28° 54' 49.92''E	West

7.3. Field recording

At the sites, 300 dpi resolution colour photographs were taken, using either a Nikon D300™ or a Nikon D300s™ single-lens reflex digital camera. Photographs were saved as large uncompressed TIFF files, which do not lose quality when sections of the photograph are magnified, and this enabled easy manipulation once

uploaded to the computer. Where appropriate, the standard IFRAO scale bar was used to determine the size and sharpness of the image (Bednarik 2004). In time, these photographs will be stored and digitilised by the South African Rock Art Digital Archive (SARADA) at the Rock Art Research Institute (RARI). Researchers will be able to view the photographs online and can access, with appropriate permission, high-resolution images.

7.4. Site recording forms

At each rock art site, individual motifs were examined. In the formation of categories for the site recording form, neutral terms and non-interpretative language were used to maintain a level of objectivity. However, the recording of data is not wholly objective, and a degree of interpretation and subjectivity is involved when creating even the simplest classifications.

Before identifying styles from motifs that share visual characteristics, these attributes should "be defined and analysed so that the validity of superficial identification can be examined and comparisons made between figures, sites or units" (Maynard 1977: 387). This forms an agreed nomenclature that is a necessary foundation for this and future studies. As with the definition of style, the terms used in this methodology are clearly defined below.

7.4.1. Motifs

The smallest and most common unit of analysis is the motif, with a motif being any figure or object that often recurs within a specific arrangement of components

(Maynard 1977: 396). These recurrent motifs may vary in shape to a degree, but their simple visual organisation remains the same (*ibid*.). According to Leslie Maynard (1977: 397), motifs are the objectified expressions of mental schemata (*ibid.*: 397). A schema is an "pattern of thought or behaviour that organises categories of information and the relationships among them" (*ibid*). Importantly, the standardised pictorial forms which are derived from constant schemata, will be consistent within and between groups (*ibid*.). Schemata or motifs form the basis of the typology.

The motif typology was created with information obtained, using a detailed site recording form for each site (Table 7.2). The form is divided into seven sections. The first section consists of the recorder's details together with the time, date and weather conditions.

Table 7.2: Example of the site recording form used for each rock art site in the Makgabeng

Makgabeng, Limpopo Rock Art Recording Form		
RECORDER DETAILS		
Person/s recording:		
Date of visit:	Time:	Weather conditions:
SITE DETAILS		
Site name:	Alt. site names:	
Map reference:	District:	
Panel no:	Altitude (m):	Accuracy (m):
WGS 84/World Mercator CRS S: E:	Site size: N-S X E-W (metres) Associated archaeological assemblages or surface finds:	
ROCK ART INFORMATION		
Rock art context: Rock shelter ☐ Cliff face ☐ Boulder ☐ Rock outcrop ☐ Other ☐		
Engravings ☐ Paintings ☐ Painted engravings ☐		
Engraving technique: Incised ☐ Pecked ☐ Scratched ☐ Other ☐		
Painting technique: Finger-painted ☐ Fine-line ☐		

Makgabeng, Limpopo Rock Art Recording Form			
Known traditions: Bushman ☐ Khoekhoe ☐ Bantu language speakers (Northern Sotho) ☐ Settler ☐ Other ☐			
Aspect (the direction it faces):	Estimated number of motifs:		
Main pigment colour/s are:	Manner of depiction or technique:		
Photo log numbers:			
Superimpositioning? Yes/No A: over B: over C:			
What is superimposed over what?			
Subject matter or iconography:			
PANEL THEMES/ASSOCIATIONS/ACTIVITIES			
MOTIF COLOUR			
Colour method: Monochrome ☐ Bichrome ☐ Polychrome ☐			
Main colour pigment:			
Outline:	Fill:		
MOTIF SHAPE			
Shape types: Anthropomorphic ☐ Zoomorphic ☐ Geometric ☐ Arboreal ☐			
ANTHROPOMORPHIC			
Head shape:	Body shape:	Arms:	Legs:
Material culture (kit):			
Clothing: Worn:	Standalone:	Primary sexual characteristics?	
Posture:	Angle: Side ☐ Front ☐ Back ☐	Twisted perspective: Yes/No	
ZOOMORPHIC			
Head shape:	Body shape:	Front limbs:	Back limbs:
Posture:	Gendered characteristics:		
Angle: Side ☐ Front ☐ Back ☐			
GEOMETRIC			
Shape/s:			
COMMENTS/NOTES/ADDITIONAL DRAWINGS			

Information for the second section – the site details – was collected with the aid of a Garmin eTrex® 10 GPS and a tape measure. The name of the site was given together with any alternative names. The map reference referred to the map sheet used, which correlated with a 1:50 000 map of South Africa. Recorders such as B. Smith and Van Schalkwyk had used these maps and plotted previously visited

sites. The district in which the site is found and the co-ordinates were logged. The co-ordinates recorded by Eastwood were expressed as both decimal degrees and degrees, minutes and seconds, and were easily adjusted using a mathematical formula to just using degrees, minutes and seconds. The GPS also provided the altitude, in metres above the geoid, of each site. A compass was used to determine the aspect or direction in which the shelter faces.

The panel, "defined as the imagerycontained within or immediately adjacent to a rock art shelter or contiguous imagery located along a cliff face with no more than four metres between painted surfaces" (Boyd 2003: 26), was studied and the overall colour method was noted, assessing whether most of the motifs were mono-, bi- or polychrome. The main colour used was also recorded. If the site consisted of more than one panel, the size of each panel was documented. In addition, the size of the shelter was measured and recorded in metres, using a tape measure. Shelter size is important in terms of stylistic communication, since audiences would differ depending on the size and accessibility of sites. Larger sites could have been living or working spaces, while smaller sites may have had a smaller reception (Clegg 1977: 263). This section of the form ends with the question of whether any surface archaeological material was found.

The third section focuses on the rock art itself. On what type of geologic feature does the art appear? Is the rock art an engraving, a painting or a painted engraving? If a painting, was it painted using a fine-line brush or a finger? If an engraving, was it scratched, pecked or incised? The main colours of the site are requested again but with the intention, here, of the recorder being more thorough

and noting down all the pigments used. A Munsell soil colour chart was not used due to the high degree of error and subjectivity using Munsell colour codes (Ruiz & Pereira 2014: 344). Subjectivity, was reduced by using online applications. The total number of motifs was jotted down. For each site, photo logs were kept. Any superimpositioning was recorded, together with what subject matter occurs under and above motifs. This provided a relative dating technique where the most recent layer is identified as being on top and the oldest on the bottom. Lastly, the overall subject matter, or predominant iconography, for example whether human figures or animals dominate, was noted. Following Eastwood's reports, information regarding which known rock art tradition to which the images belonged was completed. However, as the project progressed, this category became problematic in the light of this thesis's aim of reviewing categories that link ethnicities to rock art. The complexity of the history of interaction in this area disallows an essentialised view of identity since the fluidity of identity is demonstrated by the many identities interacting in this area and the shared motifs of many of the rock art styles.

The fourth section outlines the panel themes, associations or activities, such as figures with bow and arrows, a hunt or a dance. This section provides space for descriptions of what Lewis-Williams and Pearce (2009: 43) term scenic relationships, which form symbolic systems. Scenic relationships are occurrences where actions hold images together (Lewis-Williams & Pearce 2009: 43). It is through scenic relationships that researchers can track changes in rock art. These conceptual relationships are how the artists made sense of panels, and thus they

offer an avenue for rock art researchers to gauge whether change occurred due to interaction.

The fifth section looks at the individual motifs in greater detail, focusing on which colour/s and colour method were used in each motif, and whether the motif was outlined and filled in.

The sixth section comprises the shape typology, which is divided into four sub-sections: anthropomorphic, zoomorphic, geometric or aboreal. For anthropomorphic or human motifs, there is space on the form for drawing and/or describing the shape of the head, body, arms and legs. Any material culture or kit such as bows, arrows or staffs could be drawn or described, if applicable. A figure holding a quiver of arrows was considered part of one motif rather than two, since it formed a unified theme. Clothing plays a major role in the project's objectives and therefore space is provided for drawing, and/or describing, the clothing worn. Stand-alone or free-floating articles of clothing were also recorded. Primary sexual characteristics, such as the observation of male and female sexual organs and/or breasts, were listed. The figure's posture or position was listed, such as whether he/she is seated, leaning, standing or dancing. The angle or perspective of the figure was chronicled. Lastly, whether the figure was depicted in a 'twisted' perspective – for example, the legs being shown in profile while the head, torso and arms are shown in frontal view. For zoomorphic or animal motifs, the same information used in the anthropomorphic section was required, bar the variables – material culture, clothing, primary sexual characteristics and twisted perspective.

For geometric motifs, space on the form is available for drawing or describing the shape/s of the geometrics. Lastly, arboreal motifs recorded were representations of trees and/or plants or foliage.

The seventh section allows the recorder to add comments and additional notes and/or drawings. The last two pages of the recording form have reference tables of common imagery recorded by Eastwood and Van Schalkwyk (2002: 32, 53-55).

7.5. Input of information into a digital database

The site recording forms were collated and the information, together with additional data from photographs, was added to the data editor in IBM's *Statistical Package for the Social Sciences* (SPSS) 17.0 (Appendix A). SPSS is a suite of programs that can help social scientists to analyse, manipulate and display data (Landau & Everitt 2004: I). The data editor is made up of two windows – a data view window and a variable view window. The data window resembles a Microsoft Excel spreadsheet and allows a user to enter variables into the data editor. A total of 50 variables (nominal and scale) were accessed with 45 nominal variables attached in Appendix B. All variables with examples are provided in Table 7.3. The most objective variables were chosen. Together with the attributes and variables recorded, photographic evidence was collated.

Photographs shot in the field were combined with photographs taken primarily by Eastwood and B. Smith, available on the South African Rock Art Digital Archive (SARADA) at http://www.sarada.co.za/. At this point image-enhancement software was used. High-tech programs such as the *CPED* program designed by

Kevin Crause have yielded excellent results, but at this stage the logistics and costs are unfeasible for use on a large project (Hollmann & Crause 2011). Instead, a popular free image-enhancement plugin for *ImageJ*©, called *DStretch*®, was used. Unlike other such software, *DStretch*® was designed by Jon Harman in 2005 specifically for the enhancement of digital pictograph images (Harman 2005). Field experience has proven that it works especially well in areas such as the Makgabeng. *DStretch*® uses algorithms that decorrelate "colour bands via transformation into alternative colour spaces", after which "performing a contrast" or 'stretch' emphasises the differences (Gunn *et al.* 2010: 132; see Alley 1996). In simple terms, decorrelation stretching highlights differences in a photograph too subtle under normal light conditions to be perceived by the naked eye.

The three examples below illustrate the advantages of using *DStretch*® image enhancement in the rock art of the Makgabeng. First, a human figure identifiable on this panel from the property, Bonne Esperance, has faded due to flaking and erosion of the rock substrate (Fig. 7.2a). For fear of damaging this panel, contact tracing should be avoided and *DStretch*® used instead. In this case, the LRE function in the software is used to perform a decorrelation stretch by calculating the covariance matrix of the image colours, within the LRE colourspace, and then determines the transformation. In this example, the red pigments are clear while other colours are supressed (Fig. 7.2b).



Figure 7.2a: True-colour image of a figure on flaking rock



Figure 7.2b: False-colour image of figure (LRE)

Second, the study of superimposed motifs is one of the "principal methods of developing sequences in rock art" (Gunn *et al*. 2010: 131). The Makgabeng has sites where superimpositioning and overlap are common. It is often difficult to make out any motifs when all the pigments have been overlain. A site on Groenepunt property shows at least three different colours used to depict specific motifs, with many motifs overlaying others (Fig. 7.3a).

DStretch® allows the separation of different-coloured motifs. Using the LXX function, the software performs a decorrelation stretch using a custom colourspace created by the user. In it red, orange and white motifs are clearly observed. From the false-colour image white is recognised as the most recent pigment, since it overlays both orange and red (Fig. 7.3b).



Figure 7.3a: True-colour image of superimpositioning

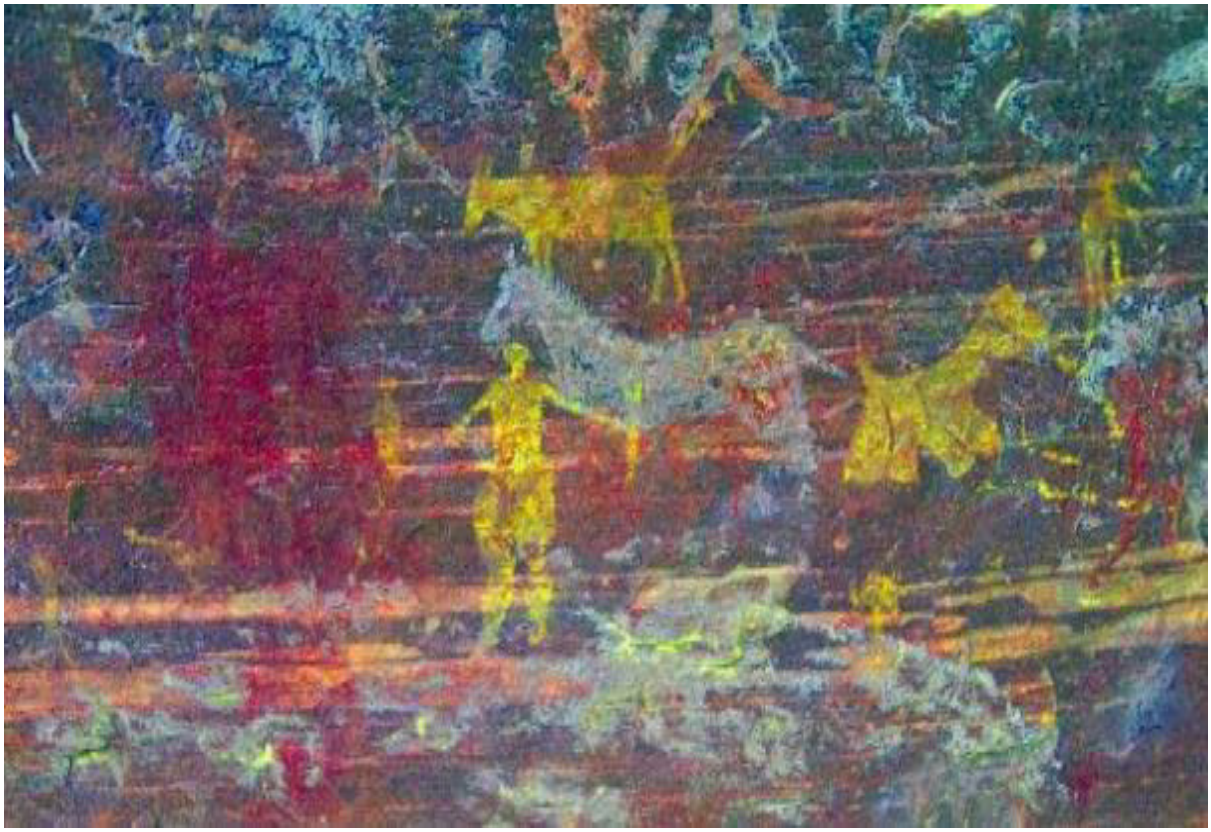


Figure 7.3b: False-colour image of superimpositioning. Enhanced image using *DStretch*® (lxx)

Orange and red seem to be contemporary, as they lie under and over one another. *DStretch*® aids researchers by allowing them to "keep the interpreted layers of superimposition separate [, which] gives an opportunity for greater analysis of regional and chronological styles" (Gunn *et al*. 2010: 131). Lastly, with *DStretch*® using an area selection, even the most indefinite motifs can be enhanced (Figs. 7.4a and 7.4b).



Figure 7.4a: True-colour image of a small selection from Groenepunt property



Figure 7.4b: False colour image of a small selection from Groenepunt property (CRGB)

By focusing on a specific delineated area of the photograph, the program uses the colours in the selection to perform a decorrelation stretch on the entire image.
In this example (Fig. 7.4b), the CRGB colourspace was used on part of an image from Groenepunt property. CRGB colourspace is especially useful for faint red paintings.

These three examples show how fast and easy the plugin is to use, regardless of the user's expertise (Le Quellec *et al.* 2015: 56). As a rule, the original true-colour photographs are provided alongside the false-colour enhanced images, and the chosen colourspaces used in each decorrelation stretch are captioned and in brackets. This ensures that the results are reproducible and objective, which is necessary for an accurate methodology of the artistic corpus (Hollmann & Crause 2011; Le Quellec *et al.* 2015: 56).

However, like most techniques, the use of *DStretch*® has limitations. Firstly, the user may unintentionally omit data by supressing some colours to allow others to stand out (Le Quellec *et al*. 2015: 58). Secondly, the risk of pareidolia is high when image-enhancement software is used for a long time (Le Quellec *et al*. 2015: 63). Pareidolia is defined as the imagined perception of a pattern or meaning where it does not exist, for example clouds taken as resembling animals or facial features seen on the moon's surface. However, looking at enhanced digital images is unlikely to be any more of a risk for pareidolia than looking at true-colour photographs of rock art for prolonged periods.

Lastly, as other researchers using image-enhancement software have noted, when analysing superimpositioning some colours "are more intense and tend to show through overlying layers, while others adhere badly on a pre-existing tint" (Morwood 1980: 104). If there was uncertainty over cases of superimpositioning, the specific instances were mentioned in the SPSS spreadsheet, under 'Comments'.

Several key categories on the SPSS spreadsheet require elaboration. With regard to colour, instead of using subjective terms that vary from recorder to recorder, a number of standardised colour systems and codes were used. The first colour system under 'Colour description' uses an online application that provides standard names for over 1650 colours (Mehta 2007). Another standardised colour system under 'Colour description (second colour)' uses HTML colour codes, which are hexadecimal triplets representing the amount of red, green and blue (RGB) that is in each hue and is written in code. For example, black is written as #000000. These systems are more objective than a recorder's own terms for colours. Other colour charts, such as the Munsell soil chart, are limited and not ideal for paint colours and need to be purchased. HTML colour codes are more suited to paint colours and are freely accessible online. Even though the project strove to be as objective and accurate as possible, there were limtations and degrees of inaccuracy with this method. For example, the colours from which the colour analysis was conducted were deduced from photographs and not from the actual colour of the paint in the field. A standardised photographic protocol was not used. Rather, a subjective selection of colours was used using HTML colour codes that may not reflect the actual colours of the paint. This was necessary as time in the field was limited.

A few categories in the SPSS spreadsheet were adopted from past researchers. For instance, 'block style' is a term used by researchers working in the south-eastern mountains (e.g. Vinnicombe 1976; Pager 1971; Mazel 2009a). These researchers used the term in different ways, with little common consensus. Following Adrian

Flett and Penny Letley (2013: 6), who clearly defined the term, 'block style' motifs have a quadrangular shape with a stiff appearance and often have colours clearly separated from each other.

Superimpositioning as opposed to superpositioning is used following Lewis-Williams (1974: 100). Superimpositioning is the intentional painting of one motif over another, a procedure that is "governed by a set of rules that favoured certain combinations and avoided others" (Lewis-Williams 1974: 100). Overpainting or repainting, on the other hand, refers to a motif that is painted over another in precisely the same manner as the original, possibly where the artist wanted to finish, update, mimic or improve the original.

'Emphasis or outline' is a category that other researchers have called 'character'. In order to have character, a figure must stand out in some way (e.g. Maynard 1977: 398). This 'extra' quality may take the form of a distortion in 'photographic reality' (*ibid.*). Outline and emphasis was used, rather than character, as certain zoomorphic motifs in the Makgabeng have a partial red outline, interpreted by some as representing females' receptivity to mate (Eastwood & Cnoops 1993; Eastwood & Eastwood 2006). These features in the motifs are extra-ordinary, or beyond photographic reality, and therefore were included in this category. Some authors use this extra quality as the criterion for a specific style. However, a single criterion cannot represent a whole style. Rather, style needs to consider multiple variables and the totality of features (Maynard 1977; Layton 1992).

Motifs were separated by type, whether the motif was zoomorphic (animals), anthropomorphic (human figures and associated material culture), geometric (abstract forms) or arboreal (plant or tree) motifs. Regarding anthropomorphic and zoomorphic motif types, several questions are asked in order to gather information on the amount of detail and modelling of forms that was given to each motif. How was each part of the human figure represented? Did the figure have facial features? Were the legs painted as blocks of solid paint, or did the artist/s depict anatomically correct legs – with knees, calf muscles and thighs? The answers to these questions provide the researcher with a means to gauge how much attention and time the artist spent on a motif, hinting at the possible reasons the motif was painted in the first place.

Even cursory observation of the paintings in the Makgabeng reveals that the anthropomorphic figures exhibit common repeated postures. A technique to analyse these patterns was sought. The *Pose Tool 3D* (version 6.8.25), designed by the artist Riven Phoenix for artists by AlienThink Inc (AlienThink Inc & Riven Phoenix 1996), offered a solution. The software allows one to model any pose quickly and easily. For example, figure 7.5 shows a person with the right leg slightly back and both arms outstretched at 40° from the body. Figure 7.6 is of a figure in a common forward-bending posture with arms outstretched behind the back. Each pose was assigned a number and entered on the spreadsheet.



Figure 7.5: Pose 15 in Pose Tool 3D



Figure 7.6: Pose 13 in Pose Tool 3D

Table 7.3: SPSS spreadsheet of variables with examples

Site details	
Name	**Example**
Site	Name of the site
Altitude	The site's altitude (in metres above sea level)
Motif details	
Name	**Example/s**
Motif	Each motif is given a unique number
Technique	Pictograph: Finger
	Pictograph: Brush
	Engraving: Incised
	Handprint
	Paint smear
	Pictograph: Chalk
Motif type	Geometric Zoomorphic Anthropomorphic Arboreal
Outline	Yes No
Fill	Solid No fill Dotted
Colour method	Monochrome Bichrome Polychrome
Colour description	Brownish-red Brown
Colour description (2nd colour)	White
Colour description (3rd colour)	Raw sienna
Colour description (4th colour)	Black
HTML colour codes	FFFFFF
HTML colour codes (2nd colour)	
HTML colour codes (3rd colour)	
HTML colour codes (4th colour)	
Block style	Yes
	No
Overpainting	Yes
	No
Superimpositioning	Yes
	No
Quality of draughtsmanship	Good
	Moderate
	Poor

Emphasis or outline	Exaggerated head and facial features
	Elongated front limbs
	Elongated body and neck/tail raised
Motif shape	Curvilinear
	Quadrangular
	Angular
Size of motif (mm)	
Perspective	Profile
	Front
	Twisted
Tracing or redrawing available	Yes
	No
	Both
Photos available	Motifs found in which photos? (Photo log)
Comments	

Geometric motifs

Name	Description
Shape of geometric motif	Wavy line
	Zigzag
	Circular

Zoomorphic motifs

Name	Description
Species	Equid: Zebra
	Common reedbuck
	Kudu
	Indeterminate
Animal's sex	Male
	Female
	Unknown
Animal's posture	Sitting
	Standing
	Walking
Animal's hooves	Yes
	No
Animal's pasterns	Yes
	No
Animal's fetlocks	Yes
	No
Animal's knees	Yes
	No
Animal's hocks	Yes
	No

Animal's head and facial features	Yes
	No
Animal in mating posture	Yes
	No

Anthropomorphic motifs	
Name	**Description**
Sexual characteristics	Penis
	Breasts
Figure's feet	Yes
	No
Figure's legs	Calf muscles exaggerated
	Knees
Figure's pelvic region	Buttocks present
	Buttocks absent
Figure's torso	Square
	Double concave
	Stick-like
	Verisimilar
	Inverted triangle
Figure's arms	Stick-like
	Block-like
	Well-defined
Figure's hands	Yes
	No
	Yes, fists
Figure's head	Circular
	Not present
	Verisimilar (side profile)
	Long and conical
Figure's facial features	Yes
	No
	Chin, possible mouth
Figure's posture	Pose 0
	Pose 1
	Pose 2
Figure's coiffure or headdress	Head covering with strings hanging from the back
	Headdress with hair
	Skullcap of hair, only top of head
Material culture associated with motif	Arrows
	Two to three arrows behind the right arm
	Holding bow in right hand
	Two to three sticks/arrows behind the back

7.6. Selection of variables and analysis of database

Once the site motifs in individual sites had been recorded, differences and similarities within and between sites were noted by identifying stylistic attributes of a group of rock art images and analysing and comparing these to other stylistic units (Sanz 2008: 106). This was facilitated using statistics (contingency tables) and a cluster analysis.

7.7. Statistics

To move beyond descriptive analyses of the data, statistical tests were conducted in order to assess whether there is a relationship between fine-line and finger-painted art. Following Michael Rainsbury (2009), a series of multivariate statistical tests were used.

Multivariate analyses are well-known to archaeologists and rock art researchers (Layton 1992; Taçon, Wilson and Chippindale 1996; Bwasiri & B. Smith 2015; Travers & Ross 2016). Multivariate analyses begin with hypothesis testing and specifying a null hypothesis and an alternative hypothesis. The null hypothesis is the hypothesis of no difference while the alternative hypothesis is the hypothesis of statistical significance. In this study, the alternative hypothesis is that there is at least some connection between the fine-line and finger-painted rock art corpora. The assumption in this hypothesis is that there will be a correlation between the presence of variables within and between sites. For example, that finger-painted aprons will be present together with other motifs, found within what B. Smith and Ouzman (2005) have clustered together in the geometric rock art tradition. The

null hypothesis, conversely, will be that there is no or very little statistical significance between the two art bodies.

7.7.1. Contingency tables

In order to test the alternative hypothesis, multivariate analyses, in the form of contingency tables and cluster analyses, were conducted in IBM's SPSS 17.0. Contingency tables are used when measurements of various characteristics are made within a single sample. The total counts are placed in a table of rows and columns and are analysed using a Pearson's Chi-squared test of independence or, when the sample is too small, Fischer's exact test (Landau & Everitt 2004: 74, Box 3.1). A contingency table summarises "observations on two categorical variables" to assess "whether or not […] a relationship or association [exists] between the row variable and the column variable that make up the table" (Landau & Everitt 2004: 73-74). The Chi-square shows the frequencies of joint occurrences between two variables. These tests output p-values that demonstrate the probability (a p-value) quantifying the strength of the evidence against the null hypothesis in favour of the alternative. In appendices D through I, each test created a table. If the "Asymp. Sig. (2-sided)" or p-value for the Pearson Chi-Square statistic is less than .05, there is a relationship between the variables (Landau & Everitt 2004: 73). This means that increases or decreases in one variable significantly relate to increases or decreases in the second variable (Landau & Everitt 2004: 73).

Statistic tests were used to find if correlations exist between variables. For instance:

- Is there a correlation between the presence of finger-dots and strokes and aprons and loincloths?
- Is there a correlation between the presence of handprints and finger-dots and strokes?
- Is there a correlation between the presence of clothing and handprints?
- Is there a correlation between the presence of sheep and handprints?
- Is there a correlation between the presence of sheep and fingerdots?
- Is there a correlation between the presence of sheep and clothing?

7.7.2. Cluster analysis

In order to answer the second hypothesis, a cluster analysis was used to answer whether styles can be discerned. "Cluster analysis is a form of multivariate analysis where assemblages of data are arranged in terms of their similarities, grouping or clustering the most similar together. The results are graphically displayed in the form of dendrograms or comb plots" (Rainsbury 2009: 188). The dendrogram (Appendix N) is a simple tree-like diagram that represents "the series of fusions as the clustering proceeds for individual sample members [motifs] to a single group" (Landau & Everitt 2004: 327) (Fig. 7.7). Rather than discerning variations between regions by separating sites into groupings, cluster analysis reflects variations within regions (Rainsbury 2009: 184-185).

In order to answer the second hypothesis, a cluster analysis was used to test whether styles, ways of doing, or choices made during the art-making process can be discerned. Each cluster comprises a set of similar core variables (the attributes of a motif). For instance, what was the overall shape of the motif, the outline of shape, the fill of the shape, colour method, colour and the technique used? Twelve cluster tests were conducted before deciding on six variables. These six variables are shared by geometric and fine-line rock art corpora.

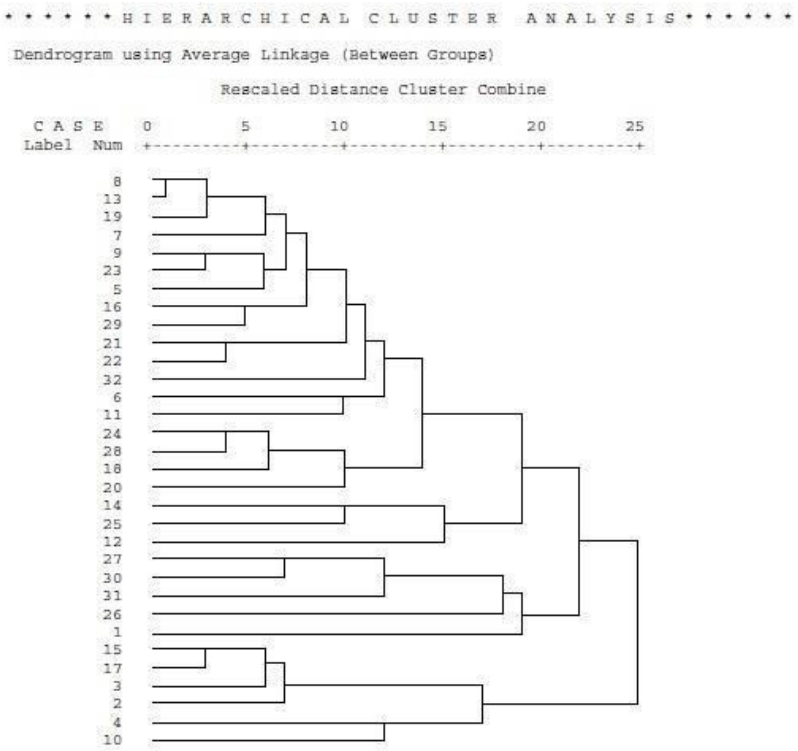


Figure 7.7: Example of a dendrogram (Landau & Everitt 2004, Display 12.13: 327)

In this analysis, the function 'between groups linkage/interval square euclidian distance' (Ward Method) was performed using six variables – Motif_Type, Outline, Fill, Colour_Method, Colour_Description and Technique to create nine clusters. These were chosen as they best capture the zeitgeist of the style.

The Motif_Type variable discerns whether the motif was geometric, zoomorphic, anthropomorphic or arboreal. In other words, is it abstract, animal, human or plant shaped? Outline noted whether the motif was outlined or not. Fill recorded what is within the outlines whether the motif was:

- solidly filled
- had no fill
- solid fill with white stripes
- finger-strokes in all directions
- no-fill with stripes
- dotted
- partial fill or partially dotted
- partially filled

Colour_Method showed the recorder whether the colours were monochromatic, bichromatic or polychromatic. Within the Colour_Description variable eleven colours were identified (Table 7.4):

- brownish-red
- brown
- white
- yellow-brown
- orange ochre
- raw sienna
- cream
- black

- Lotus
- scorpion
- flesh

Table 7.4: The eleven colours identified in the stylistic analysis

Raw Sienna	Brown	Brownish-red	flesh	White
Scorpion	Cream	Lotus	Orange ochre	Yellow-brown
Black				

Lastly, Technique showed whether the motif was finger-painted, brush-painted, an engraving, a handprint, a paint smear or chalk or crayon marks.

This hierarchic Ward Method was chosen, which takes as its starting point all cases being regarded as separate clusters, with the clusters then being joined together (agglomerative). This method is based on distances – they either work by joining together cases with a 'small' distance (cases that are close together in multidimensional space), or separating cases that are 'furthest apart'. Furthermore, Ward's Method was used (distance is the distance of all clusters to the grand

average of the sample). Ward's Method uses the F value to maximize the significance of differences between cluster, which gives it the highest statistical power of all methods. The F-test measures the variance of group means/mean of the within group variances (Galpin 2015: 443-444). Such variation will provide answers to how similar the two rock art bodies are to eachother but they do not provide spatial data. To identify spatial variation, Geographic Information Systems (GIS) was utilised.

7.8. Geographic Information Systems (GIS)

Sites and their features were plotted as waypoints on base maps using *ArcGIS 10*™ and *QGIS 2.12*® software and the Google Earth™ mapping service, allowing a visual distribution of the sites in the physical landscape. This is useful for plotting the type and frequency of motifs within stylistic phases, to establish areas of concentration where certain motifs and changes within the landscape are located. Once plotted, spatial analyses were conducted, including a Hot Spot analysis.

Lastly, Hot Spot analysis measures the intensity or complexity of a site. A 'hot spot' is a location on a map with high numbers of a certain motif, variables, sets of variables or styles. In *ArcGIS 10*™'s Hot Spot Analysis (Getis-Ord Gi*) a set of weighted features (in this case the frequency of handprints per site) identifies statistically significant hot spots and cold spots using the Getis-Ord Gi* statistic (A. Mitchell 2005; Law & Collins 2016: 320). The Gi* statistic returned for each feature in the dataset is a z-score. The resultant z-scores and p-values indicate to

the analyst which features with either high or low values cluster spatially (Law & Collins 2016: 320). This determination of hot spots is performed through a kernel density and a nearest neighnour analysis (*ibid.*). This tool works by looking at each feature within the context of neighbouring features. A feature with a high value is interesting but may not be a statistically significant hot spot. To be a statistically significant hot spot, a feature will have a high value and be surrounded by other features with high values as well. The local sum for a feature and its neighbours is compared proportionally to the sum of all features: when the local sum is very different from the excepted local sum, and where that difference is too large to be the result of random chance, a statistically significant z-score results (A. Mitchell 2005; Law & Collins 2016: 320). The patterns of spatial distribution of each stylistic phase were used to draw conclusions about regionalism, interaction and territoriality (Sanz 2008: 106). The last factor to include in stylistic analyses is time. To identify temporal variation, superimpositioning studies using Harris Matrices were utilised.

7.9. Superimpositioning

Superimposed motifs were counted and a master Harris Matrix created using ArcEd 1.4.1 (Max Planck Institut für Informatik at Saarbrücken in Germany), open source software that allows the user to input stratigraphic relationships such as earlier, later and contemporary (Rains 2000). The software uses this data to create an organised Harris Matrix diagram to obtain a relative stylistic chronological sequence (Appendix N). Figure 7.8 provides an example of a Harris

Matrix using ArchEd 1.4.1. In this example Style 4 is the oldest superimposed by Style 3. Style 3 is contemporary with Style 2. Style 2 is superimposed by Style 1.

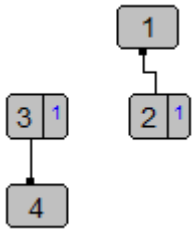


Figure 7.8: An example of a Harris Matrix created using ArchEd 1.4.1

7.10. Ethnography

It is unlikely that meaning or the source of stylistic variation will be revealed by examining the clustering of similar and differentiated motifs alone (Wiessner 1990: 107). For this, one must take into account the ethnography and the archaeological, linguistic and historical evidence of the area concerned. From the results of the stylistic analysis, ethnographies of the Central and Eastern Khoe Bushman language groups were used to interpret the possible meanings of these different styles and to assess which styles could be linked to specific changes in the environment or technology, and/or identity markers such as age, sex, initiation and gender (Chapter IX).

Ethnographies were not used uncritically. As stated in Chapter IV, ethnographic analogies have successfully been used when deducing meaning in southern African rock art and beyond (Lewis-Williams 1987; Clottes & Lewis-Williams 1998; Lewis-Williams 2002). However, they are not without challenges (cf.

Gould & Watson 1982) as researchers scour the ethnographies and sometimes 'cherry pick', often superficial pieces of ethnographic testimony that best explains their research are used. Moreover, such single instances are used to forcibly 'fit' the ethnographies to the rock art. This form of 'ethnographic snap' is inherently superficial and does not delve into the deeper meanings of why the artists painted and what the function and meaning of the illustrations were to the community. To counter superficial uses of ethnography, critical analyses of multiple ethnographic analogies were used that explain worldviews and perspectives, rather than single instances of specific topics (Wylie 1982,1985; Lewis-Williams 1991,1992). Lastly, a critical review of the early travel writers and ethnographers was necessary as many had unfounded preconceived assumptions regading the people they met (Pratt 1991, 1992). Such biases are exposed and discussed throughout this thesis.

7.11. Discussion

Following the previous surveys completed on the rock art of the Makgabeng, this ethnographic-stylistic study makes use of multiple research methods, software programs and techniques (image-enhancement, multivariate statistics, 3D modelling tools, cluster analysis, superimpositioning studies and ethnographic analogies). The potentials and limitations of these methods have been dicussed and their uses demonstrated.

A stylistic analysis is neither final nor an exhaustive system, but rather provides a starting point for stylistic analyses in southern Africa, which can assist in the

study of rock art. The next chapter outlines the results of the stylistic analysis in relation to the study's aims and objectives.

VIII. Results

The methods described in Chapter VII were implemented and a combination of statistical tests (Appendices A-L) and geographical maps were completed, the results of which are summarised in this chapter. The interpretation of these results is discussed in Chapters IX and X.

The results provide empirical evidence to the two research questions/hypotheses set out at the start of this study. One, what is the relationship between the fine-line and finger-painted rock art corpora within the Makgabeng? In other words, are there statistical and/or spatial similarities between the two? Or are they distinct 'traditions'? Two, may styles, ways of doing and choices be discerned?

Instead of looking at broad level distributions of rock art motifs which stretch across many different ecozones and terrains, this research focused at a localised level on an area that is restricted to less than 400 km². It is within such an area where a critical, close reading of specific instances of similarities and differences between rock art sites may be undertaken.

8.1. First impressions

Before analysing specific motifs and their relationship to each other, some general patterns were observed and several conclusions drawn. For the analysis an examination of each variable was undertaken. Even upon cursory inspection, some patterns in this variability were evident. From the SPSS datasheet, which included 36 sites, 52 variables, 1210 motifs and 61,828 entries, observations and

frequency tests were conducted. Similarities and differences were evident regarding sites, methods of depiction, colours and shapes.

8.1.1. Site analysis

The physical features of each site were examined. These included site elevation, shelter size and site type, the aim being to consider if sites were chosen for specific types of motifs. Previous studies have used such site analyses to try to determine authorship (cf. Eastwood and Eastwood 2006; Bwasiri & B. Smith 2015: 448).

1) *Site elevation*

   In the Makgabeng, sites visited did vary in elevation (altitude). Groenepunt 24 lies at the lowest altitude, 974 metres above sea level, while Millbank 6 sits at the highest altitude at 1258 metres above sea level. Previously, Eastwood and Tlouamma (2006b: 73) had seen that sites 'higher up' contained red phase geometric finger-painted imagery. This study could not asses the validity of Eastwood's general observations using elevation only. Nevertheless, in the sample some disparities existed between site elevation and motif types, and will be discussed later in this chapter.

2) *Shelter dimensions*

   Another consideration was whether the size of the shelter/boulder and the total number of motifs of the site revealed a preference in selecting small

or large shelters for certain painting types. For instance, did smaller sites have some significance in terms of the size of audience that can fit in that shelter? In terms of total motifs, the smallest sites held seven or more motifs, small sites held between eight and 17 motifs, medium sites held between 18 and 31 motifs, large sites had between 32 and 58 motifs and very large sites have between 59 and 101 motifs. Site size was measured in surface area (m²). The length was deduced from the extent of the dripline, while the estimated height used the distance from the floor to the ceiling of the rock shelter at the highest point in the shelter (Eastwood & Tloumma 2003a: 8). The smallest sites were classified as 96 m² or smaller, small sites as 255 m² or smaller, medium sites as 653 m² or smaller, large sites as 1944 m² or smaller and very large sites as 4880 m² or smaller. From Figure 8.1 (overleaf) one may observe that the size of the sites often differs from the total number of motifs. However, there is a moderate statistical correlation between size of the rock art site and number of motifs (see Appendix C for Pearson's Correlation test and graph). The larger the site, the more rock art paintings exist in these sites. On a motif level, when analysing fine-line and finger-painted geometric motifs, no clear patterning was identified that corresponded with site sizes and specific motif types. All motif styles occur in both small and large sites.

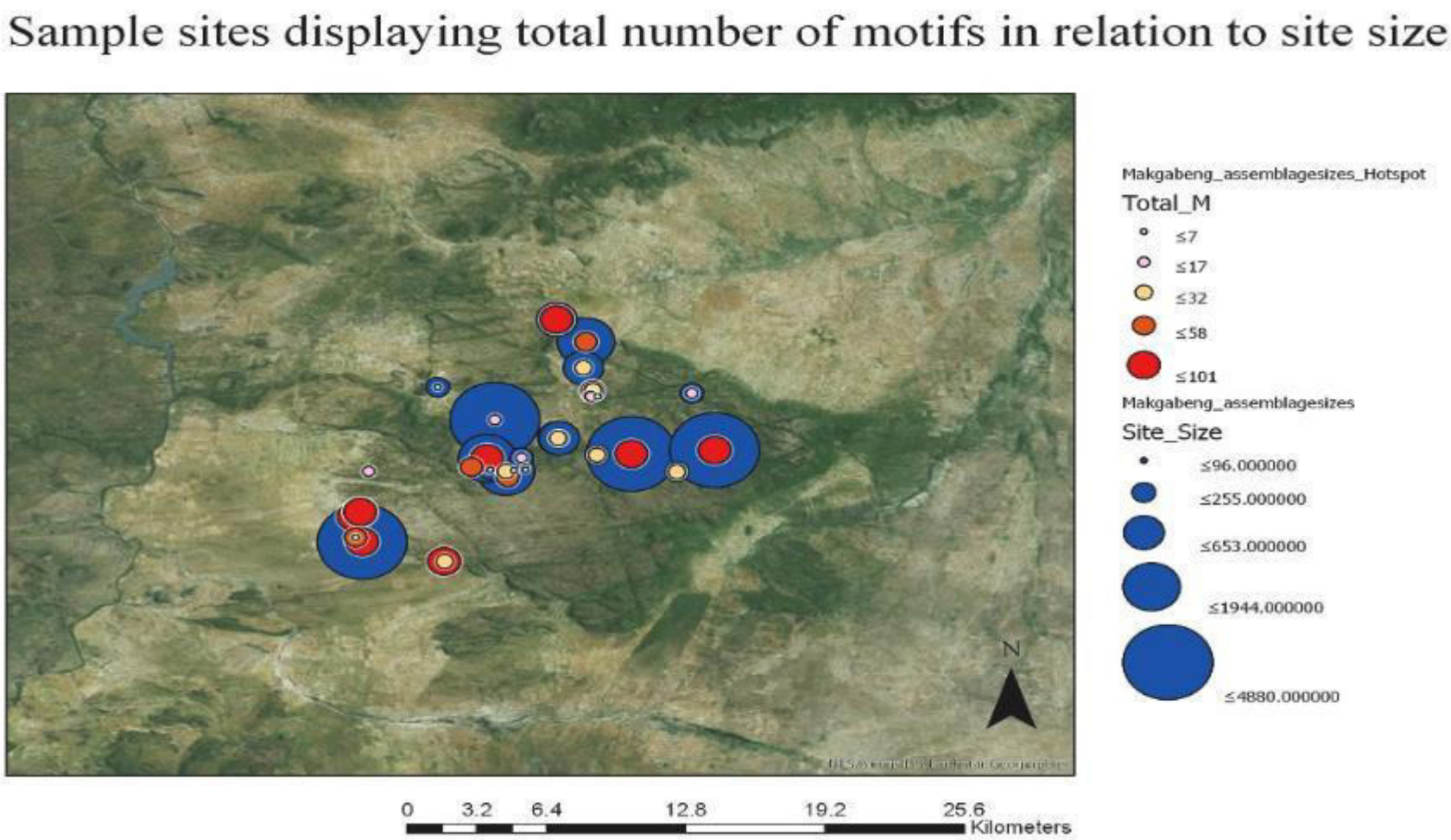


Figure 8.1: Map showing the distribution of sites in the sample with the darker the red hue and the greater the total quantity of motifs (Total_M). The larger the blue circle, the larger the site size in m² (Site_Size)

3) Site type

The majority of paintings are found in rock shelters or overhangs but boulders in some parts of the Makgabeng are painted. In this sample one fifth of the total dataset was on boulders. A detailed comparison of the imagery, using SPSS variables, of these two site types (rock shelters and boulders) demonstrated no significant stylistic differences. The presence of cupules, engravings and white circles of paint found on boulders are found within rock shelters and may demonstrate spatial and/or temporal patterning, but lack of relative chronologies from suprimpositioning studies or other dating techniques makes this difficult to discern. Moreover, the small sample of sites that have these features would not create any significant spatial patterning.

8.1.2. Methods of depiction

Brush painted motifs make up by far the majority of the total sample dataset (89%), while paintings made using the finger make up less than ten percent of the total sample dataset (9.8%). The technique of making handprints is the third most common in the total sample (0.7%) (Fig. 8.2, overleaf). The remaining percentage (0.59%) accounts for rare cases of engravings.

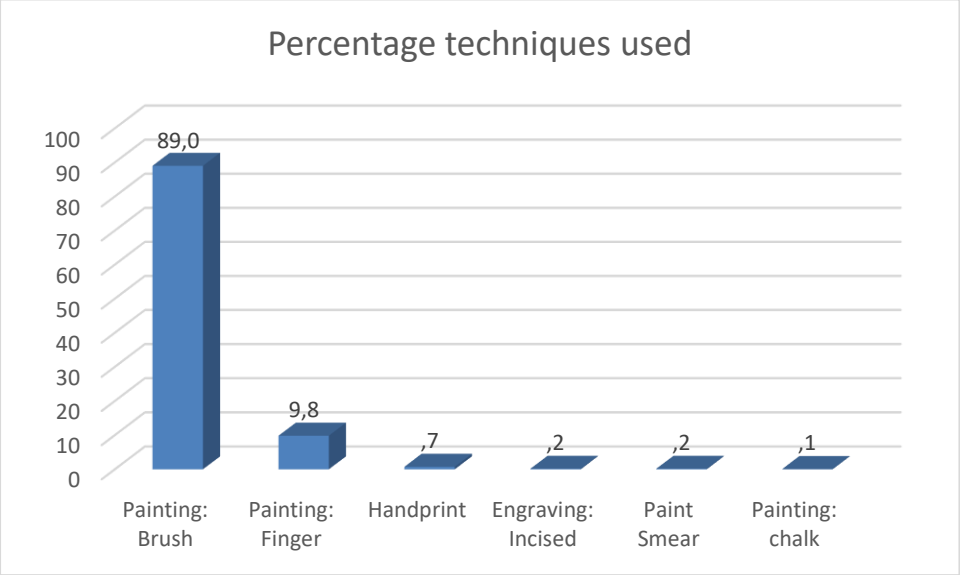


Figure 8.2: A bar graph displaying the sample percentage divided by techniques used

8.1.3. Colour

Brownish-red is the most common colour used, while white is the second most common (Fig. 8.3). Pale brownish-red (#5E585C), dark brownish-red (#993333), very faded brownish-red (#CC9966) and brown (#964B00) are likely the same colour in various conditions of pigment deterioration due to environmental factors. White (#FFFFFF) and black (#000000) are also relatively common. Often white pigment will turn black after exposure to fire and smoke. Yellow-brown (#8B4513) is the third commonest. Raw sienna (#D27D46), orange ochre (#CC7722) and Lotus (#863C3C) are used, but not often. Overall, brownish-red, yellow-brown motifs are more carefully and intricately painted while white, black, lotus, orange ochre and raw sienna motifs are often standardised with less care taken to paint figures in these colours.

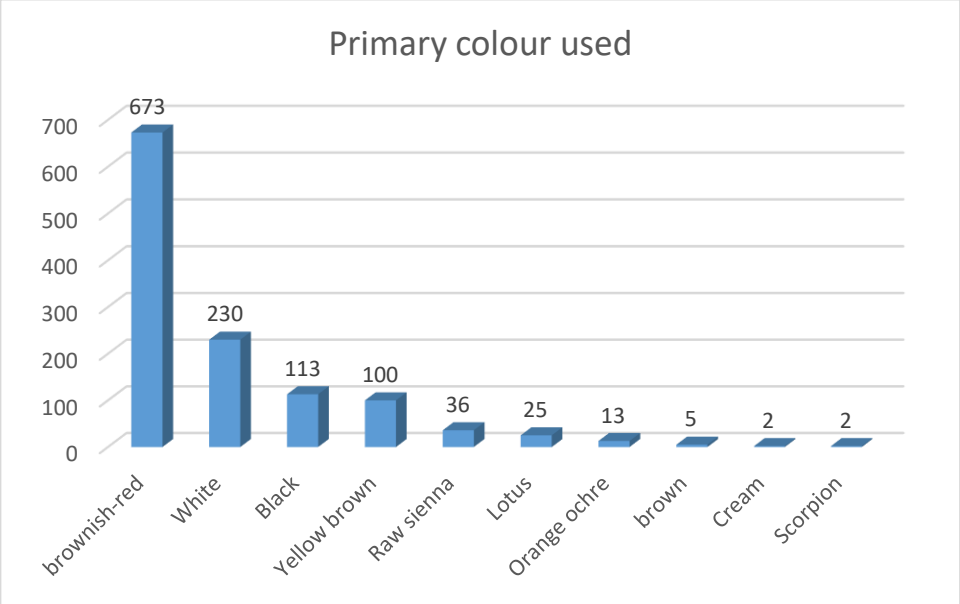


Figure 8.3: Bar graph of all the colours used to paint motifs in the sample (%)

Motifs were further divided into the method by which colour was applied – whether one colour (monochrome), two colours (bichrome) or multiple colours (polychrome) was/were used. Monochromatic motifs occur most frequently (89.90%), while bichromatic motifs make up 9.10%. Only 0.91% of the total motifs are polychromatic. The remaining 0.9% of the total motifs makes up one site of incised lines. Shaded paintings in the Limpopo Valley regions including the Makgabeng account for below 3% of the total number of zoomorphic depictions, whereas the number is approximately 15% in the Drakensberg (Pager 1973a: 45).

8.1.4. Shape

A shape typology was created to classify the painted shapes. The paintings were divided into four main types – anthropomorphic, zoomorphic, geometric and arboreal designs. Of these four types, anthropomorphic motifs were the most

common (42.98%), followed by zoomorphic motifs (37.11%). Geometric motifs make up a substantially low percentage of the total sample dataset (19.67%). The remaining quarter of a percent (0.24%) consisted of botanical and arboreal motifs (Fig. 8.4).

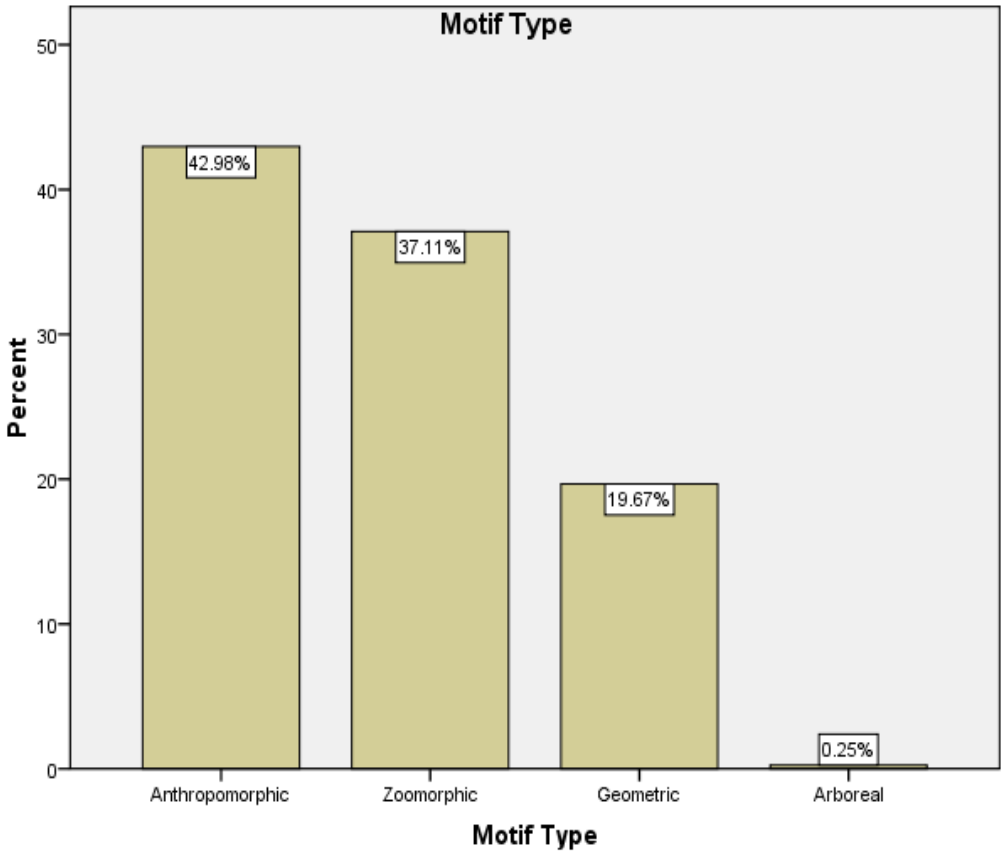


Figure 8.4: Bar graph of the frequency of shape motif types (%)

1) *Anthropomorphic*:

Anthropomorphic motifs include human figures as well as recognisable material culture (e.g. bows, arrows, sticks, clothing on a person). Anthropomorphic motifs are always fine-line and brownish-red pigment and makes up the majority of painted figures (Fig. 8.5).

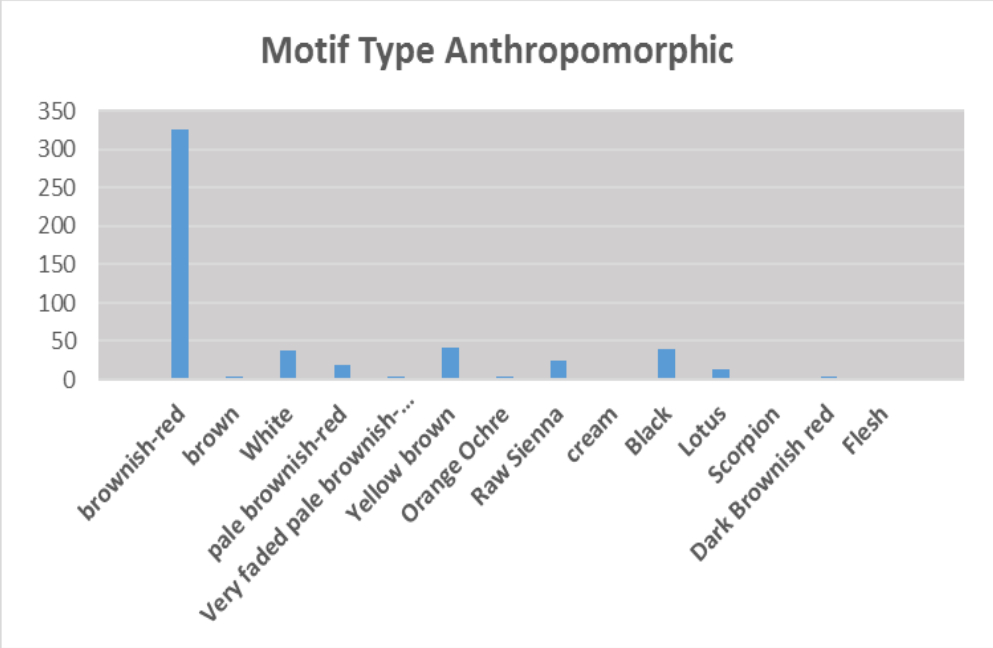


Figure 8.5: Bar graph demonstrating the total count of colours that are used to paint anthropomorphic motifs

2) *Zoomorphic*:

A large diversity of fine-line animal subject matter is depicted including wild and domesticated animals (Fig. 8.6). Domesticates make up 12.3% of the total animal dataset. The five animals most frequently represented are indeterminate animals, kudu, sheep, impala and giraffe. Indeterminate animals are mostly antelope without any diagnostic features to determine species. Brownish-red is used most often in depicting animals (44.6%).

Giraffe, ostriches and wildebeest are often painted in white in this sample. Sheep are painted in brownish-red, white, yellow-brown and black (Fig 8.7).

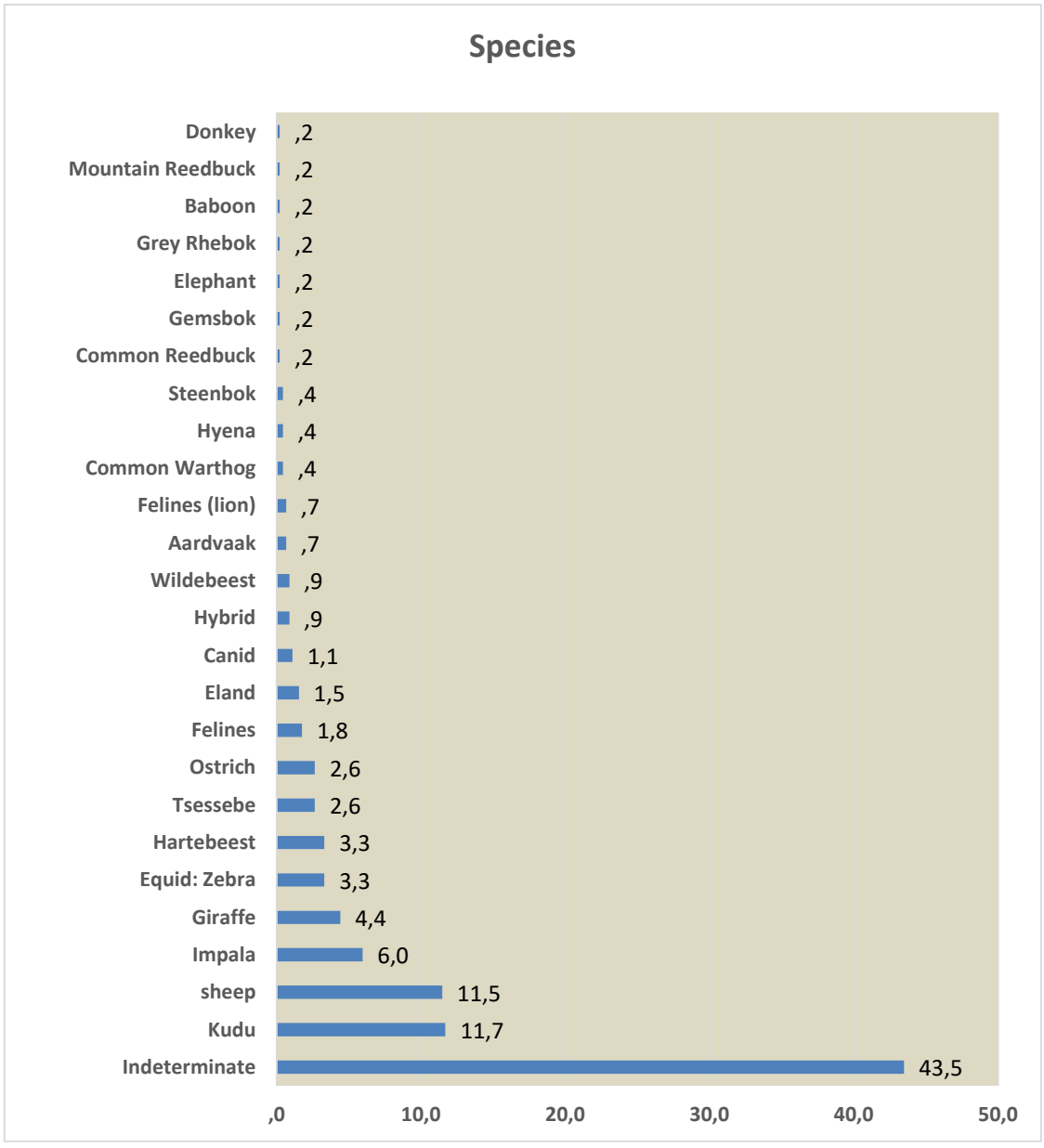


Figure 8.6: Bar graph of the frequency of all the most frenquently painted animal species represented in the sample of motifs (%)

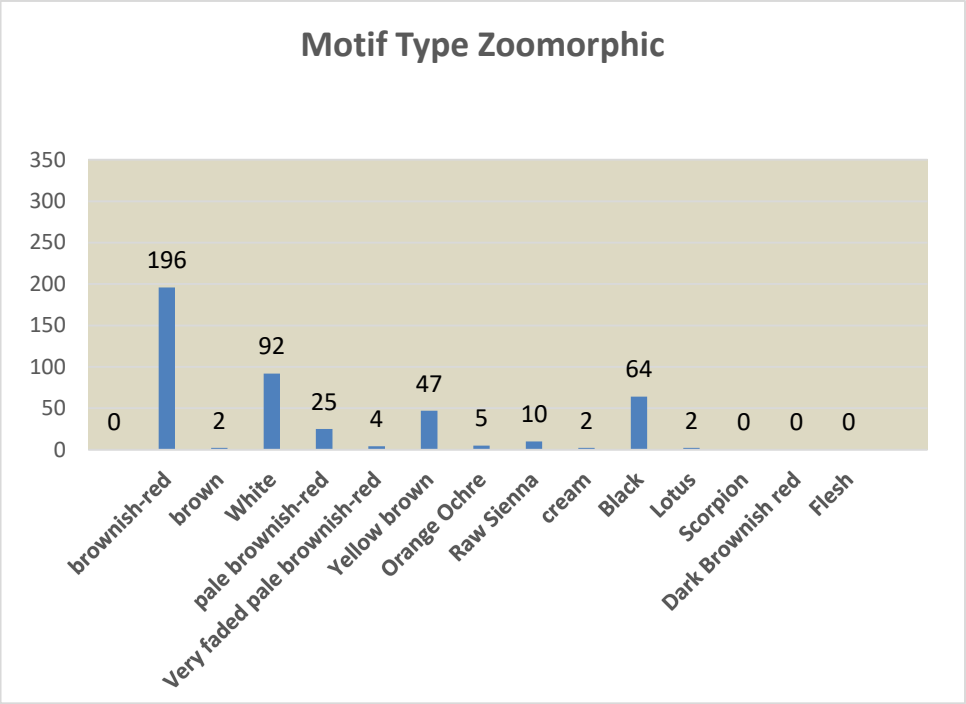


Figure 8.7: Bar graph demonstrating the total count of colours that are used to paint zoomorphic motifs

3) *Geometric*:

Motifs that were non-figurative were included in the sample. Material culture of a geometric nature and associated with human figures such as sticks, drums and digging sticks were not included under this variable, but were placed in the anthropomorphic category. The five most common geometric shapes in the sample are the apron, U-shaped, square, wavy line motifs and finger-dots (Fig. 8.8). Many of the U-shaped and square motifs are more than likely aprons. Geometrics were most commonly executed using the finger and white pigment, which was used extensively (45.1%) in relation to other colours (Fig. 8.9).

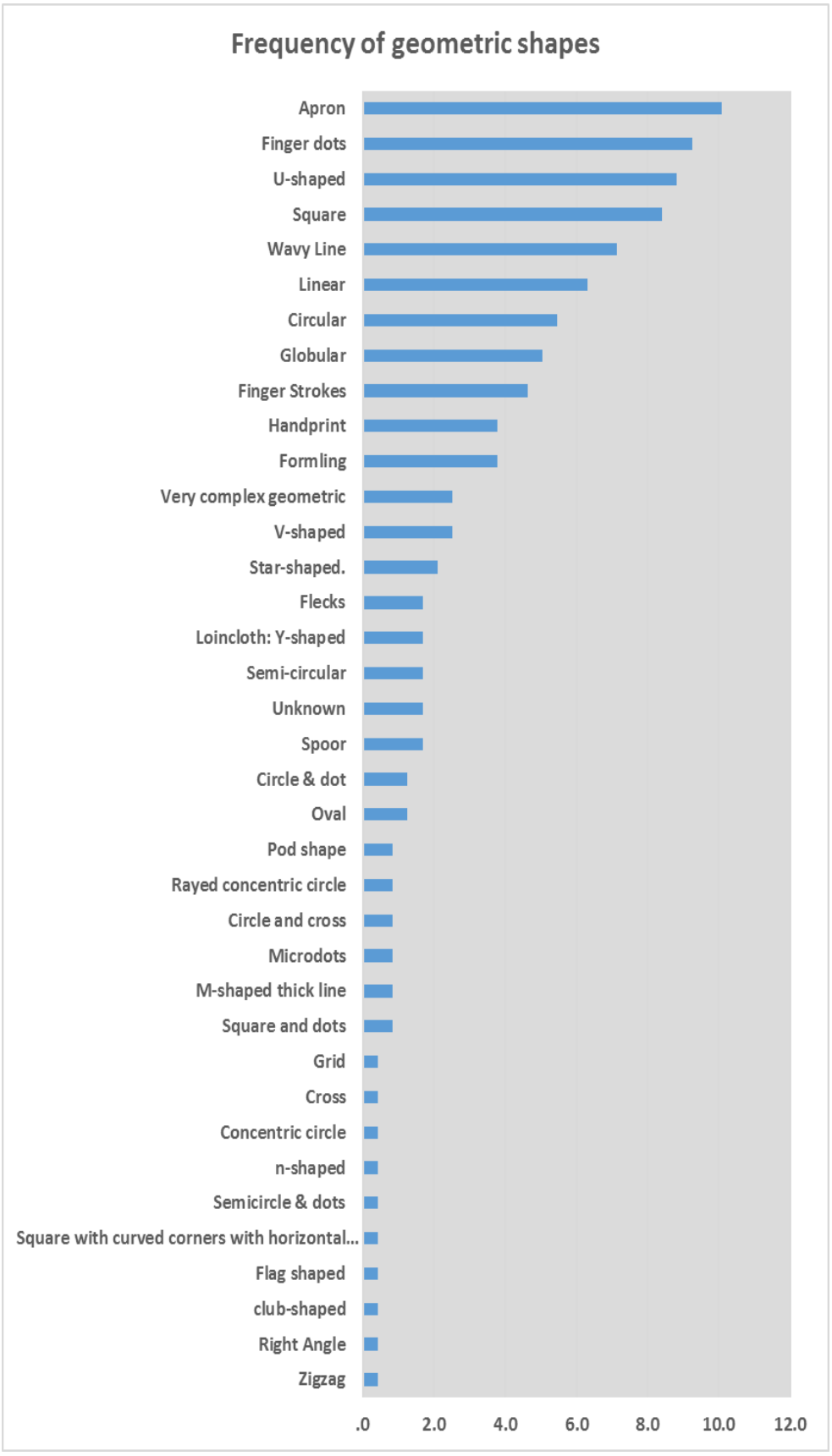


Figure 8.8: Bar graph demonstrating the total count of geometric shapes in the painted sample (%)

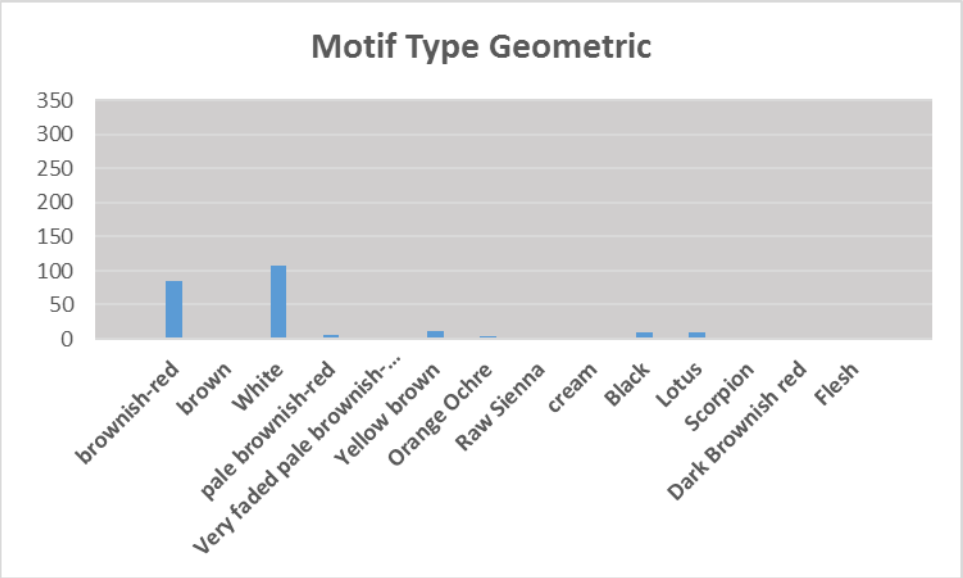


Figure 8.9: Bar graph demonstrating the total count of colours that are used to paint geometric motifs

8.2. Comparative motif analysis

As mentioned in Chapter IV, three key motif types identified by B. Smith and Ouzman (2004) are crucial to the identification of what they term 'the geometric rock art tradition' and which is allegedly authored by Khoe-speaking peoples. The three motif categories are finger-dots; handprints; finger-painted aprons and loincloths. Fine-line sheep motifs are included in the analysis as they are proxy evidence for the introduction of livestock and possibly herding peoples. Each motif category was dealt with in detail.

Within each category the significance of the stylistic analysis can be divided into three key foci ─ a temporal dimension, a spatial dimension and motif relationships. Motif relationships are discerned by looking at what motifs occur alongside each other. This analysis attempts to delineate any significant relationships between motifs, assuming that certain motifs were intentionally

painted near other motifs to signify some connection between the two (e.g., Lewis-Williams 1974). This connection expresses what artists deemed important and what they may have wanted to emphasise.

8.2. Finger-dots

Finger-dots are varied and are but one form of many different marks identifiable in the Makgabeng (Table 8.1). Finger-dots were considered along with finger-strokes, dots, micro-dots and paint smears. Finger-dots totalled 1563 found in 13 sites, four of which have both finger-dots and finger-strokes. These occur in a plethora of colours (scorpion, brownish-red, yellow-brown, white, Lotus, pale brownish-red and black). All finger-dots were solid and monochrome. One site in the sample has over 600 finger-dots. The longest row of finger-dots is around nine metres long. Finger-strokes were more difficult to quantify as the occurrences were not easily recognisable, being faded and only visible using *DStretch*® back in the lab.

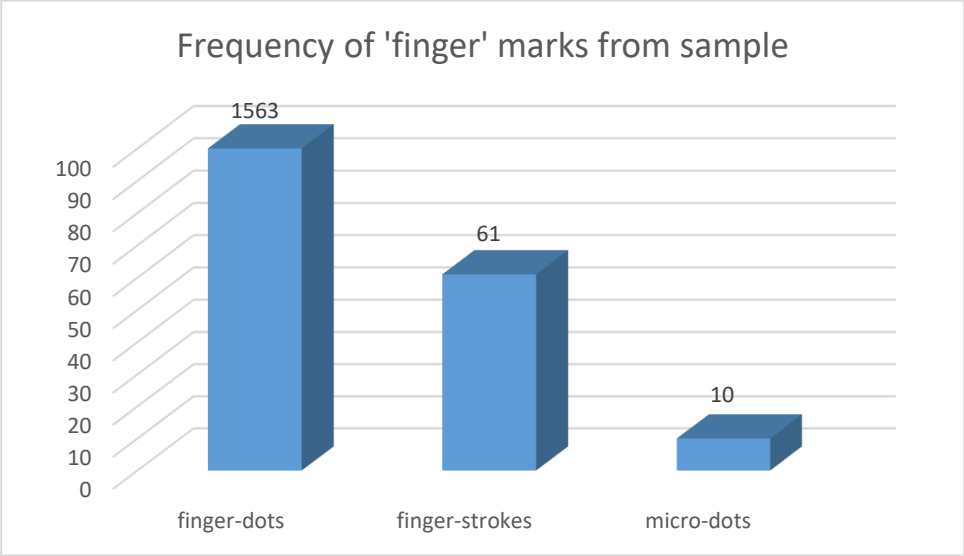


Figure 8.10: Frequency of the total count of finger-dots, finger-strokes and micro-dots

Finger-dots are similar to fingerprints in shape and were likely made using the finger. Finger-strokes are horizontal and vertical lines made by dragging the painted finger in a specific direction. Many finger marks appear rubbed or smudged. Unlike finger-dots and finger-strokes, dots and micro-dots appear rounded and uniform, as if they were painted using a brush rather than a finger. Dots, of all forms, often appear in rows or grid patterns. Paint smears are patches of smeared paint on the rock surface.

For instance, Langbryde 40, a site with extensive superimpositioning, has three different types of finger marks. In Figures 8.11a and 8.11b (overleaf), the bottom row of finger marks is too small and too perfectly round to be finger-dots and are what Eastwood (2002b: 6) calls micro-dots.



Figure 8.11a: True-colour image of three forms of finger marks on Langbryde 40 (LB40)



Figure 8.11b: False-colour image of three forms of finger marks on Langbryde 40 (LB40). Enhanced image using *DStretch*® (rgb)

These micro-dots are painted in a darker hue to the brownish-red style typical of the naturalistic fine-line body of art. The second row of finger marks are finger-dots and finger-strokes superimposed over a brownish-red indeterminate antelope.

The finger-strokes look as if they are painted in a lighter red than the finger-dots. This hue is similar to the indeterminate antelope as well as the faded figure to the right of the finger-strokes. Lastly, the topmost finger-dots are in the same hue as the micro-dots and finger-dots below, but are somewhat larger.

8.2.1. Temporal dimension

Finger-dots and finger-strokes have 11 occurrences of superimpositioning. These 11 occurrences are scattered throughout the orthogonal diagram of the Harris Matrix (Appendix N) suggesting that finger-dots and finger-strokes occur throughout the chronological sequence under and above most other rock art clusters. For instance, white finger-strokes occur over black solid anthropomorphic motifs and black solid zoomorphic motifs. A row of brownish-red finger-dots are found under white and brownish-red solid bichrome animal motifs (Table 8.1).

Table 8.1: Superimpositioning table of finger-dots, finger-strokes and micro-dots from Harris Matrix (Appendix N)

Motif type	Later than (superimposed over)	Earlier than (under superimposed image)	Contemporary with
W Fin Strokes (Long white finger-strokes)	Bl Sol Anthro (Black solid anthropomorphic motifs)		RS Sol Fin Stroke (Raw sienna solid finger-stroke)
	Bl Sol Zoo (Black solid zoomorphic motifs including a fat-tailed sheep)		W Sol Dots (White solid dots)
			BR & W Oval Geo & microdots (Brownish-red oval-shaped geometric with white micro-dots)
RS Sol Fin Stroke (Raw Sienna Solid Finger-Stroke Reverse L)	W Sol Fds (White solid finger-dots)		
W Sol Dots (Large white dots)	BR Sol Anthro (Brownish-red solid anthropomorphic motifs)		
BR & W Oval Geo & microdots (Brownish-red oval-shaped geometric with white micro-dots)	BR Sol Zoo (Brownish-red solid zoomorphic motifs)		
	BR Sol Anthro (Brownish-red solid anthropomorphic motifs)		
	Lotus Sol Fds (Lotus solid finger-dots)		
BR Sol Fds (Row of brownish-red finger-dots)	BR Sol Zoo (Brownish-red solid zoomorphic motifs)	W & BR Sol Bichr Zoo (White and brownish-red solid bichrome zoomorphic motifs)	
Lotus Sol Fds (Five lines of Lotus Sol finger-dots >100)	BR Sol Zoo	BR & W Oval Geo & micro-dots	
		BR Sol Anthro	
		W Sol Anthro (White solid anthropomorphic motifs)	

W Sol Fds (White solid finger-dots (pasty))		RS Sol Fin Stroke	
		W Sol Zoo (White solid zoomorphic motifs)	
Bl Sol Fds (Black solid finger-dots)		YB Sol Anthro (Yellow-brown solid anthropomorphic motifs)	
Lotus Sol Fin Stroke (Lotus solid finger-strokes)		BR Sol Zoo	
		BR Sol Anthro	

8.2.2. Spatial dimension

Finger-dots, finger-strokes and paint smears occur at more than half of the total number of sites in the sample (19 out of the 37 sites). They are found across the landscape with little patterning or clustering (Fig. 8.12, overleaf).

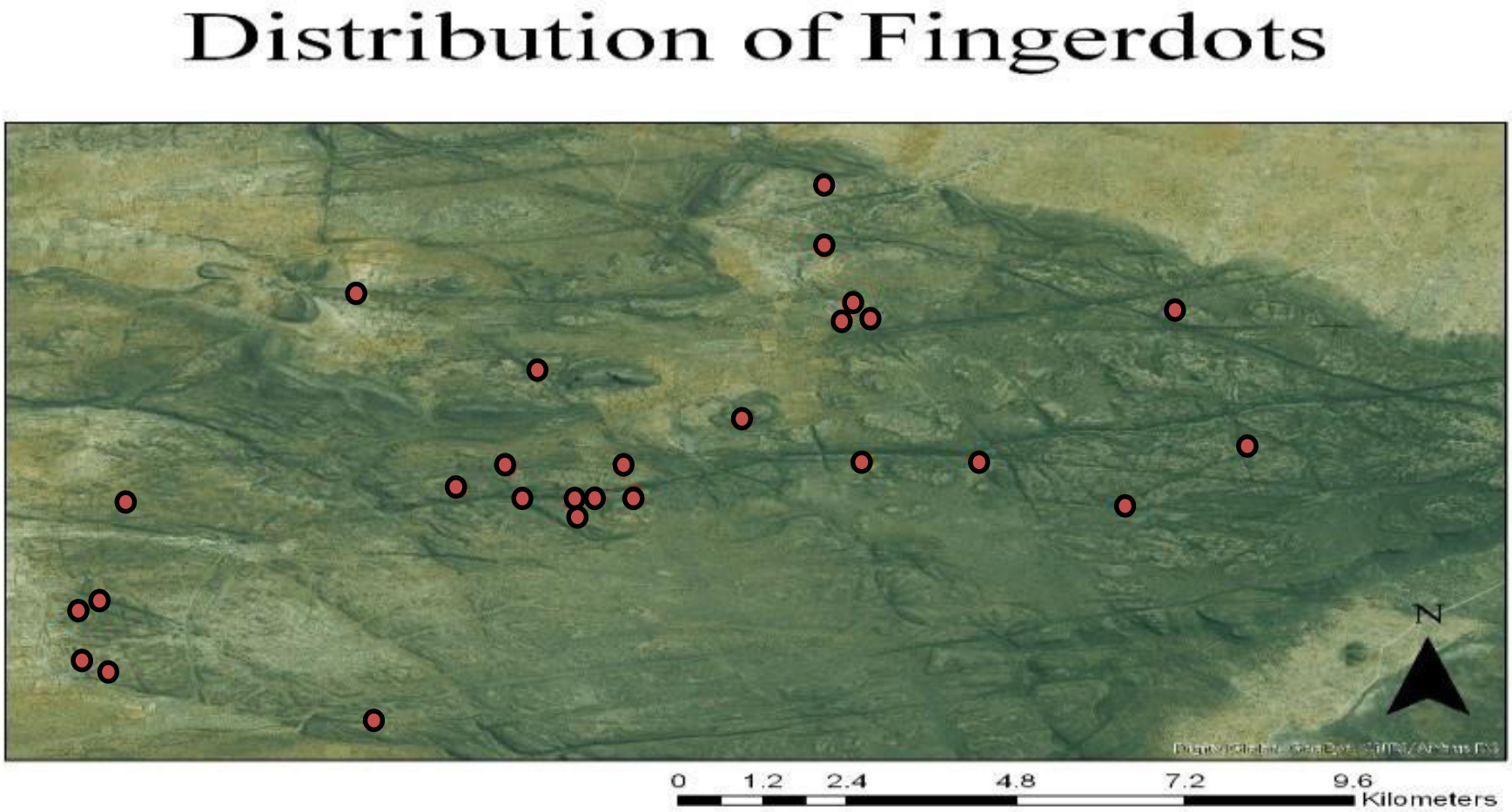


Figure 8.12: Distribution of finger-dots and finger-strokes from all the sites in the Makgabeng. They are evenly distributed.

8.2.3. Motif relationships

Finger-dots cannot be considered in isolation and are often associated with geometrics, but not exclusively. One out of the 13 sample sites has finger-dots and handprints. Three sites with finger-dots also have motifs of sheep. Five different sites out of the 13 with finger-dots have figures wearing aprons, geometric aprons and finger-painted geometrics (Fig. 8.13).

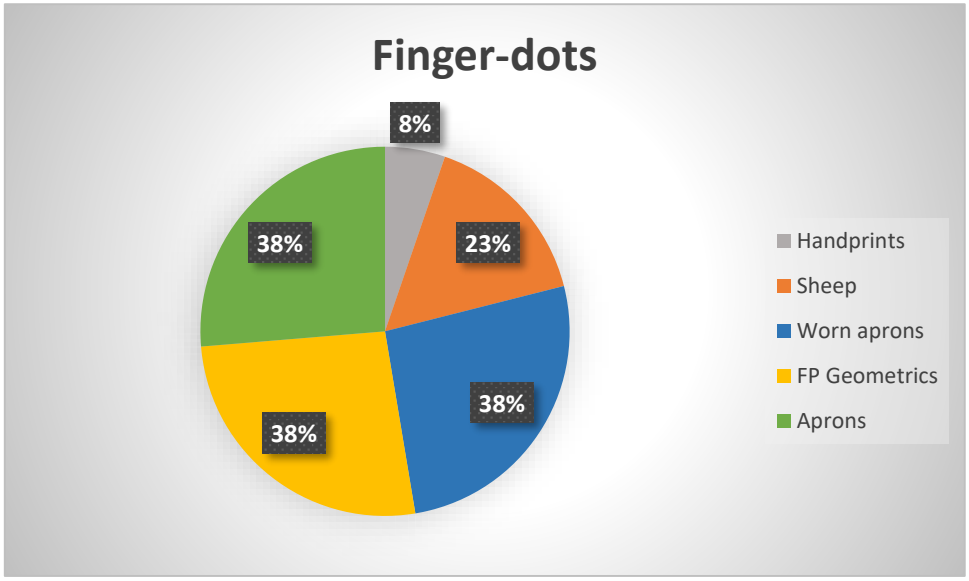


Figure 8.13: Pie graph displaying relationships between finger-dots and other motifs

In fact, from the total sampled sites (18) with finger-dots and finger-strikes, only two sites exhibit the co-occurrence of these motifs. The sites where they are found together are large, with much superimpositioning and imagery.

8.2.4. Conclusions

Finger-dots are commonly painted in a different colour from most anthropomorphic, zoomorphic or geometric imagery. The colour, Lotus

(#863C3C) is used most often to paint finger-dots. Finger-dots occur under and over other motifs, suggesting they are neither the earliest nor the latest motifs to be painted. Finger-dots and finger-strokes are found in half of the sites in the sample.

8.3. Handprints

Handprints are far from stylistically uniform. Three types of handprints are observable within the sample. The first is made using pasty white pigment. The second is a rudimentary outline of a handprint in brownish-red. Lastly, handprints were likely made by applying paint to the palm and pressing a flat palm against the rock surface (Table 8.2).

Table 8.2: Table illustrating the types of handprinst in the Makgabeng

Type	Description
White handprints	Made in a pasty white pigment. Often appear smudged.
Handprint outline	Rudimentary outline of handprint coloured brownish-red
Clear handprint	Handprints in white or brownish-red made carefully with no smudging.

These prints are made in red and white hues and are the most common in the sample. Fingers on the handprints are sometimes splayed (Fig. 8.14), sometimes close together (Fig. 8.15).



Figure 8.14: Handprints with splayed fingers at Galashiels 8 (Photo by Edward Eastwood, courtesy of SARADA)



Figure 8.15: Handprints close together with fingers together at Groenepunt 35

For instance, sites on De La Roche and Langbryde properties contain handprints in a chalky, pasty white paint (Figs. 8.16 and 8.17). These sites are large shelters with Langbryde 40 being 3960 m² while De La Roche 42 is 81 m². The handprints from the two sites are remarkably similar in pigment type to the 'late white' body of art which occurs at these large sites and which has been attributed to Northern Sotho -speaking people. Of interest is the angle and placement of the handprints. Unlike other handprints in the area, which are created vertically or horizontally, many of these handprints are angled at 45 degrees to the right. This hints at the quick and haphazard nature of their placement. In comparison, handprints from properties Galashiels 8 and Groenepunt 35 display red and white handprints, neatly arranged. Galashiels 8 is 1200 m² while Groenepunt 35 is 45 m². Six brownish-red handprints using both left and right hands with splayed fingers at Galashiels 8 are created in a row (Fig. 8.14). The pigment consistency, how it adheres to the rock's surface, and the hue, is reminiscent of the fine-line rock art.

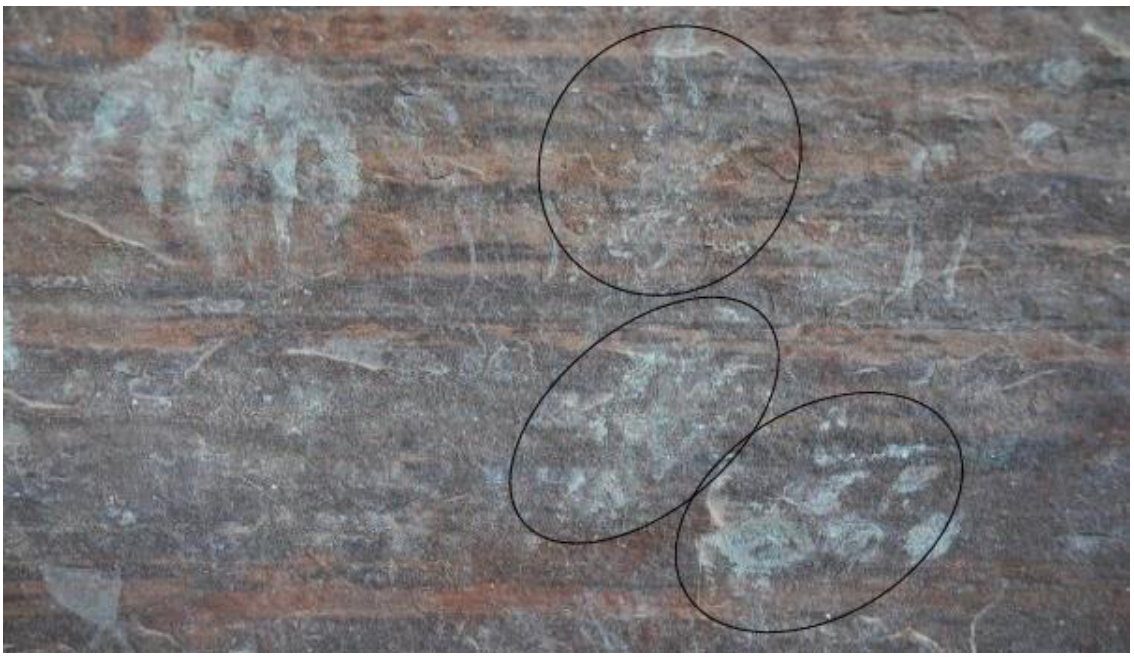


Figure 8.16: Handprints at De La Roche 42



Figure 8.17: Handprints at Langbryde 40

Groenepunt 35 has over 20 handprints. To access this small site, one needs to crawl into the small entrance and lie on one's back to see the handprints painted on the upper part of the walls and ceiling (Fig. 8.18). At this site, to create a handprint, an adult would need to lie on one's back and stretch out an open palm. There is very little rock wall that is not covered with handprints placed horizontally and vertically. Unlike the handprints with splayed fingers in other sites in the Makgabeng, many of these handprints have fingers close together and handprints are placed near to one another (Fig. 8.19). This site is unique in the Makgabeng for the sheer number of handprints and the small scale of the shelter. Handprints made up the majority of the motifs in the shelter with a few fine-line 'star-burst'geometrics.



Figure 8.18: Groenepunt 35 or 'Cave of hands'. Notice the small entrance and the rock art is visible when lying on one's back looking up to the upper parts of the walls and ceiling



Figure 8.19: Groenepunt 35 'Cave of hands' notice the sheer number of handprints many of which have fingers close together and are applied veritcally and horizontally

Previous studies have been conducted to assess whether the measurements of painted handprints can be compared with handprint sizes from present day Khoe peoples, in an effort to discern possible authorship of painted handprints (Willcox 1959; Manhire 1998). Similar measurements were taken from the sample and compared with their results. In this sample, the smallest handprint length, from bottom of heel of the palm to the top of the middle finger is 112 mm and width, from pinkie to thumb, is 60 mm. The largest handprint length is 181.6 mm and the largest width is 158.9 mm.

Two sites were chosen as they had instances where clear handprints could be measured. Looking at site Gallashiels 8, if the handprints were all made by the same people, the average length of a hand was 172.52 mm. This average would place the handprints closer to the size of Khoekhoe handprints (cf. Willcox 1959: 296). Based on the size of the handprints, a height of 1.581 metres and an age of 16-17 years old was calculated using Anthony Manhire's formula. The problem with this formula is that full adult height is reached by 17 years of age and there is little increase in height after this age. In other words, the age of the people creating the handprints would have been either 16-17 years old or older. The second site, Groenepunt 35, had an average handprint length of 120 mm, giving a height of 1.116 metres using Manhire's formula (Manhire 1998). Using this formula, the handprints may have belonged to children aged between six and seven.

Studies on the sex of handprint makers have returned inconclusive results (Meister 2003; Hays-Gilpin 2004: 91). However, one study on sexual dimorphism in Upper Paleolithic hand stencils (2004) has shown that it is possible to calculate sex from handprint measurements. Using Dean Snow's equations (2004: 398), the handprints from Gallashiels 8 were likely produced by women. However, male-female differences vary between populations and researchers cannot assume this model applies to all populations (Snow 2004: 391). Furthermore, a larger sample would be needed to produce accurate results. At Groenepunt 35, the sex of the handprint makers was difficult to identify, as the height of boys and girls does not, on average, differ, below the age of 10 (Snow 2004).

Looking at the dataset, handprints feature in five sites. Brownish-red and white are the only two colours used to make handprints and all handprints are monochromatic, one is outlined in brownish-red and the rest are solid. Sites with handprints range from the smallest at 45 m² with a total of 29 motifs painted to the largest at 3960 m² with over 953 total motifs depicted.

8.3.1. Temporal dimension

Handprints within the orthogonal ArchEd Harris Matrix (Appendix N) are rarely superimposed over other images but in one case white solid handprints were superimposed over brownish-red naturalistic rock art and are found under a solid white 'star-shaped' geometric. Chalky white handprints appear as if they were created in the same manner and technique as Northern Sotho rock art and therefore were likely made later. From the lack of superimpositioning and the few

cases of superimpositioning, it is possible that handprints are relatively recent or that there may have been taboos against painting over them (Chapters IX and X) (Table 8.3).

Table 8.3: Superimpositioning table of handprints from Harris Matrix

Motif type	Later than (superimposed over)	Earlier than (under superimposed image)	Contemporary with
W Sol HP (White solid handprints (pasty))	BR Sol Zoo (Brownish-red solid zoomorphic motifs)	W Sol Geo (White solid pasty geometrics)	

8.3.2. Spatial dimension

Handprints seem to be painted on the periphery of the 'plateau' (Figures 8.20 and 8.21). Handprints are restricted in distribution rather than finger-dots and finger-strokes, which seem generalised. Handprint sites were collated with the remaining total handprint sites in the Makgabeng and a Hot Spot Analysis (Getis-Ord Gi*) completed. The analysis calculates the Getis-Ord Gi* statistic for each feature in a dataset. The resultant z-scores and p-values (Appendix C) refer to features with either high or low values that cluster spatially. In the diagram, the darker the hue and the larger the size of the circle, the more statistically significant the cluster. The Hot Spot Analysis reiterates the peripheral distribution, with major clusters occurring in the southwest, north, north-northeast and southeast of the Makgabeng.

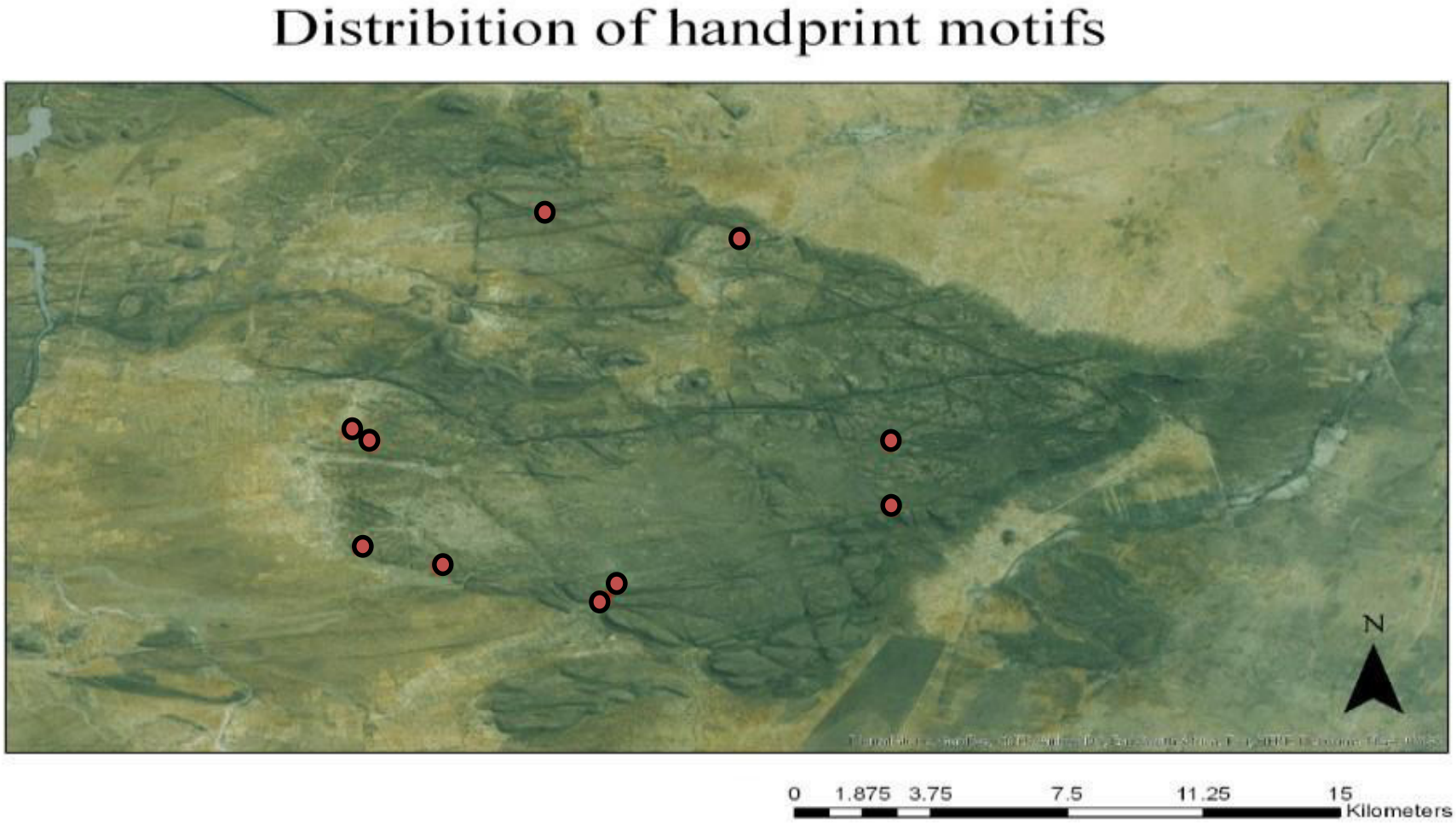


Figure 8.20: Map showing the distribution of handprints in the Makgabeng

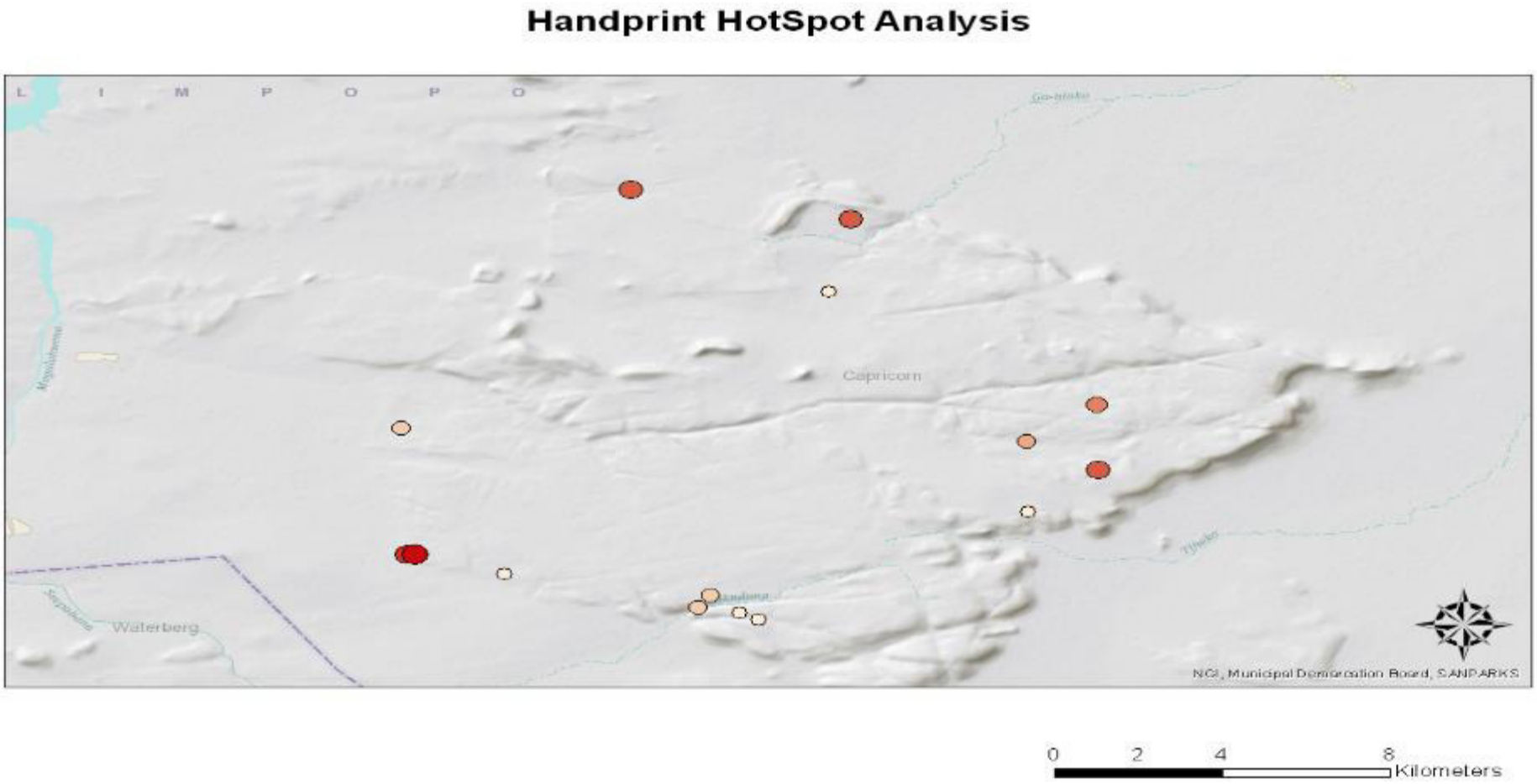


Figure 8.21: Distribution of sites with handprints in the Makgabeng. The darker and bigger the circle, the more concentrated the clustering of handprints

8.3.3. Motif relationships

Handprints occur with finger-dots and/or finger-strokes in three of the four sample sites, while finger-painted geometrics and aprons occur in two of the four sites (Fig. 8.22). Sheep and worn aprons do not occur close to handprints. This is not to say they do not occur in the same site, but that within the panel upon which the handprint motif is painted, there is no sign of these other motifs.

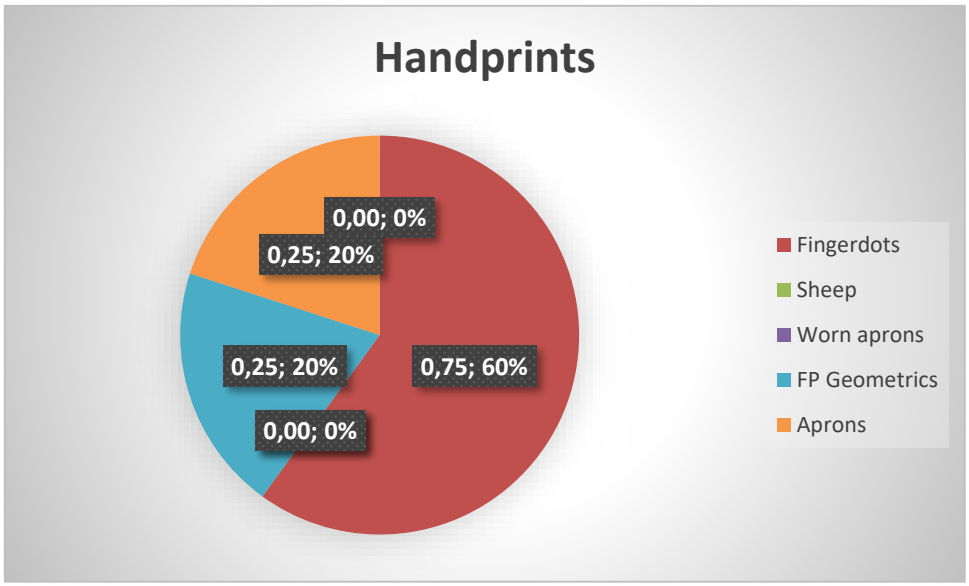


Figure 8.22: Pie graph reflecting the percentages of motif relationships between handprints and other motifs

8.3.4. Conclusions

Even though the two groups of images, finger-dots and handprints often co-occur in sites, they seem to follow completely different image-making choices including colour, placement and site preference. Taboos and acts of association are important aspects of Khoe-San belief and are likely to have played a role in the production and ritual use of handprint imagery (Chapter IX).

8.4. Geometrics

Most geometric motifs in the sample that were not associated with Northern Sotho rock art, and were not fine-line material culture associated with human figures (e.g. bags, sticks and quivers), were clothing motifs, in particular aprons and loincloths (disembodied geometrics resembling clothing in plan view). The shapes used in these motifs are diverse and include U-shapes, squares, rectangles, shapes of animal skins (Fig. 8.23), V-shapes and semi-circular designs. Aprons and loincloths are created by applying one of two techniques – using a brush or finger. Of 57 sites, five have both fine-line and finger-painted geometrics.



Figure 8.23: Animal skin geometric alongside figure with bow and arrow (Gallashielsls 8). Photo taken by Edward Eastwood. Courtesy of SARADA.

The diagnostic feature that separates these motifs from other similar looking images (e.g. bags), is that they often have tying chords and/or tassels and are often internally decorated, but do not have looped carrying straps (Green & Eastwood 2008: 145). Bags are commonly associated with arrows, bows and quivers. Collecting and female bags are depicted as ovoid or semi-ovoid, with or without tassels and a looped carrying strap. Bags are frequently depicted in the Drakensberg and in Lesotho (Vinnicombe 1976; Lewis-Williams & Dowson 1989) (Fig. 8.24). The decorations on these bags are micro-dots and circular motifs. Bags are painted as standalone, as carried, or hanging from pegs or sticks (Green & Eastwood 2008: 145).



Figure 8.24: Panel detail of a site near the Quthing River, Lesotho. Notice the bags with looped carrying strap and associated material culture. Image courtesy of SARADA

In contrast, front aprons have tying chords rather than looped carrying straps. Occasionally, the tying thongs are omitted or are imperceptible. In terms of shape, front aprons are also more diverse compared to bags and occur in rectangular, semi-ovoid, square and cordiform shapes. This formal diversity extends to front aprons' decoration which includes crosses, micro-dots, vertical and/or horizontal lines and circles (Green & Eastwood 2008: 145) (Table 8.4, overleaf).

Three to four types of geometric motifs, likely aprons, were identified in the Makgabeng:

- White finger-painted motifs, often large, with interior finger-strokes or finger-dots, or finger-strokes as tassels are painted in white (Figures 8.25 and 8.26). This style is the most common in the sample.

- Finger and brush painted geometrics in reddish-brown that often have interior horizontal divider lines, one with finger-strokes as white thick pasty tassels, which could have been added later, around the grid motif, while another two have what look like brush-painted tassels in degrees from naturalism to more abstract.

- More idiosyncratic motifs include some brush-painted animal skin motifs in brownish-red and a yellow-brown semi-circular motif with interior rayed lines (Figures 8.27a and 8.27b). On the upper right-hand corner of these images are smaller lines coming to a point, possibly indicating a tying string.

Table 8.4: Similarities and differences between bags and front aprons (after Green & Eastwood 2008: 145, Table 1)

Characteristics	Description	Example
Bags		
Shape	Elongated, rectangular, triangular, ovoid, semi-ovoid	
Decoration	With or without tassels, internal decoration of micro-dots, With or without tassels, internal decoration of micro-dots, circles, vertical bars	
Attachments	Usually painted with looped carrying straps	
Depicted as	Stand-alone, carried over the shoulder, hanging from pegs	
Front Aprons		
Shape	Rectangular, square, cordiform, semi-ovoid, composed of strips of leather or strings of beads	
Decoration	With or without tassels, internal decoration of micro-dots, circles, vertical bars. rectangles, vertical and/or horizontal bars, chevrons	
Attachments	With or without tying thongs or vestigial tying thongs	
Depicted as	Stand-alone or worn	



Figure 8.25: Large white apron or loincloth with tying cords and thick finger-painted tassels from site Groenepunt 24A

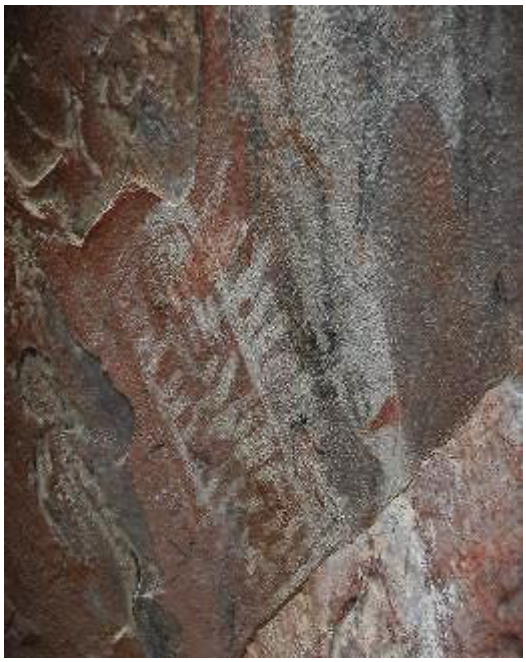


Figure 8.26: Large abstract rectangular apron with thick finger-painted tassels and internal finger-strokes from site Kirstenspruit 8

Colours commonly used to paint aprons and loincloths include brownish-red, white and yellow-brown. White, finger-painted apron motifs generally occur between 1111 and 1243 metres above sea level. Many of these motifs have no fill. Instead, they have finger-strokes in all different directions, dots, strokes or lines within their outlines.

U-shaped motifs are made using brownish-red and white hues. Brownish-red motifs are painted using a brush, while white motifs are finger-painted. The smallest U-shaped apron motif is 60 mm in contrast to the largest which is 570 mm. The finger-painted white U-shaped apron motifs are all found between 1122-1140 metres above sea level.



Figure 8.27a: True-colour image of possible brush-painted apron in yellow-brown from site Groenepunt 24B (GP24B)

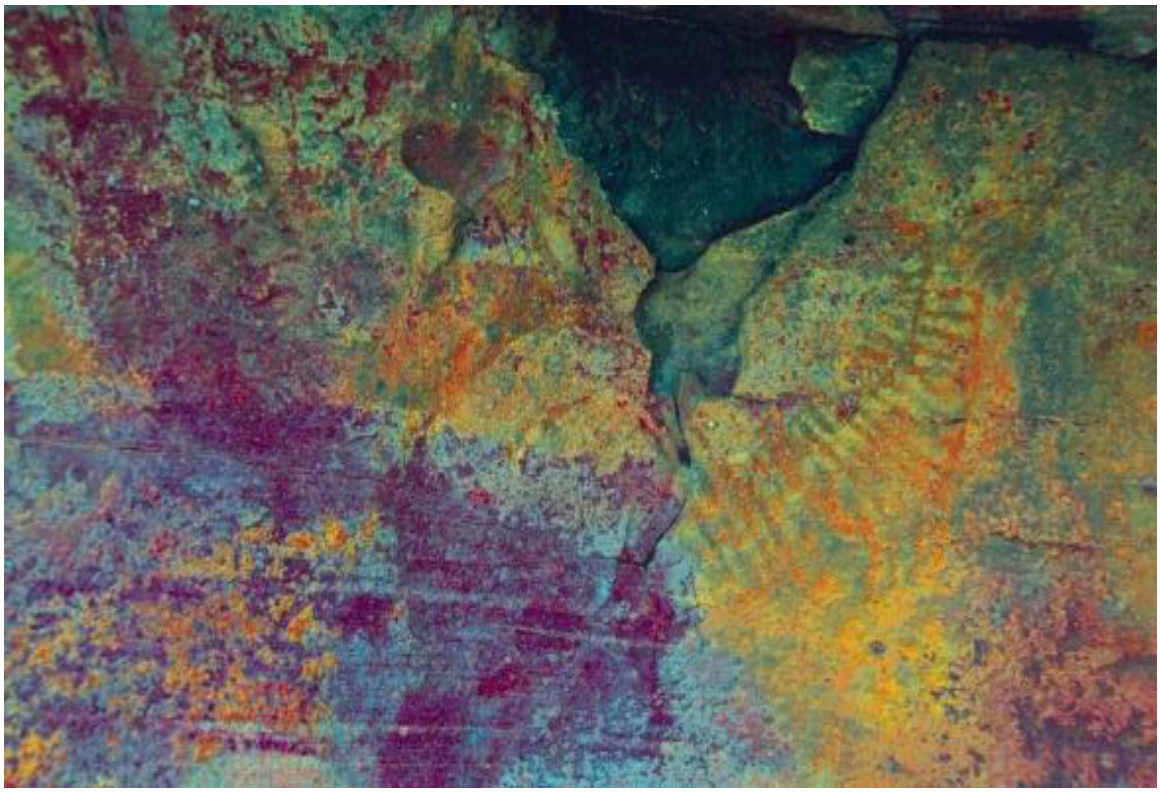


Figure 8.27b: False-colour image of brush-painted geometric in yellow-brown from site Groenepunt 24B (GP24B). Enhanced image using *DStretch*® (lds)

Likewise, square-shaped apron motifs are found between 1113-1122 metres above sea level. All are white finger-painted and the smallest is 80 mm, while the largest measures 310 mm. One square-shaped apron motif has rounded corners and is 1075 metres above sea level. It is finger-painted in black with no fill. It is not clear, whether V-shaped motifs are aprons or loincloths. V-shaped motifs are found between 1112 and 1122 metres above sea level. All are finger-painted in white paint. The smallest V-shaped motif is 40.96 mm and the largest 120 mm. Y-shaped motifs, which are likely loincloths, occur in orange ochre and black. They are all brush painted and are small ranging from 13.32 mm to 19.98 mm. This is in direct contrast to the sheer large size of the apron motifs. Y-shaped motifs occur at between 1075 and 1111 metres above sea level.

8.4.1. Temporal dimension

Aprons and geometrics occur throughout the orthogonal ArchEd Harris Matrix chronological sequence, with one occurrence at the earliest stage of the chronology (Appendix N). They are found under and over brush-painted rock art. Square-shaped finger-painted apron motifs occur over brownish-red naturalistic fine-line rock art, while U-shaped and V-shaped finger-painted apron motifs occur under and over brownish-red brush-painted fine-line rock art. Four occurrences of superimpositioning involving aprons, in one where an apron motif lies under brownish-red animals and humans, and three cases where aprons are superimposed over brownish-red humans and animals. Lastly, a star-shaped geometric is superimposed over a solid white handprint (Table 8.5, overleaf).

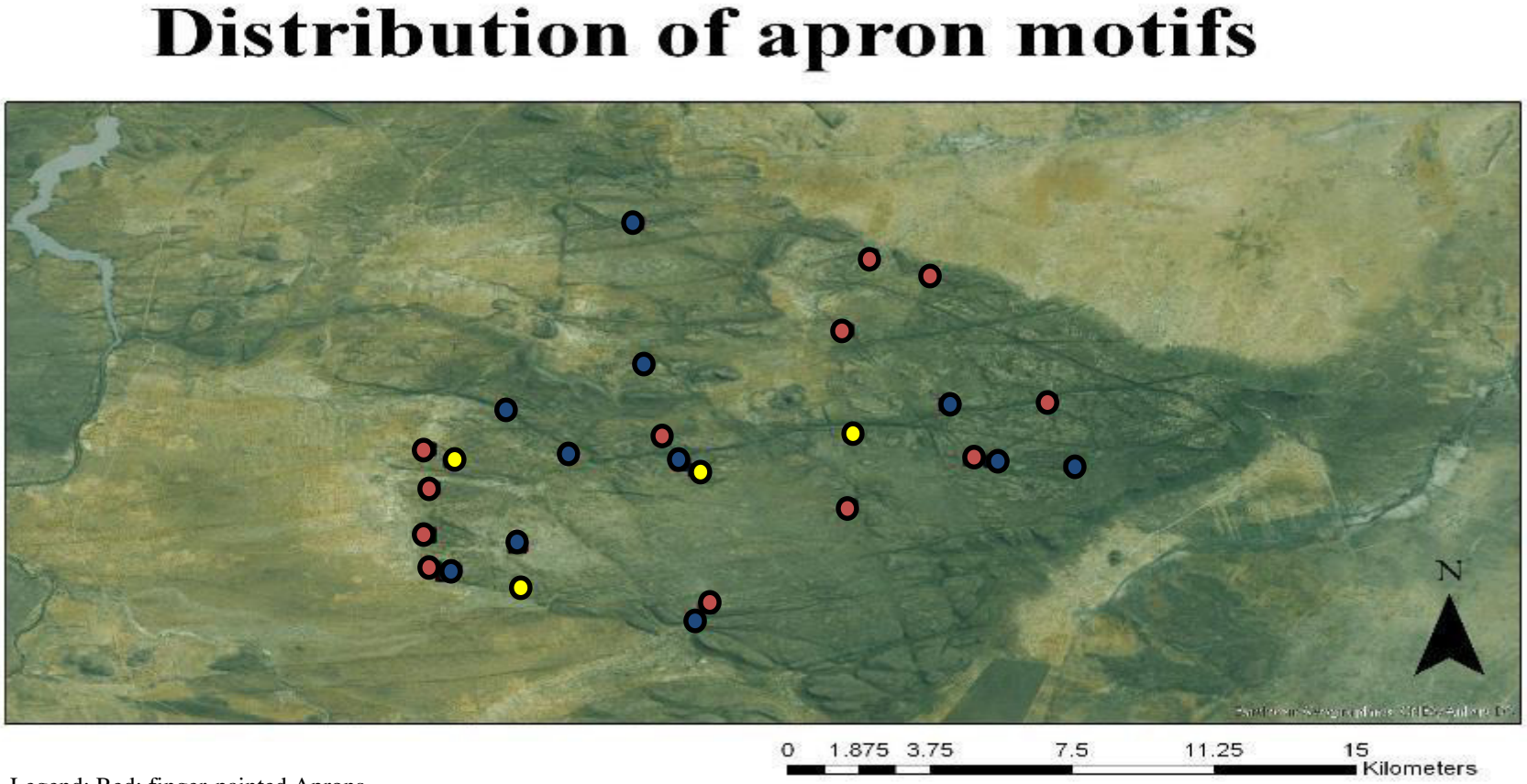
Table 8.5: Superimpositioning table of geometric and clothing motifs from Harris Matrix (* denotes geometrics that are aprons)

Motif type	Later than (superimposed over)	Earlier than (under superimposed images)	Contemporary with
W & BR Sol Geo (white and brownish-red solid geometrics including a thick bichrome line entering and emerging from a crack in the rock surface. The thick line is outlined in BR)		BR Sol Zoo (Brownish-red Solid Zoomorph)	W Fin complex (White Finger-painted complex) Lotus Sol Fin Stroke
*** W Fin complex (White Finger-painted complex)**		BR Sol Zoo	Lotus Sol Fin Stroke W & BR Sol Geo
***W F-P Geo (White Finger-painted rayed circle)**	BR Sol Zoo Lotus Sol Anthro (Large solid human figure) W Sol F-T Sheep (White solid fat-tailed sheep) YB Sol Anthro (Yellow-brown solid human figure)	BR Out Zoo (Brownish-red outlined animal)	
Bl Sol Geo (Black Solid Y-shaped geometric (Loincloth))		W Sol Zoo (White solid animal)	
***OO Sol Y-shape (Orange ochre solid y-shaped geometric (apron/loincloth))**	BR Out Zoo	BR F-P Geo	
***BR F-P Geo (Brownish-red solid semi-circular finger-stroke and a pale brownish-red rectangular apron with five horizontal dividing lines)**	OO Sol Y-shape BR Sol Zoo	BR Sol Anthro RS Sol Zoo Block (Raw sienna solid animal in block style)	
BR Sol Geo (a thick undulating line M-shaped castellation)	BR Sol Anthro W Sol Zoo YB Sol Anthro	YB Sol Geo (Yellow-brown solid geometric)	
	BR Sol Zoo		

YB Sol Geo (Yellow-brown solid geometric)	BR Sol Geo W Sol Anthro		
BR & W Oval Geo & micro-dots (Brownish-red oval-shaped geometric with white micro-dots)	BR Sol Zoo BR Sol Anthro Lotus Sol Fds (Lotus coloured solid finger-dots)		
W Sol Geo (Pasty white solid geometric)	W Sol HP (Solid hand prints in chalky white)		

8.4.2. Spatial dimension

Sample sites with fine-line and finger-painted apron and loincloth motifs in the Makgabeng were collated and plotted (Fig. 8.28). Fine-line and finger-painted aprons and loincloths follow no spatial pattern and occur alongside naturalistic fine-line paintings, although, a small cluster of finger-painted aprons is situated on the western edge of the Makgabeng.



Legend: Red: finger-painted Aprons
Blue: fine-line Aprons
Yellow: both fine-line and finger-painted aprons

Figure 8.28: Distribution of aprons and loincloths from the sampled sites

8.4.3. Motif relationships

Five out of 22 sample sites with geometrics resembling aprons and loincloths in this sample also have finger-dots. Geometrics resembling clothing occur with handprints in one of the 22 sites. Motifs of sheep and women occur with these geometrics in four out of the 22 sites. Motifs of human figures wearing aprons/clothing are seen in only one of the 22 sites (Fig. 8.29).

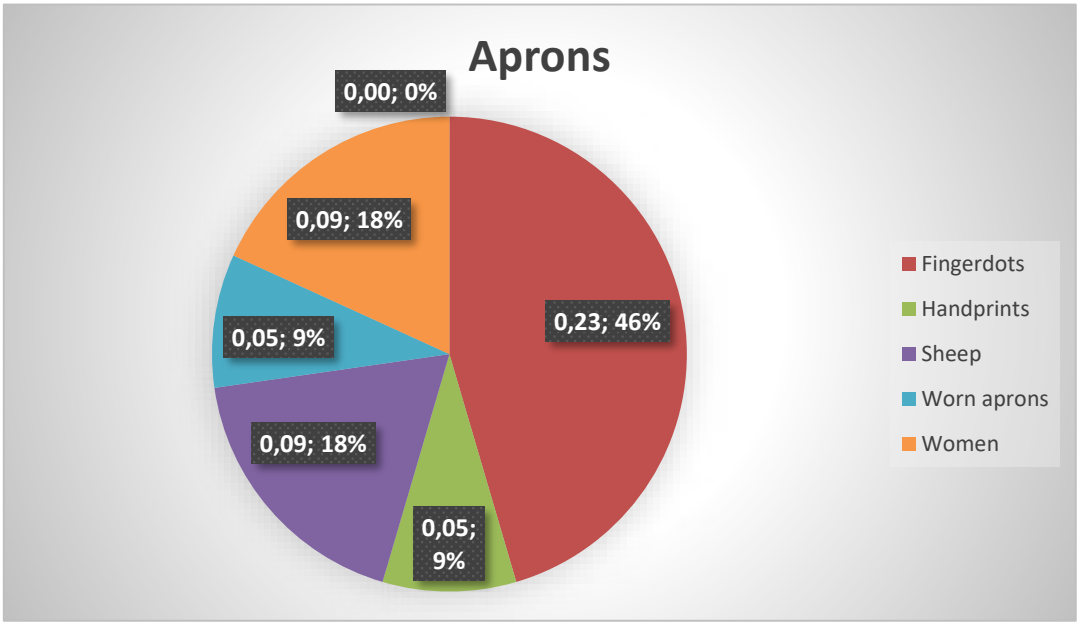


Figure 8.29: Pie graph indicating percentage of motif relationships between apron and loincloth motifs with other variables

8.4.4. Conclusions

Geometric motifs are not spatially separate and co-occur in many sites. White finger-painted apron shapes are created in shelters at higher elevations. The difficulty reaching these higher elevations may indicate ritual seclusion or initiation. The disparity in size and colour between aprons and loincloths in the sample could reflect the potency of certain clothing items and engendered practices (Chapters IX and X). That clothing motifs are made using both brush

and finger could reflect that different peoples created these art forms, or it could also indicate different ritual uses within one community, such as initiation ceremonies, aggregation and dispersal patterns, and ritual acts of association.

8.5. Sheep

Three types of sheep imagery occur in the Makgabeng – fat-tailed sheep, thin-tailed sheep and, possibly, therianthropes with sheep heads (Figures 8.30a and 8.30b). All sheep motifs are brush-painted. Sites have between one and 18 sheep. They are often painted without people, except on two occasions where they are painted with human figures, one distinctively male, holding long bows (Figures 8.31a, 8.31b to 8.32). Sheep motifs occur in brownish-red, white (Fig. 8.33), black and yellow-brown hues. They are sometimes clustered together, occasionally following each other or painted alone. Some are verisimilar, while others are more abstract.



Figure 8.30a: Therianthrope with possible sheep head iconic floppy ears in bending forward posture similar to trance postures. At site Bonne Esperance 2

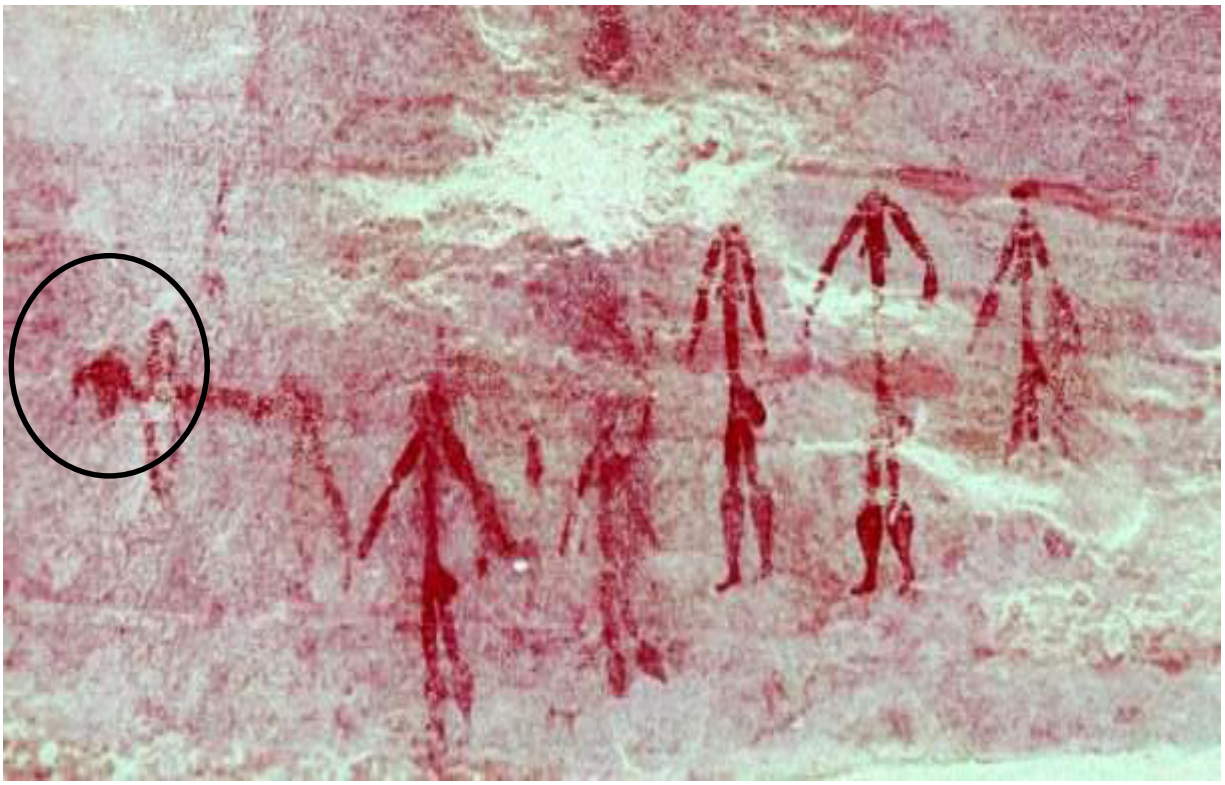


Figure 8.30b: Detail of sheep-headed thrianthrope in bending forward posture similar to trance postures from site Bonne Esperance 2. Enhanced image using *DStretch*® (yre)

.

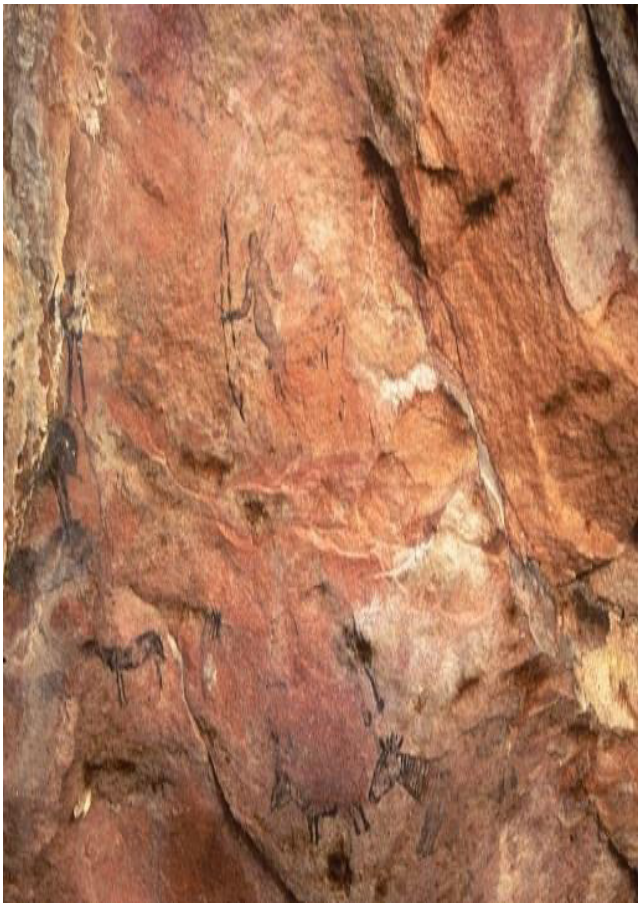


Figure 8.31a: True-colour image of male figure painted to the right of a cluster of black sheep. This figure holds a long bow and possibly a quiver of arrows slung over his back at site Bonne Esperance 16 (BE16)



Figure 8.31b: False-colour image of male figure painted to the right of a cluster of black sheep. This figure holds a long bow and possibly a quiver of arrows slung over his back at site Bonne Esperance 16 (BE16). Enhanced image using *DStretch*® (lds)



Figure 8.32: Detail of black sheep's head at site, Bonne Esperance 16 (BE16)



Figure 8.33: White fat-tailed sheep with head lowered and distinctive fat tail at site Bonne Esperance 15 (BE15). Photo taken by Benjamin Smith. Image courtesy of SARADA

Most are monochromatic, except for one site where there are two bichromatic sheep, with the bodies of the sheep painted in white while the heads are brownish-red (Figs 8.34a and 8.34b, overleaf). Sizes of sheep motifs from head to tail range from 100 mm to 317.5 mm. One indeterminate animal that may be a sheep is situated at 963 metres above sea level but the rest occur between 1057 and 1258 metres above sea level. Of the 449 zoomorphic motifs, 51 are sheep (11%) compared to Vinnicombe (1976: 364) where out of a total of 3606 animal figures only 1% are sheep.

8.5.1. Temporal dimension

In the orthogonal ArchEd Harris Matrix chronological sequence (Appendix N), motifs of white fat-tailed sheep occur under a white finger-painted rayed circle superimposed over solid black and brownish-red zoomorphic motifs (Table 8.6).

Table 8.6: Superimpositioning table of sheep motifs from Harris Matrix

Motif type	Later than (superimposed over)	Earlier than (under superimposed images)	Contemporary with
W Sol F-T (White solid fat-tailed sheep)	BR Sol Zoo (Brownish-red solid zoomorphic motifs)	W F-P Geo (White finger-painted geometrics)	YB Sol Anthro (Yellow-brown solid anthropomorphic motifs)
	Bl Sol Zoo (Black solid zoomorphic motifs		Lotus Sol Anthro (Lotus solid anthropomorphic motifs)



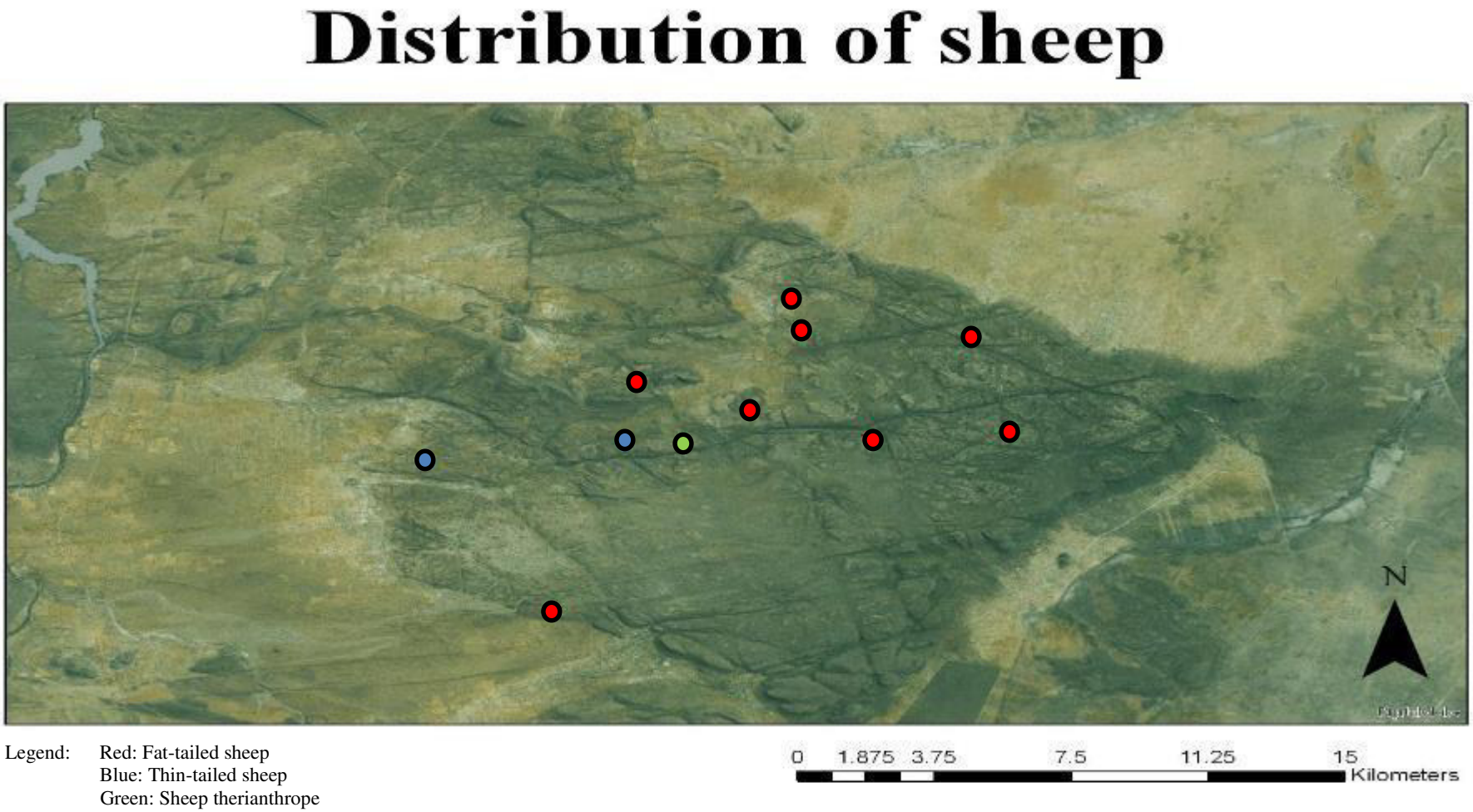
Figure 8.34a: True-colour image of three white sheep with brownish-red faces, ears and horns. The large animal to the left could have a sheep head at site Langbryde 40 (LB40)



Figure 8.34b: Langbryde 40 (LB40). Three white sheep with brownish-red faces, ears and horns. The large animal to the left could have a sheep head (false colour image) Enhanced image using *DStretch*® (rgb)

8.5.2. Spatial dimension

Sheep in this sample follow a different distributional trend than do handprints, as many of the sheep motifs occur deeper within the Makgabeng around the central gorge. Fat-tailed sheep occur further to the east, while sheep with indeterminate or thin tails occur to the west (Fig. 8.35, overleaf).



Legend: Red: Fat-tailed sheep
Blue: Thin-tailed sheep
Green: Sheep therianthrope

Figure 8.35: Map of the distribution of sheep in the sample of sites including the spatial differentiation of fat-tailed sheep and thin-tailed sheep motifs

8.5.3. Motif relationships

Four out of 12 sites with sheep motifs have finger-dots and finger-strokes. One out of 12 sites with sheep motifs have handprints. Aprons and finger-painted geometrics occur in six out of 12 sites. Four out of 12 sites have motifs depicting worn clothing. Lastly, sites with sheep occur with depictions of women only at two out of 12 sites (Fig. 8.36).

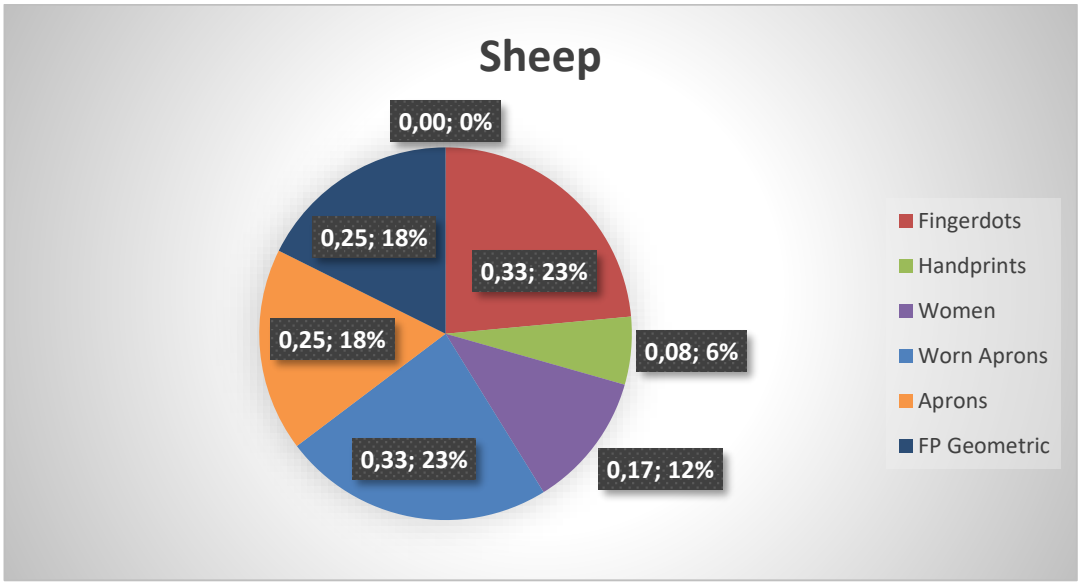


Figure 8.36: Pie graph indicating the percentages of motif relationships between sheep with other motifs

8.5.4. Conclusion

The arrival of sheep in the Makgabeng likely had an impact on the inhabitants. One may identify this impact in the resulting rock art. Sheep were absorbed into the socio-religious milieu of Bushman cosmology with artists depicting part-sheep therianthropes within a shamanistic framework. Additionally, sheep co-occur with finger-dots and strokes in a third of the total sample sites and with geometrics in half of the total sample sites, reflecting a relationship. Furthermore, they are found under a finger-painted white geometric rayed circle, indicating an older date. This

may represent a connection between touching and sheep. Lastly, spatially fat-tailed sheep occur further to the east, while sheep with indeterminate or thin-tails occur to the west.

8.6. Statistics

8.6.1. Contingency tables

Using contingency tables, six statistical tests were conducted on the sample SPSS field data. For the tests it was calculated which variables were present or absent at each site, to discover whether an association between two variables could be discerned from the 36 sample sites. The results of the tests are summarised in Table 8.7 and SPSS outputs can be found in appendices D through I. From Table 8.7, it is apparent that the association between finger-dots and strokes and aprons and loincloths is not quite statistically significant.

Table 8.7: Contingency table (cross-tabulation) results

	Hypothesis	P-value	Interpretation
1	Correlation between presence of finger-dots/strokes and aprons/loincloths?	0.70	P > 0.10
2	Correlation between presence of handprints and finger-dots/finger-strokes?	0.73	P > 0.10
3	Correlation between the presence of clothing and handprints?	0.192	P > 0.10
4	Correlation between the presence of sheep and handprints?	0.453	P > 0.10
5	Correlation between the presence of sheep and finger-dots?	0.473	P > 0.10
6	Correlation between the presence of sheep and clothing?	0.813	P > 0.10

The remaining tests did not point to any statistical significance between variables. The presence of one variable does not mean that the other variable will be present

at the site. It is possible that the clustering of specific motifs in 'traditions' is arbitrary and the motifs may not have any testable associations. A cluster analysis was conducted to determine if stylistic similarities and differences between motifs could be discerned.

8.6.2. Cluster analysis

The results of the cluster analysis, with accompanying dendrogram is placed in Appendix N. Each cluster will be dealt with in detail and is summarised in Table 8.8 with key variables highlighted. A cluster has one or two attributes that are significant and define the style.

Cluster One (46 motifs in 18 sites): these motifs are identified by the finger-painted technique and are distributed evenly in the landscape with no significant spatial patterning (Fig. 8.37). Common attributes include finger-dots and solid monochromatic finger-painted geometric shapes including aprons, V-shaped forms and concentric semi-circles. Figures 8.38a and 8.38b illustrate the Lotus-coloured finger-painted undulated lines and the brownish-red finger-dots under the line. Figure 8.39 depicts white horizontal and vertical horizontal finger-strokes painted on the ceiling of a rock overhang and diagnostic of this cluster. Similarly, Figure 8.40 shows long white vertical finger-strokes painted over black imagery including a hartebeest or tsessebe, human figures and an indeterminate antelope. Figure 8.41 shows an example of a white undulating line.

Table 8.8: Table demonstrating the nine resulting clusters with key variables highlighted

Cluster One	Cluster Two	Cluster Three	Cluster Four	Cluster Five	Cluster Six	Cluster Seven	Cluster Eight	Cluster Nine
Finger dots	Finger dots within outlined geometrics			Microdots	BR fingerstrokes and dots over aardvark			
Finger	Finger	Brush bar one	Brush	Brush	Brush	Brush	Handprints	Brush
monochrome	monochrome	monochrome	monochrome	monochrome	monochrome	Bichrome	Chalk	monochrome
White	White	bichrome	bichrome	bichrome		Polychrome	Paint smears	
BR	BR	polychrome	BR	OO	BR	BR	BR	BR
RS		White	White	Scorpion	White	White	YB	White
Lotus		BR	Black	Black	Brown	OO	White	Black
Scorpion		YB	RS	RS	Many animals	Cream	Outline of giraffe, detailed head	Human figures
YB	YB	OO	YB	YB	White sheep over BR	RS	Cone shaped paint smear	Material culture
Black	Black	Black	OO	Lotus	Strange human figures	Black	monochrome	
Finger strokes		Cream and White	Lotus	Flesh	Rain drop shapes	YB		
Crude elephant/baboon			Outlined circle	faded female kudus	Indetermine antelopes	Flesh		
Concentric semi-circle	Concentric circle		Outlined figures	F-T sheep YB	Unique geometric shapes (recent)	Majestic antelopes		
Circle and dot	semi-circle and dot		Outlined animals	F-T sheep Black	F-T sheep white	Female figures with aprons		
zigzag line	Circle and dot	Dotted mythical animal	Grid	Various humans	Castellation	warthog		
Undulating line	Apron (V-shaped)	Dotted hyena		Ostriches Black	White giraffe	Bichrome humans rare		

Cross	Grid	Circle no fill lines within		YB humans	BR paint smears same as figures around	BR and B animal under YB	YB paint smear over BR	
Indeterminate animal	Triangular geometric	Antelope no fill		Paint smears	Spoor	Bending forward figures		
Apron (skin) U	Apron (skin) globular U	Zebra no fill just stripes		RS Giraffe (crude)	Canid	Ostriches		
V-shaped line	Globular outline	Eland, crude outlined			White flecks	Hyena		
Apron (skin) Sq	Rectangle outline	Rectangular formling		Y-shaped geometric (loincloths)	F-T sheep BR			
Apron (skin) Semi-ovoid	Apron (skin) Semi-ovoid	Woman with no fill	linear geometric	Undulating line	White zebra over antelope			
microdots	Square geometric	Kudu no to partial fill	Apron (skin) Sq	Various animals both sexes	V-shaped motif (spoor?)			
Superimposed over and under	Apron (skin) Sq	Apron (skin) Sq	Superimposed under YB	YB under castellations	White castellation over antelope			
Solid	No fill	Partial fill	No fill	Solid	Solid	Solid	Solid	Solid
	Dotted	Partial Dotted	Dotted			Solid with white stripes over		
		Dotted	Solid			More care		

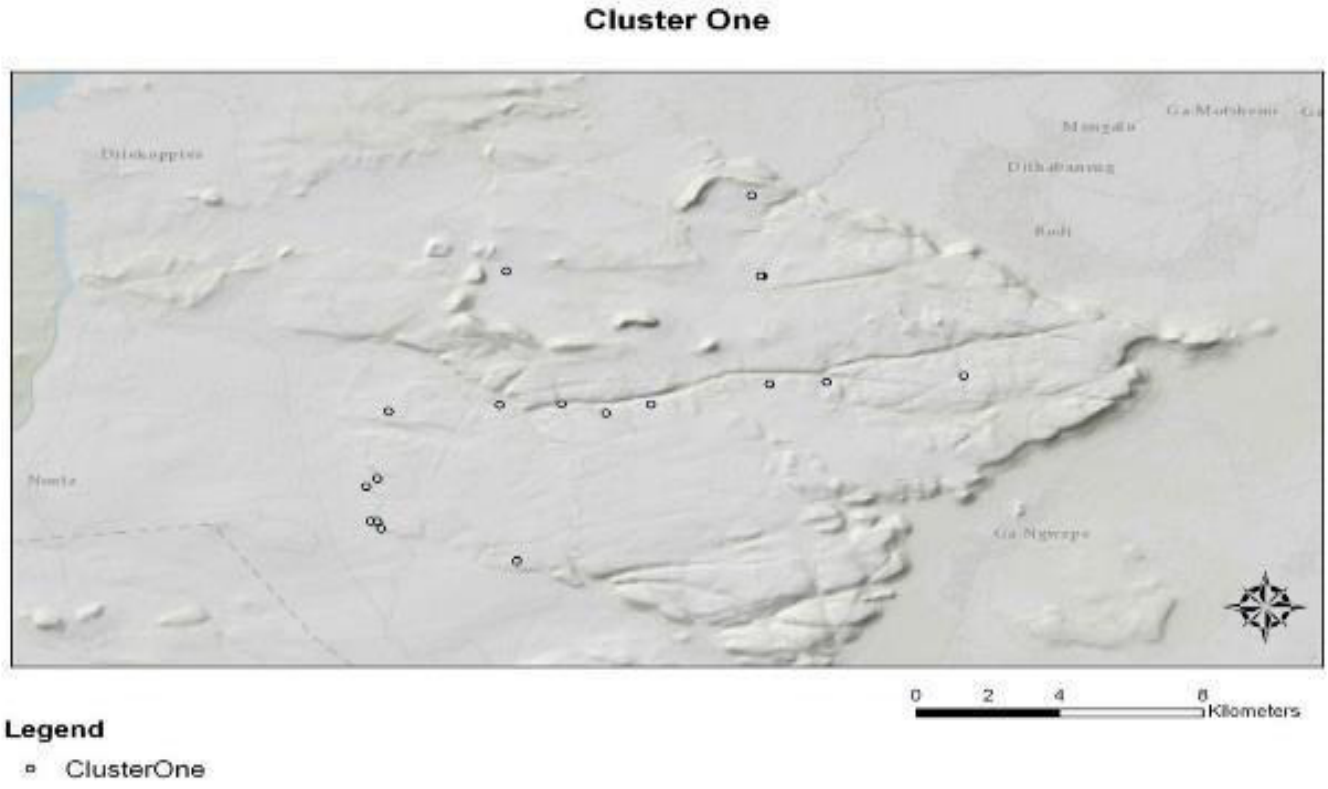


Figure 8.37: Map of sites in cluster one showing evenly distributed sites



Figure 8.38a: Lotus undulating line superimposed over brownish-red finger-dots at site Bonne Esperance 21



Figure 8.38b: Lotus undulating line superimposed over brownish-red finger-dots at site Bonne Esperance 21 Enhanced image using DStretch® (yye)



Figure 8.39: Vertical and horizontal finger-strokes on cealing at site Too Late 3



Figure 8.40: Three long white finger-strokes over black imagery at site Disseldorp 8



Figure 8.41: White finger-painted undulating white line at site Groenepunt 47

The brownish-red finger-dots in Figures 8.42a and 8.42b are the same hue as the aardvark that is under them. Lastly, Figures 8.43a and 8.43b have a crude, white finger-painted human figure with an indeterminate abstract form in front of it.



Figure 8.42a: Brownish-red finger-dots superimposed over aardvark at site Too Late 11



Figure 8.42b: Brownish-red finger-dots superimposed over aardvark at site Too Late 11. Enhanced image using DStretch® (rgb)



Figure 8.43a: Thick white finger-painted human figure with abstract form at site Bonne Esperance 21



Figure 8.43b: Thick white finger-painted human figure with abstract form at site Bonne Esperance 21. Enhanced image using DStretch® (lds)

Cluster Two (68 motifs in 11 sites): these finger-painted monochromatic motifs are distinguished by either the lack of fill, or the many motifs that have dotted fills within their outlines. Spatially, sites in cluster two are evenly spaced and are evenly spread out (Fig. 8.44).

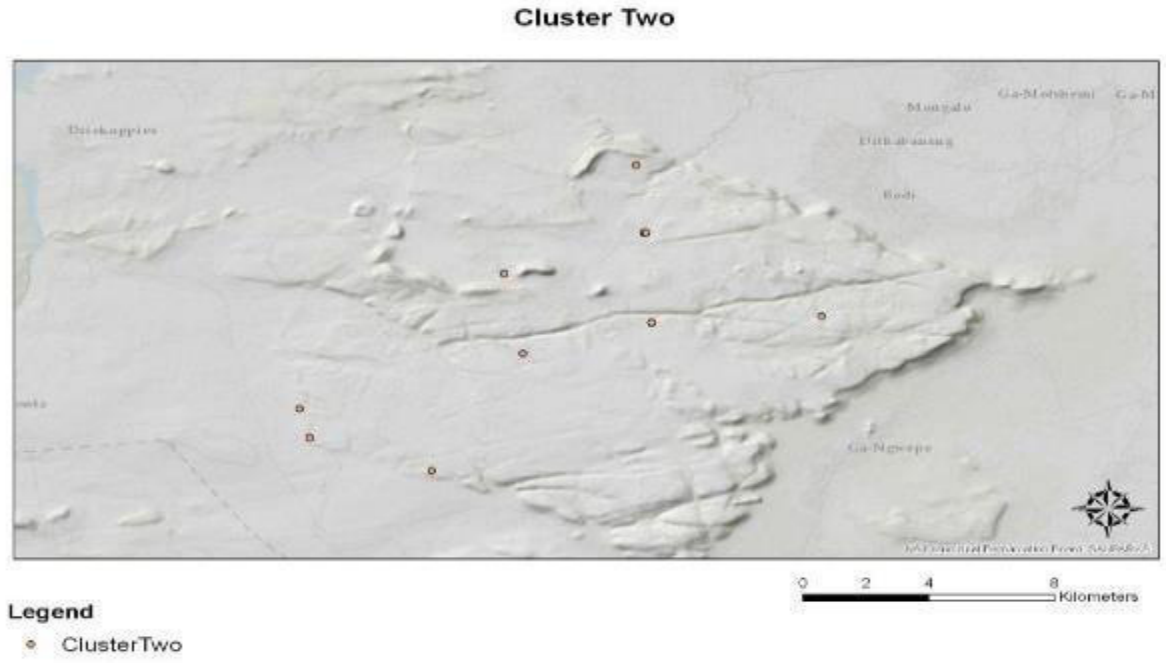


Figure 8.44: Map of sites in cluster two, which are scattered evenly throughout the Makgabeng

Figure 8.45 demonstrates over 33 finger-dots enclosed by a thick white finger-painted line. The finger-dots begin next to a shelter wall crack. They are superimposed over fine-line human figures. Figure 8.46 illustrates two black geometric shapes. The first is a finger-painted semi-circle with a painted line extending down. The second is a finger-painted near-complete circle within the middle of the cup of the larger semi-circle. Figure 8.47 has two finger-painted rayed concentric circles with curved triangular geometrics motifs. Lastly, in Figure 8.48, finger-painted geometrics are shown including a white semi-ovoid apron motif below a larger semi-ovoid apron motif (w-shaped one). This apron motif is sealed with two stubby ties. Within the borders of the first apron motif are seven white dots.



Figure 8.45: Langbryde 40. Finger-dots (33+) in semi-ovoid motifs, possibly apron motifs. They end at a crack in the shelter wall. Superimposed over three fine-line painted humans. At site Langbryde 40



Figure 8.46: Two black geometric shapes. The first is a finger-painted semi-circle with a line extending down. The second is finger-painted near-complete circle within the middle of the cup of the larger semi-circle. At site Disseldorp 8

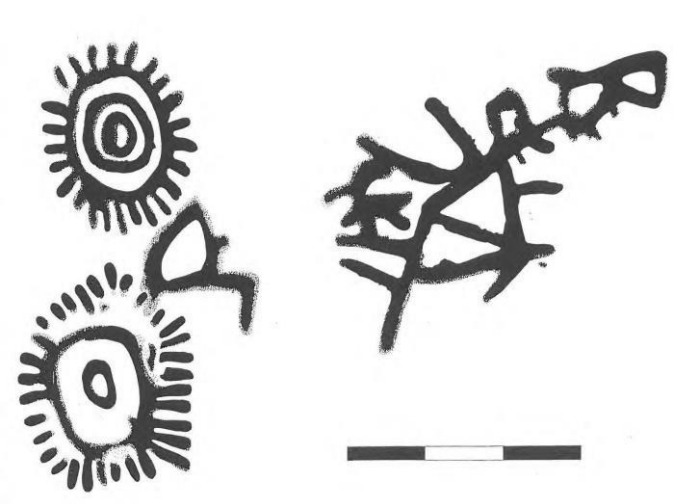


Figure 8.47: Re-drawing of two finger-painted rayed concentric circles with curved triangular geometric motifs. Scale is 300mm. At site Gallashiels 8. Redrawn by Eastwood (Eastwood & Van Schalkwyk 2002: 68)



Figure 8.48: An upside down white semi-ovoid apron motif below the larger semi-ovoid apron motif (w-shaped one). This motif is sealed with two stubby apron ties. Seven white dots within the shape. At Nieuwe Jerusalem 19

Cluster Three (19 motifs from 11 sites): motifs in cluster three are defined using no fill, partial fill or partially dotted. Both brush and finger-painted motifs are reflected in this cluster. Spatially, the sites are evenly distributed with a small cluster in the west of the Makgabeng (Fig. 8.49).

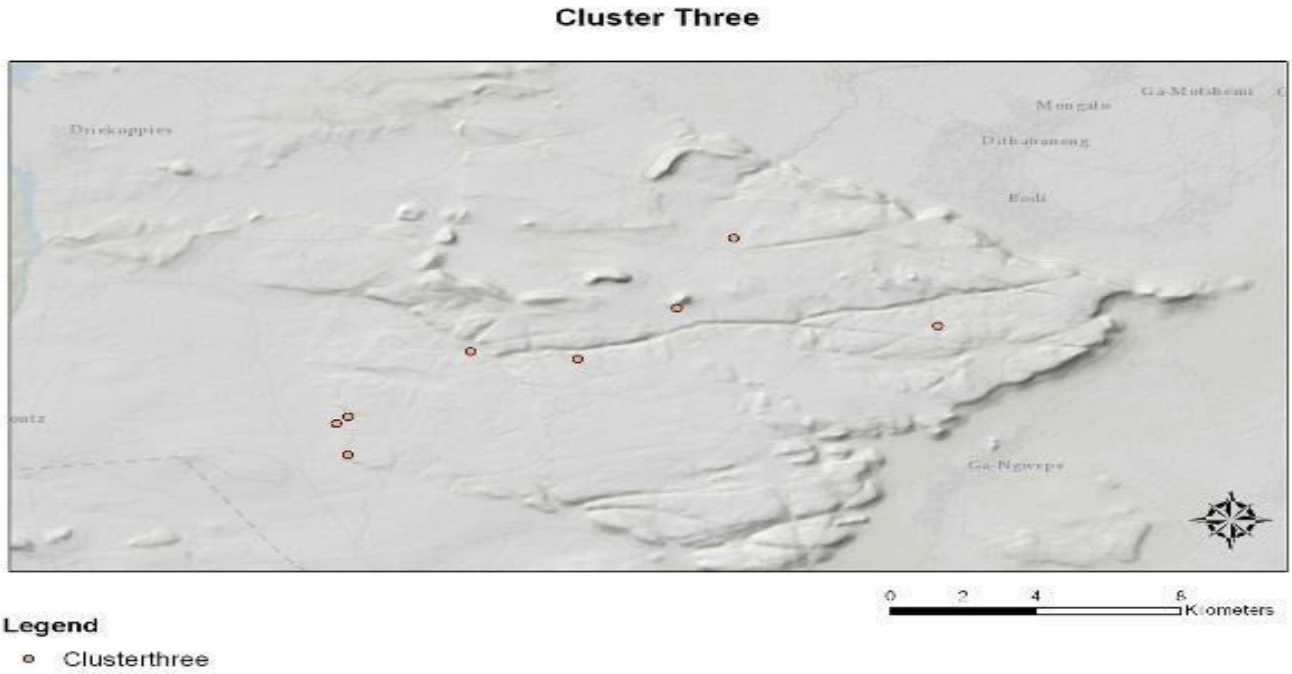


Figure 8.49: Map of sites in cluster three. Sites are evenly distributed with a small cluster in the west

The abstract motifs in Figure 8.50 are six nested oval shapes, outlined in white with cream-coloured in-fill and with brownish-red dots speckled inside the ovals. Figure 8.51 illustrates the diagnostic partial fill attribute of this cluster. In this figure, a male kudu is depicted, but only the head, horns and neck are filled in. It is painted in the same style as the finger-painted square apron motif superimposed over it. Figure 8.52 depicts a brownish-red large antelope (possibly an eland) unfilled, with only the rump and upper legs depicted. Lastly, figure 8.53 reveals a black square apron motif with long vertical lines extending from the bottom corners.



Figure 8.50: Detail of six nested oval shapes outlined in white with cream-coloured fill with brownish-red dots speckled inside the ovals. At site Bonne Esperance 17



Figure 8.51: Black motif of a kudu bull. The body of which is unfilled while the head, neck and horns are filled. A finger-painted square apron motif is superimposed over the bull. At site Nieuwe Jerusalem 19



Figure 8.52: A brownish-red outline of imperceivable, or unfinished, large antelope. Possibly an eland. At site Groenepunt 24A. Image courtesy of SARADA



Figure 8.53: Black finger-painted square apron motifs with long vertical lines extending from bottom corners. At site Nieuwe Jerusalem 19

Cluster Four (44 motifs from 18 sites): the fourth cluster emphasises outlined geometrics, anthropomorphic and zoomorphic motifs. Spatially, sites in this cluster are evenly distributed, although small clusters occur in the centre and on the western edge of the Makgabeng (Fig. 8.54).

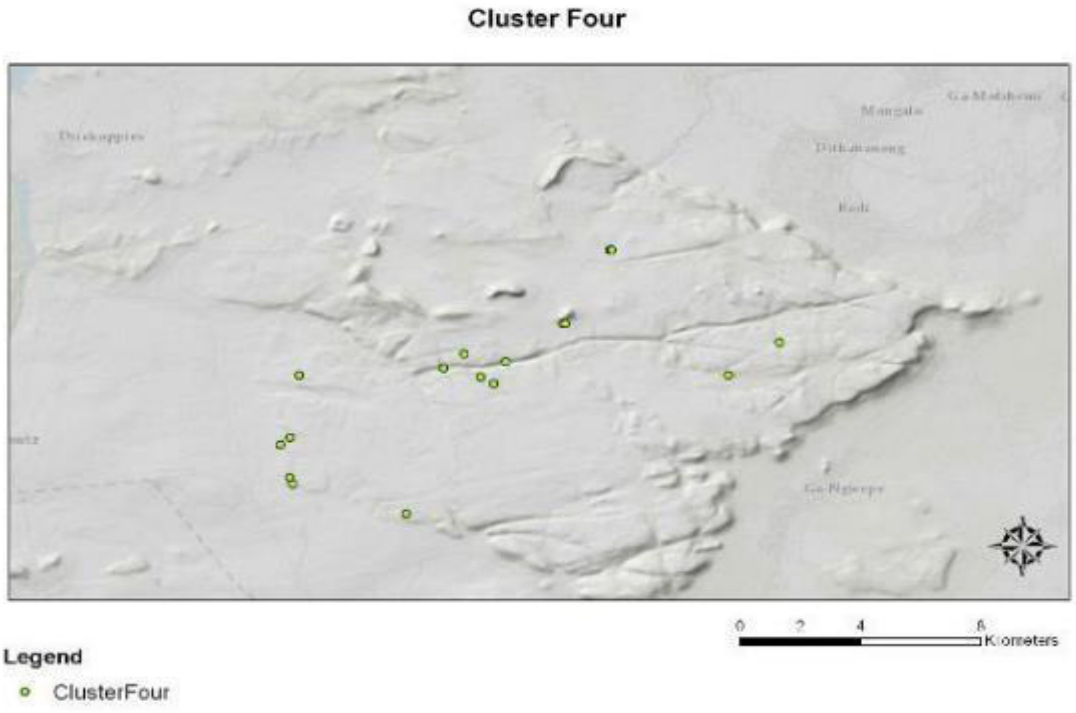


Figure 8.54: Map of sites in cluster four with small clusters occurring in the centre and on the western edge of the Makgabeng

Figures 8.55a and 8.55b show a brownish-red linear complex geometric with an internal wavy line. Figure 8.56 illustrates a fine-line oval-shaped geometric with crossed tassel-like pieces at the base. The inner line of the oval is outlined in white, while the exterior is lined with white micro-dots. These micro-dots extend beyond the oval. At the apex of the oval, two rows of micro-dots parallel to each other extend upwards. At the base, the micro-dots extend beyond the shape, creating a rectangular outline of white dots. This complex geometric is superimposed over finger-dots, a smudged paint smear and antelope. Figure 8.57 reveals another outlined geometric which is a feature attribute of this cluster. In this example, a brownish-red grid-like geometric, possibly an abstract apron motif, is painted. The grid has six internal lines running vertically. It is a possible apron because of four lines emitting from the corners, representing tassels. The grid is under a large yellow-brown elephant. Lastly, Figure 8.58 identifies a black unfilled zebra depicted in charcoal. The head of the zebra is raised and unlike other fine-line zebras. The hairs in the zebra's mane are abstracted and evenly spaced.



Figure 8.55a: True-colour image of a complex geometric motif with wavy line enclosed at site Groenepunt 35



Figure 8.55b: False-colour image of a complex geometric with wavy line enclosed at site Groenepunt 35. Enhanced image using DStretch® (rgb)



Figure 8.56: An oval-shaped geometric with crossed tassel-like pieces at the base. The inner line of the oval is outlined in white while the exterior is lined with white micro-dots. At Bonne Esperance 25

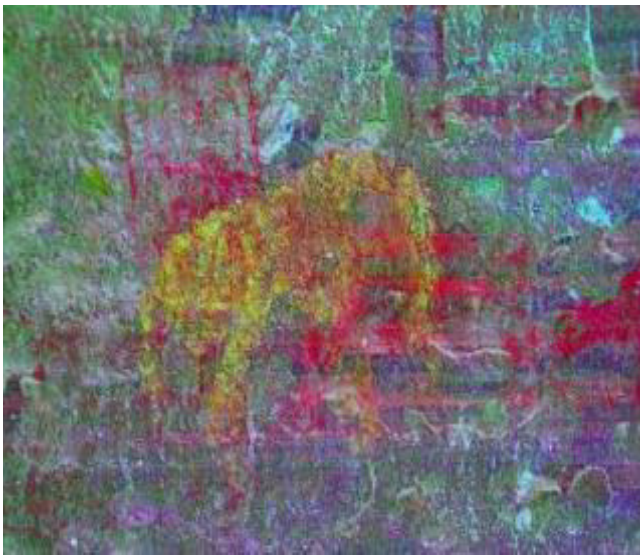


Figure 8.57 A false-colour image of a brownish-red grid and has six internal lines running vertically. Possible an apron because of four lines emitting from the corners representing tassels. The motif is seen under a large yellow-brown elephant at De la Roche 42. Enhanced image using DStretch® (ybr)



Figure 8.58: Black unfilled zebra done in charcoal. The head of the zebra is raised and unlike fine-line zebras. The hairs in the zebra's mane are abstracted and evenly spaced. Site near Bonne Esperance 2

Cluster Five (242 motifs in 25 sites): the fifth cluster represents the second largest cluster and has motifs in most sites in the sample dataset. The motifs are brush-painted monochromatic and bichromatic and include yellow-brush figures as well as rare colours. Spatially, cluster five sites are distributed across the Makgabeng with no patterning (Fig. 8.59).

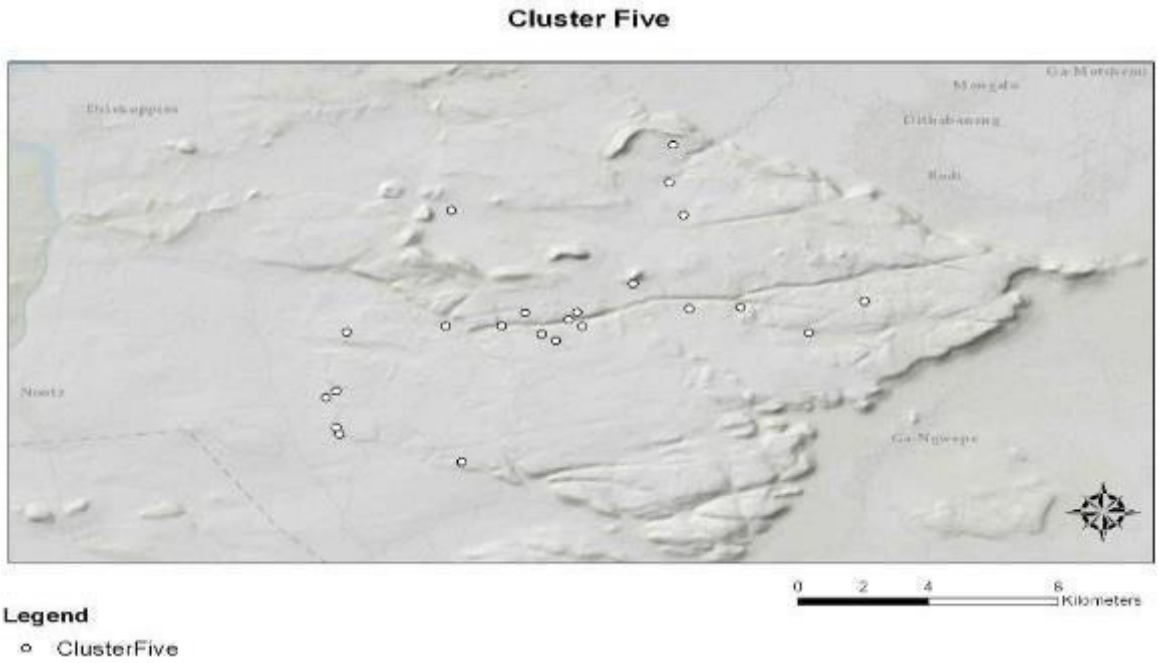


Figure 8.59: Map of sites in cluster five

Figures 8.60a and 8.60b show a row of seven or eight human figures, all with exaggerated calf muscles and no heads or arms visible. Similarly, Figures 8.61a and 8.61b illustrate two tiny stick-like yellow-brown animals walking one behind the other. The first animal's head is slightly raised. Both animals have long pointy ears. A more detailed painting of a yellow-brown antelope with flat straight back, short tail, thin stick-like legs, long rounded ears and raised head are identified in Figures 8.62a and 8.62b. Lastly, figure 8.63 has a yellow-brown fat-tailed sheep with large stomach and extended legs.



Figure 8.60a: Groenepunt 24A. True-colour image of a row of seven or eight yellow-brown human figures, all with exaggerated calf muscles and no heads or arms visible (True colour image)



Figure 8.60b: Groenepunt 24A. A row of seven-eight human figures, all with exaggerated calves and no heads or arms visible (false colour image). Enhanced image using DStretch® (ybk)



Figure 8.61a: True-colour image of two tiny stick-like yellow-brown animals walking one behind the other. The first animal's head is slightly raised. Both animals have long pointy ears. At Too Late 3

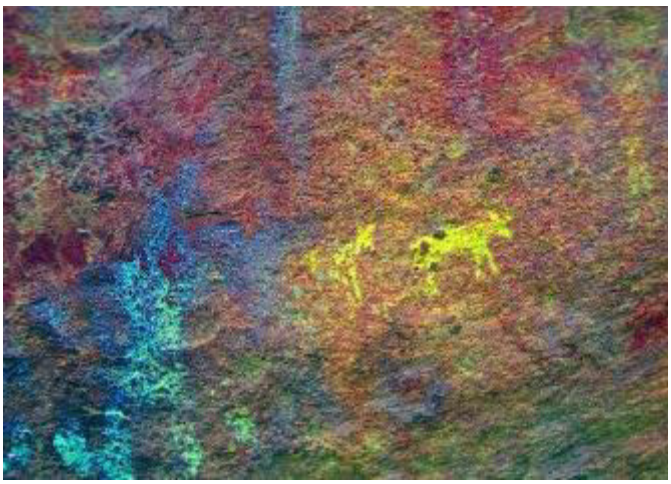


Figure 8.61b: False-colour image of two tiny stick-like yellow-brown animals walking one behind the other. The first animal's head is slightly raised. Both animals have long pointy ears. At Too Late 3. Enhanced image using DStretch® (lds)



Figure 8.62a: True-colour image of a yellow-brown antelope with flat straight back, short tail, thin stick-like legs, long rounded ears and raised head. At site, Too Late 11



Figure 8.62b: True-colour image of a yellow-brown antelope with flat straight back, short tail, thin stick-like legs, long rounded ears and raised head. At site Too Late 11. Enhanced image using DStretch® (lds)



Figure 8.63: A crudely painted sheep in yellow-brown paint. Small lump tail. Body is very round with large curved stomach and long legs. Sheep lies under Northern-Sotho rock art. At site, Too Late 11

Cluster Six (315 motifs in 31 sites): the sixth cluster represents the largest cluster and has motifs in most sites in the sample dataset. The cluster mostly consists of brush-painted monochromatic brownish-red and white animal motifs. Spatially, the sites are evenly spaced but several sites are grouped within the centre of the Makgabeng gorge (Fig. 8.64).

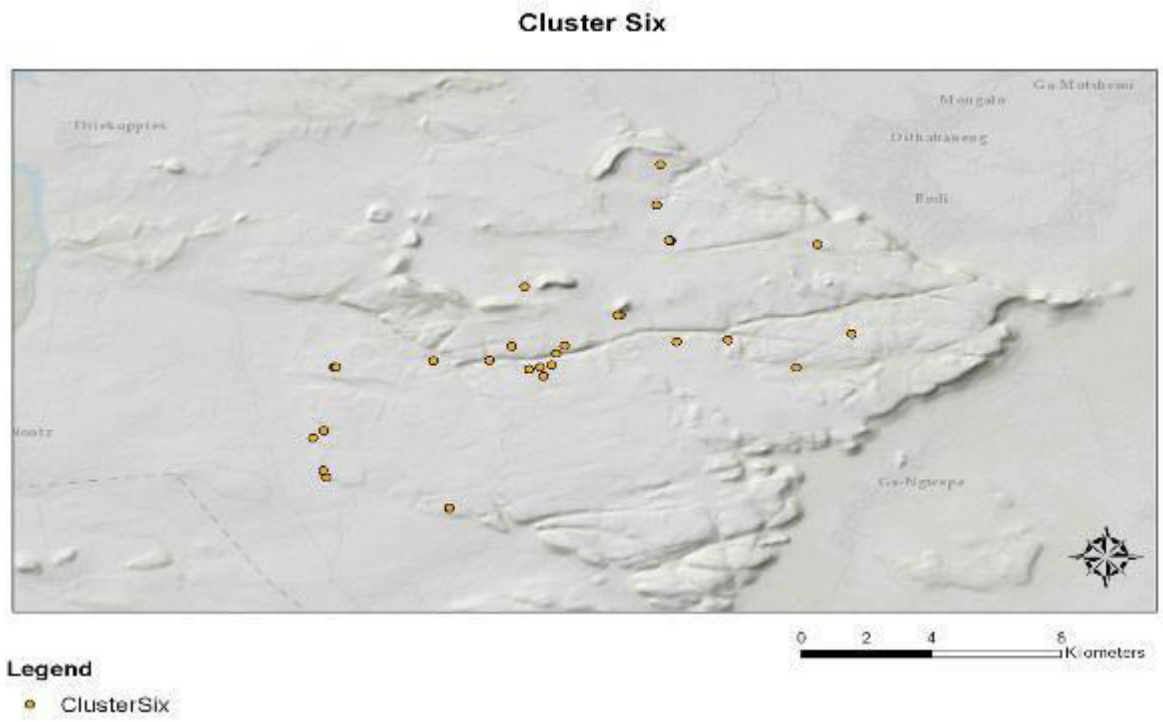


Figure 8.64: Map of sites in cluster six with clustering on either side of the Makgabeng gorge

Figures 8.65a and 8.65b show a group of seven to eight brownish-red indeterminate antelope painted together. Figure 8.66 illustrates faded white paintings that depict a wildebeest head and front limb, facing a man holding bow and arrows. Figures 8.67a and 8.67b depict true and false colour images of a brownish-red human figure partially superimposed over bending forward figure.



Figure 8.65a: True-colour image of seven to eight brownish-red indeterminate antelope. At Groenepunt 47

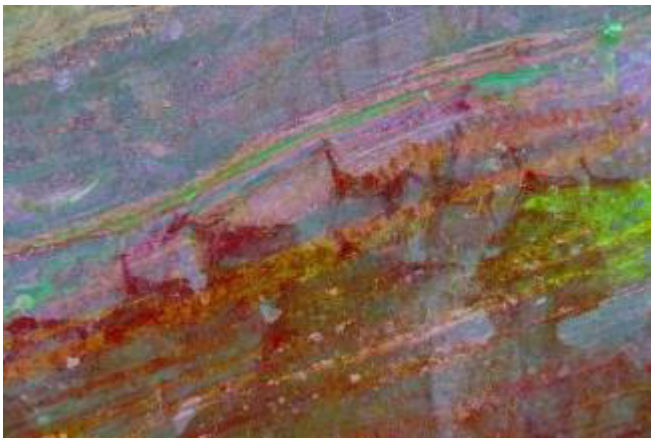


Figure 8.65b: False-colour image of seven to eight brownish-red indeterminate antelope. At Groenepunt 47. Enhanced image using DStretch® (crgb)

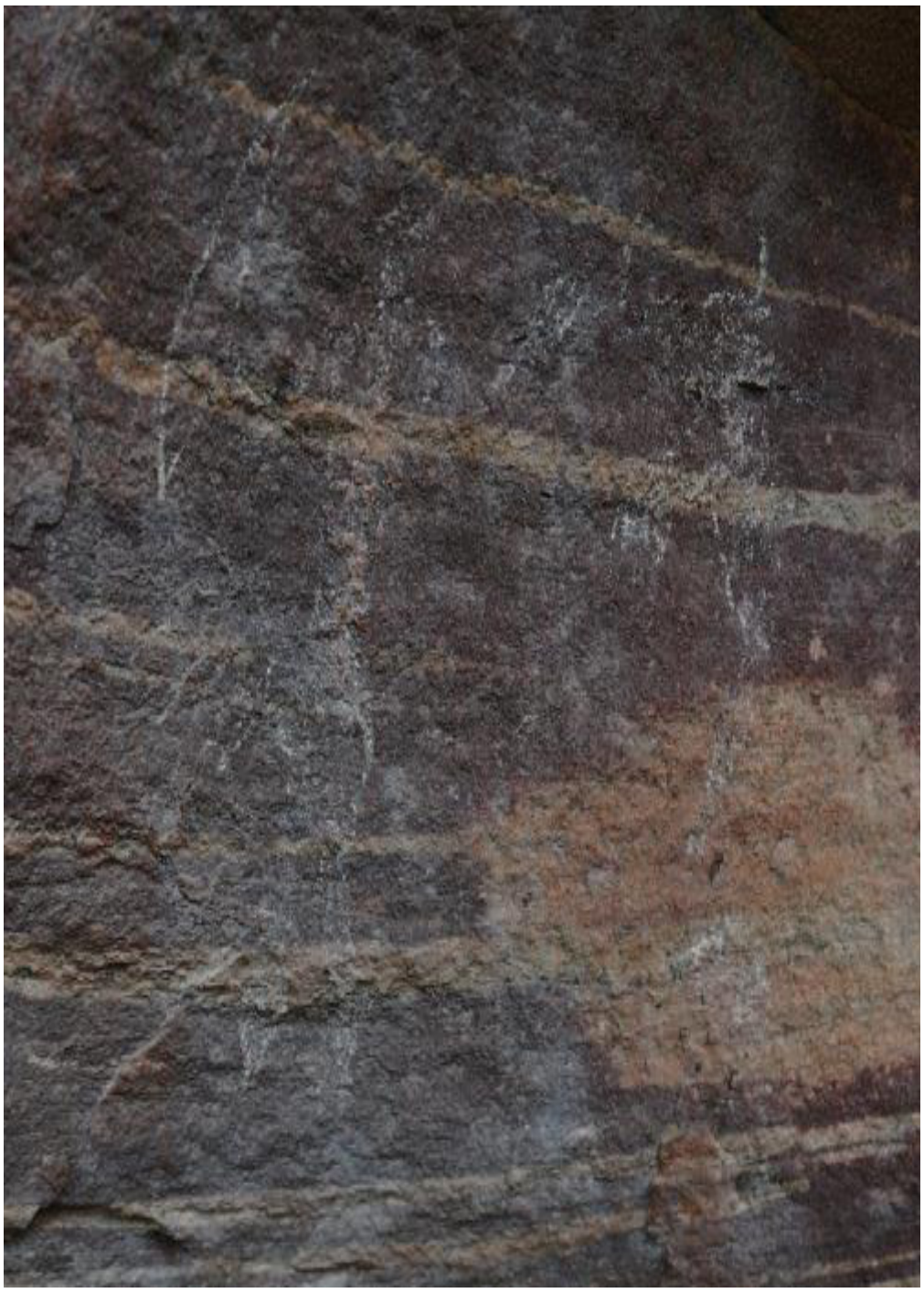


Figure 8.66: Faded white paintings with recognisable wildebeest head and front limb. Wildebeest is facing a man holding bow and arrow. At site Groenepunt 24b



Figure 8.67a: True-colour image of brownish-red human figure partially superimposed over bending forward figure. At site Groenepunt 11



Figure 8.67b: False-colour image of brownish-red human figure partially superimposed over bending forward figure. Enhanced image using DStretch® (crgb). At site Groenepunt 11

Cluster Seven (105 motifs in 20 sites): the seventh cluster emphasizes the more majestic or rare animals (hyena and ostrich) in bichrome and polychrome. These animals seem to have been be painted with more care. Once again, spatially, the sites are evenly distributed across the Makgabeng (Fig. 8.68, overleaf).

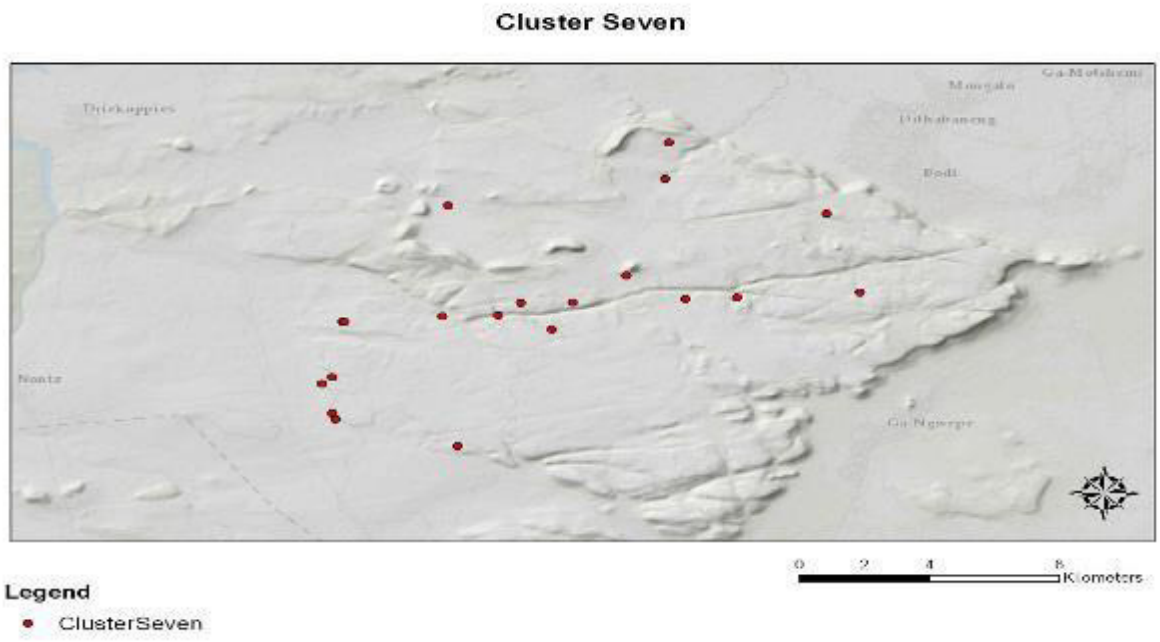


Figure 8.68: Map of sites in cluster seven evenly distributed across the Makgabeng

Figure 8.69 illustrates a rare black and white bichrome ostrich, with black feathers over the body and with legs, neck and head in white. The bichrome ostrich is painted above a Northern-Sotho finger-painted ostrich. Another rare animal is a hyena or canid. Figure 8.70 illustrates a seated hyena painted in yellow-brown and outlined in white. Whilst, Figure 8.71 highlights a cream-coloured kudu, hornless, with a white underbelly, white stripes down the front of the back legs, while white paint outlines the ears and a raised tail. Figure 8.72 illutrates an indeterminate antelope, head slightly lifted, painted in white with brownish-red remnants of paint on the neck, extending up to the one ear. Northern Sotho finger-paintings are painted over the bottom half of the antelope. Lastly, Figure 8.73, shows a tall thin human figure holding three arrows/sticks in the right hand. These arrows/sticks are painted in raw sienna.



Figure 8.69: A black and white bichrome zoomorph. The largest of three fine-line ostriches at this site. Black feathers over body with legs, neck and head in white. Above a Northern-Sotho finger-painted ostrich. At site Nieuwe Jerusalem 9



Figure 8.70: Yellow-brown seated hyena or possibly a canid outlined in white. At site De la Roche 42



Figure 8.71: Cream-coloured kudu with no horns. White underbelly, white stripes down the front of the back legs, white paint lines the ears. At site, Bonne Esperance 17



Figure 8.72: Indeterminate antelope painted in white with brownish-red remnants of paint on neck painted up to the one ear. Superimposed over by N-S finger-paintings over the bottom half of the antelope. Antelope's head is lifted. At site, De la Roche 42

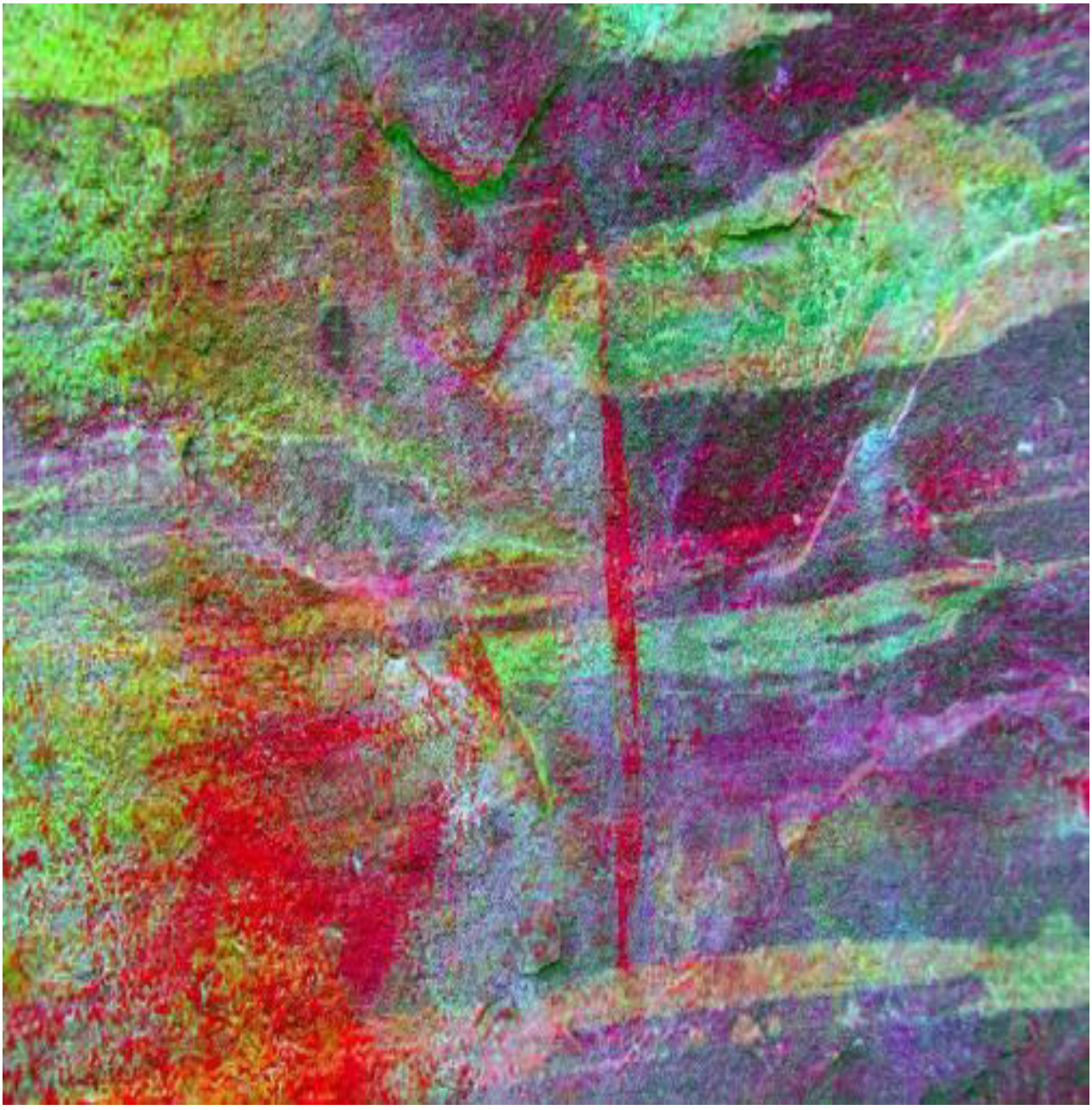


Figure 8.73: False-colour image of a thin tall human figure holding three arrows/sticks in right hand. The arrows/sticks are painted in raw sienna. At site Groenepunt 11. Enhanced image using DStretch® (ybr)

Cluster Eight (12 motifs from six sites): the eighth cluster is the smallest cluster and is characterised by monochromatic handprints and paint smears. Spatially, the six sites within this cluster are situated on the periphery of the Makgabeng, as was

to be expected, given the results of the map distribution from all the handprints in the Makgabeng (Fig. 8.74).

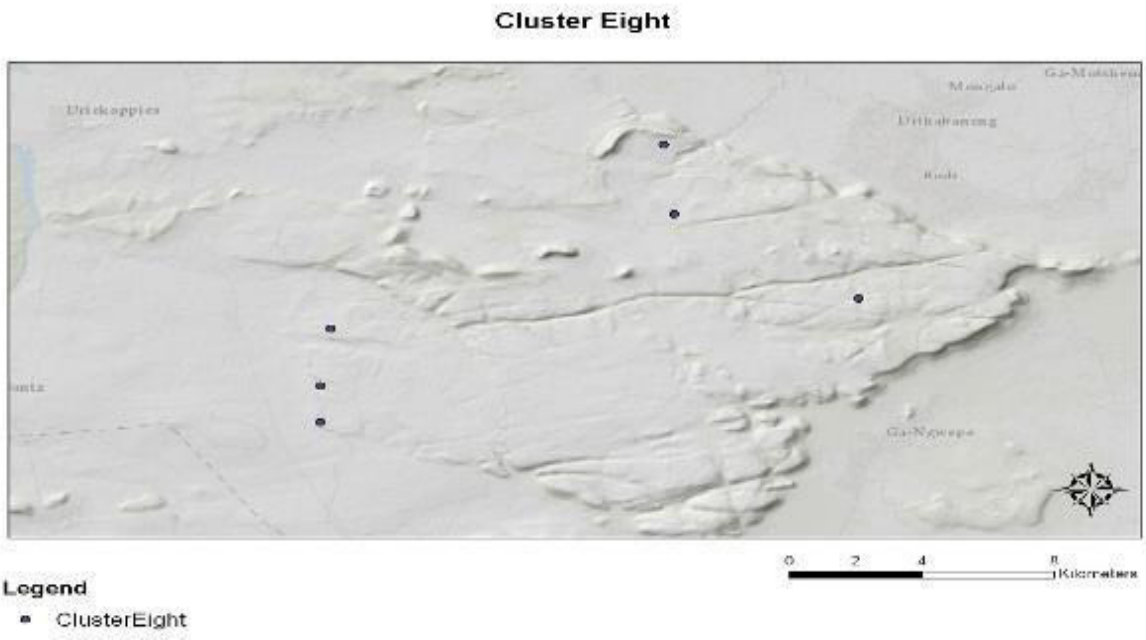


Figure 8.74: Map of sites in cluster eight situated on the periphery of the Makgabeng heelo

Figures 8.75a and 8.75b highlight a sample of five handprints of similar size: two left and three right handprints. Figure 8.76 illustrates one or more handprints applied with chalky white paint. Brownish-red paint was placed prior to the creation of the handprints. Along with handprints, paint smears are diagnostic of this cluster. For example, a yellow-brown globular paint smear is superimposed over a brownish-red figure (Fig. 8.77). Figures 8.78 and 8.79 are photographs from Cave of Hands or Groenepunt 35. The rear wall of the Cave of Hands is filled with multiple rows of closely made white handprints (Fig. 8.78). Figure 8.79 illustrates the detail of five handprints in the Cave of Hands.



Figure 8.75a: True-colour image of five handprints. All similar size. Two left hand prints and three right hand prints. At Galashiels 8 (Photo by Eastwood, courtesy of SARADA)



Figure 8.75b: False-colour image of five handprints. All similar size. Two left handprints and three right handprints. At Galashiels 8 (Photo by Eastwood, courtesy of SARADA). Enhanced image using DStretch® (lds)



Figure 8.76: One or two handprints in chalky white. Thumb missing. Red paint is seen under handprints. At site Langbyde 40



Figure 8.77: Yellow-brown globular paint smear superimposed over brownish-red figure. At site Groenepunt 11



Figure 8.78: Cave of hands, Groenepunt 35, illustrates the rows of closely made white handprints



Figure 8.79: Detail of five handprints from the Cave of hands, Groenepunt 35

Cluster Nine (348 motifs from 29 sites): the last cluster is similar to cluster six but rather than emphasising animals, this cluster is characterised by brush-painted human figures and material culture, in mainly brownish-red and white colours. Spatially, many sites from this cluster, are concentrated in the central gorge (Fig. 8.80).

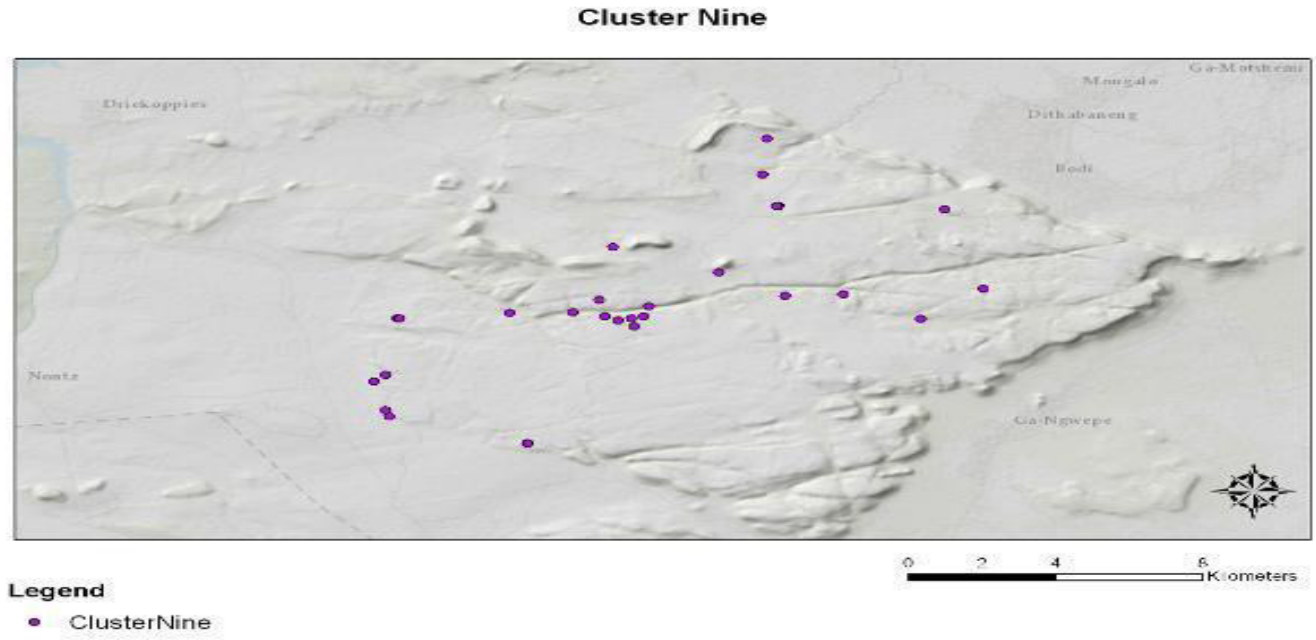


Figure 8.80: Map of sites in cluster nine, which are concentrated on either side of the gorge

Figures 8.81a and 8.81b have three brownish-red figures. The figure on the left is holding a curved stick and wearing a back apron. Figure 8.82 shows two figures standing with an arrow/stick through their middrifts. One figure is holding an arrow. Figure 8.83 demonstrates a white female figure with breasts and coiffure or headdress. Her hands are in a clapping pose. Figures 8.84a and 8.84b highlight a muscular human figure with exaggerated calves and huge arm muscles. The right hand's fingers are outspread and in the left hand the figure holds three or more arrows or sticks. These arrows/sticks point in various directions.



Figure 8.81a: True-colour image of three brownish-red figures standing. The figure on the left is holding a curved stick and wearing a back apron. At site Groenepunt 24A

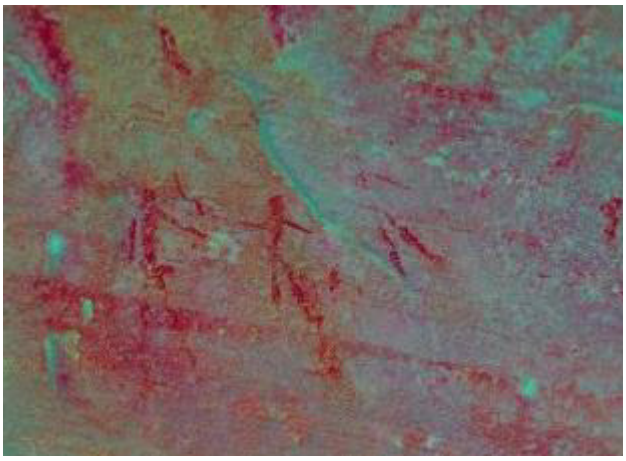


Figure 8.81b: False-colour image of three brownish-red figures standing. The figure on the left is holding a curved stick and wearing a back apron. At site Groenepunt 24A. Enhanced image using DStretch® (lre)

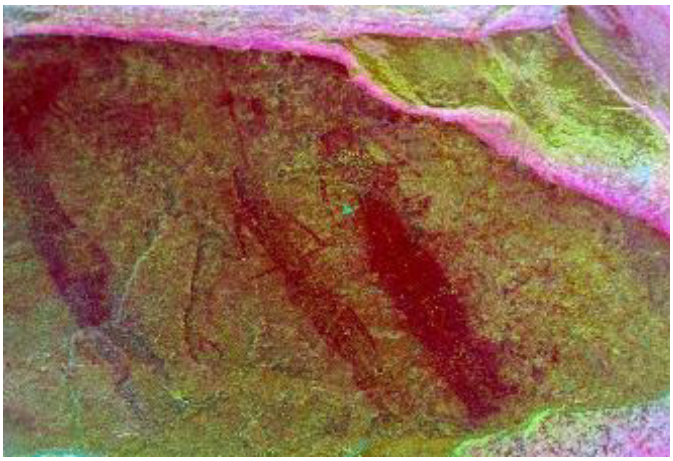


Figure 8.82: False-colour image of two figures standing with an arrow/stick through their mid-drifts. One figure seems to be holding it. Line/stick coming from top of panel towards figure's shoulder before fading. Enhanced image using DStretch® (crgb). At site Groenepunt 24A.



Figure 8.83: White female figure with sagging breasts with coiffure/headdress. Hands in clapping pose. At Groenepunt 11



Figure 8.84a: A true-colour image of a muscular human figure with exaggerated calves and huge arm muscles. Right hand's fingers are outspread and in the left hand, the figure holds three or more arrows or sticks in hand. These arrows/sticks point in all directions. At site Langbryde 40



Figure 8.84b: A false-colour image of a muscular human figure with exaggerated calves and huge arm muscles. Right hand's fingers are outspread and in the left hand, the figure holds three or more arrows or sticks in hand. These arrows/sticks point in all directions. At site Langbryde 40. Enhanced image using DStretch® (rgb)

8.7. Discussion

The frequency tests, motif associations and maps yielded interesting findings. In the Makgabeng, finger-dots, handprints and finger-strokes are visually diverse, the analysis categorised this diversity. There was an association between finger-dots, figures wearing aprons, geometric aprons and finger-painted geometrics. Finger-dots are differentiated often by the colour Lotus. From superimpositioning, we know they are neither the earliest nor the latest. Finger-dots and handprints often co-occur, especially in the larger sites, but they follow different image-making conventions. Handprints are created on the periphery of the Makgabeng. These handprints and finger-marks could be associated with taboos, acts of association and the ritual use of touching the rock shelter wall, drawn from Khoe-San ethnographies (Thunberg 1795; Baines 1864; Hoernlé 1918; Dornan 1925; Rudner 1982; Hoff, 1990, 1995; Louw 2007b, 2008).

The analysis showed the sheer diversity in forms, shapes and types that make up the geometric corpus of rock art. It also identified that most geometrics analysed were aprons with a small percentage being loincloths and abstract geometrics that do not denote pieces of material culture. Fine-line and finger-painted aprons and loincloths occur in the same shelters as fine-line naturalistic rock art, showing no spatial difference between them. Studies on the differences in elevations between motifs highlighted that white geometric aprons were painted at higher elevations and not red geometrics, *contra* Eastwood and Tlouamma (2006b: 73). This may be as a result of the difference between studying at the Makgabeng only, as compared to the whole Limpopo Valley. White apron motifs may have been

painted at a higher elevation, signalling ritual seclusion and/or initiation. The size and colour differences between aprons and loincloths is also significant and could show a separation in engendered practices and/or male and female initiation rituals. Clothing plays an important role in Khoe-San beliefs and will be elaborated upon in the following chapter.

Aprons and sheep occur evenly distributed across the Makgabeng, alongside imagery of fine-line naturalistic rock art. There is a small cluster of aprons in the west. Indeterminate thin-tailed sheep also occur to the west, while fat-tailed sheep are identified in the east. This is perhaps relevant to the migration routes of herders coming from the west, accommodating genetic and linguistic theories (Chapters IX and X). Sheep may have played an important component in trance-related rituals and cosmology and are seen integrated into painted trance imagery. From superimpositioning, motif associations between sheep and finger-dots and strokes could reflect an association between sheep and touching the rock.

The use of style is controversial (Chapter V) and its subjectivity was countered by statistical and cluster analyses. Yet, the general gestalt of the style was increasingly lost through rigorous testing and diachronous interpretation of rock art. Using style with Harris Matrices, as predicted in Chapter V, was challenging. Temporal variation may be better understood by analysing superimpositioning within sites and by analysing separate rock art panels. Thereafter the researcher may use this patterning and compare it with other panels in other sites (cf. Russell 2000). However, quantitative studies provided a number of important conclusions

about the relationship between the geometric rock art and the fine line rock art bodies, which assisted in the interpretation of specific motifs (Chapter IX).

Importantly, the contingency tables found that correlations between finger-painted geometric rock art and the fine-line rock art motifs were not statistically significant, indicating that the geometric rock art corpus is not a coherent tradition as has previously been suggested. Moreover, the cluster analysis exposed some interesting spatial patterning, especially with regard to outlined finger-painted geometrics in Cluster Two and handprints in Cluster Eight. Temporal patterns, using Harris Matrices, were difficult to discern across sites. The exception was in Cluster Eight, where superimpositioning was identified in only a few examples, while superimpositioning over handprints and paint smears rarely occurred. All this diversity, especially in terms of finger-marks, handprints and geometrics, problematises the clear-cut definitions and authorship of so called San and Khoekhoe 'traditions'.

Theoretically and practically, stylistic analyses have value. What is of great importance is the concept of stylisticity – how the original artists would regard the previous works of others and whether they would conplemplate style, or stylisticity, in the same way researchers do. In this way the concept of stylisticity acts as middle range theory. The theory behind style is of interest because it points to the essence of why and how certain motifs were made. This is closer to an emic perspective. Using the patterns identified above and using relevant ethnography is

one way of moving away from an etic, and closer to an insider's view, on the meaning of the rock art.

IX. Ethnography: What does a Spiny Cucumber have to do with the Moon?

In the previous chapter, the results of the rock art analysis were presented. To understand the possible meanings of these results, distribution patterns and the associated rock art motifs, it is necessary to examine the relevant ethnographies related to the peoples that previously lived in the Makgabeng. Ethnographies are essential because they provide documented information on Khoekhoe and Bushman beliefs and cosmology (Lewis-Williams 1972, 1990b: 41). In effect, ethnographies allow researchers an 'insider's look' into the informants' ways of lives and their belief systems expressed over time (*ibid.*; Chapter IV).

To avoid using ethnography uncritically, it is relevant to outline two methodological problems which arise when using this approach. The first deals with *how* ethnographies are utilised while the other helps determine *which* ethnographies to use. The use of ethnographies always involves ethnographic analogy. Ethnographic analogy comprises the painted data on the one hand and the ethnographic instance on the other (Wylie 1982, 1985; Cunningham 2003: 391). The argument then proceeds, by induction and probability statements, to suggest that the two may correlate (Wylie 1982). In areas where the original artists are long departed, ethnographic analogies have been crucial in advancing rock art studies beyond mere descriptions and speculative explanations (McGranaghan 2017).

Yet the method of using ethnographic analogy is not without issue. Michael Wessels (2010: 43) has highlighted that, too often, writers make simplistic analogies between one informant's view, under particular socio-historical conditions, and the rock art. For example, the assumption that an "essentialised Bushman identity and culture can be represented by five or six [interviewees] and texts that emerged from their forced collaboration with Bleek and Lloyd" (Wessels 2010: 43). To counter this, I use multiple ethnographies with texts from various Khoekhoe and Bushman groups to engage in complex discussions of symbolism that embrace interaction and history.

The second methodological problem that arises in any ethnographic method is the uncritical use of certain analogues over others, an issue that was brought to the fore in the Kalahari or revisionist debate (e.g. Marshall 1976; Lee 1979, 2002; Schrire 1980, 1984; Gordon 1984; Katz 1982; Denbow 1984; Parkington 1984a; Denbow & Wilmsen 1986; Wilmsen 1989; Wilmsen *et al.* 1990; Lee & Guenther 1991; Barnard 1992; Solway & Lee 1990; Kent 1992; Shott 1992; Biesele 1993; A. Smith 1996; Sadr 1997, 2002).

9.1. The Kalahari Debate

In brief, this debate centred around two camps of researchers: traditionalists and revisionists. The revisionists argued that the traditionalists, the Harvard scholars involved in the Kalahari, regarded a specific Bushman society, the Nyae Nyae Ju|'hoansi, in the Kalahari, as unchanging, isolated and fixed. Rather, the revisionists argued the society was fluid, changing and part of a web of

relationships that was, in turn, part of a broader capitalist economy. Authors from the two camps held differing views of Ju|'hoansi society, not only in specific details, but in their basic "understandings of what the Ju|'hoansi think, do and how they relate to" the external world (Barnard 1992: 296). These diverse views are primarily independent of the changes in Ju|'hoansi society, reflecting rather the broader theoretical orientations of the ethnographers themselves (Barnard 1992: 296).

Revisionists such as Carmel Schrire (1980, 1984), Robert Gordon (1984), James Denbow (1984) and Wilmsen (1989), examined the historical and continuing contact between the Ju|'hoansi and outsiders. Wilmsen (1989) challenges the classic, primordialist view of Bushman society, which emphasises Bushmen's abstract 'antiquity' to the detriment of their history (Barnard 1992: 296). The revisionists argued that the popular materialist bias towards environment and economy had led primordialists or traditionalists to overemphasise "subsistence and has limited the scope of inquiry" (Kent 1992: 54). Revisionists tried to present a far more precise account of the place of Bushman groups in the southern African economic system (*ibid.*). Yet they focus on those aspects of Bushman culture which are most susceptible to outside influences – those related to production and trade, as these are easier to discern from the historical records (*ibid.*). Wilmsen (1989) demonstrates that the Ju|'hoansi have been in continuous interaction with other groups for as long as we have evidence. Therefore, political and economic relations linked the supposedly 'pristine' "Kalahari with a regional political economy both in the colonial and [pre-colonial] eras; [and] that [Bushmen] have

often held cattle; and that no strict separation of pastoralists and foragers can be sustained" (Gupta & Ferguson 1992: 15-16). Groups that are categorised in terms of modes of subsistence may move and interact across those modes. In conclusion, the Kalahari Debate showed how varied interaction can be and that the resulting ramifications of contact can equally be varied.

9.2. Ethnographic analogies

Following the debate, Anthony Humphreys (2005: 37), questions whether using modern ethnographies from the Kalahari, in an attempt to understand the Later Stone Age in South Africa, presents a distorted image of the past (cf. Pargeter 2014: 3). Modern Bushmen in the Kalahari live in conditions that may, in the past, have been atypical. For instance, ethnographies of the 1970s showed that the need for water, not the availability of animal and plant resources that was the primary motivation for mobility strategies among the Ju|'hoansi (Humphreys 2005: 37). Similar arguments were made by Kazuyoshi Sugawara (2004: 117) for the G|wi-G||ana in the Central Kalahari Game Reserve. Humphreys (2005: 37), using Australian aborigines as a comparison, found that modern hunter-gatherers in southern Africa are dissimilar to 'pristine' hunter-gatherers of the past. This statement is problematic in that it assumes an 'archetypal' hunter-gatherer in a past that has disappeared. This is highly unlikely as highlighted in the Kalahari Debate (cf. McGranaghan 2017). However, Humphreys (2005: 37) does pose an interesting argument relating to the possible differences between the ethnographic analogs used to understand the past and whether behaviours in the past correlate with those of the present. The ethnographic record used captures a fraction of the

possible gamut of human experience and may systematically be biased (McGranaghan 2017: 4). Archaeological data can be "written back in to the original source-side community in a way that challenges anthropological assumptions and reverses the common assumption that […] ethnographic analogy dehistorises the past" (McGranaghan 2017: 19). Differences were identified by Humphreys (2005: 37) in three areas – linguistic diversity, territoriality and continuity.

9.2.1. Linguistic diversity

Most Bushman languages are no longer spoken, but a great variety of languages and dialects existed in the past (Parkington 1984a; Humphreys 2005: 38; P. Mitchell 2005; Pargeter 2014; Pargeter & Duke 2015; Figure 2.3). The diversity of languages in the past may have posed serious cultural barriers. For example, Joseph Millard Orpen in the mid-nineteenth century met a man from Bethulie who was fluent in several Bushman languages yet he could not understand the Bushmen of Riet River, some 120 km northeast of Bethulie (Humphreys 2005: 37).

9.2.2. Territoriality

Language was not the only boundary in the past. It seems that territorial boundaries in specific areas were also more strictly defined. The perception of hunter-gatherers living in small mobile bands and travelling long distances for food as in the Kalahari may not apply to all hunter-gatherers in the past.

From isotopic analyses in the south-western Cape, Judith Sealy and Susan Pfeiffer (2000: 654) identified economic differences between two adjacent groups of hunter-gatherers. One group spent their entire lives at the coast, while the other group subsisted on terrestrial foods, signifying they remained inland, rather than following the expected seasonal mobility pattern between the coast and the Cape fold mountains. These differences Sealy and Pfeiffer (2000: 654) attribute to territorial boundaries. Territorial boundaries were mentioned in Chapter III, where I drew attention to the journal entry of Thomas Baines (1872: 33, 1877: 64), in which he reported that the Limpopo River acted as a major territorial boundary between two Bushman groups.

However, it is necessary not to see these examples as hard and fast explanations of behaviours of the past occurring throughout South Africa. Hunter-gatherer societies are hugely variable today and were most likely to have been in the past.

The opposite of what was occurring in south-western Cape may hold true elsewhere, as has been suggested by Sugawara (2004: 118) for the G|wi and G||ana in the Central Kalahari Game Reserve. For Sugawara (2004: 118) areas

with abundant food, the periodic concentration of groups in a site and constant inter-camp interaction renders the idea of territoriality obsolete. Yet an abundance of resources does not guarantee that territoriality falls away, as seen in the east of the Makgabeng. Similarly, Hall and Johan Binneman (1987: 149), found that territoriality may play a role in maintaining social cohesion when group sizes expand and/or conflicts arise.

9.2.3. Continuity

Lastly, Humphreys (2005) argues there is no demonstrable continuity, or link, between the modern Bushmen and the Later Stone Age. It is on this point of 'no demonstrable continuity' where I differ. Demonstrable similarities exist in terms of worldviews, key beliefs and rituals between diverse Khoe-San groups, past and present (e.g. Wilmsen 1986; Barnard 1992; Guenther 1999; Morris 2002). This is not to say there are no differences across time and space, but that shared ideologies have more tenacity than do other aspects of Bushman or hunter-gatherer life (e.g. mobility strategies, economic practices and settlement patterns). It is with this idea, that temporal continuities and discontinuities exist, that I turn to the specific ethnographies used in this study.

9.3. The ethnographies of Khoe-Kwadi speakers

First, the ethnographies of non-Khoekhoe Khoe-speaking Bushmen (speaking the Kalahari Khoe language grouping) were examined. These include the Kua (G|wi and ||Gana speakers) of the Central Kalahari Game Reserve, northern Botswana (Silberbauer 1981; Valiente-Noailles 1991, 1993), the 'river Bushmen' of

northern Botswana and southern Angola, including the Khwe, and the contemporary Tshwa (also called the Hiechware, Kua and Tsoa) (Dornan 1925; Cashdan 1979, 1984a, 1984b, 1986, 1987; Eastwood 2005; Eastwood & Eastwood 2006). Some refer Carlos Valiente-Noailles's informants as G|wi and G||ana not the Kua (Barnard 1996: 693; Power 2004:85). The second group, and its body of ethnographies, includes Khoekhoe speakers. These include the Damara, who are Nama-speaking peoples of Namibia (Anderson 1861; Inskeep 2003; Low 2007b, 2008), the Nama of Namibia and the Northern Cape, South Africa (Hahn 1881; Hoernlé 1918, 1925; Hoff 1990, 1995) and the historic Cape Khoekhoen (Kolbe 1968 [1731]; Wikar 1935 [1779]; Raper & Boucher 1988) (Table 1). The predecessors of these modern Khoe-speaking Bushmen were likely the painters of the oldest rock art of the Makgabeng (Chapter II).

It is likely, the second group were descendants of proto-Khoe-Kwadi language groups related genetically and linguistically to the Khoekhoen. From genetic and linguistic evidence (Ehret 2008; Güldemann 2008; Güldemann & Elderkin 2010), it is likely the descendants of these two groups interacted and this interaction is likely to have had an influence on the art extant in the Makgabeng.

It has long been accepted that the Khoekhoen and the Bushmen share significant components of ritual and belief (Schapera 1926, 1930; Barnard 1988, 1992, 2007; Biesele 1993; Guenther 1999). Early travel writers of the 16th ,17th and for much part of the 18th century found the Bushman and the Khoekhoen largely indistinguishable (Barnard 2007: 21). In the last part of the 18th century, mounting

interest in economic modes and their links to society became important (Barnard 2004: 2).

By the early 19th century, travellers had invented the idea of hunting and gathering 'Bushman' we recognise today "through published artists' impressions, reports in South African publications", and the division of the Bushmen from the Khoekhoen (Barnard 2007: 23; Fauvelle-Aymar 2008).

This image of the Bushmen burnt bright and long, often overriding research conducted on other groups including the Khoekhoen. Nowhere was this more apparent than in rock art studies where, only recently, have a handful of researchers made use of Khoekhoe ethnographies to any significant degree in an effort to understand specific rock art imagery in southern Africa (cf. Morris 2004; Ouzman 2005; Hollmann 2011).

9.4. Shared beliefs

There are shared beliefs between the Khoekhoen and Bushmen but there are also differences in the rock art of different areas. This could be due to differing groups interacting. By consulting ethnographies, outlining their belief systems, researchers could provide clues to such interaction.

In Khoekhoe culture, language, and therefore ideas have changed little in the last 363 years (Low 2008: 39). For instance, 70% of the 200 words recorded by Jan Van Riebeeck in the Cape are still in use by present Khoe-speakers in Namibia

(Low 2008: 39). Such evidence suggests that change affects some aspects of culture more than others. Ideas woven in to Khoe-San cosmology and ontology are more resilient.

Related to these shared ideologies, is the argument that specific tenets of anthropological enquiry have been prioritised over others. According to Chris Low (2008: 108) the role of shamans and the trance dance has been allotted centrestage, when it is merely one element of a full spectrum of Khoe-San beliefs and customs. This emphasis on shamanism by contemporary anthropologists and rock art researchers promotes the notion that Bushmen are different, with regard to their rituals and beliefs, from the Khoekhoen (Low 2008: 108).

Contrastingly, several ideological notions related to healing, medicine and rain are shared by Khoe-speaking, San-speaking Bushmen and the Khoekhoe, past and present. For example, two notions that are closely tied to the experiences of Bushman shamans in altered states of consciousness are therianthropes and medicine men/women or rain-men/women (Chapter IV). However, these notions have wider significance in the broader Khoe-San cosmology.

Therianthropes or the transformation of healers into animals, is depicted in the rock art and the phenomenon as something that is generally understood as a purely Bushman characteristic in southern Africa rock art studies, even though the same experience of animal transformation appears in a Khoekhoe context (Low 2008). For instance, Johannes Gulielmus de Grevenbroek, Secretary of the local

Council of Policy for the Dutch East India Company at the Cape from 1684 to 1694, recalled in a letter to a clergyman in Holland how Khoekhoe 'wizards' at the Cape spoke of their transformation into lions (Schapera & Farrington 1933: 213). These ritual specialists could allegedly "summon storm, rain, hail, winds, thunder and lightning; and that they have supernatural knowledge and can foretell the future and prophesy truth" (Schapera & Farrington 1933: 213). In the original letter by De Grevenbroek, his tone is dismissive. He finds the 'wizards' braggarts or conmen who will say all sorts of trite things to ensnare a poor man into their wicked plots. This must be seen as a European's sensibilities about, what must have been for him, merely African superstition. Ritual specialists must have said they can do these things.

Similarly, in 1818, the well-known London Mission Society missionary, Robert Moffat, stationed at the Vredeberg mission in Namibia, observed that Nama sorcerers made attempts to scare a lion from their kraals by impersonating it (Dedering 1997: 44). Not only did they imitate the lions, but they believed they could transform into lions (Dedering 1997: 44). The power the ritual specialists had to transform themselves into animals was similar to the power specialists had in controlling rain.

Ritual specialists influencing the weather present another tenet of Bushman shamanic belief. Low's findings with contemporary Damara in Sesfontein, Namibia, showed that the role of the ritual-specialist, or what the Damara call rain-men and women, *nanu* |*aob*, who are said to hold the essence of the rain or

lightning, was not restricted to one task. Instead his or her role in society was broader (Low 2007a: 22). Rain-men and women negotiated day to day experiences such as "drought, hunting, child-birth and difficulties arising from new eventualities" (Low 2008: 234). Unlike Bushman beliefs, the rain-men and women Low interviewed did not mention forays into a spirit world or travelling to ǁ*Gâuab*[18], the ultimate divine being. This is slightly contradictory, as he mentions how the Damara rain-men are said to ride to their supreme being mounted on kudu (Low 2008: 237).

In terms of healing, Dagmer Wagner-Robertz in the 1970s, found that the Damara rain-men and women during healing asked ǁ*Gâuab* whether the illness they smelled is the correct one, and asked for the power to cure it (Low 2008: 237).

Interestingly ǁ*Gâuab*, in most Central Bushman Khoe-speaking, as well as Khoe, groups (Nama, the Cape Khoekhoe groups), represents the evil or wicked god, as opposed to the good god (Barnard 1988: 224-228; Hoff 1990: xii-xiii). For the Nama, good included health, vitality and prosperity. In contrast, evil comprises illness, death and degeneration (Hoff 1990: xii-xiii). Good is ascribed to Tsũiǁgoab, the benevolent god, and evil to ǁGâunab, the wicked god (*ibid.*: xii-xiii). Both beings were regarded as fundamental causative factors. However, this is not the case with the Damara, who seem to have had a different perception of the gods. ǁ*Gâuab* is the supreme being for the Damara, with both good and evil characteristics. Heinrich Vedder (1938: 61 in Inskeep 2003) encountered a

[18] Vedder 1938: 61 in Inskeep 2003: 322

Damara group with these beliefs in an area uninfluenced by the Nama, in north-western Namibia. If these beliefs originate before the split from the Nama, they may be of considerable antiquity.

9.4.1. Body, health and disease

While disparities between the Damara rain-men and women and Bushman medicine men and women exist, there are striking similarities (Low 2008: 249). Regardless of the apparent difficulty when comparing Khoe-San beliefs spatially and temporally, there is an expansive ethnography serving as evidence of a Khoe-San way of thinking, centering on the body, health and disease (Low 2007b: 226). All aspects of healing and disease, including potency, relate to the concept of vital force, or wind, in Khoe-San thought.

9.4.2. Nature, vital force and wind

In Khoe-San thought, every living thing has its own essence, called wind. This wind, often conceptualised as smell, is an individualised expression of one's self, which shows itself to Khoe-San people via relational pathways or what Low (2007b: 572) calls a 'phenomenology of encounter'. Vital force and wind have long been recognised in the ethnographies of Khoe-speaking groups.

Agnes Winifred Hoernlé (1918: 65), in 1912, collected data from different Khoe-speaking groups including the !Gamí-≠nūn on the southern bank of the Orange River in Little Namaqualand, in the north-west of the Northern Cape Province. This group had fled Namibia. The next year, she visited Berseba in Namibia,

where she spent time with the ≠Ăunin or Topnaars of Walvis Bay and the /Hei /Khauan, who crossed the Orange River at the start of the 19th century (Hoernlé 1918: 65).

In these communities, life's rites of passage such as childbirth, puberty, marriage or death involve a member of the society donning a new liminal status. This status needs to be recognised and the necessary steps taken to protect both individual and society (Hoernlé 1918: 68). This liminal status is called *!nau*. The person is in a very vulnerable state and exposed to danger at every turn. In the same vein, the society from which he/she stems is also vulnerable. It is therefore necessary for that person to avoid contact with others, both human and non-human.

In the case of re-marriage, initiation of boys, reception into the rank of hunters, treatment of diseases, for the *!nau* person to be accepted, or accepted back, into society, an 'essence' or vital force of that group needs to be inserted into him or her (Hoernlé 1918: 68). Incisions are made in certain parts of the body, depending on the life crisis, and medicine inserted into these cuts. An ingredient of this medicine is the grease and dirt scraped from the body of the officiator (*ibid.*). This person is often solely responsible for the well-being of the *!nau* person and can act in this capacity because he or she is usually considerably older and past life crises (Hoernlé 1918: 67).

Other rites involve ritual seclusion for the protection of the community. For example, during a girl's puberty ritual, the young woman is secluded from the rest

of society in a specially built hut for the ritual (Hoernlé 1918; Hoff 1990). Due to her *!nau* state, two rules are adhered to strictly. Wind must not blow on her and she must not speak above a whisper (Hoernlé 1918: 70-71). This is due to the *!nau* state being contagious and moveable, thus dangerous to people, but also to animals and plants, upon which the society depends for its livelihood (Hoernlé 1918: 67).

More recently, Ansie Hoff (1990) collected information from interviewees within two main Khoekhoe groups, namely the Cape Khoekhoen and the Nama. She uncovered that the concept of vital force that forms the foundation of how the Khoekhoen see the world and its inhabitants. These beings, supernatural and human, together with nature, are imbued with power. The amount of power an entity holds is determined by its position in a power hierarchy. An increase in the power of one specific entity disturbs the equilibrium between powers in the universe (Hoff 1990: xii). In line with the idea that beings in the universe constitute differing manifestations of vital force, is the concept that the whole is greater than the sum of its parts and the "natural and supernatural or human and non-human are not distinguished to any significant extent" (Hoff 1990: xii).

Similarly, with the Damara, Low (2007b: 571) found that wind or vital force is intrinsically linked to ideas surrounding identity, potency, smell, essence, 'dirtiness', spirits, dead people, illness, contagion and sweat (Low 2007b, 2008). ǁ*Gâuab* places wind inside people and animals as a gift. The present from ǁ*Gâuab* is the individualised wind that "underlies an organism's form and action and

constitutes its potency" (Low 2007b: 574). For humans, personal potency is commensurate with the form of a person, the sum total of what the person is and what the person can do (Low 2007b: 574). Personal wind is also often thought to be present in the 'dirtiness' scraped off the body, bodily excretions and secretions such as urine, sweat, menstrual blood, saliva and breath (Low 2007b: 578). These effluvia of a person hold the smell, wind and breath in essential form (Low 2007b: 578), hence the insertion into a person of these substances with vital forces during rites of re-incorporation.

In this way, wind is moveable since there is a connection between the wind that is inhaled, the wind that blows and shared winds that travel between things. Wind can traverse between bodies. It can be transferred from one healer to another in a similar way to how arrows of potency are shared between Bushman healers (Low 2008: 235; cf. Marshall 1962: 251; Lee 1967: 35; Katz 1982: 102-3). This sharing of wind binds people and animals across space and time (Low 2007b: 572). The smell is a living connection between one organism and another. It is this connection that allows one organism to become another (Low 2007b: 572). Wind smells lock participants into a network of relationships similar to Ingold's relational pathways (*ibid.*: 575).

Such a network of relationships occurs during the hunt, where wind connects hunter with prey. When a hunter smells or listens to the wind, it tells the hunter where the animals are hiding. It is likened to a thread interlinking one entity to another, so that when an animal's wind enters the hunter's body, they are

considered bound (Low 2007b: 575). Like hunting, wind plays a crucial role in healing.

Healers either received a range of attributes or potencies during an event, or these were exchanged between healers during rites (Low 2007b: 581). Once transferred, the attributes or internalised winds were felt to be dormant within specific sections of the body and could be activated during certain occasions (Low 2007b: 581). The Damara and some Hai||om refer to these attributes or potencies as ||*gawas*, *gaib*(*s*) or |*gais*, which means a strike of lightning (Low 2008: 235). *Gais* are said to reside in four areas of the body – the chest, abdomen, temples and the centre of the forehead (*ibid*.). Within the healer's body, the |*gais* within healers "communicate as either voices, pictures, or feelings that come to them asleep or awake" (Low 2007b: 581). With his or her |*gais* the healer pulls wind sickness out of the afflicted patient and removes it from his or her body (Low 2007b: 586). This is similar to how a Bushman healer draws out arrows of sickness by flicking or snapping his or her fingers, each snap signifing an arrow of potency. These are then expelled through the top of the head or through the cervico-dorsal junction, the *n//ao* spot (Katz 1982: 46, 168; Low 2007b: 586).

To protect the healer's patients from harmful arrows of sickness fired by malicious spirits, he or she will take sweat from his or her armpits and rub it on body of the patient (Marshall 1962: 251). |Han≠kass'o's[21] mother told him a story about Bushman doctors 'snoring' out invisible arrows to heal patients

[21] |Han≠kass'o was one of Bleek and Lloyd's primary informants

(LL.VIII.15: 7293-4). Like Bushman trance dances, the Damara sometimes apply "smouldering branches or coals to their upper bodies or scalp to stimulate the potency" (Low 2008: 235; cf. Marshall 1976). There is a danger of too much ǁ*gawas*, thus, rather than disposing of the potency or wind before collapsing, female dancers often allow the potency to build up until they lose consciousness. When she collapses, she may expose herself and the other women rush over to her. They cover her, not to save her modesty, but to stop wind from entering her (Low 2008: 236). Another parallel in Bushman and Damara belief is how a powerful ritual specialist can accidentally, without intent to harm, stare at someone and thus transfer harmful wind or bad thoughts (ǂ*ais*) to another person (Low 2007b: 582, Katz 1982: 49).

During the Khoekhoe rain ceremony Hoff (1990: 32) explains how the purpose the rite was to slaughter either a pregnant antelope, sheep or cow as an offering to Tsũiǁgoab, so that he gives rain. The ceremony can occur at any time of the year and the whole ceremony will continue until it does rain. A fire is made next to a stream. Fat is burnt and must smoke straight up towards Tsũiǁgoab so that he may receive the offering and cause it to rain (Hoff 1990: 32). One must not throw milk upon the fire as this will lure snakes towards the homestead (Hoff 1990: 33). Like menstruating, pregnant and breastfeeding women, raw blood, milk, meat and animals that have just mated are all powerful because of their smell, which can attract lightning (Hoff 1990: 42).

It is with the notion of vital force and wind, likely shared between the Khoekhoen and the Bushmen, that we find evidence of significant cross-cultural contact exemplified in many interrelated themes. These themes in the ethnographies have the propensity to explain specific aspects of the rock art and include clothing in ritual contexts and geometric designs in the form of body modification.

9.4.2.1. Clothing – healing, rain and protection

People the world over spend a considerable amount of time altering and adorning their bodies to try meet "their cultural standards of beauty, as well as their religious and social obligations" (DeMello 2011: 338). Body modification is a part of a complex process wherein personal and social identities are fashioned and re-fashioned (*ibid*.). Such modifications serve to distinguish the human, civilised or tamed body from the natural or wild animal body, as people move from 'raw' to 'cooked' or from 'naked' to 'marked' (Douglas 1966; DeMello 2011: 338-339).

Clothing serves many purposes in society. One, it makes visible to the community a person's new social status during rites of passage. During such rites, certain garments are imbued with power or potency. Clothing can indicate sex or gender reversal. Garments can act as powerful objects in themselves. Rituals in which clothes are salient include rites involving aprons worn by Khwe ritual specialists, the Damara *arus*, or the healing dance and coming of age rites of Kua boys and girls. As mentioned in Chapter IV, aprons and loincloths are depicted in the rock art of the Makgabeng, on painted figures as well as on stand-alone images. Hollmann (2011), working on engravings in the Gestoptefontein-Driekuil Complex in the North West Province, recognised items of clothing, including

aprons and loincloths, engraved. He also found geometric symbols, which he identifies as the same designs (symbols) as on the clothing. The same geometric designs are pecked into the rock.

Two travellers' illustrations, of young Khoe women encountered outside of the Cape colony in the late 18th century, demonstrate the various symbols and designs made on these women's aprons (Figures 9.1 to 9.3). Eastwood and Eastwood (2006: 65) identified these symbols and others, as well as the aprons themselves, as indicators of fertility and of the transition from girl to woman. They also made the connection between these symbols and the geometric motifs found in the rock art of the Makgabeng. The recognition that the Khoekhoen created such geometric designs on aprons provided the impetus for Eastwood and Eastwood (2006) to conduct their own ethnography among Khoe-speaking and non-Khoe-speaking Bushmen.

The Eastwoods travelled to the Tsodilo Hills and the Okavango panhandle, northern Botswana, in 2004, to interview several women from different communities (Eastwood & Eastwood 2006: 153). When shown illustrations of the Y-shaped motifs and other geometric motifs, the Khwe and !Kung community members, from the Central Kalahari, immediately identified these as garments. In their travels and research, the Eastwoods found that each traditional community has their own stylistic choices with regard to which animal to use for the apron and loincloth skins. Small to medium antelopes such as steenbok, duiker, impala or springbok were most common (Eastwood & Eastwood 2006: 153). The desired

skins were worked and softened by rubbing and scraping, after which dye extracted from plants was added (Eastwood & Eastwood 2006: 153).



Figure 9.1: Young Nama woman, close to the Cape, South-western Cape (Laporte 1798: 302). Notice the patterns on the young woman's front apron



Figure 9.2: A young Gonaqua woman with circle and zigzag designs upon her frilled front apron (Laporte 1798: 82)



Figure 9.3: A mature Khoe woman with geometric diamond-shaped designs on her front apron (Laporte 1798: 56)

The Eastwoods found strong symbolic links between hunter, loincloths, supernatural power and gender (Eastwood & Eastwood 2006: 154). For instance, an Angolan Khwe ritual specialist named Cazungu told them that healers always, during medicine dances, wear a back apron, which is imbued with supernatural power as vital force (Eastwood & Eastwood 2006: 155).

Moreover, female healers wear the same beaded aprons as the men and place them over their animal skin back aprons. The Khwe men's back apron typically has beaded or leather tassels, which were "said to attract the spirits of the dead as well as arrows of potency" (Eastwood & Eastwood 2006: 155). When potent arrows fly and the ritual specialist "is ready for the powers of ≠ei (supernatural potency), the spirits of the dead command [him] to put on his apron and strings of beads, crossed upon his chest, and prepare to 'dance medicine'" (Eastwood & Eastwood 2006: 155). The apron and associated paraphernalia exemplify the role of the Khwe ritual specialists. Similar items of clothing have reportedly been worn by Hei||om and Hukwe (Kxoe) ritual specialists (Guenther 1999: 193). Cazungu's statement is reminiscent of a military or war metaphor. In the same way that soldiers arm themselves for battle, a healer cannot heal without his or her clothing and associated paraphernalia.

When Eastwood and Eastwood (2006: 164) showed a picture of the site De la Roche 40 (Fig. 9.4) to Cazungu, he immediately recognised 'the tail' or string hanging behind the male figure as a back apron and the figure to be a healer (Eastwood & Eastwood 2006: 164).



Figure 9.4 A figure with elaborate headdress with his or her mouth to an antelope. At site De la Roche 40, 'The Witchdoctor of the Makgabeng' shelter. Arrow pointing at tail

Cazungu was certain these pictures were not of ordinary men, but Khwe doctors (Eastwood & Eastwood 2006: 164). However, it must be noted that this painting is unique. Nowhere else in the Makgabeng do we see human facial features depicted. It is likely this painting is more recent than others. Under close inspection, I would argue that a recent painter has added white paint around an existing yellow-brown left arm, which appears to be older, to fill the space between the animal and human. The arm of the other figure forms the headband and the neck is extended unrealistically to reach the mouth of the antelope. Nonetheless, the identification by Cazungu of back aprons on ritual specialists is an important one. Like the Khwe healers, Low (2008: 235) refers to people, at a Damara *arus*, who have the 'rain-spirit' or ǀ*nanu* ǂ*oab*, dancing to awaken the potency, or wind, within them.

Like the trance dance recorded by Lorna Marshall (1976), the *arus* can continue for three hours or more. The event could take place by day or night, depending on the need. Significantly, "no special clothing was worn at the *arus* but clothing was rearranged" (Low 2008: 235). At the *arus*, Low (2008: 235) observed, one young woman danced with breasts exposed while two men removed their clothes and tied the loose garments around their waists, wearing them draped and hanging like a skirt (Low 2008: 235-236). In all, five ǀ*nanu aob* or rain-healers, "three rain-men and two rain-women [,] danced and principally three ladies beat sticks and sang" (Low 2008: 236). The rearrangement of clothing in these rituals could point to the significance of skirts or aprons worn for certain rituals, similar to the ones depicted at Bonne Esperance 13 (Fig. 9.5).

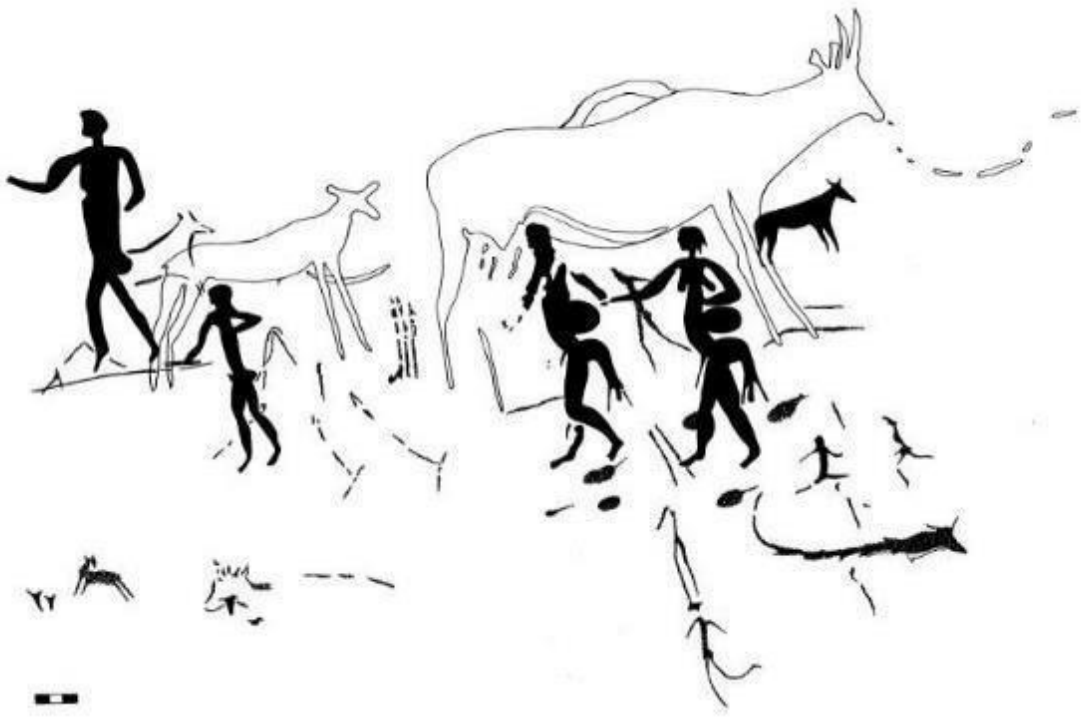


Figure 9.5: Clothing around the waist of women. At site, Bonne Esperance 13. Redrawing by Edward Eastwood. Image courtesy of SARADA

A Damara's clothing saturated with sweat was imbued with the wearer's essence and can stand in for that person. For example, when a dying person is in agony for a long time, the cause of his or her distress is attributed to an unceasing hostility towards another (Inskeep 2003: 372). If the person in question lives some distance away and cannot travel to the patient, a messenger is sent to fetch an article of clothing belonging to that person (Inskeep 2003: 372). Any article of used clothing is sufficient but Inskeep (2003: 372) mentions accounts of a sweat-saturated leather apron or 'kop-doek' (headscarf), being used. The patient is clothed with the adversary's clothing. The clothing has the same effect as if the person were present. With the tension resolved, the patient is reported to have died soon thereafter. The substances or "effluvia of the human body [are] thought to comprise the essence of that person, and in donating these substances, they were giving of themselves" (Inskeep 2003: 542).

The Damara could be using their modern clothes in a traditional way because they no longer have that tradition of creating special aprons. On the other hand, it could be that these rites are re-enacted during liminal states, during which sexual divisions or roles of participants are reversed. In the case of the healing dance, it could be both.

The division of the sexes using clothing in society starts at a young age. The Kua, for instance, have specific clothing for their children. At six to eight years old, they are given steenbok loincloths made by their fathers. Prior to this age, their mothers make their clothes (Valiente-Noailles 1993: 92). When a boy starts to

mature, his father makes him a larger loincloth that will fully cover his genitals (Valiente-Noailles 1993: 91). Similarly, a girl's loincloth will be completed with a back apron to cover her genitalia being exposed as she stoops or squats (*ibid*: 91-92). In these vulnerable transition periods for children, clothing not only serves to protect their modesty, but also prevents wind from entering the children. Similarly, in female rites of the Nama, when an initiate's period of seclusion is over, at the high point of the ceremony, a girl's clothing is replaced by a longer dress, denoting her new status as a woman (Hoff 1990: 178, 1995: 37).

Lastly, certain clothes are considered powerful and not everyday items of apparel. At the Kua girl's initiation ceremony the girl at puberty is *!nau*. At this occasion, which falls on the last day of the lunar calendar, she is given a leather bonnet made by her father. The bonnet protects the initiate and also serves to prevent the danger she poses from spreading everywhere (Valiente-Noailles 1991: 54). She is extremely powerful and dangerous at this age and can make the rain stop or cause fruits not to grow. Carlos Valiente-Noailles (1991: 54) was told that if the rain smells the scent of the girl, it will cause dangerous lightning to strike, again linking smell with vital force and power.

Clothing is special to the Damara in that the clothes worn by someone are imbued with that person's sweat and are believed to contain some of the soul's substance. Misfortune would befall the community if someone burnt or buried the clothing. Moreover, the clothes of the deceased could cause harm or kill the young (Inskeep

2003: 542). The protection of children is a recurring theme in Damara ethnography (Inskeep 2003).

In terms of symbolism and meaning, an Angolan Khwe man and woman described the geometrics, depicted on aprons, as follows: the rayed concentric circles depict the sun while concentric circles are called *qororo*, the term for the giant land snail (*Achatina spp*.). According to certain older Khwe informants, long ago the apron decorations represented "the sun, the moon, and the fruits of the veld: ostrich eggs, spiny cucumbers, tuberous vegetables and so forth" (Eastwood & Eastwood 2006: 158). Gwanxlae, a woman with Nharo, G||ana, !Kung and Nama ancestry, referred to the circular motifs as representations of the moon in its different phases or 'moods' (Eastwood & Eastwood 2006: 159).
The moon held a special place in the hearts and minds of the Nama. The rain, female initiation and fertility were associated with the moon (Eastwood & Eastwood 2006: 65). To the Nama, the image of concentric circles denoted the moon with rings, a sighting seen during the medicine dance by men that turned into lions. The circle with dots motif signified lion spoor (Eastwood & Eastwood 2006: 65).

In summary, to the Khwe and the Nama, concentric circles represent the African giant land snail and the moon. Interestingly, in Nama belief, the snails, like the moon, "have perpetual life or […] the capability of both death and rebirth" (Barnard 1988: 222).

9.4.2.2. The motivation and decoration of clothing

Ethnographic examples of loincloths and aprons from museums (Figures 24 and 151) often have the same geometric designs described in the above ethnographies. For example, SAM-AE1333 (Fig. 9.6) is an apron from Langeberg in the Cape, presented by R.C. Camp in 1911. The apron was made of what appears to be goatskin and was tanned to a darkish-yellow colour on either side. Eight red circles, three of them encircling patches, were made on it. Hair was left on at two ends and it was decorated with small, coloured glass beads along part of the sides.

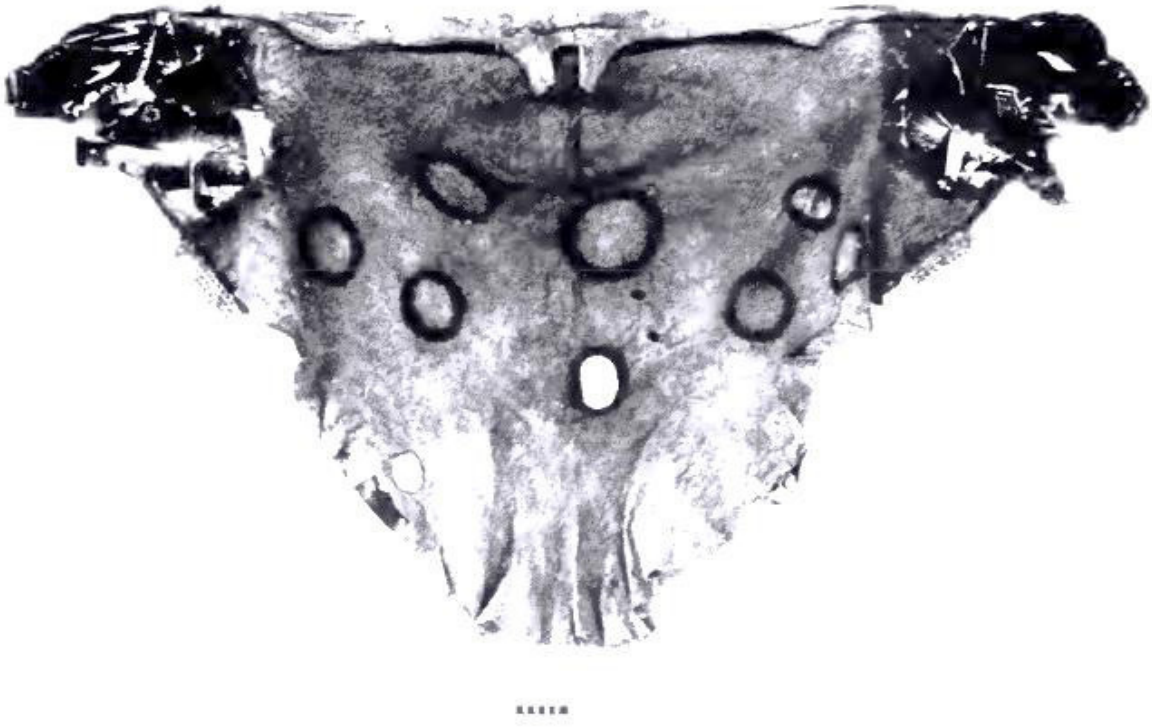


Figure 9.6: Leather skirt with red circles, possibly created using red ochre, said to be Griqua. Iziko South African museum (SAM-AE1333). Photo: J. Hosford (after Rudner 1982: 141, Fig. 9)

Valiente-Noailles (1993: 165) mentions an important incident that may illustrate a principle behind peoples' motivation to make marks on the rock surface. Referring to the decorations of an apron, a female informant said it had the same markings as incisions on objects, thus connecting incisions, geometrics, the body and objects.

If they beautify the body, they also embellish the object. The act of transposing the markings from the body to object may therefore have affected the transference of supernatural potency from person to possession.

Interestingly, what seems purely geometric may hide a figurative or descriptive narrative. For instance, the geometric marks on an ostrich egg shell by /Gwikwe, a ritual specialist, represents a bird and a snake (black mamba) creeping along a branch to devour it. The triangle is the Teku bird, while the line is the snake (Valiente-Noailles 1993; cf. Hollmann 2011, 2014) (Fig. 9.7, overleaf).

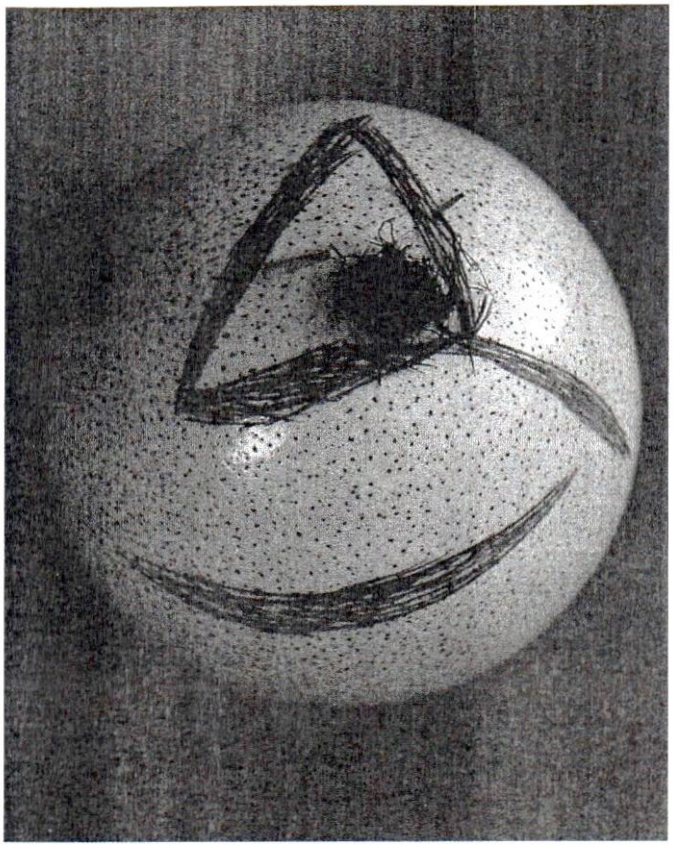


Figure 9.7: Geometric design on an ostrich egg (Valiente-Noailles 1993: 164ff, Plate 43)

From a Western perspective, celestial bodies are far removed from day to day existence, yet they are indeed linked. The moon, the female initiates and the foods of the veld, are like the spiny cucumber to the Khoe-San, intrinsically interconnected (cf. Eastwood 2006). Additionally, the traditions of decorating clothing with geometrics could have a corollary practice of creating marks on the surface of the skin (cf. Hollmann 2011).

9.4.2.3. Geometrics and body modification

In society, the use of body modification including body paint, tattooing and scarification has multiple purposes, the most central among them including

decoration and denoting social standing. Temporary adornments are typically used, to mark transitional statuses, or for specific social events, “whereas permanent changes in status, permanent affiliations, and cultural concepts of beauty” (DeMello 2011: 339). In ritual contexts, body painting is used to make the individual different, extraordinary, and often non-human. This may be done to mimic the appearance and behaviour of animals (DeMello 2011: 339). Hunter-gatherers tend to see humans and animals as related, rather than distinct, and humans are as much a part of nature as are animals (*ibid.*).

Clothing and body modification are similar, since both adorn and cover the body. The reasons for body paints were mainly cosmetic; for protecting the skin, for ritual purposes, and for medicines, particularly with red paints that were said to symbolise blood (cf. Rudner 1982).

Early references to facial and body patterns for ritual purposes in southern Africa are few and sketchy, since early travellers were rarely present at ceremonies. Body patterns were seldom recorded. During the 17th and 18th centuries, travel writers reported that the Khoekhoen at the Cape made patterns on their bodies for rituals using red ochre, but to which sex this applied was often not mentioned.

Furthermore, early records tell of patterns being 'indented' with fingers after the salve had been applied, or scratched with finger-nails into the salve on women's faces or bodies (Rudner 1982: 100). Other reports do not mention the paint being applied by finger, but with an ochre stone. For instance, in 1655, Schouten

(Raven-Hart 1971: 84 as cited in Rudner 1982: 114) recorded the use of caves or shelters by the Khoekhoen for what appears to have been some sort of ceremony, during which participants look to the sky before applying "stripes and crosses on each other's foreheads with a 'red stone'".

An example of these techniques can be seen in a series of 27 drawings by an unknown Dutch artist, who most likely lived in the 17th century and was in some way linked to the Dutch East India Company (cf. Smith & Pfeiffer 1993). These drawings, held in the National Library of South Africa, depict Khoekhoe scenes of everyday life, milking cows, face painting, travelling, dancing and so on, with detailed notes in Dutch (Fig. 9.8). The drawings were drawn *in situ* and were never filtered through the eyes of European engravers. Three portraits exhibit face paint in Figure 9.8. At A, a solid stripe is painted across the forehead, nose and two vertical stripes down each cheek, while B displays a solid stripe across the bridge of the nose.



Figure 9.8: Early sketch of the Khoekhoen in the Cape by unknown artist (National library of South Africa) dated between 1700-1740. Notice the painted face on the top left hand corner (https://www.wdl.org/en/item/11276/). A, B and C illustrate the three portraits with face paint. Notes in Dutch.

Figure 9.9 illustrates a detailed portion of the sketch, where, rather than a solid line on the face, a pattern is shown. In the annotations, mention is made of six areas on the face where red paint is applied, the forehead, both cheeks, above each eye, the chin and on the nose.



Figure 9.9: Detail of sketch C. by unknown Dutch artist. Notice the geometric shapes upon the bags and what appears to be animal skin apron

Later, a report in the late eighteenth century describes similar practices. Carl Peter Thunberg (1795: 197), the Swedish naturalist, was surprised that the Khoekhoen he observed in 1775 outside of the Cape of Good Hope on the southern coast were full of pride.

For not only did they adorn their bodies in the best finery, but when visited by strangers painted their faces with various ‘figures’ in paints made from brown and black pigments (Thunberg 1795: 197). What he meant by ‘figures’ is probably shapes or patterns.

In the 19th century Gustav Fritsch, a German anatomist, anthropologist and physiologist traveling through southern Africa between 1863 and 1866, referred to Samuel Daniell's sketch of Khoe women with cheeks and lips reddened (Fig. 9.10). Fritsch (1872 as cited in Rudner 1982: 133) explained how the Cape Khoe women's' faces were painted with red earth like the ones in Figure 150 and in Thomas Baines's illustration of Nama girls (Fig. 9.11). Thomas Baines (1864: 76), travelling through eastern Namibia, witnessed and later illustrated what he refers to as a couple of Namaqua girls standing in their 'native dress'.

He writes, "the elder was short and rather stoutly built, and might have been tolerably good looking had she been clean, and her eyebrows, nose, and cheeks not outlined with blue clay" (Baines 1864: 76). Fritsch (1872 as cited in Rudner 1982: 133) referring to these two pictures, writes of his experiences of Khoekhoe men smearing their faces with fat, buchu powder, aromatic herb, and 'red'.



Figure 9.10: Khoekhoe women with cheeks and lips reddened. The woman on the left was reproduced in Fritsch (1872: 291). Sketch by Samuel Daniell (1820: 29ff)

The women painted bizarre patterns with red ochre on their faces, including six bold stripes, rings round the eyes, paint across the bridge of the nose and on the cheeks. Likewise, the Hietshware of the Sansokwe River and the Damara occasionally paint their faces with white and black stripes (Dornan 1925: 47).

No reasons were given for this painting of patterns, other than for cosmetic adornment (Rudner 1982: 133). However, some information on the meaning of red paint is mentioned by Theophilus Hahn (1881), a philologist and ethnologist, who conducted research on the Nama in Keetmanshoop in Namibia.

According to Hahn (1881), Heitsi-eibib, the hero warrior, who appears in many of the Nama narratives, is also called ǂEiχa|kha||nabiseb, who can be said to be identical to Tsũi||goab, the supreme being. Tsũi||goab is said to paint himself red with ochre. The name ǂEiχa|kha||nabiseb is made up of three words - ǂeiχa (from ǂei), brass-like, |kha, body, and ||nabiseb, the back-bone. Hahn (1881: 140) interprets this name as the man whose body has a brass-coloured backbone. A link with red colours is made.



Figure 9.11: Namaqua girls with 'blue' clay face paint (Baines 1864: 76)

ǂEiχa|kha||nabiseb, like Tsũi||goab is associated with the phenomena of clouds, thunder, rain and lightning (Hahn 1881). According to Hahn (1881: 140), ǂEiχa|kha||nabiseb is the personification of lightning, also seen as red, *who* descends from heaven or from the cloud to the earth (Italics: mine). He argues that this could be the reason why Khoekhoe women anoint themselves in red salve and make marks with red ochre (*torob*) on certain stones and cairns: a possible connection between marks upon the body and the stone.

Only a handful of Khoekhoe groups (Griqua, !Kora/Korana, Nama) retained these practices into the 20th century (Rudner 1982: 112-114). More data from detailed studies is thus available from these groups. For example, among the Nama, Hoernlé (1918: 71) describes how in the female puberty ceremonies two face paints are used. !Naop is made by grinding a soft red stone to a powder and mixing it with fat and !quasab, a ground white stone (Hoernlé 1918: 73). These colours and techniques are widely used by the girls to paint patterns on their faces. Patterns include circles and dots (Hoernlé 1918: 71, 73, Hoff 1995: 34, 36). The beautification was also an indication of her status as an adult. Once painted, she was a completely new person.

Amongst the Nama in Namibia, when a girl is in ritual seclusion in the Kharu-oms or 'matjieshuis' during her puberty ceremony, patterns on the face are drawn with a cloth to form streaks (Hoff 1990: 170). Ochre powder is used to create a circle around the mouth or dots on the cheeks. A mixture of hard fat and !gû-i, ground parts or seeds of the camel thorn tree (*Acacia erioloba*), is rolled into a ball and heated. This ball is then pressed on the face to make dots. Dots are often called 'moles' and are regarded as desirable. Specific patterns are named after animals, such as the springbok and gemsbok. The patterns are created on the initiate to make her resemble the animal, because these animals are considered beautiful. Other statements refer to how these patterns stem from myths and legends (Hoff 1990: 171). Such patterns or variations could be what are depicted in the illustrations of Daniell and Baines, above.

Continuing with this theme of shared ontologies among the Khoekhoen and Khoe-speaking Bushmen, the reader's attention is drawn to other examples of how Khoe-San groups may have conceptualised, and motivated the making of painted geometric motifs.

9.4.2.4. Body markings

The studies completed by Jeremy Hollmann are important. Hollmann (2011, 2013, 2014) working on engravings in the North West Province, found that tattoo marks on G|wi initiates resemble markings inscribed on the engravings (Fig. 9.12). They are also like the finger-dot marks found in the Makgabeng. Such markings are also found among the Damara and the Kua (Fig. 9.13).



Figure 9.12: Small incisions made on specific parts of the face in G|wi society. The picture highlights tattoo marks made on the face of a G|wi woman during her initiation (photo from Silberbauer 1965: 85). (Hollmann 2011: 345, Figure 10.8b)



Figure 9.13: Small incisions upon forehead extending towards right ear and incisions made on the cheek of Kua man (Valiente-Noailles 1993: 163, photo 46)

When someone is sick among the Damara, scrapings of a person's essence or vital force in the form of one's 'dirt' is inserted into incisions, along with medicine (Inskeep 2003). The Kua regard the markings as being attractive to others, God and the spirits of the dead, which are similar to the designs on Khwe back aprons, which attract the attention of the spirits of the dead.

The widespread application of rubbing substances into cuts on the body, that acted as inoculations, was characteristic of many Khoe-San practices (Inskeep 2003: 741).

9.5. Discussion

This chapter used the results of a close reading of the rock art of the Makgabeng (Chapter VIII) to elaborate on its possible meanings. A critical self-reflexive examination of ethnographic analogies was undertaken to understand the specific instances of interaction between the Khoekhoen and the Bushmen. In particular, Khoe-speaking Bushmen along with Khoekhoe ethnographies were evaluated to elucidate the meanings of the motifs in the Makgabeng. Inherent issues surrounding the use of ethnography highlighted problems in the seeking 'pristine' hunter-gatherers in the past, and detailed the differences and similarities between past and present communities.

The use of certain themes in rock art studies (e.g. the trance dance and therianthropes) with regard to the Bushmen have eclipsed broader understandings of shared ontologies between Khoe-Kwadi speakers, Cape Khoekhoe and

Bushmen. Shared beliefs centering on the body, health, disease, clothing, vital force and wind provide relational pathways that bind individuals in a network of relationships. The idea of vital force is a prevailing theme that joins all of these ethnographies together.

These concepts are re-enacted in puberty rites, conflict resolution, healing and rain ceremonies and reflected in the body modification and markings, clothing and symbols on objects. Significantly, the link between these practices, styles or ways of doing and the rock art could be in the relationship between the body and 'inanimate' objects (e.g. stones, clothing and cairns). Objects such as clothing, can 'stand in' for a person and are an integral component of daily life.

The recognition of Khoe-speaking Bushmen ethnographies by Eastwood (2005; Eastwood & Eastwood 2006) has broadened our understanding and interpretative capability of rock art. In the final chapter, I discuss the results of the stylistic analysis and clusters in more detail, in relation to the ethnography drawn from the peoples that are connected to the painters in the Makgabeng.

PART 5

X. Discussion: Re-thinking the Geometric Rock Art Tradition

This chapter collates and interprets the data from the analysis of the rock art in the Makgabeng, with the ethnographic evidence, to evaluate the theories held by past authors outlined in Chapters II and IV.

B. Smith and Ouzman (2004) have earmarked the Central Limpopo Basin as representing the area where the Khoekhoen arrived in South Africa, first interacting with the Bushmen, before moving down into the interior and settling in the Cape. It is theorised that they left their mark on the landscape by leaving certain finger-painted rock art motifs, which B. Smith and Ouzman (2004) have grouped and termed the 'geometric rock art tradition'. They use the distribution of geometric rock art as proxy evidence for the migration routes of the immigrant Khoekhoen proposed by Westphal (1963) and Ehret (1982) (see Chapter II). The Makgabeng has a high percentage of the total number of geometrics found in the Central Limpopo Basin (B. Smith & Ouzman 2004). The evidence from the Makgabeng is, therefore, central to their argument.

The scenario advanced by B. Smith and Ouzman (2004) is that one group, the Khoekhoen, created the finger-painted geometric rock art tradition, while another group, the Bushmen, created the fine-line rock art tradition. According to the authors, these two rock art bodies are so distinct that these groups must have had separate origins and developed independently for millennia.

Hall and B. Smith (2000) argue that the geometric rock art tradition dates from around 2000 to 1450 BP. From the overlay sequence, B. Smith and Ouzman (2004: 508) suggest that the duration of the geometric rock art tradition was relatively brief, albeit intense, with fine-line rock art both underlying and overlaying the geometric rock art tradition. B. Smith and Ouzman (2004) argue that throughout South Africa and its surrounds, instances of geometric art are similar in iconography and site preference.

According to these authors, the development of this tradition, most probably occurred outside South Africa in 2000 BP or earlier because, they argue, an antecedent is yet to be found within South Africa (Hall & B. Smith 2000: 39; B. Smith & Ouzman 2004: 521). A possible origin was thought to be outside the borders of South Africa, and similarities were observed between geometric paintings from the Tsodilo Hills and Savuti Channel, Botswana, and another previously recognised geometric rock art corpus termed the schematic art tradition, found throughout Central Africa (Rudner 1975: 44; Dowson *et al*. 1992: 30; B. Smith 1995; B. Smith & Ouzman 2004). They suggest that the finger-painted geometric rock art tradition was introduced by early herders, around 2000 BP, migrating southward from Central Africa (B. Smith & Ouzman 2004: 521; Eastwood & B. Smith 2005). It is proposed that the Zambian hunter-gatherers, or Batwa, encountered livestock some time before 2500 BP, which they adopted into their culture as herders migrated south into the Limpopo (B. Smith & Ouzman 2004: 521). B. Smith and Ouzman (2004) propose that the advent of the geometric tradition in South Africa marks the origins of Khoekhoe identity.

The conclusions reached in this thesis cast doubt on the scenario theorised by B. Smith and Ouzman (2004). From the linguistic and genetic evidence, a migration of proto-Khoekhoe herding peoples travelled down from East Africa, with cultural diffusion occurring with local hunter-gatherers occurring within South Africa. The archaeological evidence (Chapter II and Chapter III) refers to a number of different methods in which the herders came into the country without leaving traces or 'footprints' recording their existence. A combination of demic diffusion, cultural diffusion, hybridisation and infiltration possibly occurred.

The theory that the origins of the geometric rock art tradition in southern Africa stems from Central Africa, due to the suggested migration routes through these areas into southern Africa, is problematic. First, the genetics do not point to Central Africa as a source for migrating herders. Second, the body of work of geometrics from Central Africa does not have stylistic similarities with the geometrics of southern Africa (Olivier 2011). Lastly, its not clear what kind of relationship the BaTwa, of Central Africa, and the Khoekhoe had or if, in fact, they had any relationship at all. The latter is most likely and the evolutionary diffusionist model that hunter-gatherers became herders when introduced to livestock is no longer tenable, as I explain later in this chapter. Lastly, the ethnography of Khoe-speaking Bushmen, San-speaking Bushmen and the Khoekhoen share many similarities, highlighting their shared interaction over time and space.

When considering the rock art of the Makgabeng, it would be difficult to argue convincingly that the two rock art corpora had clearly separate origins, or and that Khoekhoe identity was reified when they entered northern South Africa. This analysis shows that by the time they entered South Africa, they were likely assimilated with local hunter-gatherers. As suggested in Chapter IV, multiple hybridised communities, possibly under the names, Vaalpense, Masarwa, Masetedi, Kattea and Baduruwan, once lived in the Makgabeng.

I return to the three motif categories that were used to define the geometric rock art tradition, as well as the motifs used as proxy evidence for Khoekhoe herders – geometric motifs, finger-dots and strokes; handprints and sheep motifs. Under each motif grouping, the previous assumptions and/or theories are discussed before reviewing the new findings of this study to reach several conclusions.

In terms of the interpretation of these motifs – the focus on shamanism and using select ethnographies has overshadowed other readings of the rock art, specifically ideas around the body and phenomenological approaches emphasising touch and embodiment. The Eastwoods offer alternate interpretations of the rock art, taking into account female and male initiation and the role of women in these societies. Khoe-speaking Bushman and Khoekhoe ethnographies were used, as it is more than likely that the groups lived in the area and shared many of their beliefs, and that these are evident in the rock art.

In Chapter IX, it was argued that there are several shared beliefs that exist between Khoe-speaking, San-speaking Bushmen and the Khoekhoen, past and present, related to wind, healing, medicine and rain. These have bearing on each body of motifs.

10.1. Geometric motifs

Geometric rock art is found from the Western Cape to the Free State, from Limpopo to neighbouring Botswana, Namibia and Zimbabwe (B. Smith & Ouzman 2004). The authorship of these geometrics has long been debated (Chapter IV). Geometrics, excluding finger-strokes, finger-dots and aprons, loincloths are composed of forms such as circles, rayed circles, concentric circles, circle-and-dot motifs, circle-and-cross motifs (Eastwood & Tlouamma 2006a: 9). Finger-painted, as well as fine-line brush, geometrics were created. The forms they take include from freeform finger-painted shapes with stubby protrusions to rigid and thinly brush-painted geometric shapes.

B. Smith and Ouzman (2004) found these forms in the parts of the Eastern Cape, which were argued to be at sites where Khoekhoe herder settlements existed in the 16th century. However, as discussed in Chapter IV, the rock art used as an example was likely made by a farm labourer, ancestry unknown, in the early 20th century. This conflation of clearly distinct recent geometric rock art into the lexicon of the geometric rock art tradition is seen in the work of previous authors.

The meanings of geometric designs on objects and clothing are varied and include celestial bodies and foodstuffs. These designs are found reproduced upon aprons and ostrich egg shells. These ethnographies link fertility and female initiation with geometric marks (Eastwood & Eastwood 2006; Hollmann 2011, 2014). As stated in Chapter VI and IX, the meanings around these designs on material objects were transposed onto stone cairns and this is likely to be how meanings were transferred to the rock art.

10.1.1. Finger and fine-line painted aprons

Fine-line and finger-painted aprons outnumber geometrics (19 sites), with regard to sites, with 97 sites in the Makgabeng having both fine-line and finger-painted apron motifs. Geometric rock art in the Makgabeng consists mostly of finger-painted and fine-line aprons and loincloths. Clothing was highlighted in this study as most geometric forms in the sample were associated with clothing motifs. It is also likely that two or more groups created similar imagery of clothing, using different techniques. Eastwood and Van Schalkwyk (2002: 33) identified the fine-line apron motif as a feature of Eastern Khoe-speaking Bushman rock art, as the distribution of these motifs correlates to the distribution of these peoples (cf. Westphal 1963; Ehret 1982, 1998). The ethnography of the Hietshware and other eastern Khoe-speaking Bushmen (e.g. Dornan 1925) helps to elucidate the meaning of these motifs. The virtual absence of these motifs in areas such as the Matobo, Zimbabwe and the Brandberg, Namibia, suggests that rock art in these areas predated herder incursions (Pager 1989; Walker 1996).

Finger-painted geometrics are argued to have been painted at specific locales. Eastwood and Eastwood (2006: 67) found that geometric motifs tend to occur on steep cliff faces or on the summit of hills, hinting at the possibility that most are 'secluded'. Most of these sites occur in habitats suited to the herding of sheep, where sweet grasses grow and where perennial water is available. In terms of interpretation, they have also made the link between finger-painted and fine-line geometrics and girls' puberty rites and transition rites from girls to women.
On the other hand, fine-line apron motifs were said to be created later, when the divide between the Khoekhoen and Bushmen narrowed, the possibility of strong cross-cultural diffusion occurring. This is seen in the context of girls' puberty rites and the paintings of fine-line apron motifs (Eastwood & Eastwood 2006: 131). Eastwood (2005: 22) found 20 small sites in the Central Limpopo Basin where paintings of female kudu, fine-line aprons, women and girls co-occur in different combinations.

From this analysis of the rock art in the Makgabeng, standalone clothing motifs occur predominantly in clusters two and four. Cluster two (68 motifs in 11 sites) is characterised by finger-painted outlined geometrics commonly dotted fill. Cluster four (44 motifs from 18 sites) is made up of brush-painted linear geometrics, with no fill or dotted fill. Spatially, the fine-line motifs occur evenly across the Makgabeng in cluster two, with some clustering in the west for cluster four. From the sampled sites, fine-line apron motifs occur in small sites ranging from 48 to 180 m², except for one site that is large (1408 m²). Conversely, finger-

painted apron motifs occur at sites beginning at 27 m² in size to 96 m², with one extremely large site (3960 m²).

From past climate reconstructions, around 875 BP (cf. Chapter III), the Makgabeng's western side exhibited extensive pasturelands and high rainfall, far more cool and moist than is the case today (Scott 1982: 364; Holmgren *et al.* 2003: 2322; Woodborne *et al*. 2015: 14). The clustering of fine-line aprons in the west coupled with good pastures in this area reinforces the theory that these motifs are a feature of Eastern Khoe-speaking Bushman rock art. White finger-painted apron shapes are created in shelters at higher elevations. The difficulty reaching these higher elevations may point to ritual seclusion or initiation.

In terms of interpretation, Valiente-Noailles (1993: 165) mentions an important incident that may illustrate a principle behind peoples' motivation to make geometric marks on the rock surface. Referring to the decorations of an apron, a female informant said it had the same markings as incisions on objects, thus connecting incisions, geometrics, the body and objects. If they beautify the body, they also embellish the object. The act of transposing the markings from the body to object may therefore infer the transference of supernatural potency from person to possession (cf. Hollmann 2011, 2014). In the same way as the object represents personhood and one's identity, the tranferrence of these associations to the rock art is probable.

Two travellers' illustrations, of young Khoe woman encountered outside of the Cape colony in the late 18th century, demonstrate the various symbols and designs made on these women's aprons (Chapter IX). Eastwood and Eastwood (2006: 65) identified these symbols and others, as well as the aprons themselves, as indicators of fertility and the transition from girl to woman. The Eastwoods found that each traditional community has their own stylistic choices regarding which animal was used for the apron and loincloth skins, where small to medium antelope such as steenbok, duiker, impala or springbok were most common (Eastwood & Eastwood 2006: 153). The Eastwoods found strong symbolic links between hunter, loincloths, supernatural power and gender (Eastwood & Eastwood 2006: 154). In the Makgabeng, it was found that the fine-line apron motifs have elaborately painted tassels and cords. The emphasis on such apron decoration may refer to the role of this decoration in attracting the spirits of the dead and arrows of potency.

The role of vital force and one's essence (Chapter IX) also has bearing on the interpretation of these apron motifs. For example, a Damara's clothing saturated with sweat was imbued with the wearer's essence and could stand in for that person. If aprons saturated with the vital force of the ritual healer could stand in for the healer, individual ownership of an apron may be exemplified in the paintings of specific designs – the identification of a specific healer and the role that specific apron and healer had in such rites. The transference of power or vital force of a healer into objects and onto rock surfaces provides a link between these

associations and the possible meanings of certain geometric imagery related to clothing.

Lastly, certain garments (e.g. aprons, loincloths, dresses) are considered powerful and are not everyday items of apparel (Valientes-Noailles 1991; Entwistle 2000; Inskeep 2003; Joyce 2005; Eastwood & Eastwood 2006; Low 2007b). The smaller sites may indicate some form of ritual seclusion, possibly demonstrating the powerful attributes of aprons in rituals which adhere to strict guidelines where young girls are sequestered from the rest of society.

10.2. Finger-dots and finger-strokes

According to B. Smith and Ouzman (2004: 512), finger-dots and strokes constitute an essential part of the geometric rock art tradition, allegedly authored by the Khoekhoen. B. Smith and Ouzman (2004) use four lines of evidence to argue that finger-dots and strokes are authored by the Khoekhoen, rather than as a result of a multicultural contact landscape, or authored solely by the Bushmen.

First, they argue that there is no empirical evidence to suggest that finger-dots and strokes in the geometric rock art tradition are a non-representational, non-entoptic sub-tradition emerging from a multicultural 'contact' landscape (B. Smith & Ouzman 2004: 507). In other words, researchers have identified entoptic phenomena depicted in the rock art, which is firmly argued to be part and parcel of the fine-line, mainly representational, rock art authored by the Bushmen. In their view, it is unlikely a non-entoptic, non-representational sub-tradition would

exist authored by the Bushmen as a result of exchange between different groups. Furthermore, if the motifs were the outcome of a multicultural 'contact' landscape, we would expect to see the merging of motifs, in a similar way that we see blending of designs in seriation studies.

Second, many of the sites with finger-dots and strokes in the Central Limpopo Basin are small and poorly protected and have low inner recesses. These are relatively rare characteristics among rock shelters. According to Eastwood (2003) finger-dots seldom occur on the hills and ridges favoured by Bushman painters.

Third, the geometric rock art, which includes finger-dots, aprons and loincloths and handprints, could reflect the migratory routes of the Khoekhoen, from "northern Botswana and northern South Africa through the central interior to the Western Cape. This reflects the path some linguists have theorised as the movement of Khoe languages" (B. Smith & Ouzman 2004: 512). Related to this migration is the theory, using superimpositioning studies of painted overlays, that Khoekhoe finger-dots and finger-strokes blurred with Bushman finger-dots and gave way to handprints later (B. Smith & Ouzman 2004: 512).

Lastly, they argue there is no direct evidence in the form of commentary from a Bushman on a finger-dot motif (B. Smith & Ouzman 2004: 508). The example they use is when a |Xam informant in the 1870s was shown a panel with finger-dots, he commented extensively on the figurative rock art, but had nothing to say about the associated finger-dots (Stow & Bleek 1930: pl. 48 and pl. 23). This is

one of the lines of evidence for suggesting a non-Bushman authorship to finger-dots (B. Smith & Ouzman 2004: 508).

With regard to the first conclusion, the results from this study and analysis provide empirical evidence to the contrary. Finger-dots are varied and are one form of many different marks identifiable in the Makgabeng. Finger-dots were considered along with finger-strokes, finger-dots and paint smears by Eastwood (2003). This arbitrary designation does not suggest a coherent group of related motifs, but rather a plethora of unrelated geometric motifs executed using different techniques and pigments and in different locations on the landscape. As a result, the simplification of looking at the category 'finger-dots' may be misleading.

Moreover, the examples from the Central Limpopo Basin sites cited by Smith and Ouzman (2004) demonstrate the separate site preferences where finger-dots and fingerstrokes are found with no fine-line imagery. In this study sample, when the two motifs (finger-dots and finger-strokes) are found together they co-occur at large sites with much superimpositioning and imagery with fine-line rock art.

Dots themselves are diverse in terms of colour, size and quantity. They are found in multiple colours. They range in size and length from micro-dots to large dots and from two finger-dots to long rows (over three metres) of finger-dots, with 400 finger-dots painted on one panel. The technique used is not necessarily finger-applied and dots and micro-dots appear rounded and uniform as if they were

painted using a brush. Finger-strokes, on the other hand, are made with the finger and occur vertically dragged over mainly smaller antelope and human figures.

Finger-dots and finger-strokes were found in cluster one. Spatially, cluster one shows no spatial clustering and occurs evenly across the sample sites. Common attributes within cluster one include solid monochromatic finger-painted geometric shapes, finger-dots and finger-strokes. Within cluster one, we can identify three main sub-clusters grouped by colour – brownish-red, white and Lotus coloured finger-dots.

The brownish-red finger-dots share the same hue as the human figures and/or associated animals. A quarter of the total sample sites have brownish-red finger-dots at the base and/or above the heads of human figures and animals. Many brownish-red finger-dots are found running across the hooves/feet of mostly monochrome small antelopes, large antelopes including kudu, aardvark and human figures. The finger-dots often follow the direction in which the motifs are painted. For instance, when figures are on the same horizontal plane, the dots follow in a straight row. Where the figures are painted in a diagonal configuration, the finger-dots are superimposed over the figures in the same configuration. This hints at the concept that the finger-dots and the naturalistic representations were interlinked in some way.

A quarter of the sample sites display a tendency to depict medium to large white finger-dots, stemming from a crack or indent in the rock substrate and descending

in rows down towards the shelter floor. The white paint is rough and pasty in texture. This could be the art of Northern Sotho speakers, as a pasty chalky white paint is used, which is similar to Northern Sotho rock art. Moreover, the white finger-dots are superimposed over all other styles, both fine-line and finger-painted geometrics, suggesting that they are more recent. White large finger-dots on boulders and at the base of some boulders and shelters possibly have a different function, but because they are often painted on small boulders within rock shelters, where no other associated motifs are found. Moreover, no images lie under or are superimposed over them.

Lastly, the Lotus-coloured finger-dots are enigmatic and the unusual colour places them in their own grouping. However, these finger-dots do occur in large sites with other styles. Unlike the brownish-red finger-dots and the white finger-dots, the Lotus-coloured finger-dots lie under all other styles in the sampled sites, suggesting an earlier date.

With regard to the conclusion that finger-dots and strokes occur at small and poorly protected sites with low inner recesses, the Makgabeng sampled sites of finger-dots and strokes did not demonstrate this trend. Finger-dots, finger-strokes and paint smears occur at over half the total sites in the sample. The majority of finger-dots and strokes in the sampled sites occur alongside fine-line rock art motifs. Finger-dots and strokes, rather than being made away from the hills and ridges favoured by the Bushmen, occur at the same sites in which fine-line rock art is painted. Altitudes range from 955 to 1243 metres above sea level. They are

found across the landscape with not much patterning or clustering. The sizes of sites are as small as 16 m² and increase to 4880 m². Half of the sampled sites exhibit finger-dots and strokes at sites with low inner recesses, with most sampled sites poorly protected. These sites are visible when approaching from afar.

Only one site in the sample has handprints, finger-dots and strokes occurring together. Consequently, the three categories follow different spatial distributions. In terms of superimpositioning, finger-dots and finger-strokes occur superimposed above and under many other styles (Appendix N).

The earlier Lotus-coloured finger-dots and the brownish-red finger-dots and strokes may be associated with ceremonies found in the body of ethnographies discussed in Chapter IX – the ethnographies of non-Khoekhoe Khoe-speaking Bushmen and Khoekhoe speakers.

The most reliable evidence of a Khoekhoe group making rock art is from the late 19th century. The report describes Khoekhoe women anointing themselves with red salve before making marks with red ochre on certain stones and cairns (Hahn 1881: 140). The connection of the body with the rock is pertinent. At another Khoekhoe ceremony, Hahn (1881: 140) witnessed participants, in caves or rock shelters, looking to the sky before applying stripes and crosses to each others' foreheads with a red stone (Rudner 1982: 114). Hahn (1881: 140) argues that the reasons for these ceremonies are that the Khoekhoen deities are a personification of lightning and are seen as red, descending from heaven or via a cloud to the

earth. Lightning and the heavenly are marks of the deities and are painted on the body as well as on the rock.

The connection with the divine is mirrored in other Khoe-San speakers' rituals where groups use substances as inoculations rubbed into incisions of the skin (Inskeep 2003: 741). The resulting tattoo marks resemble the finger-dots found in the Makgabeng. Amongst the Kua, the markings are considered attractive to others and are said to attract the attention of God and the spirits of the dead.

Certain markings on the skin (shapes, stripes, crosses and dots) and rock are considered attractive as they refer to patterns on animals (Hahn 1881; Rudner 1982; Hoff 1990; Inskeep 2003). Seventeenth century Khoekhoe, modern Khoekhoe groups (Griqua, !Kora/Korana, Nama), Hietshware and Damara decorate their faces with symbols and markings. For instance, the dots or 'moles' made on Nama female initiates are considered desirable. The patterns made on the face are named after specific animals such as the gemsbok or springbok. This facial marking is used to make the initiate resemble the animal, because these animals are considered beautiful (Hoff 1990: 170). Additionally, |Han≠kass'o identified the dots painted in a rock art panel as resembling dots placed on the forehead with the forefinger, causing the individual to resemble a hunting leopard (Skotnes 2008: 49). Finger-dots painted on or around an animal may, in a ritual context, emphasise the importance of these animals in such rites. From what we know about fine-line rock art and ethnographies from Khoe-San-speaking groups, the importance of certain animals suggests that brownish-red finger-dots may be

part of a way of thinking and may place emphasis on certain animals or humans that were considered spiritually potent.

10.3. Handprints

The handprint is a motif that is considered a part of the geometric rock art tradition. The general authorship of handprints in South Africa has heavily been debated over the years with some authors arguing that handprints were created by the Khoekhoen, while others argue they were made by the Bushmen.

From the analysis of the results of this study, handprints in the Makgabeng tended to occur where few or no fine-line images were present. Handprints did not have a strong correlation with geometric forms, but were associated with them, or found together in the same sites. With regard to the argument that specific locales were used to paint handprints, the evidence suggests that this is probable. However, the specific locales differ from the characteristics identified in the broader Central Limpopo Basin and in the Western Cape.

Handprints in the Makgabeng were found in cluster eight, which is characterised by monochromatic handprints and paint smears. Handprints are painted in white and red. The texture of the handprint differed, with two sites demonstrating handprints made using a white pasty chalk-like pigment characteristic of the Northern Sotho rock art tradition and technique. The remaining two sites have handprints made from pigment that adheres to the rock surface. A notable distributional pattern with these handprints was observed from the sampled sites,

together with sites recorded from the whole of the Makgabeng. Handprint motifs, when mapped, tend to occur on the periphery of the Makgabeng.

Whether these sites were chosen because they were high up, had good pasturage or due to their seclusion is difficult to measure and test. As mentioned in Chapter III, the Makgabeng has extensive pasturelands, especially in the west (Eastwood & Tlouamma 2005: 50). The sites occur between 962 and 1243 metres above sea level. The Makgabeng, is today, generally not ideal for large herds of cattle, though small herds were observed wandering the gorge. Like finger-dots and strokes, handprints do not occur only in small sites. The sizes of the sites range from 45 m² to 1200 m².

Rather than having handprints under and overlying fine-line paintings, where superimpostioning was found, the sample sites only demonstrated handprints superimposed over fine-line rock art. Handprints within the orthogonal ArchEd Harris Matrix (Appendix N) are rarely superimposed over other images, but, in one case, white solid handprints were superimposed over brownish-red naturalistic rock art and are covered by a solid white geometrics. However, as stated in Chapter V, we cannot know when the handprints were painted. Were they painted a few weeks after the fine-line paintings or thousands of years later?

In the Makgabeng, the Eastwoods (2006: 144) argue that young initiates and their successive groups “touched these paintings to enhance their liminal powers and so bestow these beneficial effects upon their communities”. Through accurate

measurements, we know that children made handprints at at least one site (Groenepunt 35 or the 'Cave of hands') in the Makgabeng. If initiates and/or children made the handprints in a liminal phase, the handprint may be considered powerful and have had associated taboos against painting over them.

From the ethnographies of Khoe-speaking Bushmen and the Khoekhoen, acts of association and rites of re-incorporation with the environment are important in these communities, especially with regard to vulnerable groups such as children, boys and girls coming of age, menstruating or pregnant women. An individual in these societies has "a natural affinity with his or her place of birth", which is in direct contrast to the physical environment outside of the place of birth, which is experienced as dangerous (Hoff 1990: xii). To mediate the danger of one's liminality and the danger of the environment outside one's place of birth, great "emphasis is placed upon the acquisition of harmony with the environment through acts of association" and acts of re-incorporation (*ibid.*). Acts of association refer to preventative acts performed to create a bond with a source of danger, since it is the Khoe-San view that any force with which one has made a bond could, by definition, not be dangerous (Hoff 1998: 116). Rites of re-incorporation (re-marriage, boys' initiation, reception into the rank of hunters, treatment of diseases) involve liminal individuals being reintegrated into society. In order for the liminal person to be accepted, or accepted back, into society, an 'essence' or vital force of that group needs to be inserted into him or her (Hoernlé 1918: 68). Coupled with the connection with the environment, is the role of vital

force and wind as the individualised essence of a person or of a thing, which can be transferred.

If these bands were semi-nomadic, moving in and out of the Makgabeng, acts of association could have been performed by liminal individuals, such as children, using touch (sweat, dirt) associated with one's wind or life force, before entering the Makgabeng. Sweat on the hand mixed with the pigment (white or red) transfers the individual's vital force to the rock surface, either bestowing their liminal state onto the rock surface for demonstration to future initiates, or to re-connect with the environment, like acts of re-incorporation, to neutralise their liminal status, much in the same way as a substance is inserted into them by the community – to protect them, as well as the community at large.

Many of the painted motifs in the Makgabeng have been rubbed, touched, repainted or smeared. The relationship with the painting using a brush to paint in relation to a finger or hand is important. In finger-painted motifs, finger-dots and handprints "the layers of sensing between the artists' bodies and the surface of the rock become the medium wherein sensory exchanges take place, and the equivalency between the surface of the skin […] and the surface of the rock is established" (Achrati 2007: 53). Any markings made to the rock surface using touch have a visceral connection that takes away the object of mediation (the brush) and the act or performance of touching becomes as, if not more, important than the resultant mark, which remains on the surface (Lahelma 2010: 56). The brush acts as an intermediary object between the painter and the rock surface,

while the marks made by finger or hand are direct. The connection between the body, touch and the object is salient. In the same way, initiates transpose the markings from the body to an object (sometimes a stone or a piece of clothing) in rites mentioned in Chapter IX.

10.4. Sheep motifs

The high frequency of paintings of sheep make the Central Limpopo Basin key to understanding the nature and degree of interaction between Bushmen, herders, farmers and sheep. It is theorised that the Khoekhoen introduced fat-tailed sheep and later pottery-making, cattle and the domesticated dog into South Africa. The position of the sheep motifs is used as proxy evidence for the migration of Khoekhoe herders (B. Smith & Ouzman 2004). Moreover, B. Smith and Ouzman (2004) posit that the local Bushmen in the Makgabeng encountered 'herders' and their sheep and represented the sheep in fine-line paintings. Alternatively, Bushmen painted sheep that they were herding and owned (Eastwood & Van Schalkwyk 2002: 17). How did the appearance of domesticates affect the Bushmen, and how did they interpret them? Is there archaeological evidence that herders brought sheep into the Makgabeng?

Domesticates, including sheep, make up 12.3% of the total animal dataset in the Makgabeng. The top five animals represented most frequently are indeterminate animals, kudu, sheep, impala and giraffe (Fig. 8.6). Sheep motifs occur in brownish-red, white, black and yellow-brown hues. They are sometimes clustered together, occasionally following each other, or painted alone. Some are

verisimilar, while others are more abstract. Most sheep motifs are monochromatic, except for one site with two bi-chromatic sheep, where the bodies of the sheep are painted in white, while the heads are brownish-red. Sites have between one and 18 sheep in total per site. They are often painted alone, except on two occasions where they are painted with human figures. Sheep, clearly, were salient in the thoughts of the fine-line painters and this study found that they were likely part and parcel of the beliefs, in terms of fat, nourishment and beautification of the hunter-gatherers that painted them.

At Bonne Esperance 16, one figure holding a longbow, associated with at least 14 black and white fat-tailed sheep, is distinctive, with a clearly defined penis and scrotum. Could this be a representation of the 'other', a herdsman with his flock? A Khoekhoe shepherd? The ethnographies consulted demonstrate both Khoe-speakers and San-speakers used short and long bows (Inskeep 2003: 742). Sheep were also used by both groups, which disallows a clear distinction between hunter-gathering Bushmen and herding Khoekhoen.

The traditional archaeological labels 'hunter-gatherer' and 'herder' may not be the most appropriate in an interaction sphere (cf. Barnard 1992: 17) such as the Makgabeng. Approaches to identity construction need to recognise these processes as being, by their very nature, dynamic, negotiated, and contested, and not likely to conform to essentialising tropes that present distinct ethnicities or cultures in terms of self-contained, self-regulating, bundled and/or unchanging entities (Morris 2002: 7).

From the stylistic analysis and statistics of the rock art, sheep motifs occur in clusters five and six. Cluster five is characterised by solid monochromatic and bichromatic fat-tailed sheep, depicted in black, white and yellow-brown. Cluster six has solid monochromatic white and brownish-red fat-tailed sheep. Statistically, no correlations were found between the presence of sheep and handprints, sheep and finger-dots, or sheep and clothing. Previous authors found a link with female figures, aprons and fat-tailed sheep (Eastwood & Fish 1996: 62; Eastwood & Eastwood 2006: 142-143). Through the quantitative studies of this study's sampled sites, it was found that motifs of sheep occur with geometrics (aprons) and females in four out of the 22 sites.

Spatially, the Soutpansberg has only thin-tailed sheep (Eastwood & Fish 1996), while this study found that the Makgabeng, which is west of the Soutpansberg, has both fat and thin-tailed sheep. A distribution pattern exists with only two sites, with indeterminate or thin-tailed sheep occurring to the west and many sites with fat-tailed sheep found in the north and east. Generally, they do not exhibit a different spatial pattern to other fine-line paintings.

Temporally, only white fat-tailed sheep exhibit superimpositioning. In the orthogonal ArchEd Harris Matrix chronological sequence (Appendix N), white fat-tailed sheep occur under a white finger-painted rayed circle, but are superimposed over solid black and brownish-red zoomorphic and anthropomorphic motifs. At Kirstenspruit 17, white fat-tailed sheep are found

under white fine-line anthropomorphic motifs. The sheep and human figures are painted with the same white textured paint.

The proposed reasons for the creation of paintings of sheep, as outlined in Chapter IV, include them being products of stressful conditions due to competition with immigrant groups. Sheep may have represented stereotypic expressions of identity (Manhire *et al*. 1986: 22; Anderson 1996; B. Smith & Hall 2000). Lastly, sheep with fat tails were regarded as highly significant metaphors of trance, associated with potency (Eastwood & Cnoops 1998: 9; B. Smith & Hall 2000; Eastwood & Eastwood 2006).

In the Makgabeng, the archaeological excavations conducted by Sadr and students (Bradfield, Holt & Sadr 2009) as well as the study of faunal remains (Holt 2009) and lithics, do not present a significant change in subsistence, settlement strategies or technology. Rather, a continuity of Later Stone Age practices is observed. If competition existed between herders and hunter-gatherers, it is not visible below the surface.

Above ground, the competition in resources and space exhibited at Salt Pan Shelter, on the western edge of the Soutpansberg, is not paralleled in any sites in the Makgabeng. The lack of superimpositioning of fat-tailed sheep over finger-painted geometric rock art, and the absence thereof, makes agreement with the conclusions reached by Hall and B. Smith (2000) difficult. Mainly, the assertion that fat-tailed sheep motifs were painted to neutralise the power of the herders and

that the immigrant populations threatened the way of life of many local Bushmen, is tenous. More sites like Salt Pan Shelter are needed to add weight to their argument. In the Makgabeng, we do not find sheep painted in areas or spaces that differ from other fine-line paintings.

This study found that fat-tailed sheep motifs do not represent stereotypic expressions of identity or 'otherness'. Rather, it was found that sheep are absorbed and conflated in the religious ideology of the Bushmen. For instance, a human figure is depicted in a bending forward position, nearly at right angles to the ground, with arms bent at the elbows. The figure's head has a muzzle and ears reminiscent of a sheep. Chapter IV described how the bending forward posture, arms behind the back, as well as therianthropy, are characteristic representations of trance experience. In Chapter VIII, the stylistic analysis demonstrated that sheep co-occur with finger-dots and strokes in a third of the sites, with geometrics in half of the total sample site, reflecting a close relationship rather than different groups avoiding one another. Temporally, sheep are found under finger-painted white geometrics, suggesting they pre-date the creation of geometrics.

A society would not integrate stereotypic expressions of otherness into the heart of its spiritual belief system. The figure of a sheep therianthrope, the co-occurrence of geometrics and sheep and the temporal dimension, highlight the significance of sheep in Bushman beliefs and the shared beliefs, around sheep and fat, of groups in the Makgabeng. Similar arguments have been advanced regarding cattle and shared beliefs (cf. Lewis-Williams & Loubser 1986;

Campbell 1987; Hall 1994; Jolly 1996a, 1996b, 1998; Ouzman 1997b; Hoff 1998; Pinto 2012).

In place of overt trance imagery, Eastwood and Fish (1996) argue that female figures are commonly associated with sheep in the Limpopo, as well as in the Western Cape Province. Previous authors have found an association between females, and what they are depicted as wearing and sheep in the Makgabeng (Eastwood & Fish 1996: 62). At Too Late 10, women with long back-aprons, holding sticks, are associated with a fat-tailed sheep and could relate to girls' puberty rites (Eastwood & Eastwood 2006: 142-143). Sheep were more important than game or oxen, due to their fat. Galton (1853: 257), in Namibia, observed that they never had to kill oxen for the sake of fat, only sheep now and then. Fat became an essential element of food, as roughage, and as a catalyst for fat-essential vitamins (Inskeep 2003: 331, n. 20.).

Ethnographies from the Kalahari mention how animal fat, especially from eland, was used in many rites. Unlike eland fat, which had to be shared, domesticated sheep could be owned and controlled. This sustainable source of fat, this "power on tap" (Huffman 1983), could have had a huge impact on the hunter-gatherer way of life, depending on how one assesses the fixity or permeability of economic roles. It is likely that sheep and sheep fat were incorporated in rites, and this would have motivated the artists to depict them (Huffman 1983; Eastwood & Cnoops 1998: 9; Lander 2014).

In the northern Drakensberg, Faye Lander (2014) finds that the few examples of sheep paintings there appear within a spiritual world context with overt trance imagery. This is in direct contrast to the depiction of sheep in the south-western Cape, where sheep are not juxtaposed with overt trance imagery (Anderson 1996, but see Hollmann 1993). This is commensurate with the arguments made by Huffman (1983) where, within mainly Ju|'hoan ethnographies, the fatness of the eland is associated with fatness in girls at puberty, equating fatness with well-being. To Ju|'hoan men, fat women were attractive. The Bushman girls' puberty rites were similar in some respects to Khoekhoe girls' initiation, especially regarding the use of fat.

Sheep were a continuous presence in the Makgabeng, residing with Bushmen for long enough to be integrated into their belief system. As opposed to the literal interpretations and narrative descriptions of 'other' people moving through the landscape, an intricate system is presented, where interaction played a large part in the shared beliefs of groups in the Makgabeng.

10.5. Summary

Returning to the scenarios on the type and degree of interaction posed at the beginning of this chapter, I highlight the conclusions of this study and suggest possible ways forward. The origin for the geometric rock art tradition and the Central African schematic art has largely been discredited through the work of Olivier (2010). The rock art of the Makgabeng shows a continuity in beliefs, rather than disparate traditions, among two different ethnic groups. From the

conclusions drawn on the different motif clusters in the Makgabeng, it is becoming increasingly difficult to contend that geometrics, finger-dots, finger-strokes and handprints form one coherent group and that two ethnic groups made two distinct rock art traditions. Rather, area-specific analysis has found a plethora of interpretations, which emphasise specific ideas around the body and phenomenological approaches for each motif cluster.

This study has methodological and theoretical implications for how rock art researchers assign authorship to rock art and the use of ethnicity and change over time in understanding variation in rock art. The concluding section looks at the broader issues of this study and its impact on archaeology.

10.6. Broader issues

To answer the questions introduced at the start of this thesis, one needs to look at the broader interlinked theoretical concerns arising from this study that have bearing on archaeological thought. These concerns fall under four headings – an anti-culturalist perspective, interaction, shared beliefs and change.

10.6.1. Anti-culturalist perspective

Consider this quote by B. Smith and Ouzman (2004: 513):

> The accommodations that each rock art tradition makes to the other are [crucial] in understanding how people constructed and adjusted their identities. These connections shape our understandings of [Bushman-ness] and Khoekhoen-ness as identities with distinct core values that nonetheless engaged with each other to create the conditions of possibility for cultural coexistence, innovation, challenge, continuity, and even new cultural formations (B. Smith & Ouzman 2004: 513).

The quote reflects a reductionist culturalist argument, which problematically and implicitly, views a 'political' community as having cultural coherence (Bayart 2005: 59). This argument fails on grounds of three methodological errors – it asserts that a culture is a body closed in on itself. It takes for granted that this body determines a certain political designation. It posits that a transcendal 'Bushman-ness' that has been passed down unchanged over time with distinct core values intact (McGranaghan 2017: 15; cf. Bayart 2005: 65).

Increasingly, anthropologists are abandoning the concept of an ethnic group and, instead, view networks of societies that spanned wide and intricate inter-regional spaces (Bayart 2005: 61). Moreover, this argument does not take into account the processes in which a person or group identify themselves at a specific instance in time and space, in particular circumstances, and for a limited time (Bayart 2005: 93). Certain instances can be inferred in the rock art. For example, instances where handprints are created for specific reason in a society. In the same vein, it is doubtful that the idea of 'community', can be upheld. Mainly, people belong to one, aggregate coherent identity, which is meant to present a group's interests and passions completely (Bayart 2005: 95).

This study, rather than supporting a culturalist perspective, advocates an anti-cultural approach. In this approach, individuals situate themselves in terms of a multitude of "partially disjunctive, partially overlapping communities" (Bayart 2005: 95). Individuals identify themselves more with regard to the groups with which they have relations, and less with respect to their membership of a

community or culture (Bayart 2005: 95). The individual here is not understood as an actual individual in the autonomous western sense of the word, a view that has been problematized by Thomas (2002, 2004) and Agency theorists (Dobres & Robb 2000: 11; Knapp and Dommelen 2008: 15) for attempting to impose the ethnocentric concept of the individual onto the distant past. In this thesis, as in Sadr (2015), the individual or personhood is "produced and performed through networks of relationships in differing […] historical contexts and involving both people and materiality" (Knapp and Dommelen 2008: 15) (Chapter III, VI and X).

Interaction is key. The 'culture' "to which people appeal and on which they draw itself consists of borrowings, and exists only in relation to the Other, a relation that may not be one of conflict" (Bayart 2005: 96). Moreover, this approach presents the possibility that a plethora of variables exist, with which a group or an individual can affiliate, within a network of interaction (Cheng 2010: 107-110).

10.6.2. Interaction

A culturalist perspective overestimates the coherence of cultural traditions and continues to view closed cultural traditions, which conceals the possibility of multiple identities and the implicit linkages that accompany the creation of traditions and the making of identities through interaction (Cheng 2010: 43). These closed traditions and identities can be extrapolated to include the traditional archaeological labels 'hunter-gatherer' and 'herder', which are not hard and fast (Barnard 1992: 17).

Like the conclusions David Morris (2002: 1) reached at Driekopseiland, Northern Cape Province, interactions between "different subsistence modes and cultural groupings in the last 2000 years have resulted in a complex 'mosaic' of responses in the region that are not easily resolved in ethnic or techno-economic terms". The stylistic analysis of the rock art by motifs, in the Makgabeng, highlights how difficult it is to see clear boundaries in terms of ethnicity and/or economies in this area. Identities are fluid and changing, but beliefs have 'staying power' and continue relatively unchanged for long periods of time. The shared beliefs of Khoekhoe and Bushman groups are therefore applicable to the interpretation of the rock art, where groups are said to have had long periods of interaction.

These long periods of interaction likely resulted in groups of mixed descent. Called by a diversity of names (Vaalpense, Masarwa, Masetedi, Kattea and Baduruwan) and practicing different subsistence strategies (hunting and gathering, farming and herding), these creolised groups numbered 8500 in the 19th century. Historically, known by the Hananwa people of the Makgabeng to have once lived in the Makgabeng, these groups could have painted rock art. The lack of disruption in the archaeological record and the co-occurrence of finger-painted geometric and fine-line brush rock art styles can be explained by the continuity of beliefs of these groups, due to their shared origins. Moreover, the shared beliefs emanating from the Khoe-San ethnographies consulted highlights hybridity.

10.6.3. Shared beliefs and change

What rock art researchers often consider fundamentally 'Bushman' often has a parallel belief in the Khoekhoe, and Khoe-speaking Bushmen, cosmology. According to Mathias Guenther (1999), Bushmen are ideological foragers. They are resourceful and adaptive, and it is their flexibility and their "egalitarian tolerance that allows for co-existence through peaceful acceptance of divergent opinions" (Low 2008: 40). When one looks at the ethnographies of the Khoe-San that are closely linked geographically and/or linguistically to the peoples native to the Makgabeng – the Khoe-speaking Bushmen and other closely linked Khoekhoe language groups – one notices how similar the Khoekhoe, Khoe-speaking Bushman and Kalahari Bushman cosmologies are.

The rock art of the Makgabeng shows a continuity in beliefs, rather than disparate traditions, among two different ethnic groups. Large distribution maps and blanket theories need to be re-evaluated based on the evidence, at a local scale. The geometric rock art 'tradition' is not a unified body of work that is separate from the fine-line rock art. From this study in the Makgabeng, it becomes increasingly difficult to assert that the two traditions were created by different peoples. The historical accounts of multiple creolised groups on the landscape presents a far more complex situation than had previously been theorised.

10.7. Future approaches

This study found that the term 'style' to be more appropriate than the term 'tradition'. Style, defined as ways of doing, allows researchers to identity specific

instances of temporal and spatial variation. Rather than assuming a coherent body of art exists, stylistic methods allow for a contextual understanding of change through time and space, considering historicity, change and the complex interaction of groups. This method avoids the trap of empiricism criticised by Lewis-Williams and Loubser (1986), by using a strong theoretical framework emphasising specific ideas around the body and phenomenological approaches of embodiment. This theoretical framework, as well as the context of the Makgabeng, directed attention to specific ethnographies and how links between the body, clothing, body adornment, beautification and the rock art were drawn. The quantative data together with the methodological and theoretical underpinnings allowed for nuanced readings of the rock art that problematised the notion of cultural coherence and authorship. Through statistical and comparative studies, it was found to be unlikely that two distinct ethnic groups created two rock art syles. Rather than an introduction of new meanings with the migration of herders, a continuity in beliefs, shared by creolised Khoe-San groups once extant in the Makgabeng, is demonstrated.

This research has created a large empirical dataset, which may be compared with other datasets from other areas. Future research could use this data to study evidence of regionality along the migratory routes of the Khoekhoen. Areas that may provide clues include the Tsodilo Hills in Botswana at one end, and the Waterberg, Mpumalanga or Northern Cape at the other. Stylistic similarities exist between these areas and the Makgabeng.

XI. References

Achrati, A. 2007. Body and embodiment: a sensible approach to rock art. *Rock Art Research* 24(1): 47-57.

Acocks, J.P.H. 1975. Veld types of South Africa. *Memoirs of the Botanical Survey of South Africa*. Botanical Research Institute, Department of Agricultural Technical Services. 40:1-128.

Agamben, G. 2005. *State of exception*. Chicago: University of Chicago Press.

Alley, R.E. 1996. Algorithm theoretical basis document for decorrelation stretch. NASA, JPL.

AlienThink, Inc & Riven Phoenix. 1996. Learn to draw the human figure (last accessed 12 December, 2015): http://chir.ag/projects/name-that-color/#D6D6D6

Anderson, C.J. 1861. *The Okavango River, a narrative of travel, exploration and adventure*. London: Hurst and Blackett.

Anderson, G. 1996. The social and gender identity of gatherers-hunters and herders in the southwestern Cape. Unpublished Masters dissertation. Cape Town: University of Cape Town.

_____. 1997. Fingers and fine-lines: paintings and gender identity in the southwestern Cape. In: Wadley, L. (ed.) *Our gendered past: archaeological studies of gender in southern Africa*: 13-69. Johannesburg: Witwatersrand University Press.

Aubert, M., Brumm, A., Ramli, M., Sutikna, T., Saptomo, E.W., Hakim, B., Morwood, M.J., van den Bergh, G.D., Kinsley, L. and Dosseto, A. 2014. Pleistocene cave art from Sulawesi, Indonesia. *Nature* 514: 223-227.

Baines, T. 1864. *Explorations in South-West Africa, being an account of a journey in the years 1861 and 1862 from Walvisch Bay, on the western coast, to Lake Ngami and the Victoria Falls*. London: Longman, Green, Longman, Roberts & Green.

_____. 1872. Route of the South African Gold Fields Exploration Company's expedition 1869 to 1872 (and previous tracks). University of Cape Town Libraries, South Africa.

_____. 1877. *The gold regions of south eastern Africa* (Vol. 1)**.** London: E. Stanford.

Barnard, A. 1988. Structure and fluidity in Khoisan religious ideas. *Journal of Religion in Africa* 18(3): 216-236

_____. 1992. *Hunters and herders of southern Africa: a comparative ethnography of the Khoisan peoples*. Cambridge: Cambridge University Press.

_____. 1996. [Review]The Kua: life and soul of the central Kalahari Bushmen by Carlos Valiente-Noailles; In the tradition of the forefathers: Bushman traditionality at Kagga Kamma by Hylton White. *Journal of Southern African Studies* 22(4): 693-695.

_____.2004. *Hunter-gatherers in history, archaeology and anthropology*. New York: Berg.

_____. 2007. *Anthropology and the Bushman*. New York: Berg.

Barnard, A. and Spencer, J. 2002. *Encyclopedia of Social and Cultural Anthropology*. London: Routledge.

Barton, C. M., Clark, G.A. and Cohen, A.E. 1994. Art as information: explaining Upper Paleolithic art in Western Europe. *World Archaeology* 26(2): 185-207.

Battiss, W. 1939. *Art in South Africa: the amazing bushmen*. Pretoria: Red Fawn Press.

_____. 1948. *The artists on the rocks.* Pretoria: Red Fawn Press.

Bayart, J-F. 2005. *The illusion of cultural identity*. Chicago: Chicago University Press.

Bednarik, R.G. 1995. The Côa Petroglyphs: an obituary to the stylistic dating of Palaeolithic rock art. *Antiquity* 69(266): 877-884.

_____. 2004. The IFRAO Standard Scale. *Arte Preistorica, http://www.artepreistorica.it/articoli/articolo.asp?english=&idarticolo=11&p=1*

Biesele, M. 1993. *Women like meat: the folklore and foraging ideology of the Kalahari Ju/'hoan*. Johannesburg: Wits University Press.

Blacking, J. 1977. *The anthropology of the body*. Association of Social Anthropologists of the Commonwealth. London: Academic Press.

Bleek, D.F. 1935. Beliefs and customs of the /Xam bushmen: Part VII: Sorcerors (*sic*). *Bantu Studies* 9: 1-47.

Blundell, G. 2004. *Nqabayo's Nomansland: San rock art and the somatic past*. Uppsala: Uppsala University Press.

Blundell, G. and Eastwood, E.B. 2001. Identifying Y-shapes in the San rock art of the Limpopo-Shashe Confluence Area: new ethnographic and painted evidence. *South African Journal of Science* 97: 305-308.

Boast, R. 1997. A sSmall cCompany of aActors: aA cCritique of sStyle. *Journal of Material Culture* 2: 137.

Bonneau, A. *et al*. 2017. The earliest directly dated rock paintings from southern Africa: new AMS radiocarbon dates. *Antiquity* 91(356): 322-333.

Bonneau, A., Pearce, D.G., and Pollard, A.M. 2011. A multi-technique characterization and provenance study of the pigments used in San rock art, South Africa. *Journal of Archaeological Science* 39(2): 287-294.

Boonzaier, E., Malherbe, C., Berens, P. and Smith, A. 1996. *The Cape Herders: aA hHistory of the Khoikhoi of sSouthern Africa*. Johannesburg: David Philip.

Bourdieu, P. 1977. *Outline of a theory of practice*. New York: Cambridge University Press.

_____. 1980. *The logic of practice*. Stanford: Stanford University Press.

Boshier, A. 1972. A note on the Masetedi, *South African Journal of Science* 68: 206-208.

Boyd, C.E. 1998. Pictographic evidence of peyotism in the Lower Pecos, Texas Archaic. In: Chippindale, C. and Taçon, P.S.C. (eds.) *An Archaeology of rock art*: 229-246. Cambridge: Cambridge University Press.

_____. 2003. *Rock Art of the Lower Pecos*. College Station, TX: Texas A & M University Press.

Bradfield, J.S., Holt, S. and Sadr, K. 2009. The last of the LSA on the Makgabeng Plateau, Limpopo Province. *The South African Archaeological Bulletin* 64 (190): 176-183.

Brady, L.M. and Bradley, J.J. 2014. Reconsidering regional rock art styles: exploring cultural and relational understandings in northern Australia's gulf country. *Journal of Social Archaeology* 14(3): 361-382.

Breuil, H. 1930. Premiers impressions de voyage sur la prehistoire Sud-Africaine. *L'Anthropologie* 40: 209-223.

Breutz, P-L. 1958. An Ancient people in the Kalahari Desert. *Africa und Ubersee* 42 (42): 49-68.

Burkitt, M.C. 1928. *South Africa's past in stone and paint*. Cambridge: Cambridge University Press.

Butzer, K.W. 1980. Civilizations organisms or systems? *American Scientist* 68: 517-523.

Bwasiri, E.J. and Smith, B.W. 2015. The rock art of Kondoa District, Tanzania. *Azania: Archaeological Research in Africa* 50(4): 437-459.

Campbell, C. 1987. Art in crisis: contact period rock art in the south-eastern mountains of Southern Africa. M.Sc. Thesis, University of the Witwatersrand.

Cashdan, E.A. 1979. Trade and reciprocity among the River Bushmen of northern Botswana. PhD thesis. Albuquerque: University of New Mexico.

_____. 1984a. G//ana territorial organization. *Human ecology* 12: 443-463.

_____. 1984b. The effects of food production on mobility in the Central Kalahari. In: Clark, J.D. and Brandt, S.A. (eds.) *From hunters to farmers*, 311-327. Berkeley: University of California Press.

_____. 1986. Competition between foragers and food producers on the Botletli River, Botswana. *Africa* 56: 299-318.

_____. 1987. Trade and its origins on the Botletli River, Botswana. *Journal of anthropological research* 43: 121-38.

Challis, W. 2008. The impact of the horse on the AmaTola 'Bushmen': new identity in the Maloti-Drakensberg mountains of southern Africa. Unpublished Ph.D. Thesis, University of Oxford.

_____. 2012. Creolisation on the nineteenth-century frontiers of southern Africa: a case study of the AmaTola 'Bushmen' in the Maloti-Drakensberg. *Journal of Southern African Studies* 38(2): 265-280.

Chaloupka, G. 1993. You gotta have style. In: Lorblanchet, M. and Bahn, P.G. (eds.) *Rock art studies: the post-stylistic era or where do we go from here?*: 77-98. Oxbow Monograph 35. Oxford: Oxbow.

Chaplin, J.H. 1962. Further unpublished examples of rock-art from Northern Rhodesia. *South African Archaeological Bulletin* 17: 5–12.

Chebanne, A.M. 2002. Shifting identities in Eastern Khoe: ethnic and language endangerment. *Pula: Botswana Journal of African Studies* 16(2): 147-157.

Cheng, B. 2010. The space between: locating "culture" in artistic exchange. *Ars Orientalis* 38: 81-120.

Chippindale, C. 1996. The A-B-C of rock-art: fundamentals in the archaeological study of ancient pictures. Unpublished manuscript. Cambridge: University of Cambridge.

Chippindale, C., Smith, B.W. and Taçon, P.S.C. 2000. Visions of dynamic power: archaic rock paintings, altered states of consciousness and 'clever men' in Western Arnhem Land (NT), Australia. *Cambridge Archaeological Journal* 10(1): 63-101.

Chippindale, C. and Taçon, P.S. 1993. Two old painted panels from Kakadu: variation and sequence in Arnhem Land rock art. In: Steinbring, J., Watchman, A., Faulstich, P. and Taçon, P.S.C. (eds.) *Time and space: dating and spatial considerations in rock art research*: 32-56. Occasional AURA Publication N° 8, Australian Rock Art Research Association, Melbourne.

Cisney, V.W. and Morar, N. 2015. *Biopower: Foucault and beyond.* Chicago: University of Chicago Press.

Clark, J. D. 1950. A note on the pre-Bantu inhabitants of Northern Rhodesia and Nyasaland. *Northern Rhodesian Journal* 1: 49-59.

_____. 1959. The rock paintings of Northern Rhodesia and Nyasaland. In: Summers, R. (ed.) *Prehistoric rock art of the federation of Rhodesia & Nyasaland*: 163–220. Glasgow: National Publication Trust.

Clegg, J.K. 1977. A method of resolving problems which arise from style in art. In Ucko, P.J. (ed.) *Form in indigenous art*: 260-276. Canberra: Australian Institute of Aboriginal Studies.

_____. 1987. Style and tradition at Stuart's Meadows. *World Archaeology* 19: 236-255.

_____. 1993. Post-stylistic? In: Lorblanchet, M. and Bahn, P.G. (eds.) *Rock art studies: the post-stylistic era, or Where do we go from here?*: 19-25. Oxford: Oxbow.

Clifford, J. 1986. On ethnographic allegory. In: Clifford, J. and Marcus, G.E. (eds.) *Writing culture: The poetics and politics of ethnography*: 98-121. Berkeley: University of California Press.

Clottes, J. 1993. Post-Stylistic? In: Lorblanchet, M. and Bahn, P.G. (eds.) *Rock art studies: the post-stylistic era, or Where do we go from here?*: 19-25. Oxford: Oxbow. Monograph 35.

_____. 2002. *World Rock Art*. Los Angeles: Getty Conservation Institution.

Conkey, M.W. and Hasfort, A. 1990. Introduction. In Conkey, M.W. and Hasfort, A. (eds.) *The uses of style in archaeology*: 1-4. Cambridge: Cambridge University Press.

Cooke, C.K. 1957. The occurrence of circle-and-dot in Southern Rhodesian rock art. *The South African Archaeological Bulletin* 12(46): 62-66.

_____. 1965. Evidence of human migrations from the rock art of southern Rhodesia. *Africa 35*(3): 263-285.

Couzens, R. and Sadr, K. 2010. Rippled Ware at Blinkklipkop, Northern Cape. *South African Archaeological Bulletin* 65(192): 196-203.

Cummings, V. 2013. *The anthropology of hunter-gatherers: key themes for archaeologists*. London: A&C Black.

Daniell, S. 1820. *Sketches representing the native tribes, animals and scenery of South Africa from drawings by the late Mr Samuel Daniell.* London.

Davis, W. 2011. *A general theory of visual culture*. Princeton: Princeton University Press.

Deacon, H.J. and Deacon, J. 1999. *Human beginnings in South Africa: uncovering the secrets of the Stone Age*. Cape Town: David Philip Publishers.

Deacon, H.J., Deacon, J., Brooker, M. and Wilson, M. 1978. The evidence for herding at Boomplaas Cave in the southern Cape, South Africa. *South African Archaeological Bulletin* 33: 39–65.

Deacon, J. 1972. Wilton: an assessment after fifty years. *South African Archaeological Bulletin* 27(105/106): 10-48.

_____. 1984. Later Stone Age people and their descendants in southern Africa. In: Klein, R.G. (ed.) *Southern African prehistory and palaeoenvironments*: 221-328. Rotterdam: A.A. Balkema.

Dedering, T. 1997. *Hate the old and follow the new: Khoekhoe and missionaries in early nineteenth-century Namibia*. Stuttgart: F. Steiner Verlag.

DeMello, M. 2011. Modification blurring the divide: human and animal body modifications. In: Mascia-Lees, F.E. (ed.) *A companion to the anthropology of the body and embodiment* (First Edition): 338-352. Chichester: John Wiley and Sons Ltd.

Denbow, J.R. 1984. Prehistoric herders and foragers of the Kalahari: the evidence of 1500 years of interaction. In: Schrire, C. (ed.) *Past and present in hunter-gatherer studies*: 1-25. Orlando: Academic Press.

_____. 2013. *The archaeology and ethnography of Central Africa*. Cambridge: Cambridge University Press.

Denbow, J. and Wilmsen, E.N. 1986. Advent and course of pastoralism in the Kalahari. *Science* 234(4782): 1509-1516.

Denninger, E. 1967. Age determination of rock paintings in Northern Transvaal (Limpopo Valley) and Natal (Drakensberg). Pretoria: C.S.I.R..

_____. 1971. The use of paper chromatography to determine the age of albuminous binders and its application to rock paintings. *South African Journal of Science Special Publication* 2: 80-84.

Derricourt, R. 1977. *Prehistoric man in the Ciskei and Transkei.* Cape Town: Struik.

Dewar, G. and Marsh, E.J. 2018. The comings and goings of sheep and pottery in the coastal desert of Namaqualand, South Africa. *The Journal of Island and Coastal Archaeology* 0: 1-29.

Dietler, M. and Herbich, I. 1998. Habitus, techniques, style: an integrated approach to the social understanding of material culture and boundaries. In: Stark, M. (ed.) *The Archaeology of Social Boundaries*: 232-263. Washington, DC: Smithsonian Press.

Dobres, M. and Robb, J.E. 2000. Agency in archaeology: paradigm or platitude? In: Dobres, M. and Robb, J.E. (eds.) *Agency in Archaeology*: 3-17. London: Routledge.

Dornan, S.S. 1925. *Pygmies and Bushmen of the Kalahari: an account of the hunting tribes inhabiting the great arid plateau of the Kalahari Desert, their precarious manners of living, their habits, customs and beliefs; with*

some reference to Bushman art, both early and of recent date, and to the neighbouring African tribes. London: Seeley, Service & Co.

Douglas, M. 1966. *Purity and danger*. London: Routledge.

Dowson, T.A. 2007. 'Debating shamanism in southern African rock art: Time to move on …'. *South African Archaeological Bulletin* 62(185): 49-61.

Dowson, T.A., Blundell, G. and Hall, S. 1992. Finger paintings in the Harts River Valley, Northern Cape Province, South Africa. *Southern African Field Archaeology* 1(1): 33-39.

Dowson, T. A. and Holliday, A. L. 1989. Zigzags and eland: an interpretation of an idiosyncratic combination. *South African Archaeological Bulletin* 44: 46-48.

Dubow, S. 1995. Scientific Racism in modern South Africa. Cambridge: Cambridge University Press.

Eastwood, E.B. 1994. A brief description of the Daskop II bushman paintings near Pietersburg. *Die Rooi Olifant* 9: 4-6

_____. 1999. Red lines and Arrows: Attributes of supernatural potency in San rock art of the Northern Province, South Africa and south-western Zimbabwe. *South African Archaeological Bulletin* 54(169): 16-27.

_____. 2002a. 'The Rock Art of the Makgabeng Plateau: Volume 2. The rock paintings of Nieuwe Jerusalem'. Unpublished volume.

_____. 2002b. The Rock Art of the Makgabeng Plateau. Volume 3. The rock paintings and engravings of Too Late. Unpublished report for The Swan Fund.

_____. 2003. A cross-cultural motif in San, Khoekhoe and Northern Sotho rock paintings of the Central Limpopo Basin, southern Africa. *South African Archaeological Bulletin* 58(177): 14-26.

_____. 2005. From girls to women: female imagery in the San rock paintings of the Central Limpopo Basin, southern Africa. *Before Farming* 3(2): 1-25.

_____. 2006. Animals behaving like people: San rock paintings of kudu in the Central Limpopo Basin, southern Africa. *South African Archaeological Bulletin* 61(183): 26-39.

Eastwood, E.B., Blundell, G. and Smith, B.W. 2010. Art and authorship in southern African rock art: Examining the Limpopo-Shashe Confluence Area. In: Blundell, G., Chippindale, C. and Smith, B.W. (eds.) *Seeing and Knowing: Understanding rock art with and without ethnography*: 75-99. Johannesburg: Wits University Press.

Eastwood, E.B. and Cnoops, C. 1993. Further comments on the red dorsal stripes on elephant and rhino. *Die Rooi Olifant* 7: 1-3.

_____. 1994. The rock paintings of Greefswald, Limpopo River Valley. *Die Rooi Olifant* 10: 9-11.

_____. 1998b. The rock art of the Limpopo-Shashi Confluence, South Africa and Zimbabwe: an overview. *Pictogram* 10(1): 1-16.

_____. 1999. Capturing the spoor: towards explaining kudu in the San rock art of the Limpopo-Shashi confluence area. *South African Archaeological Bulletin* 54(170): 107-119.

Eastwood, E.B., Cnoops, B.W., Fish, W.S. and Cnoops, C.J.H. 1997. *Fragile Icons: Northern Province Rock Art conservation & management*. Louis Trichardt: Palaeo-Art Field Services.

Eastwood, E.B. and Eastwood, C. 2006. *Capturing the Spoor: an exploration of southern African rock art*. Cape Town: David Phillip Publishers.

Eastwood, E. B. and Fish, W.S. 1996. Sheep in the rock paintings of the Soutpansberg and Limpopo River valley. *Southern African Field Archaeology* 5: 59-69.

Eastwood, E.B., Fish, W. and Cnoops, C. 1995a. Sheep Paintings in the rock art of the Limpopo River Valley and the Soutpansberg. *The Digging Stick* 12(3): 1-2.

Eastwood, E.B., Fish, W. and Cnoops, C. 1995b. Sheep paintings in the rock art of the Limpopo River Valley and the Soutpansberg. *Die Rooi Olifant* 12: 3-6.

Eastwood, E.B. and Green, D. 2007. Tsodilo: some ideas on authorship. *The Digging Stick* 24(2): 9–12.

Eastwood, E.B. and Smith, B.W. 2005. Fingerprints of the Khoekhoen: geometric and handprinted rock art in the Central Limpopo Basin, South Africa. *South African Archaeological Society Goodwin Series* 9: 63–76.

Eastwood, E.B. and Tlouamma, J.N. 2002. The rock art of the Makgabeng Plateau. Volume 4: The rock paintings of Millbank and Langbryde. Unpublished volume.

_____.2003a. The rock art of the Makgabeng Plateau. Volume 5: The rock paintings and engravings of Old Langsine and Millstream. Unpublished volume.

_____.2003b. The rock art of the Makgabeng Plateau. Volume 6: De Villiersdale and De la Roche. Unpublished volume.

_____.2004. The rock art of the Makgabeng Plateau. Volume 7: Groenepunt, Kirstenspruit and Bayswater. Unpublished volume.

_____.2005. The rock art of the Makgabeng Plateau. Volume 8: Rosamond and Disseldorp. Unpublished volume.

_____. 2006a. The rock art of the Makgabeng Plateau. Volume 9: Sweet Home and Mont Blanc. Unpublished volume.

_____. 2006b. The rock art of the Makgabeng Plateau. Volume 10: Bonne Esperance. Unpublished volume.

Eastwood, E.B. and Van Schalkwyk, J. 2002. The Rock Art of the Makgabeng Plateau: Volume 1: Introducing the Makgabeng and the Rock Paintings of Gallashiels. Palaeo-Art Field Services. Unpublished report for The Swan Fund.

Eastwood, E.B., Van Schalkwyk, J. and Smith, B. 2002. Archaeological and rock art survey of the Makgabeng Plateau, Central Limpopo basin. *The Digging Stick* 9(1): 1-3.

Ehret, C. 1982. The first spread of food production to southern Africa. In: Ehret, C. and Posnansky, M. (eds.) *The archaeology and linguistic reconstruction of African history*: 158-182. Berkeley: University of California Press.

_____. 1998. *An African Classical Age: eastern and southern Africa in world history, 1 000 BC to AD 400*. Oxford: James Curry.

_____. 2008. The early livestock-raisers of southern Africa. *Southern African Humanities* 20: 7-35.

Eldredge, E.A. 1992. Sources of Conflict in Southern Africa, C. 1800-30: The 'Mfecane' Reconsidered. *The Journal of African History* 33(1): 1-35.

Elphick, R. 1977. *Kraal and Castle: Khoikhoi and the founding of white South Africa*. New Haven: Yale University Press.

_____. 1985. *Khoikhoi and the founding of white South Africa*. Johannesburg: Raven Press.

Entwistle, J. 2000. Fashion and the Fleshy Body: dress as embodied practice. *Fashion Theory* 4(3): 323-348.

Etherington, N. 2001. *The great treks: the transformation of southern Africa, 1815-1854.* London: Longman.

Fauvelle-Aymar, F-X. 2008. Against the 'Khoisan paradigm' in the interpretation of Khoekhoe origins and history: a re-evaluation of Khoekhoe pastoral traditions. *South African Humanities* 20: 77-92.

Fauvelle-Aymar, F-X., and Sadr, K. 2008. Trends and traps in the reconstruction of early herding societies in southern Africa. *Southern African Humanities* 20: 1-6.

Fauvelle-Aymar, F-X., Sadr, K., Bon, F. and Gronenborn, D. 2006. The visibility and invisibility of herder's kraals in southern Africa, with reference to a possible early contact period Khoekhoe kraal at KFS 5, Western Cape. *Journal of African Archaeology* 4(2): 253-271.

Fisher, G. and Loren, D.D. 2003. Embodying identity in archaeology: introduction. *Cambridge Archaeological Journal* 13: 225-230.

Flett, A. and Letley, P. 2013. Style and stylistic change in the rock art of the southeastern mountains of southern Africa**.** *South African Archaeological Bulletin* 68: 3-14.

Forssman, T. 2013. Missing pieces: Later Stone Age surface assemblages on the greater Mapungubwe landscape, South Africa. *Southern African Humanities* 25: 65-85.

Forssman, T. 2014. Dzombo Shelter: A contribution to the Later Stone Age sequence of the greater Mapungubwe landscape. *South African Archaeological Bulletin* 69(200): 182-191.

_____. 2015. Hunter-gatherers on the Mapungubwe landscape. *The Digging Stick* 32(3): 15-18.

_____. 2017. Foragers and trade in the middle Limpopo Valley, c. 1200 BC to AD 1300. *Azania: Archaeological Research in Africa* 52(1): 49-70.

Fortis, P. 2010. The birth of design: a Kuna theory of body and personhood. *Journal of the Royal Anthropological Institute* 16(3): 480-495.

Foucault, M. 1977. *Discipline and punish: the birth of the prison*. New York: Pantheon Books.

Foucault, M. 1978. *The history of sexuality, Vol. I: an introduction*. New York: Pantheon Books.

Franklin, N.R. 2003. Research with style: a case study from Australian rock art. In: Shennan, S. (ed.) *Archaeological approaches to cultural identity*: 306-318. London: Routledge.

Frobenius, L. 1929. The mystery of South Africa's prehistoric art. *The Illustrated London News*: 333-5.

Frobenius, L.1931. *Madsimu Dsangara*. Graz: Akademische Druck-u.

Galpin, J.S. 2015. University of Witwatersrand School of Statistics and Actuarial Science Course notes for Statistical Research Design and Analysis. Revised by R.E. Krommenhoek.

Galton, F. 1853. *Narrative of an explorer in tropical South Africa: being an account of a visit to Damaraland in 1851* (Vol. 1). London: John Murray.

Garlake, P.S. 1995. *The hunter's vision: the prehistoric art of Zimbabwe*. London: British Museum Press.

Giddens, A. 1984. *The constitution of society: outline of the theory of structuration*. Cambridge: Polity Press.

Gifford-Gonzalez, D. 2005. Pastoralism and its consequences. In: Stahl, A.B. (ed.) *African archaeology: A critical introduction*: 187-224. Oxford: Blackwell.

Goffman, E. 1959. *The presentation of everyday life*. New York: Double day Anchor Books.

Goodwin, A.J.H. 1936. Vosburg: its petroglyphs. *Annals of the South African Museum* 24: 163-210.

Goodwin, A.J.H., and Van Riet Lowe, C. 1929. The Stone Age Cultures of South Africa. *Annals of the South African Museum* 27: 1–276.

Gordon, R. 1984. The !Kung in the Kalahari exchange: an ethnohistorical perspective. In Schrire, C. (ed.) *Past and Present in hunter gatherer studies*: 195-224. Orlando, FL: Academic Press.

Gosselain, O.P. 1992. Technology and style: potters and pottery among Bafia Cameroon. *Man* 27(3): 559-586.

Gould, R.A. and Watson, P.J. 1982. A dialogue on the meaning and use of analogy in ethnoarchaeological reasoning. *Journal of Anthropological Archaeology* 1(4): 355-381.

Green, D. and Eastwood, E.B. 2008. Preliminary report on females' aprons in hunter-gatherer rock paintings of the southern Drakensberg, South Africa. *South African Archaeological Bulletin* 63(188): 144-150.

Guenther, M. 1999. *Tricksters and trancers: bushman religion and society*. Bloomington, IN: Indiana University Press.

Güldemann, T. 2008. A linguist's view: Khoe-Kwadi speakers as the earliest food-producers of southern Africa. *Southern African Humanities* 20: 93-132.

Güldemann, T. and Elderkin, E. D. 2010. On external genealogical relationships of the Khoe family. In: Brenzinger, M. and König, C. (eds.) *Khoisan languages and linguistics: The Riezlern symposium 2003*: 15–52. Quellen zur Khoisan-Forschung 24. Cologne: Rüdiger Köppe.

Güldemann, T. and Vossen, R. 2000. Khoisan. In: Heine, B. and Nurse, D. (eds.) *African languages: An introduction*: 99–122. Cambridge: Cambridge University Press.

Gunn, R.G., Ogleby, C.L., Lee, D. and Whear, R.L. 2010. A method to visually rationalise superimposed pigment motifs. *Rock Art Research: The Journal of the Australian Rock Art Research Association (AURA) 27*(2): 131-136.

Gupta, A. and Ferguson, J. 1992. Beyond culture: space, identity and the politics of difference. *Cultural Anthropology* 7(1): 6-23.

Haacke, W.H.G. 2008. Linguistic hypotheses on the origin of Namibian Khoekhoe speakers. *Southern African Humanities* 20: 163–177.

Haacke, W.H.G. and Eiseb, E. 2002. *A Khoekhoegowab dictionary with an English-Khoekhoegowab index*. Windhoek: Gamsberg Macmillan.

Hahn, N. 2011. Refinement of the Soutpansberg Geomorphic Province, Limpopo, South Africa. *Transactions of the Royal Society of South Africa* 66(1): 32-40.

Hahn, T. 1879. Felszeichnungen der Buschmänner. *Zeitschrift für Ethnologie* 11: 307-308.

_____. 1881. *Tsuni-//goam. The supreme being of the Khoi-Khoi*. London: Trübner.

Hall, S.L. 1994. Images of interaction. Rock art and sequence in the Eastern Cape'. In: Dowson, T. and Lewis-Williams, J.D. (eds.) *Contested images: diversity in southern African rock art research*: 61-82. Johannesburg: Witwatersrand University Press.

Hall, S. and Binneman, J. 1987. Later Stone Age burial variability in the Cape: a social Interpretation. *The South African Archaeological Bulletin* 42(146): 140-152.

Hall, S. and Prins, F.E. 1993. Late White rock paintings of central and southern Africa. *Lantern* 42: 2.

Hall, S.L. and Smith, B.W. 2000. Empowering places: rock shelters and ritual control in farmer-forager interactions in the Northern Province. *South African Archaeological Society Goodwin Series* 8: 30-46.

Hampson, J. 2011. Rock art regionalism and identity: case studies from Trans-Pecos Texas and Mpumalanga Province, South Africa. Clare College and Department of Archaeology, University of Cambridge. Unpublished PhD dissertation.

Hampson, J., Challis, W., Blundell, G. and De Rosner, C. 2002. The rock art of Bongani Mountain Lodge and its environs, Mpumalanga Province: an introduction to problems of southern African rock art regions. *South African Archaeological Bulletin* 57(175): 15-30.

Harman, J. 2005. Using Decorrelation Stretch to Enhance Rock Art Images (last accessed 14 March 2012): http://www.petroglyphs.us/article_using_decorrelation_stretch_to_enhance_rock_art_images.htm/

Hays-Gilpin, K. 2004. *Ambiguous images: gender and rock art*. London: Altamira Press.

Hegmon, M. 1992. Archaeological research on style. *Annual Review of Anthropology* 21: 517-536.

Henn, B.M., Gignoux, C., Lin, A.A., Oefner, P.J., Shen, P., Scozzari, R., Cruciani, F., Tishkoff, S.A., Mountain, J.L. and Underhill, P.A. 2008. Y-chromosomal evidence of a pastoralist migration through Tanzania to southern Africa. *Proceedings of the National Academy of Sciences* 105(31): 10693-10698.

Henry, L. 2010. Rock art and the contested landscape of the north eastern Cape, South Africa. Unpublished Master's Thesis. University of Witwatersrand, Johannesburg, South Africa.

Hitchcock, R.K. and Biesele, M. 2010. San, Khwe, Basarwa, or Bushmen? Terminology, identity, and empowerment in southern Africa (last accessed 4 April 2016): http://www.khoisanpeoples.org/indepth/ind-identity.htm.

Hoernlé, A.W. 1918. Certain rites of transition and the conception of !Nau among the Hottentots. In Bates, O. (ed.) *Harvard African Studies II*: 75-77. Cambridge, MA: African Department of the Peabody Museum of Harvard University.

_____. 1925. The social organisation of the Nama Hottentots. *American Anthropologist* 27(1): 1–24.

Hoff, J.A. 1990. Die tradisionele wêreldbeskouing van die Khoekhoen. Unpublished PhD thesis. University of Pretoria.

_____. 1995. Puberteitsrite van 'n Khoekhomeisie. *South African Journal of Ethnology* 18(1): 29-41.

_____. 1998. The water bull of the /Xam. *South African Archaeological Bulletin* 53: 109-124.

Hofmeyr, I. 1988. Popularizing history: the case of Gustav Preller. *The Journal of African History 29*(3): 521-535.

Hogg, A.G., Hua, Q., Blackwell, P.G., Niu, M., Buck, C.E., Guilderson, T.P., Heaton, T.J., Palmer, J.G., Reimer, P.J., Reimer, R.W., Turney, C.S.M. & Zimmerman, S.R.H. 2013. SHCal13 southern hemisphere calibration, 0–50,000 years cal BP. *Radiocarbon* 55(4): 1889–1903

Hollmann, J.C. 1993. Preliminary report on the Koebee rock paintings, Western Cape Province, South Africa. *South African Archaeological Bulletin* 48: 16-25.

_____. 2005. Swift-People: therianthropes and bird symbolism in hunter-gatherer rock paintings, Western and Eastern Cape Province, South Africa. *South African Archaeological Society Goodwin Series* 9:21-33.

_____. 2011. The cutting edge: Khoe-San rock-markings at the Gestoptefontein-Driekuil engraving complex, North West Province, South Africa. Unpublished PhD thesis, University of Western Cape, Cape Town, South Africa.

_____. 2013. Exploring the Gestoptefontein-Driekuil Complex (GDC): an ancient women's ceremonial centre in North West province, South Africa. *South African Archaeological Bulletin* 68(198): 146-159.

_____. 2014. Geometric motifs in Khoe-San rock art: depictions of designs, decorations and ornaments in the Gestoptefontein-Driekuil Complex, North West Province, South Africa. *Journal of African Archaeology* 12(1): 1-35.

Hollmann, J.C. and Crause, K. 2011. Digital imaging and the revelation of 'hidden' rock art: Vaalekop Shelter, KwaZulu-Natal. *Southern African Humanities* 23: 56-76.

Hollmann, J.C. and Hykkerud, M.K. 2004.Khoekhoen herder paintings in the Karoo: exciting new finds from South Africa. *International Newsletter on Rock Art* (INORA) 40: 7–15.

Holmgren, K., Lee-Thorp, J.A., Cooper, G.R., Lundblad, K., Partridge, T.C., Scott, L., Sithaldeen, R., Talma, A.S. and Tyson, P.D. 2003. Persistent millennial-scale climatic variability over the past 25,000 years in Southern Africa. *Quaternary Science Reviews* 22(21): 2311-2326.

Holt, S. 2009. The faunal remains from the Makgabeng plateau, Limpopo Province. Unpublished MSc thesis. University of the Witwatersrand.

Hopfl, H.M. 1978. From Savage to Scotsman: conjectural history in the Scottish Enlightenment. *Journal of Bristish Studies* 17(2): 19-40.

Hopkins, R. 2004. Painting, sculpture, sight, and touch. *The British Journal of Aesthetics* 44(2): 149-166.

Huffman, T. 1983. The trance hypothesis and the rock art of Zimbabwe. *South African Archaeological Society Goodwin Series* 4: 49–53.

_____. 2005a. *Mapungubwe: ancient african civilisation on the Limpopo*. Johannesburg: Wits University Press.

_____. 2005b. The stylistic origin of Bambata and the spread of mixed farming in southern Africa. *Southern African Humanities* 17: 57-79.

_____. 2007. *A handbook to the Iron Age: the archaeology of pre-colonial farming societies in southern Africa*. Pietermaritzburg: University of KwaZulu-Natal Press.

Humphreys, A.J.B. 1971. Age determination of the rock art of southern Africa. *South African Journal of Science Special Publication* 2: 86-9.

_____. 2005. De-!Kunging" the Later Stone Age of the central interior of South Africa. *Southern African Field Archaeology* 13 & 14: 36-41.

Hynes, R., and Chase, A. 1982. Plants, sites and domiculture: Aboriginal influence upon plant communities in Cape York Peninsula. *Archaeology in Oceania* 17(1): 38-50.

Ingold, T. 2000. *The perception of the environment: essays of livlihood, dwelling and skill*. London: Routledge.

Inskeep, A. 2003. *Heinrich Vedder's "The Bergdama". An annotated translation of the German original with additional ethnographic material*, Volumes I and II. Köln: Köppe.

Jerardino, A., Fort, J., Isern, N., and Rondelli, B. 2014. Cultural diffusion was the main driving mechanism of the Neolithic transition in southern Africa. *PLoS ONE* 9(12): 1-19.

Johnson, J.P. 1912. *The pre-historic period in South Africa*. London: Longmans, Green and Co.

Johnson, M. 1999. *Archaeological theory: an introduction.* Oxford: Blackwell.

Jolly, P. 1986. A first generation descendant of the Transkei San. *The South African Archaeological Bulletin* 41(143): 6-9.

_____. 1996a. Symbiotic interaction between black farmers and southeastern San: implications for southern African rock art studies, ethnographic analogy and hunter-gatherer cultural identity. *Current Anthropology* 37: 277-305.

_____. 1996b. Interaction between southeastern San and southern Nguni and Sotho communities c. 1400 to c. 1880. *South African Historical Journal* 35(1): 30-61.

_____. 1998. Modelling change in the contact art of the southeastern San, southern Africa. In: Chippindale, C. and Taçon, P.S.C. (eds.) *The archaeology of rock art*: 247-265. Cambridge: Cambridge University Press.

Jones, A. 2005. Lives in fragments? Personhood and the European Neolithic. *Journal of Social Archaeology* 5: 193–224.

Joyce, R.A. 2000. *Gender and power in pre-hispanic Mesoamerica*. Austin (TX): University of Texas Press.

_____. 2005. Archaeology of the Body. *Annual Review of Anthropology* 34:139-158.

Katz, R. 1982. *Boiling energy: community healing among the !Kung*. Cambridge, Massachusetts: Harvard University Press.

Keane, A.H., Quiggin, A.H. and Haddon, A.C. 1920. *Man: past and present*. Cambridge: Cambridge University Press.

Kent, S. 1992. The current forager controversy: real versus ideal views of hunter-gatherers. *Man* 27(1): 45-70.

Kinahan, J. 1989. Pastoral nomads of the Central Namib Desert. Unpublished PhD thesis, University of the Witwatersrand.

Kirby, P.R. (ed.). 1940. *The diary of Dr. Andrew Smith, director of the "Expedition for exploring Central Africa":1834-1836,* Vol II. Cape Town: Van Riebeeck Society.

Klein, R.G. 1984. Later Stone Age faunal samples from Heuningneskrans Shelter (Transvaal) and Leopard's Hill Cave (Zambia). *The South African Archaeological Bulletin* 39(140): 109-116.

Klein, R.G. 1986. The prehistory of Stone Age herders in the Cape Province of South Africa. *South African Archaeological Society Goodwin Series* 5: 5-12.

Knapp, A.B. and van Dommelen, P. 2008. Past practices: rethinking individuals and agents in archaeology. *Cambridge Archaeological Journal* 18(1): 15-34.

Kolb, Peter [Peter Kolbe, Peter Kolben]. 1968 [1731]. *The present state of the Cape of Good Hope*, Vol. I (trans. Guido Medley). New York and London: Johnson Reprint Company.

Kolbe, P. 1731. *Present state of the Cape of Good Hope: or, a particular account of the several nations of the Hottentots: their religion, government, laws, customs, ceremonies, and opinions; their art of war, professions, language, genius, etc. together with a short account of the Dutch settlement at the Cape*. London: W. Innys.

Kuman, K. 2007. The earlier Stone Age in South Africa: site context and the influence of cave studies. In: Pickering, P.T., Schick, K. and Toth, N. (eds) *Breathing life into fossils: taphonomic studies in honor of C.K. (Bob) Brain. Stone Age Institute Publication Series Number 2*: 181-192. Indiana: Stone Age Institute Press.

Kuman, K., Le Baron, J.C. and Gibbon, R.J. 2005. Earlier stone age archaeology of the Vhembe-Dongola National Park (South Africa) and vicinity. *Quaternary International* 129: 23-32.

Lahelma, A. 2010. Hearing and touching rock art: Finnish rock paintings and the non-visual. In: Goldhahn, J., Fuglestvedt, I. and Jones, A.M. (eds) *Changing pictures: rock art traditions and visions in the northernmost Europe*: 48-59. Oxford: Oxbow Books.

Lander, F.E. 2014. An investigation into the painted sheep imagery of the northern uKhahlambaDrakensberg, southern Africa. Unpublished MSc thesis, University of the Witwatersrand.

Laue, G.B. 2000. Taking a stance: posture and meaning in the rock art of the Waterberg, Northern Province, South Africa. Unpublished MSc thesis, University of the Witwatersrand, Johannesburg.

Law, M. and Collins, A. 2016. *Getting to know ArcGIS Pro*. Redlands, CA: ESRI Press.

Layton, R. 1992. *Australian rock art: a new synthesis*. Cambridge: Cambridge University Press.

Lee, R.B. 1967. Trance cure of the !Kung Bushmen. *Natural History* 78(10): 14-22, 60-61.

_____. 1979. *The !Kung San men, women, and work in a foraging society*. Cambridge: Cambridge University Press.

_____. 2002. *The Dobe Ju/'hoansi* (Third Edition). Belmont: Wadsworth Publishing.

Lee, R.B. and Guenther, M. 1991. Oxen or onions? The search for trade (and truth) in the Kalahari. *Current Anthropology* 32(5): 592-601.

Lee, G. and Hyder, W.D. 1991. Prehistoric rock art as indicator of cultural interaction and tribal boundaries in southcentral California. *Journal of California and Great Basin Anthropology* 13(1): 15-28.

Leggatt, H. and Rust, R. 2004. An unusual rock painting of a ship found in the Attakwaskloof. *The Digging Stick* 21(2): 5-8.

Landau, S. and Everitt, B.S. 2004. *A handbook of statistical analyses using SPSS*. London: Chapman & Hall/CRC Press LLC.

Laporte, J. 1798. *El viagero universal o noticia del mundo antiguo y nuevo. Obra recopilada de los mejores viajeros por D.P.E.P*. Madrid: Imprenta de Villalpando.

Lenssen-Erz, T. 1998. The Third Gender: human. Gender-related patterns of activity in the rock paintings of the Brandberg, Namibia. In: Banks, A. Heese, H. and C. Loff (eds) *The proceedings of the Khoisan cultures & cultural heritage conference, Cape Town*: 146-152. Cape Town: Infosource.

Le Quellec, J-L. 2008. '6. Rock art research in Southern Africa, 2000-2004'(last accessed 5 March 2010): http://rupestre.onrev.com/page93/assets/JLLQ_2008-f.pdf

Le Quellec, J-L., Duquesnoy, F. and Defrasne, C. 2015. Digital image enhancement with *DStretch*®: Is complexityalways necessary for efficiency? *Digital Applications in Archaeology and Cultural Heritage* 2(2-3): 55-67.

Leroi-Gourhan, A. 1968. *The art of prehistoric man in western Europe*. London: Thames and Hudson.

Le Roux, W. and White, A. 2004. *Voices of the San: living in southern Africa today*. Cape Town: Kwela Books.

Lesure, R.G. 2005. Linking theory and evidence in an archaeology of human agency: iconography, style, and theories of embodiment. *Journal of Archaeological Method and Theory* 12(3): 237-255.

Lewis-Williams, J.D. 1972. The syntax and function of the Giant's Castle rock paintings. *South African Archaeological Bulletin* 27: 49-65.

_____. 1974. Superpositioning in a sample of rock paintings from the Barkly East District. *South African Archaeological Bulletin* 29: 93-103.

_____. 1981. *Believing and seeing: symbolic meanings in southern San rock painting*. London: Academic Press.

_____. 1984. The empiricist impasse in South African rock art studies. *South African Archaeological Bulletin* 39(139): 58-66.

_____. 1986. Beyond style and portrait: a comparison of Tanzanian and southern African rock art. In: Vossen, R. and Keuthmann, K. (eds) *Contemporary studies on Khoisan*: 93-139. Hamburg: Helmut Buske Verlag.

_____. 1987. Paintings of power: ethnography and rock art in southern Africa. In: Biesele, M. and Gordon, R. (eds) *Past and future of !Kung ethnography*: 231-273. Hamburg: Buske Verlag.

_____. 1990a. Review: documentation, analysis and interpretation: dilemmas in rock art research. *The South African Archaeological Bulletin* 45(152): 126-136.

_____. 1990b. Discovering southern African rock art. Cape Town: David Philip.

_____. 1990c.On Palaeolithic art and the neuropsychological model. *Current Anthropology* 31: 407-408.

_____. 1991. Wrestling with analogy: a methodological dilemma in the Upper Palaeolithic art research. *Proceedings of the Prehistoric Society* 57: 149-162.

_____. 1992. Ethnographic evidence relating to 'trance' and 'shamans' among northern and southern Bushmen. *South African Archaeological Bulletin* 47: 56-60.

_____. 1995. Modelling the production and consumption of rock art. *South African Archaeological Bulletin* 50: 143–154.

_____. 1998. Quanto? The issue of 'many meanings' in southern African San rock art research. *South African Archaeological Bulletin* 53: 86–97.

_____. 2001. Brainstorming images: neuropsychology and rock art research. In: Whitley, D.S. (ed) *Handbook of Rock Art Research*: 332-57. New York: Alta Mira Press.

_____. 2002. *A cosmos in stone: interpreting religion and society through rock art archaeology of religion*. Walnut Creek, California: AltaMira Press.

_____. 2008. Religion and archaeology: an analytical, materialist account. In: Whitley, D.S. and Hays-Gilpin, K. (eds) *Belief in the past – theoretical approaches to the archaeology of religion*: 23-42. Walnut Creek, CA: Left Coast Press.

_____. 2015. *Myth and meaning: San-Bushman folklore in global context.* Cape Town: UCT Press.

Lewis-Williams, J.D. and Biesele, M. 1978. Eland hunting rituals among Northern and Southern San groups: striking similarities. *Africa* 48: 117-134.

Lewis-Williams, J.D. and Clottes, J. 1998. Shamanism and Upper Palaeolithic art: a response to Bahn. *Rock Art Research* 15(1): 46-50.

Lewis-Williams, J.D. and Dowson, T.A. 1988. The signs of all times: entoptic phenomena in Upper Palaeolithic art. *Current Anthropology* 29(2): 201–245.

_____. 1989. *Images of power: understanding bushman rock art.* Johannesburg: Southern Book Publishers.

_____. 1990. Through the veil: San rock paintings and the rock face. *South African Archaeological Bulletin* 45(151): 5-16.

_____. 1994. Aspects of rock art research. In: Dowson, T.A. and Lewis-Williams, J.D. (eds) *Contested images: diversity in southern African rock art research*: 201-222. Johannesburg: Witwatersrand University Press.

Lewis-Williams, J.D. and Loubser, 1986. Deceptive appearances: a critique of southern African rock art studies. *Advances in World Archaeology* 5: 253-89.

Lewis-Williams, J.D. and Pearce, D.G. 2004a. *San Spirituality: roots, expression and social consequences*. Johannesburg: Double Storey Books.

_____. 2004b. Southern African San rock painting as social intervention: a study of rain-control images. *African Archaeological Review* 21(4): 199-228.

_____. 2009. Constructing spiritual panoramas: order and chaos in southern African San rock art panels. *Southern African Humanities* 21: 41-61.

Lombard, M., Wadley, L., Deacon, J., Wurz, S., Parsons, I., Mohapi, M., Swart, J. and Mitchell, P. 2012. South African and Lesotho Stone Age sequence updated. *South African Archaeological Bulletin* 67(195): 123-144.

Lorblanchet, M. and Bahn, P.G. (eds). *Rock Art Studies: The Post-Stylistic era, or where do we go from here?*: 27-36. Oxford: Oxbow. Monograph 35.

Loubser, J.H.N. 1993. A guide to the rock paintings of Tandjesberg. *Navorsinge van die Nasionale Museum, Bloemfontein* 9(11): 345-384.

_____. 1997. The use of the Harris diagrams in recording, conserving and interpreting rock paintings. *International Newsletter on Rock Art* 18: 14-21.

Low, A.B. and Rebelo, A.G. 1996. *Vegetation of South Africa, Lesotho & Swaziland: a companion to the vegetation map of South Africa, Lesotho & Swaziland*. Pretoria: Department of Environmental Affairs and Tourism.

Low, C. 2007a. Different histories of buchu: Euro-American appropriation of San and Khoekhoe knowledge of buchu plants. *Environment and History* 13(3): 333–61.

_____. 2007b. Khoisan wind: hunting and healing. *Journal of the Royal Anthropological Institute* 13: 571-590.

_____. 2008. *Khoisan medicine in history and practice*. Köln: Rüdiger Köppe Verlag.

Maggs, T. M. O'C. 1967. A quantitative analysis of the rock art from a sample area in the Western Cape. *South African Journal of Science* 63: 100-104.

Malan, B.D. 1959. A rock gong and slide in the Parys District, Orange Free State. *South African Journal of Science* 55: 29.

Mallen, L. 2005. Linking sex, species and a supernatural snake at Lab X rock art site. *South African Archaeological Society Goodwin Series* 9: 3-10.

Mallen, L. 2008. Rock art and identity in the north Eastern Cape Province. Unpublished Masters Thesis, University of Witwatersrand, Johannesburg.

Manhire, A.H. 1981. Rock art of the Sandveld. Unpublished BSc (Hons) thesis: University of Cape Town, Cape Town.

_____. 1998. The role of handprints in the rock art of the south-western Cape. *South African Archaeological Bulletin* 53: 98-108.

Manhire, A.H., Parkington, J. E., Mazel, A. D. and Maggs, T. M. O'C. 1986. Cattle, sheep and horses: a review of domestic animals in the art of Southern Africa. *South African Archaeological Society Goodwin Series* 5: 22-30.

Manhire, A.H., Parkington, J. E. and van Rijssen, W. J. 1983. A distributional approach to the interpretation of rock art in the southwestern Cape. *South African Archaeological Society Goodwin Series* 4: 29-33.

Marshall, L.J. 1962. !Kung Bushman religious beliefs. *Africa* 32(3): 221-52.

_____. *The !Kung of Nyae Nyae*. Cambridge, MA: Harvard University Press.

_____. 1999. *Nyae Nyae !Kung beliefs and rites*. Peabody Museum Monographs 8. Cambridge, MA: Peabody Museum.

Mason, R. 1957. The prehistory of the Transvaal: a record of human activity. Unpublished PhD thesis, University of Cape Town, Cape Town.

Mason, R. 1962. *Prehistory of the Transvaal: a record of human activity*. Johannesburg: Wits University Press.

Maynard, L. 1977. Classification and terminology in Australian rock art. In: Ucko, P.J. (ed) *Form in Indigenous Art*: 387-402. Canberra: Australian Institute of Aboriginal Studies.

Mazel, A.D. 1992. Collingham Shelter: The excavation of late Holocene deposits, Natal, South Africa. *Natal Museum Journal of Humanities* 4: 1-52.

_____.1994. Dating the Collingham Shelter rock paintings. *Pictogram* 6: 33-5.

_____.1996. Maqonqo Shelter: The excavation of Holocene deposits in the eastern Biggarsberg, Thukela Basin, South Africa. *Natal Museum Journal of Humanities* 8: 1-39.

_____.2009a. Images in time: advances in the dating of Drakensberg rock art since the 1970s. In: Mitchell, P. and Smith, B. (eds) *The Eland's People: new perspectives on the rock art of the Maloti/Drakensberg bushmen. Essays in memory of Pat Vinnicombe*: 81-96. Johannesburg: Wits University Press.

_____. 2009b. Unsettled times: shaded polychrome paintings and hunter-gatherer history in the southeastern mountains of southern Africa. *Southern African Humanities* 21: 85–115.

_____. 2013. Paint and earth: constructing hunter-gatherer history in the uKhahlamba Drakensberg, South Africa. *Time and Mind: The Journal of Archaeology, Consciousness and Culture* 6(1): 49-58.

Mazel, A.D. and Watchman, A.L. 1997. Accelerator radiocarbon dating of Natal Drakensberg paintings: results and implications. *Antiquity* 71: 445–449.

_____. 2003. The dating of rock paintings in the Natal Drakensberg and the Biggarsberg, KwaZulu-Natal, South Africa. *Southern African Humanities* 15: 59–73.

McGranaghan, M. 2017. Ethnographic analogy in archaeology: methodological insights from southern Africa. *Oxford Research Encyclopedia of African History* (last accessed 12 February 2019): http://oxfordre.com/africanhistory/view/10.1093/acrefore/9780190277734.001.0001/acrefore-9780190277734-e-213

Mehta, C. 2007. Name that color (last accessed 11 June 2013): http://chir.ag/projects/name-that-color/#D6D6D6

Meister, C. 2003. Photogrammetric approaches to the recording of handprints. Unpublished MSc thesis, University of Cape Town, Cape Town.

Mesa, N. *et al*. 2000. Autosomal, mtDNA, and Y-chromosome diversity in Amerinds: pre- and post-Columbian patterns of gene flow in South America. *American Journal of Human Genetics* 67(5): 1277-1286.

Meskell, L. 1999. Archaeologies of life and death. *American Journal of Archaeology* 103(2): 181-199.

Mguni, S. 2002. Continuity and change in San belief and ritual: some aspects of the enigmatic 'formling' and tree motifs from Matopo Hills rock art, Zimbabwe. Masters Thesis, University of Witwatersrand, Johannesburg.

_____. 2005. A new iconographic understanding of formlings, a pervasive motif in Zimbabwean rock art. *South African Arcaheological Society Goodwin Series* 9: 34-44.

_____. 2015. *Termites of the Gods*: *San cosmology in southern African rock art*. Johannesburg: Wits University Press.

Miller, S. 1993. Sentinel and Nottingham. *Die Rooi Olifant* 4 & 5: 6-8.

Mitchell, A. 2005. *The ESRI Guide to GIS Analysis* (Vol. 2). Redlands, CA: ESRI Press.

Mitchell, P.J. 2002. *The archaeology of southern Africa*. Cambridge: Cambridge University Press.

_____. 2005. Why hunter-gatherer archaeology matters: a personal perspective on renaissance and renewal in southern African Later Stone Age research. *South African Archaeological Bulletin* 60: 64-71.

_____. 2010. Genetics and southern African prehistory:an archaeological view. *Journal of Anthropological Sciences* 88: 73-92.

Modikwa, B. 2008. Lithic technology and the introduction of pottery in southern Africa. MSc thesis. University of the Witwatersrand, Johannesburg.

Moodley, S. 2008. 'Koma': The crocodile motif in the rock art of the northern Sotho. *South African Archaeological Bulletin* 63(188): 116-124.

Morris, A.G. 2014. Going full circle on Khoekhoe origins. *The Digging Stick* 31(1): 1-4.

Morris, D. 2002. Driekopseiland and 'the rain's magic power': history and landscape in a new interpretation of a Northern Cape rock engraving site. Masters thesis, University of Western Cape, Cape Town.

_____. 2004. Comment on Smith, B.W. and Ouzman, S. 2004. Taking stock: identifying Khoekhoen herder rock art in southern Africa. *Current Anthropology* 45(4): 499–526.

Morwood, M.J. 1980. Time, space and prehistoric art: a principle components approach. *Archaeology and Physical Anthropology in Oceania* 15: 98-108.

Muigai, A.W.T. and Hanotte, O. 2013. The origin of African sheep: archaeological and genetic perspectives. *African Archaeological Review* 30: 39-50.

Namono, C. 2004. *Dikgatwane Tša Basadi: a study of the link between girls' initiation and rock art in the Makgabeng Plateau, Limpopo Province, South Africa.* Johannesburg: University of the Witwatersrand press.

_____. 2010. Surrogate surfaces: a contextual interpretative approach to the rock art of Uganda. Unpublished PhD thesis. University of Witwatersran, Johannesburg.

Namono, C. & Eastwood, E.B. 2005 Art, authorship and female issues in a Northern Sotho rock painting site. *South African Archaeological Society Goodwin Series: further approaches to southern African rock art*. 9: 77-85.

Olivier, M. 2011. Geometric rock art along the Luangwa Valley escarpment, Zambia, and its relationship with the Later Stone Age in southern and central Africa. Unpublished PhD Thesis. Keble College, University of Oxford.

Orpen, J.M. 1874. A glimpse into the mythology of the Maluti bushmen. *The Cape Monthly Magazine* 9: 1–11

Orton, J., Mitchell, P., Klein, R., Steele, T., Horsburgh, A.K. 2013. An early date for cattle from Namaqualand, South Africa: implications for the origins of herding in southern Africa. *Antiquity* 87: 108-120.

Ouzman, S. 1996. Thaba Sione: place of rhinoceroses and rock art. *African Studies* 55(1): 31-59.

_____. 1997a. Between margin and centre: the archaeology of southern African bored stones. In: Wadley, L. (ed.) *Our gendered past: archaeological studies of gender in southern Africa*: 71-106. Johannesburg: Witwatersrand University Press.

_____. 1997b. Hidden in the common gaze: collective and idiosyncratic rock paintings at Rose Cottage Cave, South Africa. *Navorsinge van die Nasionale Museum, Bloemfontein* 13(6): 225-255.

_____. 2001. Seeing is deceiving: rock art and the non-visual. *World Archaeology* 33(2): 237–256.

_____. 2005. The magical arts of a raider nation: central South Africa's Korana rock art. *South African Archaeological Society Goodwin Series* 9: 101-113.

Pager, H. 1971. *Ndedema. A documentation of the rock paintings of the Ndedema Gorge.* Graz: Akademische Druck Verlagsanstalt.

_____. 1973a. Shaded rock-paintings in the Republic of South Africa, Lesotho, Rhodesia and Botswana. *The South African Archaeological Bulletin* 28(109–110): 39–46.

_____. 1973b. Rock paintings in southern Africa showing bees and honey gathering. *Bee World* 54: 61-68.

_____. 1975. Rock paintings depicting fish traps in the Limpopo Valley. *South African Journal of Science* 71: 119-121.

_____. 1989. *The rock paintings of the Upper Brandberg, Part I: Amis Gorge*. Cologne: Heinrich Barth Institut.

Pargeter, J. 2014. The Later Stone Age is not San prehistory. *The Digging Stick* 31: 1-4.

Pargeter, J. and Duke, H. 2015. Redefining boundaries at the 2015 paleoanthropology society and society for American archaeology (SAA) meeting in San Francisco. *Evolutionary anthropology: issues, news, and reviews* 24(3):104-105.

Parkington, J. 1980. Time and place: some observations on spatial and temporal patterning in the Later Stone Age sequence in southern Africa. *South African Archaeological Bulletin* 35: 75–83.

_____. 1984a. Soaqua and Bushmen: hunters and robbers. In: Schrire, C. (ed.) *Past and present in hunter-gatherer studies*: 151-174. New York: Academic Press.

_____. 1984b. Changing views of the Later Stone Age of South Africa. *Advances in World Archaeology* 3: 89-142.

_____. 1996. What is an eland? N!ao and the politics of age and sex in the paintings of the Western Cape. In Skotnes, P. (ed.) *Miscast: negotiating the presence of the bushmen*: 281-290. Cape Town: University of Cape Town Press.

Parsons, I. 2015. Is niche construction theory relevant to the proposed adoption of domesticates by hunter-gatherers in southern Africa? *African Archaeological Review* 32: 35-47.

Pearce, D. 2001. Harris matrices in southern African rock art: towards a chronology of the San rock art of the north-eastern Cape. Unpublished BSc (Hons) thesis. University of the Witwatersrand, Johannesburg.

_____. 2006. A comment on Swart's rock art sequences and use of the Harris Matrix in the Drakensberg. *South African Humanities* 18(2): 173-188.

_____. 2014. Personal correspondence with researcher on 4 August, University of Witwatersrand, Johannesburg

Phillipson, D. 1969. The prehistoric sequence at Nakapula rockshelter, Zambia. *Proceedings of the Prehistoric Society*: 172–202.

_____. 1989. The first South African pastoralists and the Early Iron Age. *Nsi* 6: 127-34.

Pickrell, J.K. *et al*. 2012. The genetic prehistory of southern Africa. *Nat. Commun* 3(1143): 1-6.

Pickrell, J.K., Patterson, N., Loh, P., Lipson, M., Berger, B. & Stoneking, M. 2014. Ancient west Eurasian ancestry in southern and eastern Africa. *PNAS* 111(7): 2632-2637.

Pinto, L.C. 2012. A site-specific approach to interpreting rock art and interaction in the southern region of the Eastern Cape Province, South Africa: the case of Xoro Gwai rock shelter. Unpublished MSc Thesis. University of Witwatersrand, Johannesburg.

Pleurdeau, D., Imalwa, E., Détroit, F., Lesur, J., Veldman, A., Bahain, J-J., Marais, E. 2012. Of sheep and men: earliest direct evidence of caprine domestication in southern Africa at Leopard Cave (Erongo, Namibia). *PLoS ONE* 7(7): 1-10.

Pollarolo, L. and Kuman, K. 2009. Excavation at Kudu Koppie site, Limpopo Province, South Africa. *South African Archaeological Bulletin* 64(189): 69-74.

Pollarolo, L., Wilkins, J., Kuman, K. and Galletti, L. 2010. Site formation at Kudu Koppie: A late Earlier and Middle Stone Age site in northern Limpopo Province, South Africa. *Quaternary International* 216: 151-161.

Porr, M. and Bell, H.R. 2012. Rock-art, animism and two-way thinking: towards a complementary epistemology in the understanding of material culture and rock-art of hunting and gathering people. *Journal of Archaeological Method & Theory* 19: 161-205.

Porraz, G., Val, A., Dayet, L., De La Peña, P., Douze, K., Miller, C.E., Murungi, M.L. Tribolo, C., Schmid, V.C. and Sievers, C. 2015. Bushman Rock Shelter (Limpopo, South Africa): a perspective from the edge of the Highveld. *The South African Archaeological Bulletin* 70(202): 166-179.

Power, C. 2004. Women in prehistoric art. In: Berghaus, G. (ed.) *New perspectives on prehistoric art*: 75-103. Westport, Connecticut: Praeger Publishers Inc.

Power, C. and Watts, I. 1997. The woman with the zebra's penis: gender, mutability and performance. *Journal of the Royal Anthropological Institute* 3: 537–60.

Pratt, M.L. 1991. Arts of the contact zone. *Profession*: 33-40.

_____. 1992. *Imperial eyes: travel writing and transculturation*. London: Routledge.

Rains, M. 2000. 'Review of ArchEd and Stratigraph - excavation recording and analysis software[Software]'. *Internet Archaeology* 8 (last accessed 8 August 2017): http://dx.doi.org/10.11141/ia.8.9

Rainsbury, M.P. 2009. River and coast: regionality in North Kimberley rock art. Unpublished PhD thesis, Durham University, Durham.

Ramsey, B.C. 2009. Bayesian analysis of radiocarbon dates. *Radiocarbon* 51(1): 337–60.

Ramsey, C.B. 2017. OxCal 4.3 (last accessed 5 December 2017): https://c14.arch.ox.ac.uk/oxcal/OxCal.html.

Raper, P.E. and Boucher, M. 1988. *Robert Jacob Gordon - Cape Travels, 1777 to 1786*. Johannesburg: Brenthurst Press.

Redding, R.W. 1988. A general explanation of subsistence change: from hunting and gathering to food production. *Journal of Anthropological Archaeology* 7: 56-97.

Reid, A., Sadr, K. and Hanson-James, N. 1998. Herding traditions. In Lane, P., Reid, A. and Segobye, A. (eds) *Ditswa Mmung: The archaeology of Botswana*: 81-100. Gaborone: Pula Press and the Botswana Society.

Renfrew, C. and Bahn, P.G. 2004. *Archaeology essentials: theories, methods, and practice* (4th Edition). London: Thames & Hudson.

Roach, M.E. and Eicher, J.B. 1979. The language of personal adornment. In: Cordwell, J.M. and Schwartz, R.A. (eds) *The fabrics of culture: the anthropology of clothing and adornment*: 7-22. New York: Mouton Publishers.

Robbins, L.H., Campbell, A.C., Murphy, M.L., Brook, G.A., Srivastava, P. and Badenhorst, S. 2005. The advent of herding in southern Africa: early AMS dates on domestic livestock from the Kalahari Desert. *Current Anthropology* 46: 671–7.

Roberts, Rev. N. 1916a. The Bagananoa or Malaboch: notes on their early history, customs and creed. *South African Journal of Science* 12: 241-256.

_____. 1916b. Rock paintings of the Northern Transvaal. *South African Journal of Science* 13: 568-73.

Rudner, J. 1975. Rock art in South West Africa and the neighbouring areas of Angola, Western Botswana and the north-west Cape. *Rock Art Studies in South Africa* (occasional paper): 40-55. Witwatersrand Centre: South African Archaeological Society.

Rudner, I. 1982. Khoisan pigments and paints and their relationship to rock paintings. *Annals of the South African Museum* 87: 1-281.

Rudner, I. and Rudner, J. 1959. Who were the artists? archaeological notes from South West Africa. *South African Archaeological Bulletin* 14(55): 106-108.

Ruiz, J.F. and Pereira, J. 2014. The colours of rock art. Analysis of colour recording and communication systems in rock art research. *Journal of Archaeological Science* 50: 338-349

Russell, T. 2000. The application of the Harris Matrix to San rock art at Main Caves North, KwaZulu-Natal. *South African Archaeological Bulletin* 55: 60-70.

Russell, T. and Lander, F. 2015. 'The bees are our sheep': the role of honey and fat in the transition to livestock keeping during the last two thousand years in southernmost Africa. *Azania: Archaeological Research in Africa* 50(3): 318-342.

Sackett, J.R. 1977. The meaning of style in archaeology: a general model. *American Antiquity* 42(3): 369-380.

_____. 1982. Approaches to style in lithic archaeology. *Journal of Anthropological Archaeology* 1: 59-112.

Sadr, K. 1997. Kalahari archaeology and the bushman debate. *Current Anthropology* 38(1): 104-112.

_____. 1998. The first herders at the Cape of Good Hope. *African Archaeological Review* 15(2): 101-132.

_____. 2003. The Neolithic of southern Africa. *Journal of African History* 44: 195-209.

_____. 2004. Feasting on Kasteelberg? Early herders on the west coast of South Africa. *Before Farming* 3: 1-17.

_____. 2007. Mphekwane: test excavation of site MB5 (Mont Blanc). Report to the South African Heritage Resource Agency concerning excavation permit No. 80/04/01/002/51.

_____. 2008a. Invisible herders? The archaeology of Khoekhoen pastoralists. *Southern African humanities* 20: 179-203.

_____. 2008b. An ageless view of first millennium AD southern African ceramics. *Journal of African Archaeology* 6(1): 103–29.

_____. 2013a. A short history of early herding in southern Africa. In: Boillig, M., Schnegg, M. and Wotzka, H-P. (eds) *Pastoralism in Africa: past, present and futures*: 171-197. New York & Oxford: Berghahn Books.

_____. 2013b. The archaeology of herding in southernmost Africa. In: Mitchell, P. and Lane, P. (eds) *Oxford Handbook of African Archaeology*: 645-655. Oxford: Oxford University Press.

_____. 2014. *Radiocarbon dates, stone tools and the origin of herding on the West Coast of South Africa* (Vol. 6). Frankfurt: Africa Magna Verlag.

_____. 2015. Livestock first reached southern Africa in two separate events. *PLoS ONE* 10(8): 1-22.

Sadr, K. and Plug, I. 2001. Faunal remains in the transition from hunting to herding in southeastern Botswana. *The South African Archaeological Bulletin* 56(173/174): 76-82.

Sadr, K. and Sampson, C.G. 2006. Through thick and thin: early pottery in southern Africa. *Journal of African Archaeology* 4(2): 235-252.

Sadr, K., Smith, A., Plug, I., Orton, J.and Mütti, B. 2003. Herders and foragers on Kasteelberg: interim report of excavations 1999-2002. *The South African Archaeological Bulletin* 58(177): 27-32.

Sampson, C.G. 1972. *The Stone Age industries of the Orange River Scheme and South Africa*. Bloemfontein: National Museum of Bloemfontein.

Sampson, C.G. and Sampson, M. 1967. *Riversmead shelter: excavations and analysis*. National Museum Memoir 3.

Sanz, I.D. 2008. From the form to the artists: changing identities in Levantine rock art (Spain). In: Sanz, I., Fiore, D., May, S.K. (eds) *Archaeologies of art: time, place and identity*: 99-129. Walnut Creek, CA: Left Coast Press.

Sanz, I.D. and Fiore, D. 2014. Style: its role in the archaeology of art. In: Smith, C. (ed.) *Encyclopedia of Global Archaeology*: 7104-7111. New York: Springer-Verlag.

Schapera, I. 1926. A preliminary consideration of the relationship between the Hottentots and the Bushmen. *South African Journal of Science* 23: 833-866.

_____. 1930. *The Khoisan peoples of South Africa*: *Bushmen and Hottentots*. London: George Routledge & Sons, Ltd.

Schapera, I. and Farrington, B. (eds). 1933. *The early Cape Hottentots described in the writings of Olfert Dapper (1668), Willem ten Rhyne (1686) en Johannes Gulielmus de Grevenbroek (1695)*. Cape Town: Van Riebeeck Society.

Schapiro, M. 1952. Style. In: Kroeber, A.L. (ed.) *Anthropology Today*: 287-312. Chicago: University of Chicago.

Schilder, P. 1935. *The image and appearance of the human body*. Oxford: Kegan Paul.

Schlebusch, C.M. 2010. Genetic variation in Khoisan-speaking populations from southern Africa. Unpublished PhD thesis. University of Witwatersrand, Johannesburg.

Schlebusch, C.M. *et al*. 2012. Genomic variation in seven Khoe-San groups reveals adaptation and complex African history. *Science* 338(6105): 374-9.

Schlömann, H. 1896. Felszeichnungen der Buschmänner bei Pusompe in NordTransvaal, einer Cult-Stätte der jetzt dort ansässigen Massele. *Zeitschrift für Ethnologie* 28: 220-221.

Schoonraad, M. 1960. Preliminary survey of the rock art of the Limpopo River valley. *South African Archaeological Bulletin* 15:10-13.

Schrire, C. 1980. An inquiry into the evolutionary status and apparent identity of San hunter-gatherers. *Human ecology* 8: 9-32.

Schrire, C. (ed.). 1984. *Past and present in hunter-gatherer studies*. Orlando: Academic Press.

Scott, L. 1982. A Late Quaternary pollen record from the Transvaal Bushveld, South Africa. *Quaternary Research* 17: 339-370.

Sealy, J.C. and Pfeiffer. S. 2000. Diet, body size, and landscape use among Holocene people in the southern Cape, South Africa. *Current Anthropology* 41(4): 642-655.

Sealy J.C. and Yates, R. 1996. Direct radiocarbon dating of early sheep bones: two further results. *The South African Archaeological Bulletin* 51(164): 109-110.

Selous, F.C. 1908. *African nature notes and reminiscences*. London: Macmillian and Co, Ltd.

Shott, M. 1992. On recent trends in the anthropology of foragers: Kalahari revisionism and its archaeological implications. *Man* 27(4): 843-871.

Sieveking, A. 1993. The use of stylistic analysis within the context of West European Upper Palaeolithic art. In: Lorblanchet, M. and Bahn, P.G. (eds) *Rock art studies: the post-stylistic era, or where do we go from here?*: 27-36. Oxford: Oxbow.

Silberbauer, G.B. 1981. *Hunter and habitat in the Central Kalahari Desert*. Cambridge: Cambridge University Press.

Skotnes, P. (ed). 1996. *Miscast: negotiating the presence of the Bushmen*. Cape Town: Cape Town University Press.

_____. 2008. *Unconquerable spirit: George Stow's history paintings of the San*. Johannesburg: Jacana Press.

Smith, A.B. 1990. On becoming herders: Khoikhoi and San ethnicity in southern Africa. *African Studies* 49(2): 51-73.

_____. 1992. *Pastoralism in Africa: origins and development ecology*. London: Hurst & Co.

_____. 1996. The Kalahari Bushman Debate: implications for an archaeology in southern Africa. *South African Historical Journal* 35: 1-15.

_____. 2000. The origins of the domesticated animals of southern Africa. In: Blench, R.M. and MacDonald, K.C. (eds) *The origins of development of African livestock: archaeology, genetics, linguistics and ethnography*: 222-236. London: University College London Press.

_____. 2005. *African herders: emergence of pastoral traditions.* Walnut Creek, CA: Alta Mira Press.

_____. 2006a. Excavations at Kasteelberg and the origins of the Khoekhoen in the Western Cape, South Africa. *Cambridge Monograph in African Archaeology 66. BAR International series 1537*. Oxford: Archaeopress.

_____. 2006b. Kasteelberg: a pastoralist sealing camp in Western Cape Province, South Africa. *Journal of Island & Coastal Archaeology* 1: 109–122.

Smith, A.B. and Pfeiffer, R.H. 1993. *The Khoikhoi at the Cape of Good Hope*. Cape Town: South African Library.

Smith, A.B., Sadr, K., Gribble, J. and Yates, R. 1991. Excavations in the south-western Cape, South Africa, and the archaeological identity of prehistoric hunter-gatherers within the last 2000 years. *The South African Archaeological Bulletin* 46: 71-91.

Smith, B.W. 1995. Rock art in south-Central Africa. A study based on the pictographs of Dedza District Malawi and Kasama District Zambia. Unpublished PhD thesis. University of Cambridge.

_____. 1997. *Zambia's ancient rock art: the paintings of Kasama*. Livingstone: National Heritage Conservation Commission of Zambia.

_____. 1998. The tale of the chameleon and the platypus: limited and likely choices in making pictures. In: Chippindale, C. and Taçon, P.S.C. (eds) *The archaeology of rock-art*: 212-228. Cambridge: Cambridge University Press.

_____. 2006. Reading rock art and writing genetic history: regionalism, ethnicity and the rock art of southern Africa. In: Soodyal, H. (ed) *The prehistory of Africa*: 76-96; 176-181. Cape Town: Jonathan Ball.

Smith, B.W. and Ouzman, S. 2004. Taking stock: identifying Khoekhoen herder rock art in southern Africa. *Current Anthropology* 45(4): 499–526.

Smith, B. W. and Van Schalkwyk, J. A. 2002. The white camel of the Makgabeng. *The Journal of African History* 43(2): 235-254.

Smith, C. 1994. Situating style. An ethnoarchaeological study of social and material context in an Australian Aboriginal artistic system. Unpublished PhD dissertation, University of New England.

_____. 2008. Panache and protocol in Australian Aboriginal art. In: Sanz, I.D., Fiore, D. and May, S.K. (eds) *Archaeologies of art: time, place and identity*: 215-241. Walnut Creek, USA: Left Coast Press.

Smits, L.G.A. 1983. Rock paintings in Lesotho: site characteristics. *South African Archaeological Bulletin* 38(138): 62-76.

_____.1992. Rock painting sites near the Southern Perimetre Road in southeastern Lesotho. In: Lorblanchet, M. (ed) *Rock art in the Old World: papers presented in symposium A of the AURA Congress, Darwin (Australia) 1988*: 61-96. New Deli: Indira Gandhi National Centre for the Arts.

_____. 1993. Rock paintings in Lesotho: Form analysis of subject matter in Ha Baroana. In: Lorblanchet, M. and Bahn, P.G. (eds) *Rock art studies: the post-stylistic era, or where do we go from here?*:127–42. Oxford: Oxbow.

Solomon, A.C. 1992. Gender, representation, and power in San ethnography and rock art. *Journal of Anthropological Archaeology* 11: 291-329.

_____. 1998. Ethnography and method in southern African rock-art research. In: Chippindale, C. and Taçon, P.S.C. (eds.) *The archaeology of rock-art*: 268-282. Cambridge: Cambridge University Press.

_____. 1999. Meanings, models and minds: A reply to Lewis-Williams. *South African Archaeological Bulletin* 54: 51-60.

_____. 2011. Towards visual histories: style, interdisciplinarity and southern African rock art research. *South African Archaeological Bulletin* 66(193): 51-59.

Solway, J.S. & Lee, R.B. 1990. Foragers, genuine or spurious? Situating the Kalahari San in History. *Current Anthropology* 31:109-146.

Spriggs, M. 2006. Chapter 6. The Lapita culture and Austronesian prehistory in Oceania. In: Bellwod, P., Fox, J.J. and Darrell, T. (eds) *The Austronesians: historical and comparative perspective*. Canberra: ANU E Press.

Stevenson, J. 1995. Man-the-shaman, is it the whole story? A feminist perspective on the San rock art of southern Africa. Unpublished MA thesis, University of the Witwatersrand, Johannesburg.

Steyn. A.C. 1995. Stylverskeidenheid in rotsskilderinge van die laeveld en platorand: Geloftefees, Joubertsluck, Sabie-Klipkraal, Blydepoort en Kleinspruit terreine. *Navorsing deur die Nasionale Kultuurhistoriese Museum* 4: 101-144.

Stow, G.W. 1905. *The native races of South Africa; a history of the intrusion of the Hottentots and Bantu into the hunting grounds of the Bushmen, the aborigines of the country*. London: Swan Sonnenschein & Co, Ltd.

Stow, G.W., and Bleek, D.F. 1930. *Rock paintings in South Africa: from parts of the Eastern Province and Orange Free State*. London: Methuen.

Sugawara, K. 2004. The modern history of Japanese studies on the San hunter-gatherers. In: Barnard, A. (ed) *Hunter-gatherers in history, archaeology and anthropology*: 115-128. New York: Berg.

Sumner, T.A. and Kuman, K. 2014. Refitting evidence for the stratigraphic integrity of the Kudu Koppie Early to Middle Stone Age site, northern Limpopo Province, South Africa. *Quaternary International* 343: 169-178.

Taçon, P.S.C., Wilson, M. and Chippindale, C. 1996. Birth of the rainbow serpent in Arnhem Land rock art and oral history. *Archaeology in Oceania* 31(3): 103-124.

Thackeray, A.I. 1983. Dating the rock art of southern Africa. *South African Archaeological Society Goodwin Series* 4: 21-26.

Thomas, J. 2002. Archaeology's humanism and the materiality of the body. In: Hamilakis, Y., Pluciennik, M. and Tarlow, S. (eds) *Thinking through the body: archaeologies of corporeality*: 29-45. New York: Kluwer/Plenum.

_____. 2004. Thomas, J., 2004a. *Archaeology and modernity*. London: Routledge.

Thompson, L. 2001. *A history of South Africa.* Johannesburg & Cape Town: Jonathan Ball.

Thunberg, C.P. 1795. *Travels in Europe, Africa, and Asia, made between the years 1770 and 1779; in four volumes: containing two expeditions to the interior part of the country adjacent to the cape of good hope, and voyage to the island of Java; performed in the years 1773, 1774, and 1775.* Vol. 2. London: F. and C. Rivington.

Tilley, C. 1994. *A phenomenology of landscape: places, paths and monuments*. Oxford: Berg.

Travers, M. and Ross, J. 2016. Continuity and change in the anthropomorphic figures of Australia's northwest Kimberley. *Australian Archaeology* 82(2): 148-167.

Trigger, B.G. 2003. *Understanding early civilisations: a comparative study*. Cambridge: CUP.

Turner, B.S. 1996. *The body and society: exploration in social theory*, 2nd Edition. London: Sage.

Turner, G. 1986. Faunal remains from Jubilee Shelter, Transvaal. *The South African Archaeological Bulletin* 41(144): 63-68.

Valiente-Noailles, C. 1991. Homme-femme: différenciation et complementarité chez les K'ua (Bochiman) de la Reserve centrale du Kalahari, au Botswana. *Bulletin annuel du Musée d'Ethnographie de Genéve* 31/32: 1-64.

_____. 1993. *The Kua: life and soul of the Central Kalahari Bushmen*. Rotterdam: A.A. Balkema.

Van der Merwe, D.S. 1936. *A preliminary survey of places and objects of archaeological interest in the Northern Transvaal*. Johannesburg: University of the Witwatersrand, Department of Archaeology, File B 9/3.

Van der Merwe, N., Sealey, J., and Yates, R. 1987. First accelerator carbon-14 date for pigment from a rock painting. *South African Journal of Science* 83: 56–57.

Van der Ryst, M.M. 1998. *The Waterberg Plateau in the Northern Province, Republic of South Africa, in the Later Stone Age.* Oxford: Archaeopress.

_____. 2003. The so-called Masele or Vaalpense of the Waterberg: the origins and emergence of a subordinate class of mixed descent. *Anthropology Southern Africa* 26(1&2): 42-52.

_____. 2006. Seeking shelter: Later Stone Age hunters, gatherers and fishers of Olieboomspoort in the western Waterberg, south of the Limpopo. Unpublished PhD Thesis, University of the Witwatersrand, Johannesburg.

Van Doornum, B.L. 2005. Changing places, spaces and identity in the Shashe-Limpopo region of Limpopo Province, South Africa. Unpublished PhD dissertation. University of the Witwatersrand, Johannesburg.

Van Doornum, B.L. 2007. Tshisiku Shelter and the Shashe-Limpopo confluence area hunter-gatherer sequence. *Southern African Humanities* 19: 17-67.

Van Gennep, A. 1960. *The rites of passage* (M. B. Vizedom & G. L. Caffee, Trans.). Chicago: University of Chicago Press.

Van Riet Lowe, C. 1956. The distribution of prehistoric rock engravings and paintings in South Africa. *Archaeological Series* 7: 1-59. Pretoria, Government Printer.

Van Rijssen, W.J.J. 1984. South-western Cape rock art – who painted what? *South African Archaeological Bulletin* 39(140): 125-129.

_____. 1994. Rock art: the question of autorship. In: Dowson, T.A. and Lewis-Williams, J.D. (eds) *Contested images: diversity in southern African rock art research*: 159-175. Johannesburg: University of the Witwatersrand Press.

Van Schalkwyk, J.A. 1985. Vaalpense: verwarring en waarheid. *South African Journal of Ethnology* 8(4):146-153.

_____. 2004. Investigation of an Early Iron Age site in the Makgabeng area, Limpopo Province. *Research by the National Cultural History Museum* 13: 16-27.

Van Schalkwyk, J.A. and Smith, B.W. 2004. Insiders and outsiders: sources for reinterpreting a historical event. In: Reid, A.M. and Lane, P.J. (eds) *African historical archaeologies*: 325-346. New York: Kluwer Academic/Plenum Publishers.

Vedder, H. 1938. *South West Africa in early times: being the story of South West Africa up to the time of Maharero's death in 1890*. London: Frank Cass.

Vigilant, L., Stoneking, M., Harpending, H., Hawkes, K. and Wilson, A.C. 1991. African populations and the evolution of human mitochondrial DNA. *Science* 253(5027): 1503-1507.

Vinnicombe, P. 1967. Rock painting analysis. *South African Archaeological Bulletin* 22(88): 129-141.

_____. 1976. *People of the eland*. Pietermaritzburg: Natal University Press.

Viveiros de Castro, E. 1998. Cosmological deixis and Amerindian perspectivism. *Journal of the Royal Anthropological Institute* (n.s.) 4: 469-88.

Wadley, L., Murungi, M.L., Witelson, D., Bolhar, R., Bamford, M., Sievers, C., Val, A. and De La Peña, P. 2016. Steenbokfontein 9KR: A Middle Stone Age spring site in Limpopo, South Africa. *South African Archaeological Bulletin* 71(204): 130-145.

Waldman, P.L. 1989. Watersnakes and women: a study of ritual and ethnicity in Griquatown. Unpublished Honours thesis, University of the Witwatersrand, Johannesburg.

Walker, N.J. 1980. Later Stone Age research in the Matobo. *South African Archaeological Bulletin* 35: 19–24.

_____.1987. The dating of Zimbabwean rock art. *Rock Art Research* 4: 137–149.

_____.1991. Rock paintings of sheep in Botswana. *Rock Art – The Way Ahead. Occasional SARARA Publication* 1: 183-195.

_____. 1995. Late Pleistocene and Holocene hunter-gatherers of the Matobo: an archaeological study of change and continuity in Zimbabwe. *Studies in African archaeology*. Uppsala: Societas Archaeologica Upsaliensis.

_____. 1996. *The painted hills: rock art of the Matobo, Zimbabwe – a guidebook.* Gweru, Zimbabwe: Mambo Press.

Wallis, J.P.R. 1946. *The Northern Goldfields diaries of Thomas Baines*. London: Chatto & Windus.

Waskul, D.D. and Vannini, P. 2006. Introduction: the body in symbolic interaction. In: Waskul, D. and Vannini, P. (eds) *Body/Embodiment: symbolic interaction and the sociology of the body*: 1-18. Hampshire, England: Ashgate.

Webley, L. 1997. Jakkalsberg A and B: the cultural material from two pastoralist sites in the Richtersveld, Northern Cape. *Southern African Field Archaeology* 6(1): 3-19.

Webley, L. 2007. Archaeological evidence for pastoralist land-use and settlement in Namaqualand over the last 2 000 years. *Journal of Arid Environments* 70: 629-640.

Weismantel, M. 2015. Seeing like an archaeologist: Viveiros de Castro at Chavin de Huantar. *Journal of Social Archaeology* 15(2): 139–159.

Wessels. M. 2010. *Bushman letters: interpreting /Xam narrative*. Johannesburg: Wits University Press.

Westphal, E.O.J. 1963. The linguistic prehistory of southern Africa. *Africa* 33: 237-264.

Whitley, D.S. 1994. Shamanism, natural modelling and the rock art of far Western North American hunter-gatherers. In: Turpin, S.A. (ed) *Shamanism and rock art in North America*: 1-44. San Antonio, Texas: Rock Art Foundation.

_____. 2005. *Introduction to rock art research*. Walnut Creek, California: Left Coast Press, Inc.

Wiessner, P. 1983. Style and social information in Kalahari San projectiles. *American Antiquity* 48(2): 253-276.

_____. 1984. Reconsidiering the behavioural basis for style: a case study among the Kalahari San. *Journal of Anthropological Archaeology* 3: 190-234.

_____. 1990. Is there a unity to style? In: Conkey, M. and Hastorf, C. (eds) *The uses of style in archaeology*: 105-112. Cambridge: Cambridge University Press.

_____. 2002. Hunting, healing, and hxaro exchange: a long-term perspective on !Kung (Ju/'hoansi) large-game hunting. *Evolution and Human Behavior* 23: 407-436.

Wikar, Hendrik Jacob. 1935 [1779]. Berigt aan den Weleedelen Gestrengen Heer Mr. Joachim van Plettenbergh ... (Report to His Excellency Joachim van Plettenbergh ...), with translation by A.W. van der Horst. In: Mossop, E.E. (ed) *The journals of Wikar, Coetse and Van Reenen*: 20-219. Cape Town: The van Riebeeck Society, (Vol. 15).

Wilkins, J., Pollarolo, L. and Kuman, K. 2010. Prepared core reduction at the site of Kudu Koppie, northern South Africa: temporal patterns across the

Earlier and Middle Stone boundary. *Journal of Archaeological Science* 37: 1279-1292.

Willcox, A.R. 1955. The shaded polychrome paintings of South Africa, their distribution, origin and age. *South African Archaeological Bulletin* 10(37): 10-14.

_____. 1959. Hand imprints in rock paintings. *South African Journal of Science* 55(11): 292-298.

_____. 1960. Who were the artists? Another opinion. *South African Archaeological Bulletin* 15(57): 23-25.

_____. 1963. *The rock art of South Africa*. Johannesburg: Nelson.

_____. 1978. An analysis of the function of rock art. *South African Journal of Science* 74(2): 59.

_____. 1984. *The rock art of Africa*. New York: Holmes and Meier Publishers.

Wilmsen, E.W. 1986. Of paintings and painters in terms of Zu/'hoasi interpretations. In: Vossen, R. and Keuthmann, K. (eds) *Contemporary Studies on Khoisan: in honour of Oswin Kohler on the occasion of his seventy fifth birthday* 2: 347-72. Hamburg: Helmut Buske Verlag.

Wilmsen, E.N. 1989. *Land filled with flies*. Chicago: University of Chicago Press.

Wilmsen, E.N. and Denbow, J.R. 1990. Paradigmatic history of San-speaking peoples and current attempts at revision. *Current Anthropology* 31(5):489-524.

Wiltshire, N. 2011. Spatial analysis of archaeological sites in the Western Cape using an integrated digital archive. Unpublished MSc Thesis. University of Cape Town, Cape Town.

Woodhouse, H.C. 1964. The prehistoric painters of South Africa. *Bantu Studies* 10(9): 455-459.

_____. 1979. *The Bushmen of southern Africa*. Cape Town: Purnell.

_____. 1990. Bees and honeycombs. *South African Archaeological Bulletin* 45(152): 120.

_____. 1994. Enigmatic paintings from the Queenstown District. *South African Journal of Ethnology* 17(1): 27-29.

Wobst, M.H. 1977. Stylistic behaviour and information exchange. In: Cleland, C. (ed) *Papers for the Director: Research essays in honor of James B. Griffin*: 317-42. Ann Arbor: University of Michigan Museum of Anthropology, Anthropological Papers No. 61.

_____. 1999. Style in archaeology or archaeologists in style. In: Chilton, E. (ed) *Material meanings: critical approaches to the interpretation of material culture*: 118-32. Salt Lake Cty: University of Utah Press.

Woodborne, S., Hall, G., Robertson, I., Patrut, A., Rouault, M., Loader, N.J., *et al*. 2015. A 1000-year carbon isotope rainfall proxy record from South African baobab trees (Adansonia digitata L.). *PLoS One* 10(5): 1-18.

Wylie, A. 1982. An analogy by any other name is just as analogical: a commentary on the Gould-Watson dialogue. *Journal of Anthropological Archaeology* 1: 382-401.

Wylie, A. 1985. The reaction against analogy. *Advances in Archaeological Method and Theory* 8: 63-111.

Wylie, A. 2002. *Thinking from things: essays in the philosophy of archaeology*. Berkeley: University of California Press.

Yates, T. 1993. Frameworks for an archaeology of the body. In: Tilley, C. (ed) *Interpretative archaeology*: 31-72. Providence: Berg.

Yates, R.J. and Manhire, A. 1991. Shamanism and rock paintings: aspects of the use of rock art in the south-western Cape, South Africa. *The South African Archaeological Bulletin* 46(153): 3-11.

Yates, R. and Smith, A.B. 1993. Ideology and hunter/herder archaeology in the south-western Cape. *Southern African Field Archaeology* 2: 96-104.

Yates, R.J., Manhire, A.H. and Parkington, J.E. 1994. Rock painting and history in the south-western Cape. In: Dowson, T.A. and Lewis-Williams, J.D. (eds) *Contested images: diversity in southern African rock art research*: 29-60. Johannesburg: Witwatersrand University Press.

XII. Appendices

APPENDIX A

Variable	Position	Label	Measurement Level	Column Width	Alignment	Print Format	Write Format
Site	1	Name of Site	Nominal	8	Left	A20	A20
Motif	2	<none>	Scale	8	Left	F8.2	F8.2
Comments	3	Comments	Nominal	155	Left	A1500	A1500
Motif_type	4	Motif Type	Nominal	8	Left	F8	F8
Outline	5	Outline of each motif	Nominal	19	Left	F8	F8
Fill	6	Fill of each motif	Nominal	27	Left	F8	F8
Altitude	7	Altitude in meters	Scale	8	Left	F8	F8
Coulor_Method	8	Colour Method	Nominal	13	Left	F8	F8
Colours_Descrip	9	Colour/s	Nominal	26	Right	F8	F8
Colours_Des2	10	Colours	Nominal	16	Right	F8	F8
Colours_Des3	11	Colour	Nominal	10	Right	F8.2	F8.2
Colours_Des4	12	Colour	Nominal	10	Right	F8.2	F8.2
Colours_Hex	13	Web Safe Colour	Nominal	16	Right	F8	F8
Colours_Hex1	14	Web Safe Colour1	Scale	12	Right	F8	F8
Colours_Hex2	15	Web Safe Colour2	Nominal	14	Right	F8	F8
Colour_Hex3	16	Web Safe Colour3	Nominal	15	Right	F8	F8
Technique	17	Technique	Nominal	15	Left	F8	F8
M_Species	18	Species	Nominal	17	Right	F8	F8
Motif_Anthropomorphic_MC	19	Material Culture	Nominal	36	Right	F8	F8
MG_Shape	20	Shape of the geometric motif	Nominal	20	Right	F8	F8
Motif_Zoomorphic_sex	21	Sex of the animal	Nominal	17	Right	F8	F8

MA_Posture	22	Human Posture	Nominal	42	Right	F8	F8
MZ_Posture	23	Animal Posture	Nominal	30	Right	F8	F8
Block_Style	24	Block/ed Style	Nominal	8	Right	F8	F8
Overpainting	25	Painting over existing painting exactly	Nominal	8	Right	F8	F8
Superimposition	26	Paintings of different episode over another	Nominal	27	Right	F8	F8
Quality_draughtmansship	27	Quality of draughtmanss hip?	Nominal	11	Right	F8	F8
Emphasis_or_Outlined	28	Any features emphasised, outlined or exaggerated?	Nominal	49	Right	F8	F8
MZ_Hooves	29	Are the hooves present?	Nominal	12	Right	F8	F8
MZ_Pasterns	30	Are the pasterns present?	Nominal	12	Right	F8	F8
MZ_fetlocks	31	Fetlocks present?	Nominal	8	Right	F8	F8
MZ_Knee	32	Knees presnt?	Nominal	8	Right	F8	F8
MZ_Hock	33	Hocks present?	Nominal	8	Right	F8	F8
M_BodyShape	34	Having the shape of...	Nominal	16	Right	F8	F8
MZ_Head_facialfeatures	35	Is the head and facial features present?	Nominal	17	Right	F8	F8

MZ_MatingPosture	36	Is the animal in a mating posture?	Nominal	15	Right	F8	F8
Size_mm	37	Size of image in mm	Scale	8	Right	F8.2	F8.2
Perspective	38	What persepective is the image	Nominal	8	Right	F8	F8
MA_Feet	39	Are feet present?	Nominal	14	Right	F8	F8
MA_Legs	40	Legs?	Nominal	14	Right	F8	F8
MA_pelvis	41	Pelvis?	Nominal	23	Right	F8	F8
MA_Torso	42	Shape of Torso	Nominal	17	Right	F8	F8
MA_Arms	43	Shape of the arms	Nominal	8	Right	F8	F8
MA_Hands	44	Hands present?	Nominal	8	Right	F8	F8
MA_Head	45	Head shape if present?	Nominal	38	Right	F8	F8
MA_Facialfeatures	46	Are facial Features presnt?	Nominal	14	Right	F8	F8
MA_PosturePoseTool	47	Which posture from pose tool?	Nominal	35	Right	F8	F8
MA_Sex	48	Sexual characteristics	Nominal	8	Right	F8	F8
MA_Headdress	49	Headdress, if present	Nominal	38	Right	F8	F8
Tracing_or_redrawing	50	Is there a tracing available?	Nominal	15	Right	F8	F8
Photos	51	Motifs found in which photo?	Scale	8	Right	F8	F8

filter_$	52	Colours_Desc rip=6 (FILTER)	Scale	10	Right	F1	F1
TSC_6694	53	TwoStep Cluster Number	Nominal	8	Right	F10	F10
CLU9_1	54	Ward Method	Nominal	10	Right	F8.1	F8.1
CLU7_1	55	Ward Method	Nominal	10	Right	F8	F8
CLU7_2	56	Ward Method	Nominal	10	Right	F8	F8
QCL_1	57	Cluster Number of Case	Nominal	10	Right	F8	F8
CLU8_3	58	Single Linkage	Nominal	10	Right	F8	F8

Variables in the working file

APPENDIX B

Variable Values

Value		Label
Motif_type	1	Geometric
	2	Zoomorphic
	3	Anthropomorphic
	4	Arboreal
Outline	1	No
	2	Yes
	3	Zebra Stripes
Fill	1	Solid
	2	no fill
	3	Solid with white stripes over
	4	Finger-strokes in all directions
	5	no-fill with stripes
	6	Dotted
	7	Part fill, part dotted
	8	No fill bar the tip of the spear/stick
	9	Solid with stripes
	10	Partial fill
Coulor_Method	1	monochrome
	2	bichrome
	3	polychrome
Colours_Descrip	1	brownish-red
	2	brown
	3	White
	4	pale brownish-red
	5	Very faded pale brownish-red
	6	Yellow-brown
	7	Orange Ochre
	8	Raw Sienna
	9	cream
	10	Black
	11	Lotus

	12	Scorpion	
	13	Dark Brownish-red	
	14	Flesh	
Colours_Des2	1	White	
	2	Cream and White	
	3	Orange ochre	
	4	Brown	
Colours_Des3	1.00	Raw Sienna	
	2.00	Yellow-brown	
	3.00	Flesh	
Colours_Des4	1.00	Black	
Colours_Hex	1	CC9966	
	2		663333
	3	FFFFFF	
	4		993333
	5		996666
	6		663333
	7	#CE8F3B	
	8	#822F27	
	9	#FFE5A0	
	10	#863C3C	
	11	#CC9A38	
	12	#000000	
	13	#5E585C	
	14	#CC7722	
	15	#724A2F	
Colours_Hex1	1	CC6666	
	2		996633
	3	#FFE5A0	
	4	#CC9A38	
	5		000000
	6		66333
	7	#CC7722	
Colours_Hex2	1	FFCC99	
	2		000000

	3	#CE8F3B
	4	#FFCBA4
Colour_Hex3	1	FFFFFF
	2	000000
Technique	1	Pictograph: Finger
	2	Pictograph: Brush
	3	Engraving: Incised
	4	Handprint
	5	Paint Smear
	6	Pictograph: chalk
M_Species	1	Common Reedbuck
	2	Kudu
	3	Indeterminate
	4	Common Warthog
	5	Equid: Zebra
	6	Warthog
	7	Impala
	8	sheep
	9	Hybrid
	10	Canid
	11	Giraffe
	12	Hartebeest
	13	Ficus
	14	Gemsbok
	15	Aardvaak
	16	Felines (lion)
	17	Felines
	18	Hyena
	19	Elephant
	20	Plant
	21	Common Duiker
	22	Tsessebe
	23	Eland
	24	Steenbok
	25	Grey Rhebok

	26	Ostrich
	27	Jackal
	28	Baboon
	29	Mountain Reedbuck
	30	Donkey
	31	Wildebeest
Motif_Anthropomorphic_MC	1	Arrows
	2	None
	3	Holding arrows/sticks
	4	2-3 Arrows behind right arm
	5	Holding bow/arrows and hairstyle/headdress
	6	Hanging strings with objects attached, T-shaped object
	7	Hanging strings with objects attached
	8	Holding 5 arrows/sticks and a bow-tie shaped object
	9	Holding arced bow/stick in both hands
	10	5-6 sticks
	11	Holding bow in right hand
	12	two/three sticks/arrows behind the back
	13	Bow in right hand and clothing, arrow or stick behind the back poking out from left shoulder
	14	Bow and Arrows
	15	Bow across the lap with two arrows
	16	Two arrows at the back of the figures back
	17	Holding bow in left hand
	18	container or drum
	19	Unknown
	20	Holding stick/arrow in right hand
	21	Holding string in right hand
	22	Two pronged stick

23	Dress covering the legs from waist to knees
24	Holding ten arrows in right hand
25	Holding stick in left outstretched arm
26	two sticks/arrows behind the back, holding bow in right hand and two sticks in left
27	Neck, waist, knee and ankle bands,'tail' cord and beehive headress
28	Quiver and arrows
29	Wearing apron/skirt
30	Holding short bow in both hands and wearing a back apron
31	Holding bow in left hand, arrows in the left and has a quiver hanging across chest
32	Bow and Quiver
33	Bow behind back sticking out left side shoulder
34	Holding bow in left hand and quiver and arrows in right
35	Possible kaross waist up
36	String tied around waist
37	Holding a fan of thirteen arrows in left hand
38	Two long sticks
39	Holding stick/spear in left hand, possible back apron and headdress
40	Holding four white arrows in right hand
41	Holding torch in left hand
42	Holding a dancing stick in each hand
43	Wearing a two-piece cape
44	Holding five arrows/sticks in right hand and wearing heavy clothing
45	Holding stick/arrow in each hand
46	Under the arms is a piece of clloth blowing (strand)

47	Holding stick/arrow in left hand
48	Heavily dressed (coat)
49	Holding flywhisk in right hand while a second flywhisk is tucked in waist band. Has ankle and waist bands
50	Holding stick/arrow in right hand. Has knee bands and waist band
51	Holding a stick with a horizontal 'Y' on top of stick and a bow in left hand. From the middrift area exhibits a line angled down with a short line disessecting it close to the top of the stick.
52	Holding V-shaped shield and hearing narrow oval hat
53	Horizontal stick through or behind the middrift
54	Holding two to five arrows or sticks and a long bow in right hand
55	Holding five-six arrows or sticks and a long bow in left hand and possibly wearing a front apron
56	Bow
57	Holding bow in right hand and four arrows in left
58	Arms up above body holding object on top of head
59	Holding spear.stick in left hand under left arm
60	Holding spear/long stick in left hand while holding to short sticks/arrows in right
61	Holding bow in right hand and three arrows/flywhisks behing left shoulder
62	Wearing a defined distinct skirt that hangs from middrift to knees and holding round ball object in right hand

	63	Three torch-like objects lain upon the floor.
	64	Holding stick/arrow in right hand with arrow or line through the head.
	65	Waistband, hand, top of arm and headdress in BR. Holding M.C. in each hand but unsure.
	66	Holding short bow in left hand and a stick/arrow in the right
	67	Three stick/arrow objects lain upon the floor one under the other, evenly spaced.
	68	Holding two arrows/sticks in right hand and a long bow in the left hand
	69	Three arrows/sticks tied together at the top making the shape of a teepee
	70	Holding four arrows/sticks under left arm
	71	Three sticks standing up in the ground
MG_Shape	1	Wavy Line
	2	Zigzag
	3	Circular
	4	Globular
	5	Right Angle
	6	Linear
	7	club-shaped
	8	Finger-Strokes
	9	U-shaped
	10	Spoor
	11	Formling
	12	Unknown
	13	Flag shaped
	14	Square
	15	Finger-dots
	16	Apron
	17	V-shaped

	18	Handprint
	19	Semi-circular
	20	Square with curved corners with horizontal centreline
	21	Loincloth: Y-shaped
	22	Oval
	23	Semicircle & dots
	24	Square and dots
	25	Circle & dot
	26	M-shaped thick line
	27	Micro-dots
	28	n-shaped
	29	Concentric circle
	30	Star-shaped.
	31	Very complex geometric
	32	Circle and cross
	33	Rayed concentric circle
	34	Cross
	35	Flecks
	36	Pod shape
	37	Grid
Motif_Zoomorphic_sex	1	male
	2	female
	3	unknown
	4	female or young male
MA_Posture	1	Sitting
	2	Standing
	3	Upside Down
	4	Lying down
	5	Walking posture
	6	unknown
	7	Running posture
	8	Lunging and leaning forward
	9	Leaning back
	10	Bending forward

	11	Sitting as if on a chair/ledge
	12	Dancing pose
	13	Mid-somersault pose
	14	Standing or lying down with legs slightly bent
	15	Kneeling
	16	Squatting
	17	On all fours
MZ_Posture	1	Sitting
	2	Standing
	4	Walking
	5	Standing with legs angled slightly forward
	6	Lying down, legs folded beneath body
	7	unknown
	8	striding or leaping
	9	Running
	10	Stalking posture
	11	Standing with head lowered
	12	Standing with one pair of limbs angled slightly back
	13	Standing with neck and head turned facing back
Block_Style	1	Yes
	2	No
	3	Slightly
Overpainting	1	Yes
	2	No
Superimposition	1	Yes
	2	No
	3	No, but white paint looks recent
	4	Yes, Khoi finger-dot over leg
	5	Yes, over people holding kit
Quality_draughtmansship	1	good
	2	moderate

	3	Poor
	4	moderate to poor
Emphasis_or_Outlined	1	Yes
	2	Slightly
	3	No
	4	Elongated front limbs
	5	Elongated body and neck/ tail raised
	6	Elongated legs and torso
	7	Elongated legs
	8	Exagerated tusks
	9	Elongated left arm
	10	Elongated torso
	11	Exaggerated calves and long feet
	12	Exaggerated hump
	13	Exaggerated head and facial features
	14	Defined, leg and arm muscles
	15	Elongated curved torso
	16	Obese (very fat)
	17	Back arched excessively
	18	Extra limbs (4 back limbs)
	19	Black outlined belly and legs
	20	Upside-down
	21	Composite animal
	22	Elongated back legs
	23	Balloon encompassing its contents
	24	Emaciated backlegs
	25	Elongated body and back legs angled too far inwards.
	26	Elongated torso with wide chest
	27	Reclining back angled
	28	Exaggerated calf muscles
	29	Exaggerated penis
	30	Push-me-pull-you animal
	31	Protruding buttocks, shelf
	32	Stylised horns

33	Emaciated
34	Covered in red dots
35	Unusual feline (Conflation)
36	Pregnant and heavily dressed
37	Legs are muscular and well-defined, chest is wide and block-like with small head and short neck and stick arms
38	Unusual bichrome human figure with YB upper limbs with red stripes down the middle
39	Bizaar bichrome human figure with round head thin torso and multiple white legs similar to roots. Onion.
40	large rounded ears
41	Head only
42	Emiacated with tail/back apron
43	Very rounded belly
44	Strange figure lying down with long conical head, strange.
45	Back limbs crossed
46	Arms are thin stick-like but whimsical and elastic compared to body, head and legs
47	From the well-defined torso are these stick like upside down V-shaped legs
48	Thick neck
49	Cross-species
50	Fat hanging stomach and possibly having an animal head with horns
51	Deliberate superimpositioning
52	Genital area id outlined and is in a different colour. Deliberate superimpositioning.
53	Unreal animal
54	The lines of the back legs are sinous with additional lines running from body to ankles

	55	Disproportionate. Huge muscular arms and exaggerrated calf muscles. Long elongated neck with strange thin horizontal head.
	56	Elongated arms and legs
	57	Elongated right arm
	58	Elongated neck and legs, rounded belly
	59	Disproportionate. Huge muscular arms and exaggerrated calf muscles. Long elongated torso in relation to short arms and legs. Very exaggerated leg muscles
	60	Holding exaggerated spear or arrow with large arrow head
MZ_Hooves	1	Yes
	2	No
MZ_Pasterns	1	Yes
	2	No
MZ_fetlocks	1	Yes
	2	No
MZ_Knee	1	Yes
	2	No
MZ_Hock	1	Yes
	2	No
M_BodyShape	1	curvilinear
	2	quadrangular
	3	unknown
	4	Angular
MZ_Head_facialfeatures	1	Yes
	2	No
MZ_MatingPosture	1	Yes
	2	No
	3	Yes, head low posture
	4	Pre-mating posture
	5	Possibly

	6	Yes, due to context
Perspective	1	Profile
	2	Front
	3	Behind
	4	Twisted
MA_Feet	1	Yes
	2	No
	3	Yes, thin and long
	4	Well-defined, long and thin
	5	Sinous with skeletal toes
MA_Legs	1	calfs exaggerated
	2	knees
	3	blocks of paint
	4	Well-defined
	5	Not present
	6	Faded
	7	Stick-like
	8	Thin lean legs
MA_pelvis	1	buttocks present
	2	Buttocks absent
	3	Yes, sagging slightly (female)
	4	Yes, sagging slightly
	5	Curvy large buttocks
MA_Torso	1	Square
	2	Double Concave
	3	Stick-like
	4	Not present
	5	Block-like
	6	verisimilar
	7	Inverted triangle
	8	Large antelope-shaped body
	9	Block-like but curved
	10	Unclear
	11	Curvaceous fat body
	12	Double Convex

	13	Oval outline, no fill
MA_Arms	1	Stick-like
	2	Not Present
	3	Block-like
	4	well-defined
MA_Hands	1	Yes
	2	No
	3	Yes, fists
	4	Hands open with fingers spread
	5	Coquettish hand gestue
MA_Head	1	Circular
	2	Not present
	3	Triangular face
	4	Globular
	5	Not present, dissappears in crack
	6	Round sides, flat top and bottom
	9	Antelope-headed
	10	Sheep-headed
	11	Verisimilar (side profile)
	12	Exaggerated forehead, unpainted section in the middle of the head (globular)
	13	Very unique face and head, could be animal-like
	14	Oval with mouth agape
	15	Horizontal cone-shaped or bird beak
	16	Angular
	17	Square Head
	18	Feline-head
	19	Oval
	20	Long and conical
MA_Facialfeatures	1	Yes
	2	No
	3	chin, possible mouth
MA_PosturePoseTool	1	Pose 0

2	Pose 1
3	Pose 2
4	Unclear
5	Pose 3
6	Pose 4
7	Pose 0 or Pose 2
8	Whitelady of the Brandberg pose or pose 5
9	Pose 6
10	Pose 7
11	Pose 8
12	Walking posture
13	Pose 9 W-shape
14	Leaning back with left arm extended
15	Standing posture
16	Pose 10
17	Pose 11
18	Seated posture
19	Pose 12
20	Bending forward posture
21	Pose 13
22	Pose 14 or Dancing Pose
23	Pose 15 or Somersaulting
24	Running pose
25	Pose 16
26	Akimbo
27	Pose 17
28	Standing posture with arms outstretched
29	Arched back dancing posture
30	Pose 18 or pulling bow pose
31	Pose 19 or arms outstreched in front of body pose
32	Pose 0A
33	Pose 1A

34	Pose 2A
35	FPose0
36	FPose 1
37	Kneeling pose
38	Fpose 2
39	Legs bent backwards by the knees
40	Fpose 3
41	Pose 3A
42	FPose 4
43	FPose 5
44	FPose 6
45	Squatting
46	Bending forward arms back Pose 4A
47	Pose 5A
48	Pose 6A
49	Clapping pose with arms bent
50	FPose 7
51	Pose 7A
52	Pose 8A
53	Pose 9A
54	Pose 10A
55	Pose 11A
56	Pose 12A
57	FPose 8
58	On all fours
59	Arms up curved towards head
60	Standing with left arm raised
61	FPose 9
62	Running figure with arms crossed outstretched
63	Pose 13A
64	Pose 14A
65	FPose 10
66	Pose 15A
67	Pose 16A

	68	FPose 11
	69	Pose 17A
MA_Sex	1	Penis
	2	Breasts
	3	none
	4	Pregnant
MA_Headdress	1	Head covering with strings hanging from the back
	2	Headdress with hair
	3	Skullcap of hair, only top of head
	4	Small afro/coiffure
	5	Possibly white hair?
	6	White beehive headdress with yellow/red band around the top of the head
	7	Pageboy hairstyle or headdress with a feather or oval with a line through it
	8	Reminiscient of a knight's helmet plume
	9	Inverted triangle with thin protrusions from it above the forehead
	10	Pageboy hairstyle
	11	Pompadour shaped headdress/coiffure with a few strands of string/hair covering the face
	12	Curved forked bandana
	13	Two curvy wavy lines leaving side of head
	14	An animal pelt wrapped around neck with plume or thick tail hanging down from back of neck
	15	Narraw oval hat looks like a pie
	16	Triangular headdress
	17	Tube sock down back
Tracing_or_redrawing	1	Yes
	2	No
	3	Both

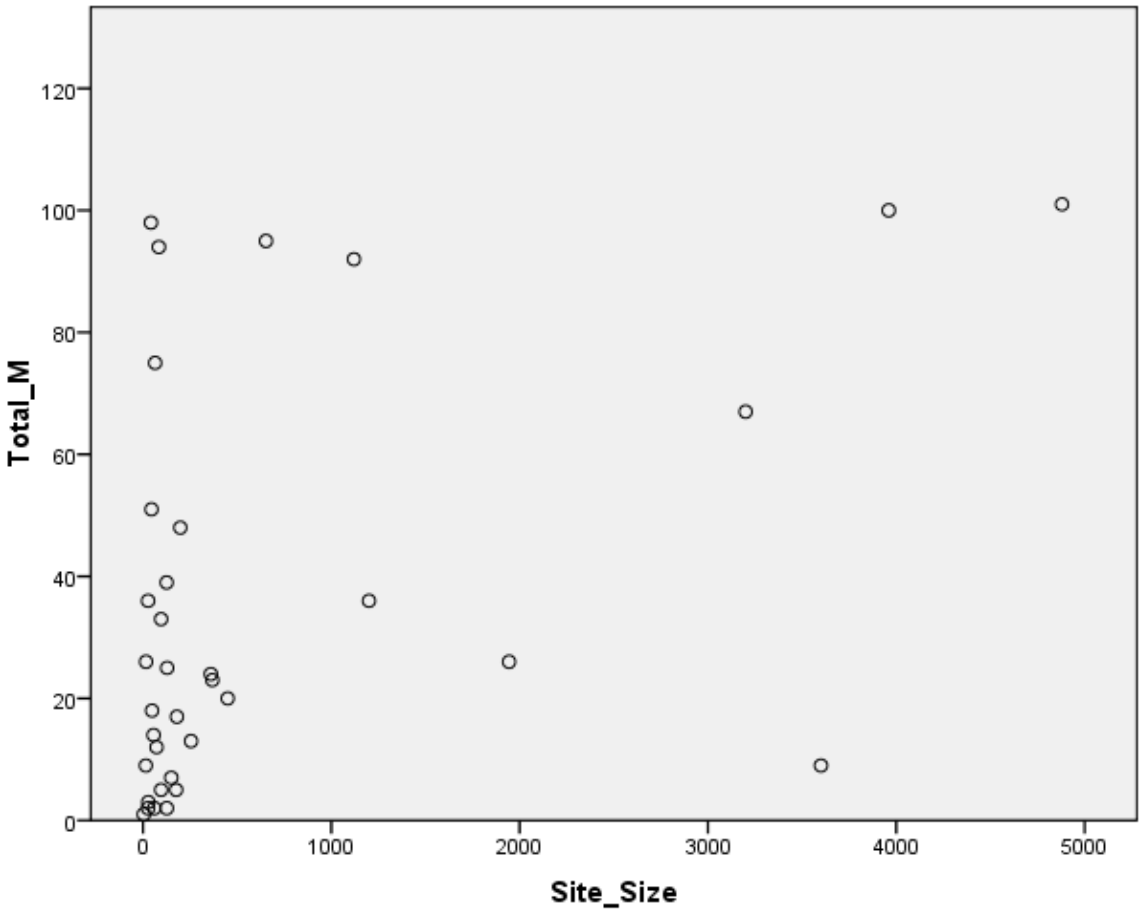
filter_$	0	Not Selected
	1	Selected
TSC_6694	-1	Outlier Cluster

Correlations

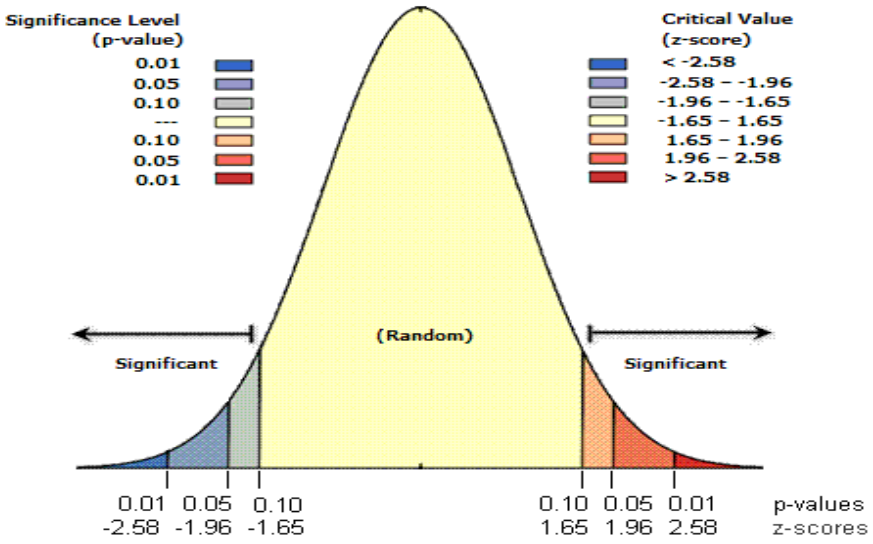
		Total_M	Site_Size
Total_M	Pearson Correlation	1	.443**
	Sig. (2-tailed)		.008
	N	35	35
Site_Size	Pearson Correlation	.443**	1
	Sig. (2-tailed)	.008	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX C



OID	OBJECTID	SOURCE_ID	Total_M	GiZScore	GiPValue
0	1	0	39	2.059479798	0.039448298
1	2	1	1	-0.470075737	0.63830091
2	3	2	3	2.059479798	0.039448298
3	4	3	68	2.059479798	0.039448298
4	5	4	1	1.318638238	0.187290084
5	6	5	1	-1.260561842	0.207466779
6	7	6	2	-1.492970616	0.135444879
7	8	7	2	-1.492970616	0.135444879
8	9	8	1	-1.260561842	0.207466779
9	10	9	11	0.002742222	0.997812026
10	11	10	12	-0.363548753	0.716195002
11	12	11	1	-0.408591102	0.682839762
12	13	12	8	-0.470075737	0.63830091
13	14	13	9	-0.470075737	0.63830091
14	15	14	13	-0.470075737	0.63830091


Significance Level
(p-value)
0.01
0.05
0.10

0.10
0.05
0.01
Critical Value
(z-score)
< -2.58
-2.58 – -1.96
-1.96 – -1.65
-1.65 – 1.65
1.65 – 1.96
1.96 – 2.58
> 2.58
(Random)
Significant
Significant
0.01 0.05 0.10
-2.58 -1.96 -1.65
0.10 0.05 0.01
1.65 1.96 2.58
p-values
z-scores

APPENDIX D

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Finger-dots * Clothing	36	100.0%	0	.0%	36	100.0%

Finger-dots * Clothing Crosstabulation

Count

		Clothing		
		.00	1.00	Total
Finger-dots	.00	11	4	15
	1.00	9	12	21
	Total	20	16	36

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.291[a]	1	.070		
Continuity Correction[b]	2.173	1	.140		
Likelihood Ratio	3.382	1	.066		
Fisher's Exact Test				.096	.069
Linear-by-Linear Association	3.200	1	.074		
N of Valid Cases	36				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.67.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.302	.070
	Cramer's V	.302	.070
	N of Valid Cases	36	

APPENDIX E

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Finger-dots * Handprints	36	100.0%	0	.0%	36	100.0%

Finger-dots * Handprints Crosstabulation

Count

		Handprints		
		.00	1.00	Total
Finger-dots	.00	15	0	15
	1.00	17	4	21
	Total	32	4	36

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.214[a]	1	.073		
Continuity Correction[b]	1.575	1	.209		
Likelihood Ratio	4.666	1	.031		
Fisher's Exact Test				.125	.102
Linear-by-Linear Association	3.125	1	.077		
N of Valid Cases	36				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.67.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.299	.073
	Cramer's V	.299	.073
	N of Valid Cases	36	

APPENDIX F

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Clothing * Handprints	36	100.0%	0	.0%	36	100.0%

Clothing * Handprints Crosstabulation

Count

		Handprints		
		.00	1.00	Total
Clothing	.00	19	1	20
	1.00	13	3	16
	Total	32	4	36

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.702[a]	1	.192		
Continuity Correction[b]	.594	1	.441		
Likelihood Ratio	1.733	1	.188		
Fisher's Exact Test				.303	.221
Linear-by-Linear Association	1.654	1	.198		
N of Valid Cases	36				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.78.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.217	.192
	Cramer's V	.217	.192
	N of Valid Cases	36	

APPENDIX G

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Sheep * Handprints	36	100.0%	0	.0%	36	100.0%

Sheep * Handprints Crosstabulation

Count

		Handprints		
		.00	1.00	Total
Sheep	.00	22	2	24
	1.00	10	2	12
	Total	32	4	36

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.563[a]	1	.453		
Continuity Correction[b]	.035	1	.851		
Likelihood Ratio	.534	1	.465		
Fisher's Exact Test				.588	.407
Linear-by-Linear Association	.547	1	.460		
N of Valid Cases	36				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.33.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.125	.453
	Cramer's V	.125	.453
	N of Valid Cases	36	

APPENDIX H

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Sheep * Finger-dots	36	100.0%	0	.0%	36	100.0%

Sheep * Finger-dots Crosstabulation

Count

		Finger-dots		
		.00	1.00	Total
Sheep	.00	9	15	24
	1.00	6	6	12
	Total	15	21	36

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.514[a]	1	.473		
Continuity Correction[b]	.129	1	.720		
Likelihood Ratio	.511	1	.475		
Fisher's Exact Test				.499	.358
Linear-by-Linear Association	.500	1	.480		
N of Valid Cases	36				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.00.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	-.120	.473
	Cramer's V	.120	.473
	N of Valid Cases	36	

APPENDIX I

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Sheep * Clothing	36	100.0%	0	.0%	36	100.0%

Sheep * Clothing Crosstabulation

Count

		Clothing		
		.00	1.00	Total
Sheep	.00	13	11	24
	1.00	7	5	12
	Total	20	16	36

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.056[a]	1	.813		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.056	1	.812		
Fisher's Exact Test				1.000	.549
Linear-by-Linear Association	.055	1	.815		
N of Valid Cases	36				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.33.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	-.040	.813
	Cramer's V	.040	.813
	N of Valid Cases	36	

APPENDIX J

Colour/s * Species Crosstabulation

			Species																												
			Common Reedbuck	Kudu	Indeterminate	Common Warthog	Equid: Zebra	Impala	sheep	Hybrid	Canid	Giraffe	Hartebeest	Ficus	Gemsbok	Aardvaak	Felines (lion)	Felines	Hyena	Elephant	Plant	Tsessebe	Eland	Steenbok	Grey Rhebok	Ostrich	Baboon	Mountain Reedbuck	Donkey	Wildebeest	Total
Colour/s	brownish-red	Count	1	31	94	1	4	21	14	3	2	3	7	1	1	1	0	2	0	0	2	8	2	1	0	0	1	1	0	1	202
		% within Colour/s	.5%	15.3%	46.5%	.5%	2.0%	10.4%	6.9%	1.5%	1.0%	1.5%	3.5%	.5%	.5%	.5%	.0%	1.0%	.0%	.0%	1.0%	4.0%	1.0%	.5%	.0%	.0%	.5%	.5%	.0%	.5%	100.0%
		% within Species	100.0%	58.5%	47.7%	50.0%	26.7%	77.8%	26.9%	75.0%	40.0%	15.0%	46.7%	100.0%	100.0%	33.3%	.0%	25.0%	.0%	.0%	100.0%	66.7%	28.6%	50.0%	.0%	.0%	100.0%	100.0%	.0%	25.0%	44.6%
		% of Total	.2%	6.8%	20.8%	.2%	.9%	4.6%	3.1%	.7%	.4%	.7%	1.5%	.2%	.2%	.2%	.0%	.4%	.0%	.0%	.4%	1.8%	.4%	.2%	.0%	.0%	.2%	.2%	.0%	.2%	44.6%
	brown	Count	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		% within Colour/s	.0%	.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	.0%	1.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.4%
		% of Total	.0%	.0%	.4%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.4%
	White	Count	0	2	38	0	4	0	18	1	2	8	2	0	0	2	2	1	1	0	0	0	0	1	1	5	0	0	1	3	92
		% within Colour/s	.0%	2.2%	41.3%	.0%	4.3%	.0%	19.6%	1.1%	2.2%	8.7%	2.2%	.0%	.0%	2.2%	2.2%	1.1%	1.1%	.0%	.0%	.0%	.0%	1.1%	1.1%	5.4%	.0%	.0%	1.1%	3.3%	100.0%
		% within Species	.0%	3.8%	19.3%	.0%	26.7%	.0%	34.6%	25.0%	40.0%	40.0%	13.3%	.0%	.0%	66.7%	66.7%	12.5%	50.0%	.0%	.0%	.0%	.0%	50.0%	100.0%	41.7%	.0%	.0%	100.0%	75.0%	20.3%
		% of Total	.0%	.4%	8.4%	.0%	.9%	.0%	4.0%	.2%	.4%	1.8%	.4%	.0%	.0%	.4%	.4%	.2%	.2%	.0%	.0%	.0%	.0%	.2%	.2%	1.1%	.0%	.0%	.2%	.7%	20.3%
	pale brownish-red	Count	0	2	17	0	0	1	0	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	25
		% within Colour/s	.0%	8.0%	68.0%	.0%	.0%	4.0%	.0%	.0%	.0%	.0%	16.0%	.0%	.0%	.0%	.0%	4.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	3.8%	8.6%	.0%	.0%	3.7%	.0%	.0%	.0%	.0%	26.7%	.0%	.0%	.0%	.0%	12.5%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	5.5%
		% of Total	.0%	.4%	3.8%	.0%	.0%	.2%	.0%	.0%	.0%	.0%	.9%	.0%	.0%	.0%	.0%	.2%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	5.5%
	Very faded pale brownish-red	Count	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		% within Colour/s	.0%	.0%	75.0%	.0%	.0%	.0%	.0%	.0%	.0%	25.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	.0%	1.5%	.0%	.0%	.0%	.0%	.0%	.0%	5.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.9%
		% of Total	.0%	.0%	.7%	.0%	.0%	.0%	.0%	.0%	.0%	.2%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.9%
	Yellow brown	Count	0	10	15	0	2	3	2	0	0	4	0	0	0	0	1	3	1	0	0	0	4	0	0	0	0	0	0	0	45
		% within Colour/s	.0%	22.2%	33.3%	.0%	4.4%	6.7%	4.4%	.0%	.0%	8.9%	.0%	.0%	.0%	.0%	2.2%	6.7%	2.2%	.0%	.0%	.0%	8.9%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	18.9%	7.6%	.0%	13.3%	11.1%	3.8%	.0%	.0%	20.0%	.0%	.0%	.0%	.0%	33.3%	37.5%	50.0%	.0%	.0%	.0%	57.1%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	9.9%
		% of Total	.0%	2.2%	3.3%	.0%	.4%	.7%	.4%	.0%	.0%	.9%	.0%	.0%	.0%	.0%	.2%	.7%	.2%	.0%	.0%	.0%	.9%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	9.9%
	Orange Ochre	Count	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5
		% within Colour/s	.0%	40.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	40.0%	.0%	.0%	.0%	.0%	.0%	20.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	3.8%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	10.0%	.0%	.0%	.0%	.0%	.0%	12.5%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	1.1%
		% of Total	.0%	.4%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.4%	.0%	.0%	.0%	.0%	.0%	.2%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	1.1%
	Raw Sienna	Count	0	3	2	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	10
		% within Colour/s	.0%	30.0%	20.0%	10.0%	10.0%	.0%	.0%	.0%	.0%	10.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	10.0%	.0%	.0%	10.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	5.7%	1.0%	50.0%	6.7%	.0%	.0%	.0%	.0%	5.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%	.0%	.0%	14.3%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	2.2%
		% of Total	.0%	.7%	.4%	.2%	.2%	.0%	.0%	.0%	.0%	.2%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.2%	.0%	.0%	.2%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	2.2%
	cream	Count	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		% within Colour/s	.0%	50.0%	50.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	1.9%	.5%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.4%
		% of Total	.0%	.2%	.2%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.4%
	Black	Count	0	2	25	0	4	2	18	0	1	1	0	0	0	0	0	0	0	0	0	4	0	0	0	7	0	0	0	0	64
		% within Colour/s	.0%	3.1%	39.1%	.0%	6.3%	3.1%	28.1%	.0%	1.6%	1.6%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	6.3%	.0%	.0%	.0%	10.9%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	3.8%	12.7%	.0%	26.7%	7.4%	34.6%	.0%	20.0%	5.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	33.3%	.0%	.0%	.0%	58.3%	.0%	.0%	.0%	.0%	14.1%
		% of Total	.0%	.4%	5.5%	.0%	.9%	.4%	4.0%	.0%	.2%	.2%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.9%	.0%	.0%	.0%	1.5%	.0%	.0%	.0%	.0%	14.1%
	Lotus	Count	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		% within Colour/s	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within Species	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	13.3%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.4%
		% of Total	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.4%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.0%	.4%
Total		Count	1	53	197	2	15	27	52	4	5	20	15	1	1	3	3	8	2	1	2	12	7	2	1	12	1	1	1	4	453
		% within Colour/s	.2%	11.7%	43.5%	.4%	3.3%	6.0%	11.5%	.9%	1.1%	4.4%	3.3%	.2%	.2%	.7%	.7%	1.8%	.4%	.2%	.4%	2.6%	1.5%	.4%	.2%	2.6%	.2%	.2%	.2%	.9%	100.0%
		% within Species	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	.2%	11.7%	43.5%	.4%	3.3%	6.0%	11.5%	.9%	1.1%	4.4%	3.3%	.2%	.2%	.7%	.7%	1.8%	.4%	.2%	.4%	2.6%	1.5%	.4%	.2%	2.6%	.2%	.2%	.2%	.9%	100.0%

APPENDIX K

Colour/s * Motif Type Crosstabulation

			Motif Type				
			Geometric	Zoomorphic	Anthropomorphic	Arboreal	Total
Colour/s	0	Count	1	0	0	0	1
		% within Colour/s	100.0%	.0%	.0%	.0%	100.0%
		% within Motif Type	.4%	.0%	.0%	.0%	.1%
		% of Total	.1%	.0%	.0%	.0%	.1%
	brownish-red	Count	84	196	327	3	610
		% within Colour/s	13.8%	32.1%	53.6%	.5%	100.0%
		% within Motif Type	35.4%	43.7%	62.9%	100.0%	50.5%
		% of Total	6.9%	16.2%	27.0%	.2%	50.5%
	brown	Count	0	2	3	0	5
		% within Colour/s	.0%	40.0%	60.0%	.0%	100.0%
		% within Motif Type	.0%	.4%	.6%	.0%	.4%
		% of Total	.0%	.2%	.2%	.0%	.4%
	White	Count	107	92	38	0	237
		% within Colour/s	45.1%	38.8%	16.0%	.0%	100.0%
		% within Motif Type	45.1%	20.5%	7.3%	.0%	19.6%
		% of Total	8.9%	7.6%	3.1%	.0%	19.6%
	pale brownish-red	Count	6	25	19	0	50
		% within Colour/s	12.0%	50.0%	38.0%	.0%	100.0%
		% within Motif Type	2.5%	5.6%	3.7%	.0%	4.1%
		% of Total	.5%	2.1%	1.6%	.0%	4.1%
	Very faded pale brownish-red	Count	0	4	4	0	8
		% within Colour/s	.0%	50.0%	50.0%	.0%	100.0%
		% within Motif Type	.0%	.9%	.8%	.0%	.7%
		% of Total	.0%	.3%	.3%	.0%	.7%
	Yellow brown	Count	12	47	41	0	100
		% within Colour/s	12.0%	47.0%	41.0%	.0%	100.0%
		% within Motif Type	5.1%	10.5%	7.9%	.0%	8.3%
		% of Total	1.0%	3.9%	3.4%	.0%	8.3%
	Orange Ochre	Count	4	5	4	0	13
		% within Colour/s	30.8%	38.5%	30.8%	.0%	100.0%
		% within Motif Type	1.7%	1.1%	.8%	.0%	1.1%
		% of Total	.3%	.4%	.3%	.0%	1.1%
	Raw Sienna	Count	2	10	24	0	36
		% within Colour/s	5.6%	27.8%	66.7%	.0%	100.0%
		% within Motif Type	.8%	2.2%	4.6%	.0%	3.0%
		% of Total	.2%	.8%	2.0%	.0%	3.0%
	cream	Count	0	2	0	0	2
		% within Colour/s	.0%	100.0%	.0%	.0%	100.0%
		% within Motif Type	.0%	.4%	.0%	.0%	.2%
		% of Total	.0%	.2%	.0%	.0%	.2%
	Black	Count	9	64	40	0	113
		% within Colour/s	8.0%	56.6%	35.4%	.0%	100.0%
		% within Motif Type	3.8%	14.3%	7.7%	.0%	9.3%
		% of Total	.7%	5.3%	3.3%	.0%	9.3%
	Lotus	Count	9	2	14	0	25
		% within Colour/s	36.0%	8.0%	56.0%	.0%	100.0%
		% within Motif Type	3.8%	.4%	2.7%	.0%	2.1%
		% of Total	.7%	.2%	1.2%	.0%	2.1%
	Scorpion	Count	2	0	0	0	2
		% within Colour/s	100.0%	.0%	.0%	.0%	100.0%
		% within Motif Type	.8%	.0%	.0%	.0%	.2%
		% of Total	.2%	.0%	.0%	.0%	.2%
	Dark Brownish red	Count	0	0	4	0	4
		% within Colour/s	.0%	.0%	100.0%	.0%	100.0%
		% within Motif Type	.0%	.0%	.8%	.0%	.3%
		% of Total	.0%	.0%	.3%	.0%	.3%
	Flesh	Count	1	0	2	0	3
		% within Colour/s	33.3%	.0%	66.7%	.0%	100.0%
		% within Motif Type	.4%	.0%	.4%	.0%	.2%
		% of Total	.1%	.0%	.2%	.0%	.2%
Total		Count	237	449	520	3	1209
		% within Colour/s	19.6%	37.1%	43.0%	.2%	100.0%
		% within Motif Type	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	19.6%	37.1%	43.0%	.2%	100.0%

APPENDIX L

OID	SOURCE_ID	Total_M	GiZScore	GiPValue	Gi_Bin
0	0	2	1.854225818	0.06370686	0
1	1	39	1.854225818	0.06370686	0
2	2	67	1.854225818	0.06370686	0
3	3	94	1.854225818	0.06370686	0
4	4	12	1.244664771	0.213255025	0
5	5	26	1.760315867	0.078354265	0
6	6	92	-2.768594604	0.005629864	0
7	7	51	-0.998125852	0.318218349	0
8	8	33	-0.578715675	0.562781041	0
9	9	20	-2.374455585	0.017574851	0
10	10	23	-2.374455585	0.017574851	0
11	11	5	-2.309462628	0.020917923	0
12	12	1	-1.980690358	0.047626009	0
13	13	7	-2.309462628	0.020917923	0
14	14	95	-0.488555647	0.625156322	0
15	15	36	-1.000759196	0.316943254	0
16	16	14	-1.536574737	0.124397483	0
17	17	9	-1.748779115	0.080329208	0
18	18	3	-2.169907147	0.030013881	0
19	19	18	-1.969543232	0.048890743	0
20	20	36	-1.969543232	0.048890743	0
21	21	101	-1.980690358	0.047626009	0
22	22	17	-0.168565983	0.866138039	0
23	23	25	-1.991020918	0.046478588	0
24	24	100	1.073587112	0.283007793	0
25	25	13	-0.273304216	0.784619375	0
26	26	48	-1.969543232	0.048890743	0
27	27	24	-0.691751392	0.489093472	0
28	28	98	1.760315867	0.078354265	0
29	29	75	1.956158042	0.050446539	0
30	30	75	1.956158042	0.050446539	0
31	31	5	-1.334242615	0.182124358	0
32	32	9	-3.082350519	0.002053728	-1
33	33	2	-1.767439957	0.077154576	0
34	34	2	-1.980690358	0.047626009	0
35	35	26	-1.886389024	0.059242551	0

APPENDIX M

Notes

Output Created			01-Jun-2016 14:09:01
Comments			
Input	Data		C:\Users\Law\Documents\Stats and GIS\MASTER Makgabeng Motifs_1.sav
	Active Dataset		DataSet1
	Filter		<none>
	Weight		<none>
	Split File		<none>
	N of Rows in Working Data File		1210
	Matrix Input		C:\Users\LawPinto\AppData\Local\Temp\spss13256\spssclus.tmp
Missing Value Handling	Definition of Missing		User-defined missing values are treated as missing.
	Cases Used		Statistics are based on cases with no missing values for any variable used.
Syntax			CLUSTER /MATRIX IN('C:\Users\LawPinto\AppData\Local\Temp\spss13256\spssclus.tmp') /METHOD WARD /PRINT SCHEDULE /PLOT DENDROGRAM VICICLE /SAVE CLUSTER(9).
Resources	Processor Time		0:00:08.265
	Elapsed Time		0:00:08.484
Variables Created or Modified	Cluster Membership	CLU9_1	Ward Method

```
[DataSet1] C:\Users\Law\Documents\Stats and GIS\MASTER Makgabeng
Motifs_1.sav
```

Ward Linkage

Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	1208	1209	.000	0	0	2
2	1207	1208	.000	0	1	1160
3	1205	1206	.000	0	0	4
4	694	1205	.000	0	3	6
5	1203	1204	.000	0	0	6
6	694	1203	.000	4	5	8
7	1201	1202	.000	0	0	8
8	694	1201	.000	6	7	10
9	1199	1200	.000	0	0	10
10	694	1199	.000	8	9	17
11	1196	1198	.000	0	0	13
12	1192	1197	.000	0	0	17
13	792	1196	.000	0	11	1113
14	1194	1195	.000	0	0	15
15	704	1194	.000	0	14	19
16	1190	1193	.000	0	0	19
17	694	1192	.000	10	12	21
18	1134	1191	.000	0	0	75
19	704	1190	.000	15	16	24
20	1188	1189	.000	0	0	21
21	694	1188	.000	17	20	28
22	1181	1187	.000	0	0	28
23	1185	1186	.000	0	0	24
24	704	1185	.000	19	23	26
25	1183	1184	.000	0	0	26
26	704	1183	.000	24	25	206
27	1162	1182	.000	0	0	47
28	694	1181	.000	21	22	30
29	1179	1180	.000	0	0	30
30	694	1179	.000	28	29	33
31	1176	1178	.000	0	0	33
32	1132	1177	.000	0	0	77

33	694	1176	.000	30	31	35
34	1174	1175	.000	0	0	35
35	694	1174	.000	33	34	37
36	1172	1173	.000	0	0	37
37	694	1172	.000	35	36	39
38	1170	1171	.000	0	0	39
39	694	1170	.000	37	38	42
40	1167	1169	.000	0	0	42
41	1151	1168	.000	0	0	58
42	694	1167	.000	39	40	44
43	1165	1166	.000	0	0	44
44	694	1165	.000	42	43	46
45	1163	1164	.000	0	0	46
46	694	1163	.000	44	45	67
47	710	1162	.000	0	27	49
48	1160	1161	.000	0	0	49
49	710	1160	.000	47	48	52
50	1142	1159	.000	0	0	67
51	1157	1158	.000	0	0	52
52	710	1157	.000	49	51	54
53	1155	1156	.000	0	0	54
54	710	1155	.000	52	53	56
55	1153	1154	.000	0	0	56
56	710	1153	.000	54	55	68
57	1141	1152	.000	0	0	68
58	696	1151	.000	0	41	60
59	1149	1150	.000	0	0	60
60	696	1149	.000	58	59	62
61	1147	1148	.000	0	0	62
62	696	1147	.000	60	61	64
63	1145	1146	.000	0	0	64
64	696	1145	.000	62	63	66
65	1143	1144	.000	0	0	66
66	696	1143	.000	64	65	283
67	694	1142	.000	46	50	70

68	710	1141	.000	56	57	126
69	1139	1140	.000	0	0	70
70	694	1139	.000	67	69	72
71	1137	1138	.000	0	0	72
72	694	1137	.000	70	71	78
73	1083	1136	.000	0	0	126
74	1131	1135	.000	0	0	78
75	793	1134	.000	0	18	124
76	1050	1133	.000	0	0	1106
77	780	1132	.000	0	32	151
78	694	1131	.000	72	74	80
79	1129	1130	.000	0	0	80
80	694	1129	.000	78	79	82
81	1127	1128	.000	0	0	82
82	694	1127	.000	80	81	84
83	1125	1126	.000	0	0	84
84	694	1125	.000	82	83	86
85	1123	1124	.000	0	0	86
86	694	1123	.000	84	85	88
87	1121	1122	.000	0	0	88
88	694	1121	.000	86	87	90
89	1119	1120	.000	0	0	90
90	694	1119	.000	88	89	92
91	1117	1118	.000	0	0	92
92	694	1117	.000	90	91	94
93	1115	1116	.000	0	0	94
94	694	1115	.000	92	93	96
95	1113	1114	.000	0	0	96
96	694	1113	.000	94	95	98
97	1111	1112	.000	0	0	98
98	694	1111	.000	96	97	100
99	1109	1110	.000	0	0	100
100	694	1109	.000	98	99	102
101	1107	1108	.000	0	0	102
102	694	1107	.000	100	101	104

103	1105	1106	.000	0	0	104
104	694	1105	.000	102	103	109
105	1100	1104	.000	0	0	109
106	1085	1103	.000	0	0	124
107	1101	1102	.000	0	0	108
108	928	1101	.000	0	107	180
109	694	1100	.000	104	105	111
110	1098	1099	.000	0	0	111
111	694	1098	.000	109	110	113
112	1096	1097	.000	0	0	113
113	694	1096	.000	111	112	115
114	1094	1095	.000	0	0	115
115	694	1094	.000	113	114	117
116	1092	1093	.000	0	0	117
117	694	1092	.000	115	116	119
118	1090	1091	.000	0	0	119
119	694	1090	.000	117	118	122
120	1058	1089	.000	0	0	151
121	1087	1088	.000	0	0	122
122	694	1087	.000	119	121	125
123	1084	1086	.000	0	0	125
124	793	1085	.000	75	106	133
125	694	1084	.000	122	123	131
126	710	1083	.000	68	73	128
127	1081	1082	.000	0	0	128
128	710	1081	.000	126	127	208
129	1076	1080	.000	0	0	133
130	1078	1079	.000	0	0	131
131	694	1078	.000	125	130	134
132	1075	1077	.000	0	0	134
133	793	1076	.000	124	129	144
134	694	1075	.000	131	132	136
135	1073	1074	.000	0	0	136
136	694	1073	.000	134	135	139
137	1065	1072	.000	0	0	144

138	1070	1071	.000	0	0	139
139	694	1070	.000	136	138	141
140	1068	1069	.000	0	0	141
141	694	1068	.000	139	140	143
142	1066	1067	.000	0	0	143
143	694	1066	.000	141	142	148
144	793	1065	.000	133	137	146
145	1063	1064	.000	0	0	146
146	793	1063	.000	144	145	164
147	1061	1062	.000	0	0	148
148	694	1061	.000	143	147	150
149	1059	1060	.000	0	0	150
150	694	1059	.000	148	149	157
151	780	1058	.000	77	120	153
152	1056	1057	.000	0	0	153
153	780	1056	.000	151	152	207
154	1000	1055	.000	0	0	207
155	1052	1054	.000	0	0	157
156	1001	1053	.000	0	0	206
157	694	1052	.000	150	155	159
158	1049	1051	.000	0	0	159
159	694	1049	.000	157	158	162
160	1044	1048	.000	0	0	164
161	1046	1047	.000	0	0	162
162	694	1046	.000	159	161	165
163	1043	1045	.000	0	0	165
164	793	1044	.000	146	160	237
165	694	1043	.000	162	163	167
166	1041	1042	.000	0	0	167
167	694	1041	.000	165	166	169
168	1039	1040	.000	0	0	169
169	694	1039	.000	167	168	171
170	1037	1038	.000	0	0	171
171	694	1037	.000	169	170	173
172	1035	1036	.000	0	0	173

173	694	1035	.000	171	172	176
174	1028	1034	.000	0	0	180
175	1032	1033	.000	0	0	176
176	694	1032	.000	173	175	178
177	1030	1031	.000	0	0	178
178	694	1030	.000	176	177	184
179	1026	1029	.000	0	0	182
180	928	1028	.000	108	174	263
181	944	1027	.000	0	0	263
182	1014	1026	.000	0	179	191
183	1024	1025	.000	0	0	184
184	694	1024	.000	178	183	186
185	1022	1023	.000	0	0	186
186	694	1022	.000	184	185	188
187	1020	1021	.000	0	0	188
188	694	1020	.000	186	187	190
189	1018	1019	.000	0	0	190
190	694	1018	.000	188	189	193
191	1014	1017	.000	182	0	1121
192	1015	1016	.000	0	0	193
193	694	1015	.000	190	192	196
194	999	1013	.000	0	0	208
195	1011	1012	.000	0	0	196
196	694	1011	.000	193	195	198
197	1009	1010	.000	0	0	198
198	694	1009	.000	196	197	200
199	1007	1008	.000	0	0	200
200	694	1007	.000	198	199	202
201	1005	1006	.000	0	0	202
202	694	1005	.000	200	201	204
203	1003	1004	.000	0	0	204
204	694	1003	.000	202	203	211
205	996	1002	.000	0	0	211
206	704	1001	.000	26	156	254
207	780	1000	.000	153	154	252

208	710	999	.000	128	194	215
209	992	998	.000	0	0	215
210	953	997	.000	0	0	254
211	694	996	.000	204	205	213
212	994	995	.000	0	0	213
213	694	994	.000	211	212	216
214	991	993	.000	0	0	216
215	710	992	.000	208	209	234
216	694	991	.000	213	214	218
217	989	990	.000	0	0	218
218	694	989	.000	216	217	220
219	987	988	.000	0	0	220
220	694	987	.000	218	219	222
221	985	986	.000	0	0	222
222	694	985	.000	220	221	224
223	983	984	.000	0	0	224
224	694	983	.000	222	223	226
225	981	982	.000	0	0	226
226	694	981	.000	224	225	228
227	979	980	.000	0	0	228
228	694	979	.000	226	227	233
229	974	978	.000	0	0	233
230	894	977	.000	0	0	309
231	833	976	.000	0	0	369
232	973	975	.000	0	0	234
233	694	974	.000	228	229	241
234	710	973	.000	215	232	288
235	966	972	.000	0	0	241
236	970	971	.000	0	0	237
237	793	970	.000	164	236	239
238	968	969	.000	0	0	239
239	793	968	.000	237	238	267
240	940	967	.000	0	0	267
241	694	966	.000	233	235	243
242	964	965	.000	0	0	243

243	694	964	.000	241	242	245
244	962	963	.000	0	0	245
245	694	962	.000	243	244	247
246	960	961	.000	0	0	247
247	694	960	.000	245	246	249
248	958	959	.000	0	0	249
249	694	958	.000	247	248	255
250	952	957	.000	0	0	255
251	955	956	.000	0	0	252
252	780	955	.000	207	251	341
253	861	954	.000	0	0	341
254	704	953	.000	206	210	280
255	694	952	.000	249	250	257
256	950	951	.000	0	0	257
257	694	950	.000	255	256	259
258	948	949	.000	0	0	259
259	694	948	.000	257	258	261
260	946	947	.000	0	0	261
261	694	946	.000	259	260	269
262	938	945	.000	0	0	269
263	928	944	.000	180	181	265
264	942	943	.000	0	0	265
265	928	942	.000	263	264	271
266	936	941	.000	0	0	271
267	793	940	.000	239	240	272
268	935	939	.000	0	0	272
269	694	938	.000	261	262	275
270	932	937	.000	0	0	275
271	928	936	.000	265	266	274
272	793	935	.000	267	268	295
273	933	934	.000	0	0	274
274	928	933	.000	271	273	277
275	694	932	.000	269	270	291
276	917	931	.000	0	0	288
277	928	930	.000	274	0	1137

278	908	927	.000	0	0	295
279	925	926	.000	0	0	280
280	704	925	.000	254	279	284
281	921	924	.000	0	0	284
282	922	923	.000	0	0	283
283	696	922	.000	66	282	320
284	704	921	.000	280	281	286
285	919	920	.000	0	0	286
286	704	919	.000	284	285	292
287	883	918	.000	0	0	320
288	710	917	.000	234	276	331
289	911	914	.000	0	0	292
290	912	913	.000	0	0	291
291	694	912	.000	275	290	298
292	704	911	.000	286	289	337
293	866	910	.000	0	0	337
294	905	909	.000	0	0	298
295	793	908	.000	272	278	297
296	906	907	.000	0	0	297
297	793	906	.000	295	296	304
298	694	905	.000	291	294	300
299	903	904	.000	0	0	300
300	694	903	.000	298	299	303
301	899	902	.000	0	0	304
302	900	901	.000	0	0	303
303	694	900	.000	300	302	306
304	793	899	.000	297	301	311
305	897	898	.000	0	0	306
306	694	897	.000	303	305	318
307	885	896	.000	0	0	318
308	892	895	.000	0	0	311
309	688	894	.000	0	230	406
310	790	893	.000	0	0	406
311	793	892	.000	304	308	313
312	890	891	.000	0	0	313

313	793	890	.000	311	312	315
314	888	889	.000	0	0	315
315	793	888	.000	313	314	317
316	886	887	.000	0	0	317
317	793	886	.000	315	316	392
318	694	885	.000	306	307	323
319	880	884	.000	0	0	323
320	696	883	.000	283	287	322
321	881	882	.000	0	0	322
322	696	881	.000	320	321	472
323	694	880	.000	318	319	325
324	878	879	.000	0	0	325
325	694	878	.000	323	324	327
326	876	877	.000	0	0	327
327	694	876	.000	325	326	330
328	873	875	.000	0	0	330
329	872	874	.000	0	0	331
330	694	873	.000	327	328	334
331	710	872	.000	288	329	352
332	869	871	.000	0	0	334
333	850	870	.000	0	0	352
334	694	869	.000	330	332	336
335	867	868	.000	0	0	336
336	694	867	.000	334	335	340
337	704	866	.000	292	293	385
338	817	865	.000	0	0	385
339	862	863	.000	0	0	340
340	694	862	.000	336	339	351
341	780	861	.000	252	253	344
342	851	860	.000	0	0	351
343	858	859	.000	0	0	344
344	780	858	.000	341	343	346
345	856	857	.000	0	0	346
346	780	856	.000	344	345	348
347	854	855	.000	0	0	348

348	780	854	.000	346	347	350
349	852	853	.000	0	0	350
350	780	852	.000	348	349	355
351	694	851	.000	340	342	367
352	710	850	.000	331	333	416
353	835	849	.000	0	0	367
354	847	848	.000	0	0	355
355	780	847	.000	350	354	357
356	845	846	.000	0	0	357
357	780	845	.000	355	356	359
358	843	844	.000	0	0	359
359	780	843	.000	357	358	361
360	841	842	.000	0	0	361
361	780	841	.000	359	360	363
362	839	840	.000	0	0	363
363	780	839	.000	361	362	365
364	837	838	.000	0	0	365
365	780	837	.000	363	364	368
366	834	836	.000	0	0	368
367	694	835	.000	351	353	375
368	780	834	.000	365	366	371
369	797	833	.000	0	231	1156
370	831	832	.000	0	0	371
371	780	831	.000	368	370	373
372	829	830	.000	0	0	373
373	780	829	.000	371	372	1137
374	827	828	.000	0	0	375
375	694	827	.000	367	374	377
376	825	826	.000	0	0	377
377	694	825	.000	375	376	379
378	823	824	.000	0	0	379
379	694	823	.000	377	378	381
380	821	822	.000	0	0	381
381	694	821	.000	379	380	383
382	819	820	.000	0	0	383

383	694	819	.000	381	382	386
384	816	818	.000	0	0	386
385	704	817	.000	337	338	426
386	694	816	.000	383	384	389
387	810	815	.000	0	0	392
388	813	814	.000	0	0	389
389	694	813	.000	386	388	391
390	811	812	.000	0	0	391
391	694	811	.000	389	390	399
392	793	810	.000	317	387	394
393	808	809	.000	0	0	394
394	793	808	.000	392	393	398
395	802	807	.000	0	0	399
396	805	806	.000	0	0	1115
397	768	804	.000	0	0	426
398	793	803	.000	394	0	1157
399	694	802	.000	391	395	401
400	800	801	.000	0	0	401
401	694	800	.000	399	400	404
402	779	798	.000	0	0	416
403	795	796	.000	0	0	404
404	694	795	.000	401	403	407
405	789	794	.000	0	0	407
406	688	790	.000	309	310	429
407	694	789	.000	404	405	409
408	787	788	.000	0	0	409
409	694	787	.000	407	408	411
410	785	786	.000	0	0	411
411	694	785	.000	409	410	413
412	783	784	.000	0	0	413
413	694	783	.000	411	412	415
414	781	782	.000	0	0	415
415	694	781	.000	413	414	420
416	710	779	.000	352	402	462
417	730	778	.000	0	0	462

418	774	777	.000	0	0	421
419	775	776	.000	0	0	420
420	694	775	.000	415	419	424
421	772	774	.000	0	418	422
422	772	773	.000	421	0	1106
423	770	771	.000	0	0	424
424	694	770	.000	420	423	427
425	767	769	.000	0	0	427
426	704	768	.000	385	397	441
427	694	767	.000	424	425	444
428	765	766	.000	0	0	429
429	688	765	.000	406	428	431
430	763	764	.000	0	0	431
431	688	763	.000	429	430	433
432	761	762	.000	0	0	433
433	688	761	.000	431	432	435
434	759	760	.000	0	0	435
435	688	759	.000	433	434	437
436	757	758	.000	0	0	437
437	688	757	.000	435	436	443
438	749	756	.000	0	0	444
439	751	755	.000	0	0	443
440	753	754	.000	0	0	441
441	704	753	.000	426	440	448
442	745	752	.000	0	0	448
443	688	751	.000	437	439	494
444	694	749	.000	427	438	446
445	747	748	.000	0	0	446
446	694	747	.000	444	445	449
447	744	746	.000	0	0	449
448	704	745	.000	441	442	485
449	694	744	.000	446	447	451
450	742	743	.000	0	0	451
451	694	742	.000	449	450	453
452	740	741	.000	0	0	453

453	694	740	.000	451	452	455
454	737	739	.000	0	0	455
455	694	737	.000	453	454	457
456	735	736	.000	0	0	457
457	694	735	.000	455	456	459
458	733	734	.000	0	0	459
459	694	733	.000	457	458	461
460	731	732	.000	0	0	461
461	694	731	.000	459	460	464
462	710	730	.000	416	417	1139
463	728	729	.000	0	0	464
464	694	728	.000	461	463	466
465	726	727	.000	0	0	466
466	694	726	.000	464	465	468
467	724	725	.000	0	0	468
468	694	724	.000	466	467	473
469	721	723	.000	0	0	1114
470	718	722	.000	0	0	473
471	719	720	.000	0	0	472
472	696	719	.000	322	471	1121
473	694	718	.000	468	470	475
474	716	717	.000	0	0	475
475	694	716	.000	473	474	477
476	714	715	.000	0	0	477
477	694	714	.000	475	476	479
478	712	713	.000	0	0	479
479	694	712	.000	477	478	481
480	709	711	.000	0	0	481
481	694	709	.000	479	480	484
482	705	708	.000	0	0	485
483	706	707	.000	0	0	484
484	694	706	.000	481	483	487
485	704	705	.000	448	482	1109
486	702	703	.000	0	0	487
487	694	702	.000	484	486	489

488	700	701	.000	0	0	489
489	694	700	.000	487	488	492
490	698	699	.000	0	0	491
491	697	698	.000	0	490	1118
492	694	695	.000	489	0	1130
493	690	692	.000	0	0	1109
494	688	689	.000	443	0	1113
495	684	685	.000	0	0	496
496	247	684	.000	0	495	512
497	668	683	.000	0	0	512
498	624	682	.000	0	0	555
499	678	681	.000	0	0	502
500	450	680	.000	0	0	715
501	670	679	.000	0	0	510
502	280	678	.000	0	499	538
503	676	677	.000	0	0	504
504	293	676	.000	0	503	506
505	674	675	.000	0	0	506
506	293	674	.000	504	505	508
507	672	673	.000	0	0	508
508	293	672	.000	506	507	511
509	669	671	.000	0	0	511
510	242	670	.000	0	501	518
511	293	669	.000	508	509	521
512	247	668	.000	496	497	514
513	666	667	.000	0	0	514
514	247	666	.000	512	513	523
515	657	665	.000	0	0	523
516	662	664	.000	0	0	518
517	637	663	.000	0	0	543
518	242	662	.000	510	516	530
519	466	661	.000	0	0	700
520	659	660	.000	0	0	521
521	293	659	.000	511	520	531
522	649	658	.000	0	0	531

523	247	657	.000	514	515	525
524	655	656	.000	0	0	525
525	247	655	.000	523	524	532
526	648	654	.000	0	0	532
527	545	653	.000	0	0	1175
528	462	652	.000	0	0	704
529	650	651	.000	0	0	530
530	242	650	.000	518	529	562
531	293	649	.000	521	522	541
532	247	648	.000	525	526	535
533	617	647	.000	0	0	562
534	645	646	.000	0	0	535
535	247	645	.000	532	534	544
536	636	644	.000	0	0	544
537	642	643	.000	0	0	538
538	280	642	.000	502	537	569
539	359	641	.000	0	0	803
540	639	640	.000	0	0	541
541	293	639	.000	531	540	561
542	635	638	.000	0	0	545
543	275	637	.000	0	517	579
544	247	636	.000	535	536	553
545	246	635	.000	0	542	547
546	633	634	.000	0	0	547
547	246	633	.000	545	546	550
548	618	632	.000	0	0	561
549	630	631	.000	0	0	550
550	246	630	.000	547	549	760
551	404	629	.000	0	0	760
552	626	627	.000	0	0	553
553	247	626	.000	544	552	556
554	623	625	.000	0	0	556
555	495	624	.000	0	498	672
556	247	623	.000	553	554	558
557	621	622	.000	0	0	558

558	247	621	.000	556	557	565
559	609	620	.000	0	0	569
560	249	619	.000	0	0	898
561	293	618	.000	541	548	602
562	242	617	.000	530	533	577
563	614	616	.000	0	0	565
564	601	615	.000	0	0	577
565	247	614	.000	558	563	567
566	612	613	.000	0	0	567
567	247	612	.000	565	566	570
568	608	611	.000	0	0	570
569	280	609	.000	538	559	574
570	247	608	.000	567	568	572
571	606	607	.000	0	0	572
572	247	606	.000	570	571	580
573	604	605	.000	0	0	574
574	280	604	.000	569	573	581
575	597	603	.000	0	0	581
576	598	602	.000	0	0	580
577	242	601	.000	562	564	583
578	599	600	.000	0	0	579
579	275	599	.000	543	578	600
580	247	598	.000	572	576	587
581	280	597	.000	574	575	589
582	595	596	.000	0	0	583
583	242	595	.000	577	582	646
584	591	594	.000	0	0	587
585	575	593	.000	0	0	602
586	589	592	.000	0	0	589
587	247	591	.000	580	584	593
588	585	590	.000	0	0	593
589	280	589	.000	581	586	591
590	587	588	.000	0	0	591
591	280	587	.000	589	590	595
592	583	586	.000	0	0	595

593	247	585	.000	587	588	596
594	582	584	.000	0	0	596
595	280	583	.000	591	592	598
596	247	582	.000	593	594	614
597	580	581	.000	0	0	598
598	280	580	.000	595	597	604
599	578	579	.000	0	0	600
600	275	578	.000	579	599	626
601	573	576	.000	0	0	604
602	293	575	.000	561	585	608
603	569	574	.000	0	0	608
604	280	573	.000	598	601	606
605	571	572	.000	0	0	606
606	280	571	.000	604	605	609
607	568	570	.000	0	0	609
608	293	569	.000	602	603	630
609	280	568	.000	606	607	652
610	560	565	.000	0	0	614
611	563	564	.000	0	0	612
612	562	563	.000	0	611	1140
613	516	561	.000	0	0	652
614	247	560	.000	596	610	618
615	540	559	.000	0	0	630
616	544	558	.000	0	0	626
617	556	557	.000	0	0	618
618	247	556	.000	614	617	620
619	554	555	.000	0	0	620
620	247	554	.000	618	619	624
621	549	553	.000	0	0	624
622	550	552	.000	0	0	623
623	548	550	.000	0	622	1117
624	247	549	.000	620	621	627
625	543	546	.000	0	0	627
626	275	544	.000	600	616	699
627	247	543	.000	624	625	629

628	541	542	.000	0	0	629
629	247	541	.000	627	628	641
630	293	540	.000	608	615	633
631	538	539	.000	0	0	1116
632	536	537	.000	0	0	633
633	293	536	.000	630	632	635
634	534	535	.000	0	0	635
635	293	534	.000	633	634	637
636	532	533	.000	0	0	637
637	293	532	.000	635	636	670
638	528	531	.000	0	0	641
639	498	530	.000	0	0	670
640	522	529	.000	0	0	646
641	247	528	.000	629	638	643
642	525	526	.000	0	0	643
643	247	525	.000	641	642	645
644	523	524	.000	0	0	645
645	247	523	.000	643	644	648
646	242	522	.000	583	640	750
647	520	521	.000	0	0	648
648	247	520	.000	645	647	651
649	517	519	.000	0	0	651
650	467	518	.000	0	0	699
651	247	517	.000	648	649	654
652	280	516	.000	609	613	656
653	514	515	.000	0	0	654
654	247	514	.000	651	653	660
655	512	513	.000	0	0	656
656	280	512	.000	652	655	659
657	509	511	.000	0	0	659
658	508	510	.000	0	0	660
659	280	509	.000	656	657	662
660	247	508	.000	654	658	666
661	506	507	.000	0	0	662
662	280	506	.000	659	661	697

663	469	505	.000	0	0	697
664	415	504	.000	0	0	750
665	502	503	.000	0	0	666
666	247	502	.000	660	665	668
667	500	501	.000	0	0	668
668	247	500	.000	666	667	673
669	494	499	.000	0	0	673
670	293	498	.000	637	639	677
671	490	497	.000	0	0	677
672	495	496	.000	555	0	1122
673	247	494	.000	668	669	675
674	492	493	.000	0	0	675
675	247	492	.000	673	674	679
676	376	491	.000	0	0	788
677	293	490	.000	670	671	683
678	488	489	.000	0	0	679
679	247	488	.000	675	678	684
680	483	487	.000	0	0	683
681	482	486	.000	0	0	684
682	484	485	.000	0	0	1149
683	293	483	.000	677	680	691
684	247	482	.000	679	681	686
685	480	481	.000	0	0	686
686	247	480	.000	684	685	688
687	478	479	.000	0	0	688
688	247	478	.000	686	687	692
689	474	477	.000	0	0	692
690	475	476	.000	0	0	691
691	293	475	.000	683	690	695
692	247	474	.000	688	689	710
693	287	473	.000	0	0	868
694	471	472	.000	0	0	695
695	293	471	.000	691	694	698
696	468	470	.000	0	0	698
697	280	469	.000	662	663	782

698	293	468	.000	695	696	702
699	275	467	.000	626	650	718
700	407	466	.000	0	519	1108
701	464	465	.000	0	0	702
702	293	464	.000	698	701	706
703	459	463	.000	0	0	706
704	252	462	.000	0	528	773
705	455	461	.000	0	0	710
706	293	459	.000	702	703	708
707	457	458	.000	0	0	708
708	293	457	.000	706	707	729
709	391	456	.000	0	0	773
710	247	455	.000	692	705	712
711	453	454	.000	0	0	712
712	247	453	.000	710	711	721
713	447	452	.000	0	0	718
714	436	451	.000	0	0	729
715	337	450	.000	0	500	817
716	382	449	.000	0	0	782
717	444	448	.000	0	0	721
718	275	447	.000	699	713	720
719	445	446	.000	0	0	720
720	275	445	.000	718	719	723
721	247	444	.000	712	717	726
722	442	443	.000	0	0	723
723	275	442	.000	720	722	727
724	438	441	.000	0	0	727
725	439	440	.000	0	0	726
726	247	439	.000	721	725	762
727	275	438	.000	723	724	730
728	435	437	.000	0	0	730
729	293	436	.000	708	714	746
730	275	435	.000	727	728	732
731	433	434	.000	0	0	732
732	275	433	.000	730	731	734

733	431	432	.000	0	0	734
734	275	431	.000	732	733	736
735	429	430	.000	0	0	736
736	275	429	.000	734	735	738
737	427	428	.000	0	0	738
738	275	427	.000	736	737	740
739	425	426	.000	0	0	740
740	275	425	.000	738	739	742
741	423	424	.000	0	0	742
742	275	423	.000	740	741	745
743	420	422	.000	0	0	745
744	419	421	.000	0	0	746
745	275	420	.000	742	743	751
746	293	419	.000	729	744	752
747	414	418	.000	0	0	751
748	413	417	.000	0	0	752
749	402	416	.000	0	0	762
750	242	415	.000	646	664	797
751	275	414	.000	745	747	761
752	293	413	.000	746	748	755
753	403	412	.000	0	0	761
754	410	411	.000	0	0	755
755	293	410	.000	752	754	757
756	408	409	.000	0	0	757
757	293	408	.000	755	756	759
758	405	406	.000	0	0	759
759	293	405	.000	757	758	784
760	246	404	.000	550	551	1124
761	275	403	.000	751	753	812
762	247	402	.000	726	749	764
763	400	401	.000	0	0	764
764	247	400	.000	762	763	766
765	398	399	.000	0	0	766
766	247	398	.000	764	765	768
767	396	397	.000	0	0	768

768	247	396	.000	766	767	770
769	394	395	.000	0	0	770
770	247	394	.000	768	769	774
771	390	393	.000	0	0	774
772	380	392	.000	0	0	784
773	252	391	.000	704	709	894
774	247	390	.000	770	771	776
775	388	389	.000	0	0	776
776	247	388	.000	774	775	778
777	386	387	.000	0	0	778
778	247	386	.000	776	777	790
779	366	385	.000	0	0	797
780	383	384	.000	0	0	781
781	371	383	.000	0	780	1141
782	280	382	.000	697	716	798
783	365	381	.000	0	0	798
784	293	380	.000	759	772	786
785	378	379	.000	0	0	786
786	293	378	.000	784	785	794
787	374	377	.000	0	0	790
788	267	376	.000	0	676	809
789	351	375	.000	0	0	809
790	247	374	.000	778	787	792
791	372	373	.000	0	0	792
792	247	372	.000	790	791	801
793	369	370	.000	0	0	794
794	293	369	.000	786	793	796
795	367	368	.000	0	0	796
796	293	367	.000	794	795	802
797	242	366	.000	750	779	837
798	280	365	.000	782	783	1155
799	361	363	.000	0	0	801
800	360	362	.000	0	0	802
801	247	361	.000	792	799	805
802	293	360	.000	796	800	831

803	358	359	.000	0	539	1119
804	355	356	.000	0	0	805
805	247	355	.000	801	804	807
806	353	354	.000	0	0	807
807	247	353	.000	805	806	832
808	325	352	.000	0	0	832
809	267	351	.000	788	789	839
810	317	350	.000	0	0	839
811	347	348	.000	0	0	812
812	275	347	.000	761	811	815
813	344	346	.000	0	0	815
814	342	345	.000	0	0	817
815	275	344	.000	812	813	821
816	338	343	.000	0	0	821
817	337	342	.000	715	814	819
818	340	341	.000	0	0	819
819	337	340	.000	817	818	820
820	337	339	.000	819	0	1123
821	275	338	.000	815	816	823
822	335	336	.000	0	0	823
823	275	335	.000	821	822	825
824	333	334	.000	0	0	825
825	275	333	.000	823	824	829
826	328	332	.000	0	0	829
827	330	331	.000	0	0	828
828	329	330	.000	0	827	1183
829	275	328	.000	825	826	1188
830	326	327	.000	0	0	831
831	293	326	.000	802	830	846
832	247	325	.000	807	808	838
833	310	323	.000	0	0	846
834	281	322	.000	0	0	1144
835	319	321	.000	0	0	837
836	318	320	.000	0	0	838
837	242	319	.000	797	835	858

838	247	318	.000	832	836	857
839	267	317	.000	809	810	842
840	298	316	.000	0	0	858
841	314	315	.000	0	0	842
842	267	314	.000	839	841	844
843	312	313	.000	0	0	844
844	267	312	.000	842	843	847
845	309	311	.000	0	0	847
846	293	310	.000	831	833	853
847	267	309	.000	844	845	849
848	307	308	.000	0	0	849
849	267	307	.000	847	848	851
850	305	306	.000	0	0	851
851	267	305	.000	849	850	854
852	302	304	.000	0	0	854
853	293	303	.000	846	0	1110
854	267	302	.000	851	852	884
855	268	301	.000	0	0	884
856	299	300	.000	0	0	857
857	247	299	.000	838	856	860
858	242	298	.000	837	840	867
859	296	297	.000	0	0	860
860	247	296	.000	857	859	862
861	294	295	.000	0	0	862
862	247	294	.000	860	861	864
863	291	292	.000	0	0	864
864	247	291	.000	862	863	871
865	288	290	.000	0	0	867
866	284	289	.000	0	0	871
867	242	288	.000	858	865	870
868	250	287	.000	0	693	883
869	285	286	.000	0	0	870
870	242	285	.000	867	869	887
871	247	284	.000	864	866	873
872	282	283	.000	0	0	873

873	247	282	.000	871	872	875
874	278	279	.000	0	0	875
875	247	278	.000	873	874	877
876	276	277	.000	0	0	877
877	247	276	.000	875	876	879
878	273	274	.000	0	0	879
879	247	273	.000	877	878	881
880	271	272	.000	0	0	881
881	247	271	.000	879	880	885
882	266	270	.000	0	0	885
883	250	269	.000	868	0	1108
884	267	268	.000	854	855	1122
885	247	266	.000	881	882	896
886	262	265	.000	0	0	887
887	242	262	.000	870	886	889
888	260	261	.000	0	0	889
889	242	260	.000	887	888	891
890	258	259	.000	0	0	891
891	242	258	.000	889	890	899
892	248	257	.000	0	0	899
893	255	256	.000	0	0	894
894	252	255	.000	773	893	895
895	252	254	.000	894	0	1103
896	247	253	.000	885	0	1129
897	245	251	.000	0	0	1110
898	243	249	.000	0	560	1164
899	242	248	.000	891	892	900
900	242	244	.000	899	0	1164
901	239	241	.000	0	0	1132
902	235	236	.000	0	0	1179
903	228	234	.000	0	0	908
904	232	233	.000	0	0	905
905	229	232	.000	0	904	907
906	230	231	.000	0	0	907
907	229	230	.000	905	906	1135

908	226	228	.000	0	903	909
909	226	227	.000	908	0	1135
910	201	224	.000	0	0	1169
911	222	223	.000	0	0	912
912	146	222	.000	0	911	915
913	162	221	.000	0	0	961
914	219	220	.000	0	0	915
915	146	219	.000	912	914	920
916	216	218	.000	0	0	918
917	214	217	.000	0	0	920
918	116	216	.000	0	916	922
919	189	215	.000	0	0	941
920	146	214	.000	915	917	931
921	212	213	.000	0	0	922
922	116	212	.000	918	921	924
923	210	211	.000	0	0	924
924	116	210	.000	922	923	929
925	206	209	.000	0	0	928
926	200	208	.000	0	0	931
927	205	207	.000	0	0	929
928	169	206	.000	0	925	1127
929	116	205	.000	924	927	937
930	203	204	.000	0	0	1151
931	146	200	.000	920	926	939
932	198	199	.000	0	0	933
933	165	198	.000	0	932	936
934	193	197	.000	0	0	937
935	194	196	.000	0	0	936
936	165	194	.000	933	935	958
937	116	193	.000	929	934	944
938	191	192	.000	0	0	939
939	146	191	.000	931	938	946
940	184	190	.000	0	0	944
941	114	189	.000	0	919	970
942	181	188	.000	0	0	946

943	186	187	.000	0	0	1127
944	116	184	.000	937	940	948
945	179	182	.000	0	0	948
946	146	181	.000	939	942	971
947	166	180	.000	0	0	958
948	116	179	.000	944	945	950
949	177	178	.000	0	0	950
950	116	177	.000	948	949	952
951	175	176	.000	0	0	952
952	116	175	.000	950	951	954
953	173	174	.000	0	0	954
954	116	173	.000	952	953	956
955	171	172	.000	0	0	956
956	116	171	.000	954	955	962
957	161	170	.000	0	0	962
958	165	166	.000	936	947	1131
959	159	164	.000	0	0	1112
960	152	163	.000	0	0	970
961	145	162	.000	0	913	1171
962	116	161	.000	956	957	964
963	158	160	.000	0	0	964
964	116	158	.000	962	963	967
965	155	157	.000	0	0	967
966	150	156	.000	0	0	971
967	116	155	.000	964	965	969
968	153	154	.000	0	0	969
969	116	153	.000	967	968	976
970	114	152	.000	941	960	972
971	146	150	.000	946	966	973
972	114	149	.000	970	0	1136
973	146	148	.000	971	0	1120
974	128	147	.000	0	0	988
975	143	144	.000	0	0	976
976	116	143	.000	969	975	978
977	141	142	.000	0	0	978

978	116	141	.000	976	977	980
979	139	140	.000	0	0	980
980	116	139	.000	978	979	982
981	137	138	.000	0	0	982
982	116	137	.000	980	981	984
983	135	136	.000	0	0	984
984	116	135	.000	982	983	991
985	133	134	.000	0	0	1125
986	130	131	.000	0	0	987
987	129	130	.000	0	986	1105
988	126	128	.000	0	974	989
989	126	127	.000	988	0	1120
990	124	125	.000	0	0	991
991	116	124	.000	984	990	993
992	122	123	.000	0	0	993
993	116	122	.000	991	992	996
994	119	121	.000	0	0	996
995	115	120	.000	0	0	1105
996	116	119	.000	993	994	998
997	117	118	.000	0	0	998
998	116	117	.000	996	997	1168
999	111	113	.000	0	0	1001
1000	99	112	.000	0	0	1013
1001	8	111	.000	0	999	1004
1002	108	110	.000	0	0	1004
1003	100	109	.000	0	0	1012
1004	8	108	.000	1001	1002	1028
1005	83	107	.000	0	0	1028
1006	98	106	.000	0	0	1014
1007	104	105	.000	0	0	1008
1008	2	104	.000	0	1007	1010
1009	102	103	.000	0	0	1010
1010	2	102	.000	1008	1009	1066
1011	57	101	.000	0	0	1052
1012	1	100	.000	0	1003	1065

1013	14	99	.000	0	1000	1017
1014	3	98	.000	0	1006	1023
1015	88	96	.000	0	0	1023
1016	94	95	.000	0	0	1017
1017	14	94	.000	1013	1016	1019
1018	92	93	.000	0	0	1019
1019	14	92	.000	1017	1018	1021
1020	90	91	.000	0	0	1021
1021	14	90	.000	1019	1020	1024
1022	87	89	.000	0	0	1024
1023	3	88	.000	1014	1015	1029
1024	14	87	.000	1021	1022	1027
1025	82	86	.000	0	0	1029
1026	84	85	.000	0	0	1027
1027	14	84	.000	1024	1026	1032
1028	8	83	.000	1004	1005	1038
1029	3	82	.000	1023	1025	1046
1030	72	81	.000	0	0	1038
1031	79	80	.000	0	0	1032
1032	14	79	.000	1027	1031	1034
1033	77	78	.000	0	0	1034
1034	14	77	.000	1032	1033	1036
1035	75	76	.000	0	0	1036
1036	14	75	.000	1034	1035	1039
1037	71	73	.000	0	0	1039
1038	8	72	.000	1028	1030	1043
1039	14	71	.000	1036	1037	1042
1040	67	70	.000	0	0	1043
1041	68	69	.000	0	0	1042
1042	14	68	.000	1039	1041	1047
1043	8	67	.000	1038	1040	1081
1044	63	66	.000	0	0	1047
1045	64	65	.000	0	0	1046
1046	3	64	.000	1029	1045	1055
1047	14	63	.000	1042	1044	1050

1048	52	62	.000	0	0	1055
1049	59	61	.000	0	0	1050
1050	14	59	.000	1047	1049	1077
1051	28	58	.000	0	0	1077
1052	53	57	.000	0	1011	1054
1053	54	55	.000	0	0	1054
1054	53	54	.000	1052	1053	1146
1055	3	52	.000	1046	1048	1059
1056	48	51	.000	0	0	1059
1057	40	50	.000	0	0	1066
1058	41	49	.000	0	0	1065
1059	3	48	.000	1055	1056	1061
1060	46	47	.000	0	0	1061
1061	3	46	.000	1059	1060	1064
1062	42	45	.000	0	0	1064
1063	13	44	.000	0	0	1101
1064	3	42	.000	1061	1062	1069
1065	1	41	.000	1012	1058	1075
1066	2	40	.000	1010	1057	1102
1067	24	39	.000	0	0	1081
1068	37	38	.000	0	0	1069
1069	3	37	.000	1064	1068	1071
1070	34	36	.000	0	0	1071
1071	3	34	.000	1069	1070	1091
1072	12	33	.000	0	0	1091
1073	7	32	.000	0	0	1093
1074	30	31	.000	0	0	1075
1075	1	30	.000	1065	1074	1094
1076	5	29	.000	0	0	1094
1077	14	28	.000	1050	1051	1079
1078	26	27	.000	0	0	1079
1079	14	26	.000	1077	1078	1087
1080	18	25	.000	0	0	1087
1081	8	24	.000	1043	1067	1083
1082	22	23	.000	0	0	1083

1083	8	22	.000	1081	1082	1085
1084	20	21	.000	0	0	1085
1085	8	20	.000	1083	1084	1089
1086	16	19	.000	0	0	1089
1087	14	18	.000	1079	1080	1090
1088	15	17	.000	0	0	1090
1089	8	16	.000	1085	1086	1128
1090	14	15	.000	1087	1088	1126
1091	3	12	.000	1071	1072	1153
1092	10	11	.000	0	0	1177
1093	6	7	.000	0	1073	1138
1094	1	5	.000	1075	1076	1095
1095	1	4	.000	1094	0	1153
1096	691	799	.048	0	0	1107
1097	551	567	.097	0	0	1149
1098	263	349	.145	0	0	1123
1099	151	195	.193	0	0	1112
1100	167	185	.242	0	0	1136
1101	13	56	.306	1063	0	1145
1102	2	43	.391	1066	0	1104
1103	252	264	.477	895	0	1117
1104	2	9	.585	1102	0	1161
1105	115	129	.702	995	987	1131
1106	772	1050	.830	422	76	1159
1107	691	929	.975	1096	0	1139
1108	250	407	1.141	883	700	1141
1109	690	704	1.324	493	485	1148
1110	245	293	1.512	897	853	1152
1111	791	916	1.705	0	0	1142
1112	151	159	1.923	1099	959	1134
1113	688	792	2.171	494	13	1148
1114	721	864	2.429	469	0	1154
1115	693	805	2.687	0	396	1142
1116	538	628	2.945	631	0	1151
1117	252	548	3.213	1103	623	1155

1118	697	750	3.503	491	0	1166
1119	358	527	3.793	803	0	1156
1120	126	146	4.103	989	973	1168
1121	696	1014	4.422	472	191	1157
1122	267	495	4.747	884	672	1152
1123	263	337	5.095	1098	820	1166
1124	246	324	5.443	760	0	1144
1125	132	133	5.806	0	985	1184
1126	14	97	6.182	1090	0	1165
1127	169	186	6.647	928	943	1172
1128	8	60	7.164	1089	0	1146
1129	247	364	7.705	896	0	1187
1130	694	738	8.247	492	0	1160
1131	115	165	8.800	1105	958	1174
1132	239	240	9.380	901	0	1143
1133	357	566	10.154	0	0	1169
1134	151	183	10.971	1112	0	1163
1135	226	229	11.830	909	907	1189
1136	114	167	12.737	972	1100	1181
1137	780	928	13.733	373	277	1159
1138	6	35	14.794	1093	0	1165
1139	691	710	15.857	1107	462	1192
1140	562	577	17.017	612	0	1162
1141	250	371	18.215	1108	781	1172
1142	693	791	19.500	1115	1111	1167
1143	239	687	20.870	1132	0	1176
1144	246	281	22.300	1124	834	1167
1145	13	237	23.798	1101	0	1161
1146	8	53	25.351	1128	1054	1147
1147	8	238	27.029	1146	0	1177
1148	688	690	28.857	1113	1109	1185
1149	484	551	30.815	682	1097	1154
1150	610	915	32.962	0	0	1180
1151	203	538	35.244	930	1116	1162
1152	245	267	37.803	1110	1122	1187

1153	1	3	40.499	1095	1091	1176
1154	484	721	43.465	1149	1114	1171
1155	252	280	46.447	1117	798	1186
1156	358	797	49.454	1119	369	1195
1157	696	793	54.162	1121	398	1191
1158	168	202	58.996	0	0	1182
1159	772	780	63.905	1106	1137	1191
1160	694	1207	69.040	1130	2	1185
1161	2	13	74.176	1104	1145	1193
1162	203	562	79.741	1151	1140	1170
1163	151	225	85.391	1134	0	1174
1164	242	243	91.423	900	898	1173
1165	6	14	97.653	1138	1126	1199
1166	263	697	103.932	1123	1118	1196
1167	246	693	110.401	1144	1142	1181
1168	116	126	117.047	998	1120	1197
1169	201	357	124.059	910	1133	1183
1170	74	203	131.086	0	1162	1178
1171	145	484	138.835	961	1154	1182
1172	169	250	146.614	1127	1141	1173
1173	169	242	155.209	1172	1164	1192
1174	115	151	164.065	1131	1163	1186
1175	460	545	173.360	0	527	1180
1176	1	239	183.008	1153	1143	1193
1177	8	10	192.806	1147	1092	1199
1178	74	547	202.639	1170	0	1198
1179	235	686	215.687	902	0	1189
1180	460	610	231.790	1175	1150	1184
1181	114	246	248.234	1136	1167	1190
1182	145	168	267.089	1171	1158	1190
1183	201	329	289.940	1169	828	1194
1184	132	460	313.207	1125	1180	1198
1185	688	694	339.229	1148	1160	1205
1186	115	252	366.140	1174	1155	1188
1187	245	247	395.731	1152	1129	1197

1188	115	275	427.008	1186	829	1200
1189	226	235	458.503	1135	1179	1204
1190	114	145	492.203	1181	1182	1194
1191	696	772	537.228	1157	1159	1200
1192	169	691	582.532	1173	1139	1195
1193	1	2	632.344	1176	1161	1202
1194	114	201	684.602	1190	1183	1201
1195	169	358	740.927	1192	1156	1196
1196	169	263	810.050	1195	1166	1207
1197	116	245	903.698	1168	1187	1202
1198	74	132	1018.472	1178	1184	1203
1199	6	8	1152.227	1165	1177	1201
1200	115	696	1291.378	1188	1191	1206
1201	6	114	1556.062	1199	1194	1203
1202	1	116	1897.340	1193	1197	1204
1203	6	74	2252.660	1201	1198	1208
1204	1	226	2728.391	1202	1189	1205
1205	1	688	3304.361	1204	1185	1206
1206	1	115	4066.116	1205	1200	1207
1207	1	169	5050.668	1206	1196	1208
1208	1	6	7248.000	1207	1203	0

Dendrogram

```
* * * * * * * * * * * * * * * * * * * * H I E R A R C H I C A L  C L
U S T E R  A N A L Y S I S * * * * * * * * * * * * * * * * * * * *


 Dendrogram using Ward Method

                         Rescaled Distance Cluster Combine

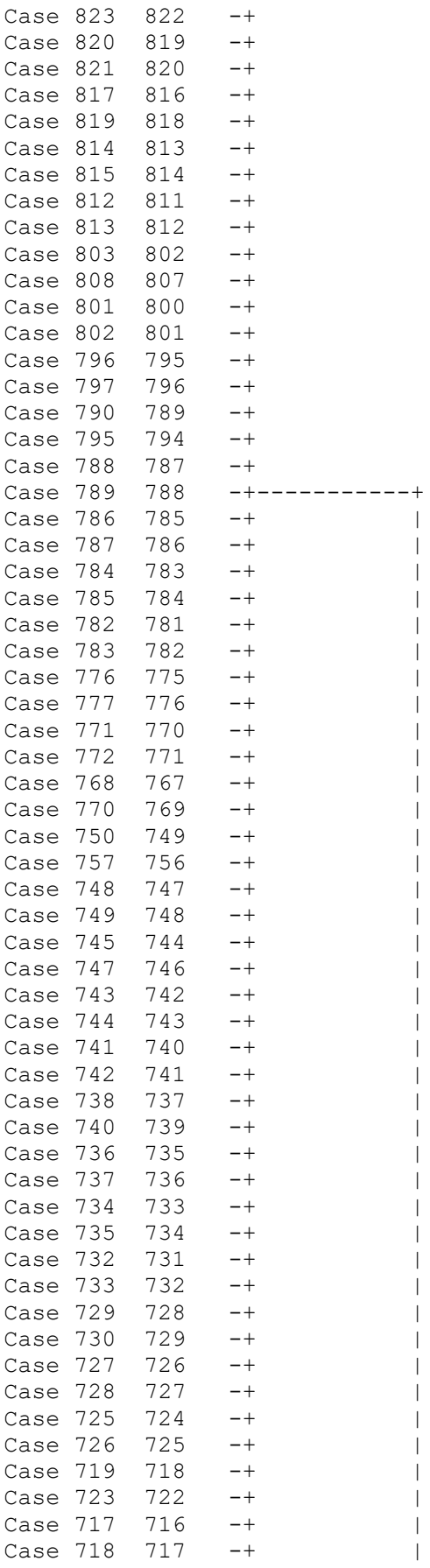
    C A S E      0         5        10        15        20
25
  Label     Num  +---------+---------+---------+---------+--------
-+

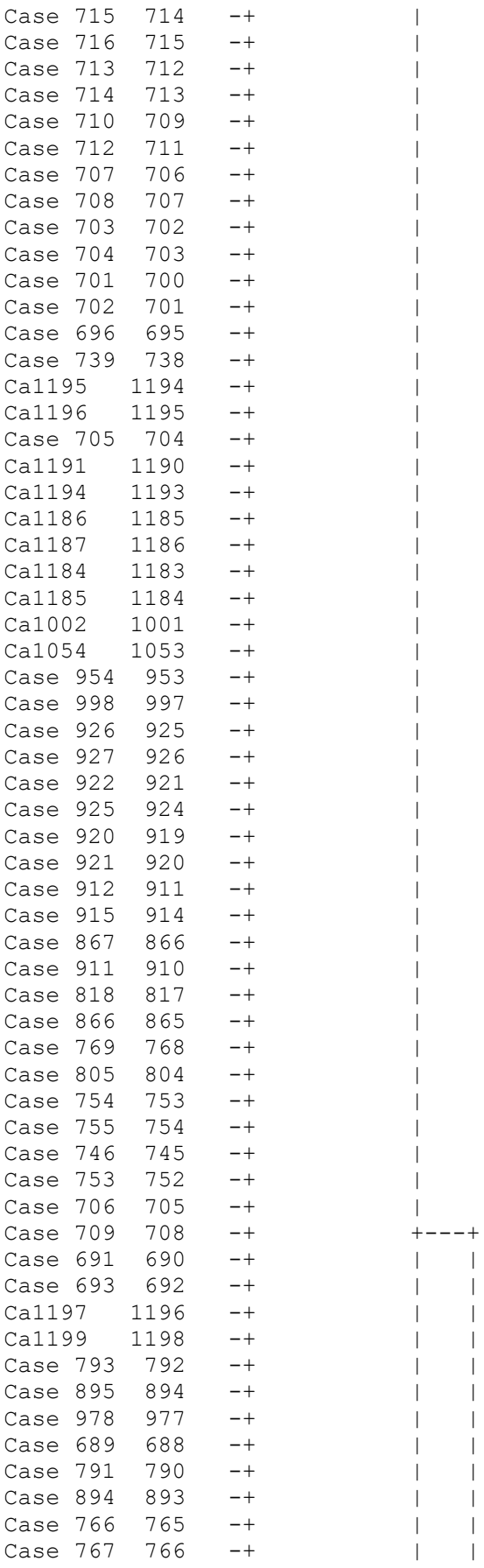
  Ca1209   1208   -+
  Ca1210   1209   -+
  Ca1208   1207   -+
  Ca1206   1205   -+
  Ca1207   1206   -+
  Case 695  694   -+
  Ca1204   1203   -+
  Ca1205   1204   -+
  Ca1202   1201   -+
  Ca1203   1202   -+
  Ca1200   1199   -+
  Ca1201   1200   -+
  Ca1193   1192   -+
  Ca1198   1197   -+
  Ca1189   1188   -+
  Ca1190   1189   -+
  Ca1182   1181   -+
  Ca1188   1187   -+
  Ca1180   1179   -+
  Ca1181   1180   -+
  Ca1177   1176   -+
  Ca1179   1178   -+
  Ca1175   1174   -+
  Ca1176   1175   -+
  Ca1173   1172   -+
  Ca1174   1173   -+
  Ca1171   1170   -+
  Ca1172   1171   -+
  Ca1168   1167   -+
  Ca1170   1169   -+
  Ca1166   1165   -+
  Ca1167   1166   -+
  Ca1164   1163   -+
  Ca1165   1164   -+
  Ca1143   1142   -+
  Ca1160   1159   -+
  Ca1140   1139   -+
  Ca1141   1140   -+
  Ca1138   1137   -+
  Ca1139   1138   -+
  Ca1132   1131   -+
  Ca1136   1135   -+
```

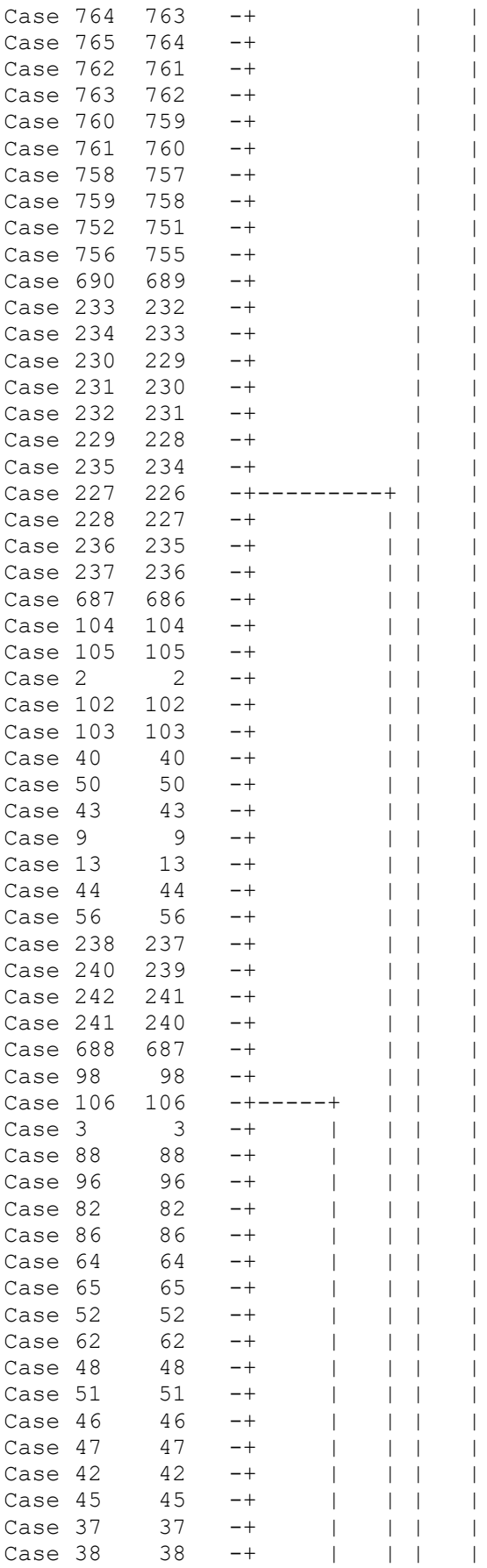
```
Ca1130   1129   -+
Ca1131   1130   -+
Ca1128   1127   -+
Ca1129   1128   -+
Ca1126   1125   -+
Ca1127   1126   -+
Ca1124   1123   -+
Ca1125   1124   -+
Ca1122   1121   -+
Ca1123   1122   -+
Ca1120   1119   -+
Ca1121   1120   -+
Ca1118   1117   -+
Ca1119   1118   -+
Ca1116   1115   -+
Ca1117   1116   -+
Ca1114   1113   -+
Ca1115   1114   -+
Ca1112   1111   -+
Ca1113   1112   -+
Ca1110   1109   -+
Ca1111   1110   -+
Ca1108   1107   -+
Ca1109   1108   -+
Ca1106   1105   -+
Ca1107   1106   -+
Ca1101   1100   -+
Ca1105   1104   -+
Ca1099   1098   -+
Ca1100   1099   -+
Ca1097   1096   -+
Ca1098   1097   -+
Ca1095   1094   -+
Ca1096   1095   -+
Ca1093   1092   -+
Ca1094   1093   -+
Ca1091   1090   -+
Ca1092   1091   -+
Ca1088   1087   -+
Ca1089   1088   -+
Ca1085   1084   -+
Ca1087   1086   -+
Ca1079   1078   -+
Ca1080   1079   -+
Ca1076   1075   -+
Ca1078   1077   -+
Ca1074   1073   -+
Ca1075   1074   -+
Ca1071   1070   -+
Ca1072   1071   -+
Ca1069   1068   -+
Ca1070   1069   -+
Ca1067   1066   -+
Ca1068   1067   -+
Ca1062   1061   -+
Ca1063   1062   -+
Ca1060   1059   -+
Ca1061   1060   -+
Ca1053   1052   -+
```

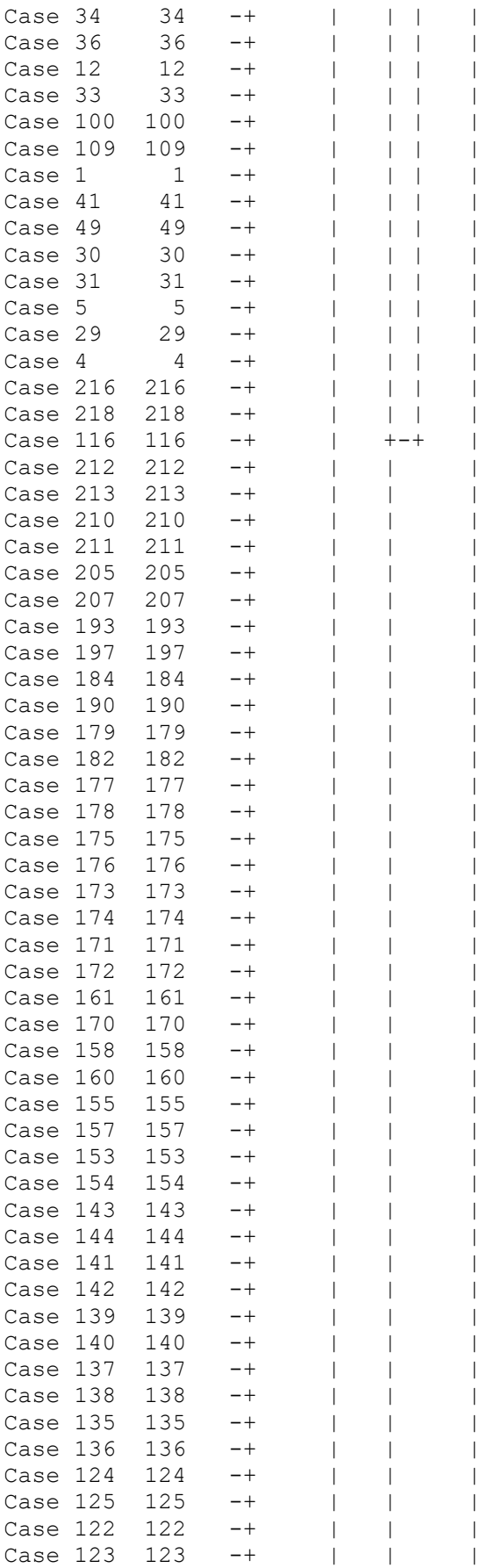
```
Ca1055   1054   -+
Ca1050   1049   -+
Ca1052   1051   -+
Ca1047   1046   -+
Ca1048   1047   -+
Ca1044   1043   -+
Ca1046   1045   -+
Ca1042   1041   -+
Ca1043   1042   -+
Ca1040   1039   -+
Ca1041   1040   -+
Ca1038   1037   -+
Ca1039   1038   -+
Ca1036   1035   -+
Ca1037   1036   -+
Ca1033   1032   -+
Ca1034   1033   -+
Ca1031   1030   -+
Ca1032   1031   -+
Ca1025   1024   -+
Ca1026   1025   -+
Ca1023   1022   -+
Ca1024   1023   -+
Ca1021   1020   -+
Ca1022   1021   -+
Ca1019   1018   -+
Ca1020   1019   -+
Ca1016   1015   -+
Ca1017   1016   -+
Ca1012   1011   -+
Ca1013   1012   -+
Ca1010   1009   -+
Ca1011   1010   -+
Ca1008   1007   -+
Ca1009   1008   -+
Ca1006   1005   -+
Ca1007   1006   -+
Ca1004   1003   -+
Ca1005   1004   -+
Case 997  996   -+
Ca1003   1002   -+
Case 995  994   -+
Case 996  995   -+
Case 992  991   -+
Case 994  993   -+
Case 990  989   -+
Case 991  990   -+
Case 988  987   -+
Case 989  988   -+
Case 986  985   -+
Case 987  986   -+
Case 984  983   -+
Case 985  984   -+
Case 982  981   -+
Case 983  982   -+
Case 980  979   -+
Case 981  980   -+
Case 975  974   -+
Case 979  978   -+
```

```
Case 967  966   -+
Case 973  972   -+
Case 965  964   -+
Case 966  965   -+
Case 963  962   -+
Case 964  963   -+
Case 961  960   -+
Case 962  961   -+
Case 959  958   -+
Case 960  959   -+
Case 953  952   -+
Case 958  957   -+
Case 951  950   -+
Case 952  951   -+
Case 949  948   -+
Case 950  949   -+
Case 947  946   -+
Case 948  947   -+
Case 939  938   -+
Case 946  945   -+
Case 933  932   -+
Case 938  937   -+
Case 913  912   -+
Case 914  913   -+
Case 906  905   -+
Case 910  909   -+
Case 904  903   -+
Case 905  904   -+
Case 901  900   -+
Case 902  901   -+
Case 898  897   -+
Case 899  898   -+
Case 886  885   -+
Case 897  896   -+
Case 881  880   -+
Case 885  884   -+
Case 879  878   -+
Case 880  879   -+
Case 877  876   -+
Case 878  877   -+
Case 874  873   -+
Case 876  875   -+
Case 870  869   -+
Case 872  871   -+
Case 868  867   -+
Case 869  868   -+
Case 863  862   -+
Case 864  863   -+
Case 852  851   -+
Case 861  860   -+
Case 836  835   -+
Case 850  849   -+
Case 828  827   -+
Case 829  828   -+
Case 826  825   -+
Case 827  826   -+
Case 824  823   -+
Case 825  824   -+
Case 822  821   -+
```


Case 823 822 -+
Case 820 819 -+
Case 821 820 -+
Case 817 816 -+
Case 819 818 -+
Case 814 813 -+
Case 815 814 -+
Case 812 811 -+
Case 813 812 -+
Case 803 802 -+
Case 808 807 -+
Case 801 800 -+
Case 802 801 -+
Case 796 795 -+
Case 797 796 -+
Case 790 789 -+
Case 795 794 -+
Case 788 787 -+
Case 789 788 -+----------+
Case 786 785 -+ |
Case 787 786 -+ |
Case 784 783 -+ |
Case 785 784 -+ |
Case 782 781 -+ |
Case 783 782 -+ |
Case 776 775 -+ |
Case 777 776 -+ |
Case 771 770 -+ |
Case 772 771 -+ |
Case 768 767 -+ |
Case 770 769 -+ |
Case 750 749 -+ |
Case 757 756 -+ |
Case 748 747 -+ |
Case 749 748 -+ |
Case 745 744 -+ |
Case 747 746 -+ |
Case 743 742 -+ |
Case 744 743 -+ |
Case 741 740 -+ |
Case 742 741 -+ |
Case 738 737 -+ |
Case 740 739 -+ |
Case 736 735 -+ |
Case 737 736 -+ |
Case 734 733 -+ |
Case 735 734 -+ |
Case 732 731 -+ |
Case 733 732 -+ |
Case 729 728 -+ |
Case 730 729 -+ |
Case 727 726 -+ |
Case 728 727 -+ |
Case 725 724 -+ |
Case 726 725 -+ |
Case 719 718 -+ |
Case 723 722 -+ |
Case 717 716 -+ |
Case 718 717 -+ |


Case 715 714
Case 716 715
Case 713 712
Case 714 713
Case 710 709
Case 712 711
Case 707 706
Case 708 707
Case 703 702
Case 704 703
Case 701 700
Case 702 701
Case 696 695
Case 739 738
Ca1195 1194
Ca1196 1195
Case 705 704
Ca1191 1190
Ca1194 1193
Ca1186 1185
Ca1187 1186
Ca1184 1183
Ca1185 1184
Ca1002 1001
Ca1054 1053
Case 954 953
Case 998 997
Case 926 925
Case 927 926
Case 922 921
Case 925 924
Case 920 919
Case 921 920
Case 912 911
Case 915 914
Case 867 866
Case 911 910
Case 818 817
Case 866 865
Case 769 768
Case 805 804
Case 754 753
Case 755 754
Case 746 745
Case 753 752
Case 706 705
Case 709 708
Case 691 690
Case 693 692
Ca1197 1196
Ca1199 1198
Case 793 792
Case 895 894
Case 978 977
Case 689 688
Case 791 790
Case 894 893
Case 766 765
Case 767 766


Case 764 763
Case 765 764
Case 762 761
Case 763 762
Case 760 759
Case 761 760
Case 758 757
Case 759 758
Case 752 751
Case 756 755
Case 690 689
Case 233 232
Case 234 233
Case 230 229
Case 231 230
Case 232 231
Case 229 228
Case 235 234
Case 227 226
Case 228 227
Case 236 235
Case 237 236
Case 687 686
Case 104 104
Case 105 105
Case 2 2
Case 102 102
Case 103 103
Case 40 40
Case 50 50
Case 43 43
Case 9 9
Case 13 13
Case 44 44
Case 56 56
Case 238 237
Case 240 239
Case 242 241
Case 241 240
Case 688 687
Case 98 98
Case 106 106
Case 3 3
Case 88 88
Case 96 96
Case 82 82
Case 86 86
Case 64 64
Case 65 65
Case 52 52
Case 62 62
Case 48 48
Case 51 51
Case 46 46
Case 47 47
Case 42 42
Case 45 45
Case 37 37
Case 38 38


Case 34 34
Case 36 36
Case 12 12
Case 33 33
Case 100 100
Case 109 109
Case 1 1
Case 41 41
Case 49 49
Case 30 30
Case 31 31
Case 5 5
Case 29 29
Case 4 4
Case 216 216
Case 218 218
Case 116 116
Case 212 212
Case 213 213
Case 210 210
Case 211 211
Case 205 205
Case 207 207
Case 193 193
Case 197 197
Case 184 184
Case 190 190
Case 179 179
Case 182 182
Case 177 177
Case 178 178
Case 175 175
Case 176 176
Case 173 173
Case 174 174
Case 171 171
Case 172 172
Case 161 161
Case 170 170
Case 158 158
Case 160 160
Case 155 155
Case 157 157
Case 153 153
Case 154 154
Case 143 143
Case 144 144
Case 141 141
Case 142 142
Case 139 139
Case 140 140
Case 137 137
Case 138 138
Case 135 135
Case 136 136
Case 124 124
Case 125 125
Case 122 122
Case 123 123

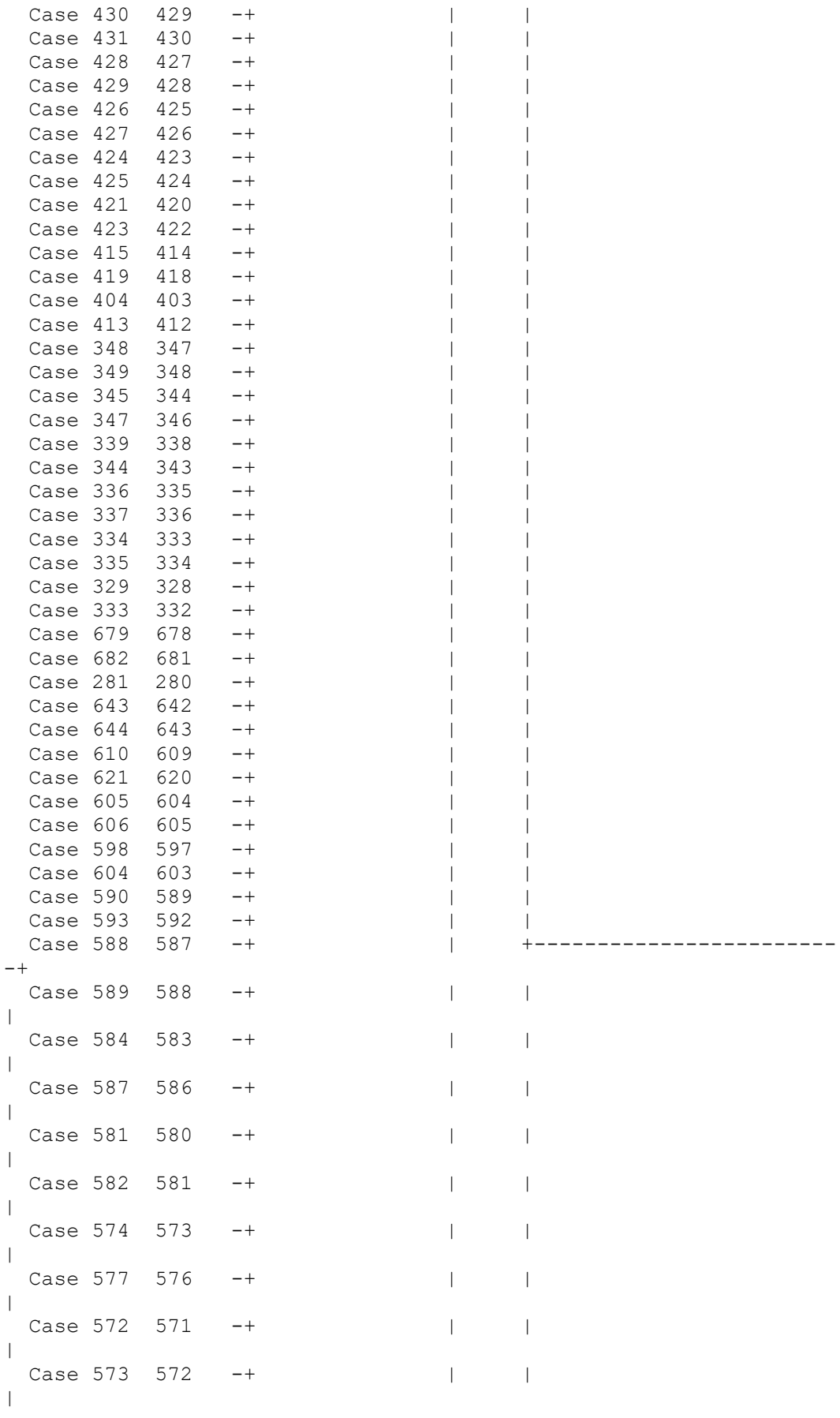
```
Case 119  119   -+      |    |      |
Case 121  121   -+      |    |      |
Case 117  117   -+      |    |      |
Case 118  118   -+      |    |      |
Case 222  222   -+      |    |      |
Case 223  223   -+      |    |      |
Case 146  146   -+      |    |      |
Case 219  219   -+      |    |      |
Case 220  220   -+      |    |      |
Case 214  214   -+-+    |    |      |
Case 217  217   -+ |    |    |      |
Case 200  200   -+ |    |    |      |
Case 208  208   -+ |    |    |      |
Case 191  191   -+ |    |    |      |
Case 192  192   -+ |    |    |      |
Case 181  181   -+ |    +----+      |
Case 188  188   -+ |    |           |
Case 150  150   -+ |    |           |
Case 156  156   -+ |    |           |
Case 148  148   -+ |    |           |
Case 128  128   -+ |    |           |
Case 147  147   -+ |    |           |
Case 126  126   -+ |    |           |
Case 127  127   -+ |    |           |
Case 685  684   -+ |    |           |
Case 686  685   -+ |    |           |
Case 248  247   -+ |    |           |
Case 669  668   -+ |    |           |
Case 684  683   -+ |    |           |
Case 667  666   -+ |    |           |
Case 668  667   -+ |    |           |
Case 658  657   -+ |    |           |
Case 666  665   -+ |    |           |
Case 656  655   -+ |    |           |
Case 657  656   -+ |    |           |
Case 649  648   -+ |    |           |
Case 655  654   -+ |    |           |
Case 646  645   -+ |    |           |
Case 647  646   -+ |    |           |
Case 637  636   -+ |    |           |
Case 645  644   -+ |    |           |
Case 627  626   -+ |    |           |
Case 628  627   -+ |    |           |
Case 624  623   -+ |    |           |
Case 626  625   -+ |    |           |
Case 622  621   -+ |    |           |
Case 623  622   -+ |    |           |
Case 615  614   -+ |    |           |
Case 617  616   -+ |    |           |
Case 613  612   -+ |    |           |
Case 614  613   -+ |    |           |
Case 609  608   -+ |    |           |
Case 612  611   -+ |    |           |
Case 607  606   -+ |    |           |
Case 608  607   -+ |    |           |
Case 599  598   -+ |    |           |
Case 603  602   -+ |    |           |
Case 592  591   -+ |    |           |
Case 595  594   -+ |    |           |
```

```
Case 586  585   -+ |   |          |
Case 591  590   -+ |   |          |
Case 583  582   -+ |   |          |
Case 585  584   -+ |   |          |
Case 561  560   -+ |   |          |
Case 566  565   -+ |   |          |
Case 557  556   -+ |   |          |
Case 558  557   -+ |   |          |
Case 555  554   -+ |   |          |
Case 556  555   -+ |   |          |
Case 550  549   -+ |   |          |
Case 554  553   -+ |   |          |
Case 544  543   -+ |   |          |
Case 547  546   -+ |   |          |
Case 542  541   -+ |   |          |
Case 543  542   -+ |   |          |
Case 529  528   -+ |   |          |
Case 532  531   -+ |   |          |
Case 526  525   -+ |   |          |
Case 527  526   -+ |   |          |
Case 524  523   -+ |   |          |
Case 525  524   -+ |   |          |
Case 521  520   -+ |   |          |
Case 522  521   -+ |   |          |
Case 518  517   -+ |   |          |
Case 520  519   -+ |   |          |
Case 515  514   -+ |   |          |
Case 516  515   -+ |   |          |
Case 509  508   -+ |   |          |
Case 511  510   -+ |   |          |
Case 503  502   -+ |   |          |
Case 504  503   -+ |   |          |
Case 501  500   -+ |   |          |
Case 502  501   -+ |   |          |
Case 495  494   -+ |   |          |
Case 500  499   -+ |   |          |
Case 493  492   -+ |   |          |
Case 494  493   -+ |   |          |
Case 489  488   -+ |   |          |
Case 490  489   -+ |   |          |
Case 483  482   -+ |   |          |
Case 487  486   -+ |   |          |
Case 481  480   -+ |   |          |
Case 482  481   -+ |   |          |
Case 479  478   -+ |   |          |
Case 480  479   -+ |   |          |
Case 475  474   -+ |   |          |
Case 478  477   -+ |   |          |
Case 456  455   -+ |   |          |
Case 462  461   -+ +---+          |
Case 454  453   -+ |              |
Case 455  454   -+ |              |
Case 445  444   -+ |              |
Case 449  448   -+ |              |
Case 440  439   -+ |              |
Case 441  440   -+ |              |
Case 403  402   -+ |              |
Case 417  416   -+ |              |
Case 401  400   -+ |              |
```

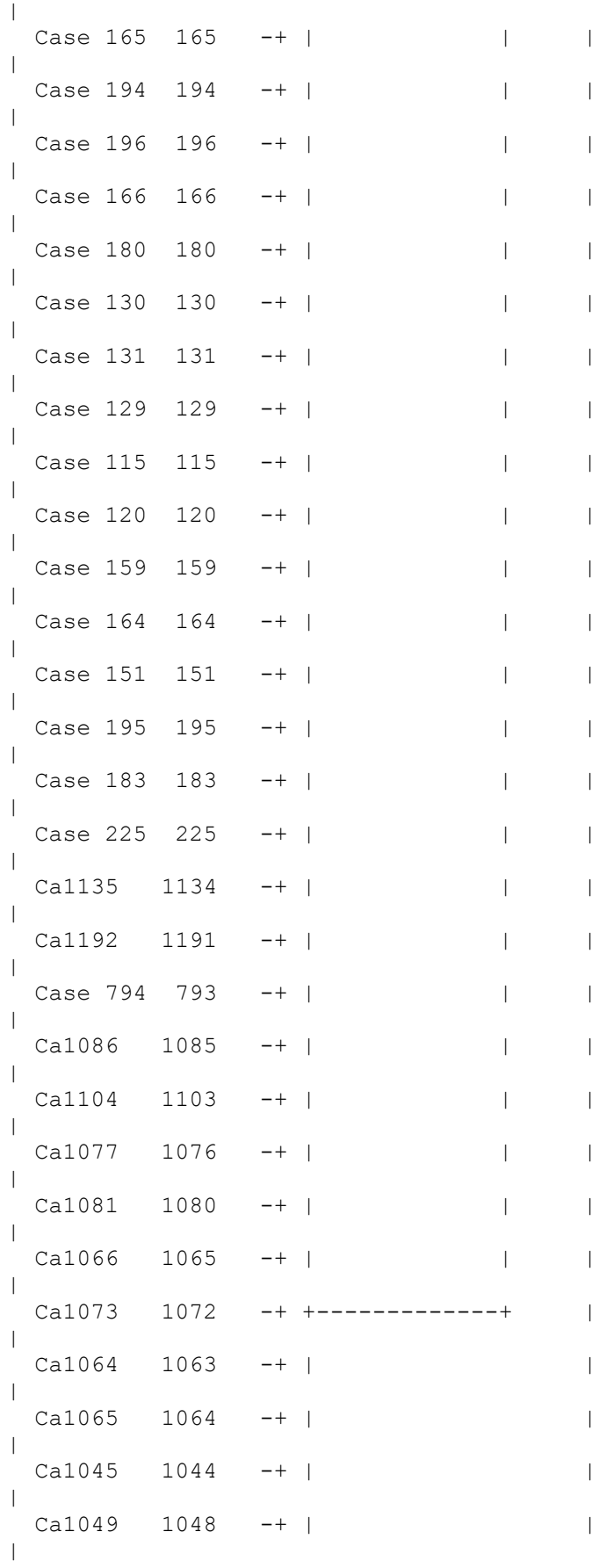
```
Case 402  401   -+ |              |
Case 399  398   -+ |              |
Case 400  399   -+ |              |
Case 397  396   -+ |              |
Case 398  397   -+ |              |
Case 395  394   -+ |              |
Case 396  395   -+ |              |
Case 391  390   -+ |              |
Case 394  393   -+ |              |
Case 389  388   -+ |              |
Case 390  389   -+ |              |
Case 387  386   -+ |              |
Case 388  387   -+ |              |
Case 375  374   -+ |              |
Case 378  377   -+ |              |
Case 373  372   -+ |             +------+
Case 374  373   -+ |             |      |
Case 362  361   -+ |             |      |
Case 364  363   -+ |             |      |
Case 356  355   -+ |             |      |
Case 357  356   -+ |             |      |
Case 354  353   -+ |             |      |
Case 355  354   -+ |             |      |
Case 326  325   -+ |             |      |
Case 353  352   -+ |             |      |
Case 319  318   -+ |             |      |
Case 321  320   -+ |             |      |
Case 300  299   -+ |             |      |
Case 301  300   -+ |             |      |
Case 297  296   -+ |             |      |
Case 298  297   -+ |             |      |
Case 295  294   -+ |             |      |
Case 296  295   -+ |             |      |
Case 292  291   -+ |             |      |
Case 293  292   -+ |             |      |
Case 285  284   -+ |             |      |
Case 290  289   -+ |             |      |
Case 283  282   -+ |             |      |
Case 284  283   -+ |             |      |
Case 279  278   -+ |             |      |
Case 280  279   -+ |             |      |
Case 277  276   -+ |             |      |
Case 278  277   -+ |             |      |
Case 274  273   -+ |             |      |
Case 275  274   -+ |             |      |
Case 272  271   -+ |             |      |
Case 273  272   -+ |             |      |
Case 267  266   -+ |             |      |
Case 271  270   -+ |             |      |
Case 254  253   -+ |             |      |
Case 365  364   -+ |             |      |
Case 677  676   -+ |             |      |
Case 678  677   -+ |             |      |
Case 294  293   -+ |             |      |
Case 675  674   -+ |             |      |
Case 676  675   -+ |             |      |
Case 673  672   -+ |             |      |
Case 674  673   -+ |             |      |
Case 670  669   -+ |             |      |
```

```
Case 672  671   -+ |             |     |
Case 660  659   -+ |             |     |
Case 661  660   -+ |             |     |
Case 650  649   -+ |             |     |
Case 659  658   -+ |             |     |
Case 640  639   -+ |             |     |
Case 641  640   -+ |             |     |
Case 619  618   -+ |             |     |
Case 633  632   -+ |             |     |
Case 576  575   -+ |             |     |
Case 594  593   -+ |             |     |
Case 570  569   -+ |             |     |
Case 575  574   -+ |             |     |
Case 541  540   -+ |             |     |
Case 560  559   -+ |             |     |
Case 537  536   -+ |             |     |
Case 538  537   -+ |             |     |
Case 535  534   -+ |             |     |
Case 536  535   -+ |             |     |
Case 533  532   -+ |             |     |
Case 534  533   -+ |             |     |
Case 499  498   -+ |             |     |
Case 531  530   -+ |             |     |
Case 491  490   -+ |             |     |
Case 498  497   -+ |             |     |
Case 484  483   -+ |             |     |
Case 488  487   -+ |             |     |
Case 476  475   -+ |             |     |
Case 477  476   -+ |             |     |
Case 472  471   -+ |             |     |
Case 473  472   -+-+             |     |
Case 469  468   -+               |     |
Case 471  470   -+               |     |
Case 465  464   -+               |     |
Case 466  465   -+               |     |
Case 460  459   -+               |     |
Case 464  463   -+               |     |
Case 458  457   -+               |     |
Case 459  458   -+               |     |
Case 437  436   -+               |     |
Case 452  451   -+               |     |
Case 420  419   -+               |     |
Case 422  421   -+               |     |
Case 414  413   -+               |     |
Case 418  417   -+               |     |
Case 411  410   -+               |     |
Case 412  411   -+               |     |
Case 409  408   -+               |     |
Case 410  409   -+               |     |
Case 406  405   -+               |     |
Case 407  406   -+               |     |
Case 381  380   -+               |     |
Case 393  392   -+               |     |
Case 379  378   -+               |     |
Case 380  379   -+               |     |
Case 370  369   -+               |     |
Case 371  370   -+               |     |
Case 368  367   -+               |     |
Case 369  368   -+               |     |
```

```
Case 361  360   -+                |      |
Case 363  362   -+                |      |
Case 327  326   -+                |      |
Case 328  327   -+                |      |
Case 311  310   -+                |      |
Case 324  323   -+                |      |
Case 304  303   -+                |      |
Case 246  245   -+                |      |
Case 252  251   -+                |      |
Case 625  624   -+                |      |
Case 683  682   -+                |      |
Case 496  495   -+                |      |
Case 497  496   -+                |      |
Case 377  376   -+                |      |
Case 492  491   -+                |      |
Case 268  267   -+                |      |
Case 352  351   -+                |      |
Case 376  375   -+                |      |
Case 318  317   -+                |      |
Case 351  350   -+                |      |
Case 315  314   -+                |      |
Case 316  315   -+                |      |
Case 313  312   -+                |      |
Case 314  313   -+                |      |
Case 310  309   -+                |      |
Case 312  311   -+                |      |
Case 308  307   -+                |      |
Case 309  308   -+                |      |
Case 306  305   -+                |      |
Case 307  306   -+                |      |
Case 303  302   -+                |      |
Case 305  304   -+                |      |
Case 269  268   -+                |      |
Case 302  301   -+                |      |
Case 638  637   -+                |      |
Case 664  663   -+                |      |
Case 276  275   -+                |      |
Case 600  599   -+                |      |
Case 601  600   -+                |      |
Case 579  578   -+                |      |
Case 580  579   -+                |      |
Case 545  544   -+                |      |
Case 559  558   -+                |      |
Case 468  467   -+                |      |
Case 519  518   -+                |      |
Case 448  447   -+                |      |
Case 453  452   -+                |      |
Case 446  445   -+                |      |
Case 447  446   -+                |      |
Case 443  442   -+                |      |
Case 444  443   -+                |      |
Case 439  438   -+                |      |
Case 442  441   -+                |      |
Case 436  435   -+                |      |
Case 438  437   -+                |      |
Case 434  433   -+                |      |
Case 435  434   -+                |      |
Case 432  431   -+                |      |
Case 433  432   -+                |      |
```


Case 430 429
Case 431 430
Case 428 427
Case 429 428
Case 426 425
Case 427 426
Case 424 423
Case 425 424
Case 421 420
Case 423 422
Case 415 414
Case 419 418
Case 404 403
Case 413 412
Case 348 347
Case 349 348
Case 345 344
Case 347 346
Case 339 338
Case 344 343
Case 336 335
Case 337 336
Case 334 333
Case 335 334
Case 329 328
Case 333 332
Case 679 678
Case 682 681
Case 281 280
Case 643 642
Case 644 643
Case 610 609
Case 621 620
Case 605 604
Case 606 605
Case 598 597
Case 604 603
Case 590 589
Case 593 592
Case 588 587
Case 589 588
Case 584 583
Case 587 586
Case 581 580
Case 582 581
Case 574 573
Case 577 576
Case 572 571
Case 573 572

```
  Case 569  568   -+-+            |     |
|
  Case 571  570   -+ |            |     |
|
  Case 517  516   -+ |            |     |
|
  Case 562  561   -+ |            |     |
|
  Case 513  512   -+ |            |     |
|
  Case 514  513   -+ |            |     |
|
  Case 510  509   -+ |            |     |
|
  Case 512  511   -+ |            |     |
|
  Case 507  506   -+ |            |     |
|
  Case 508  507   -+ |            |     |
|
  Case 470  469   -+ |            |     |
|
  Case 506  505   -+ |            |     |
|
  Case 383  382   -+ |            |     |
|
  Case 450  449   -+ |            |     |
|
  Case 366  365   -+ |            |     |
|
  Case 382  381   -+ |            |     |
|
  Case 551  550   -+ |            |     |
|
  Case 553  552   -+ |            |     |
|
  Case 549  548   -+ |            |     |
|
  Case 463  462   -+ |            |     |
|
  Case 653  652   -+ |            |     |
|
  Case 253  252   -+ |            |     |
|
  Case 392  391   -+ |            |     |
|
  Case 457  456   -+ |            |     |
|
  Case 256  255   -+ |            |     |
|
  Case 257  256   -+ |            |     |
|
  Case 255  254   -+ |            |     |
|
  Case 265  264   -+ |            |     |
|
  Case 198  198   -+ |            |     |
|
  Case 199  199   -+ |            |     |
```

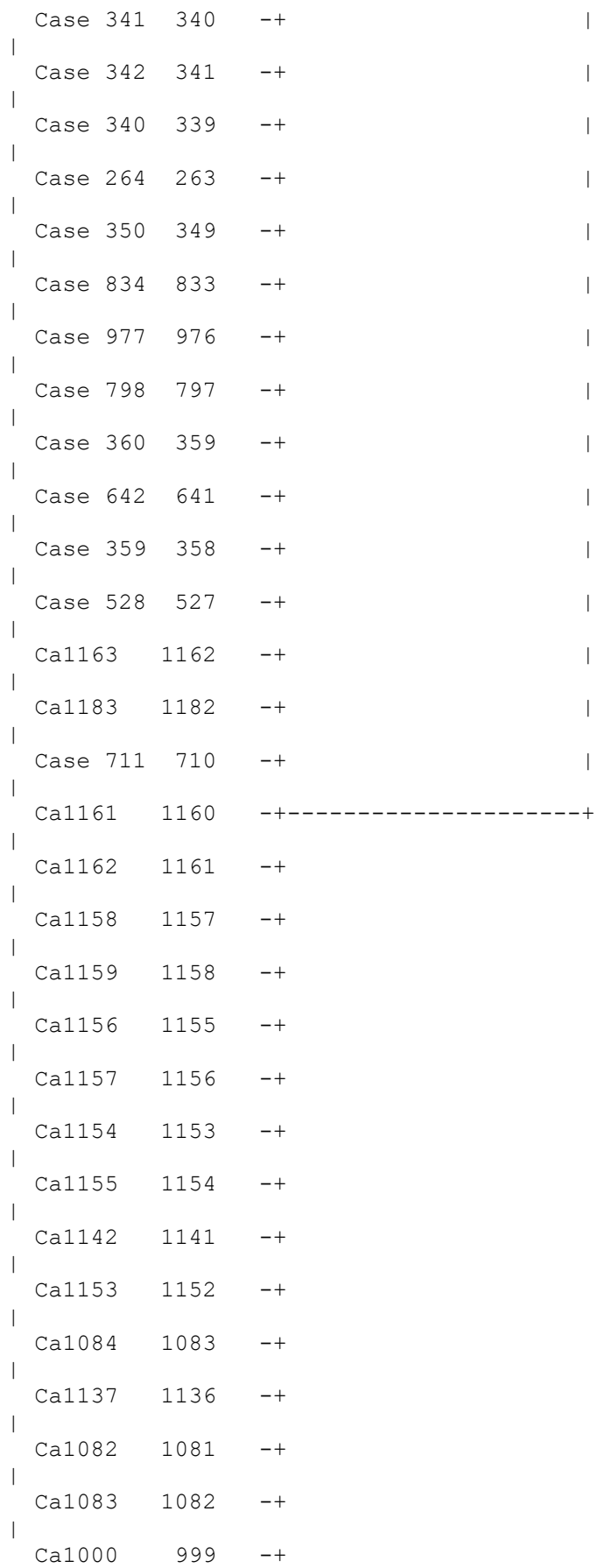

Case 165 165
Case 194 194
Case 196 196
Case 166 166
Case 180 180
Case 130 130
Case 131 131
Case 129 129
Case 115 115
Case 120 120
Case 159 159
Case 164 164
Case 151 151
Case 195 195
Case 183 183
Case 225 225
Ca1135 1134
Ca1192 1191
Case 794 793
Ca1086 1085
Ca1104 1103
Ca1077 1076
Ca1081 1080
Ca1066 1065
Ca1073 1072
Ca1064 1063
Ca1065 1064
Ca1045 1044
Ca1049 1048

```
  Case 971  970   -+ |                  |
|
  Case 972  971   -+ |                  |
|
  Case 969  968   -+ |                  |
|
  Case 970  969   -+ |                  |
|
  Case 941  940   -+ |                  |
|
  Case 968  967   -+ |                  |
|
  Case 936  935   -+ |                  |
|
  Case 940  939   -+ |                  |
|
  Case 909  908   -+ |                  |
|
  Case 928  927   -+ |                  |
|
  Case 907  906   -+ |                  |
|
  Case 908  907   -+ |                  |
|
  Case 900  899   -+ |                  |
|
  Case 903  902   -+ |                  |
|
  Case 893  892   -+ |                  |
|
  Case 896  895   -+ |                  |
|
  Case 891  890   -+ |                  |
|
  Case 892  891   -+ |                  |
|
  Case 889  888   -+ |                  |
|
  Case 890  889   -+ |                  |
|
  Case 887  886   -+ |                  |
|
  Case 888  887   -+ |                  |
|
  Case 811  810   -+ |                  |
|
  Case 816  815   -+ |                  |
|
  Case 809  808   -+ |                  |
|
  Case 810  809   -+ |                  |
|
  Case 804  803   -+ |                  |
|
  Ca1027   1026   -+ |                  |
|
  Ca1030   1029   -+ |                  |
|
  Ca1015   1014   -+ |                  |
```

```
|
  Ca1018   1017   -+ |                    |
|
  Ca1152   1151   -+ |                    |
|
  Ca1169   1168   -+ |                    |
|
  Case 697  696   -+ |                    |
|
  Ca1150   1149   -+ |                    |
|
  Ca1151   1150   -+ |                    |
|
  Ca1148   1147   -+ |                    |
|
  Ca1149   1148   -+ |                    |
|
  Ca1146   1145   -+ |                    |
|
  Ca1147   1146   -+ |                    |
|
  Ca1144   1143   -+ |                    |
|
  Ca1145   1144   -+ |                    |
|
  Case 923  922   -+ |                    |
|
  Case 924  923   -+ |                    |
|
  Case 884  883   -+ |                    |
|
  Case 919  918   -+ |                    |
|
  Case 882  881   -+ |                    |
|
  Case 883  882   -+ |                    |
|
  Case 720  719   -+ |                    |
|
  Case 721  720   -+-+                    |
|
  Ca1051   1050   -+                      |
|
  Ca1134   1133   -+                      |
|
  Case 775  774   -+                      |
|
  Case 778  777   -+                      |
|
  Case 773  772   -+                      |
|
  Case 774  773   -+                      |
|
  Ca1102   1101   -+                      |
|
  Ca1103   1102   -+                      |
|
  Case 929  928   -+                      |
|
```

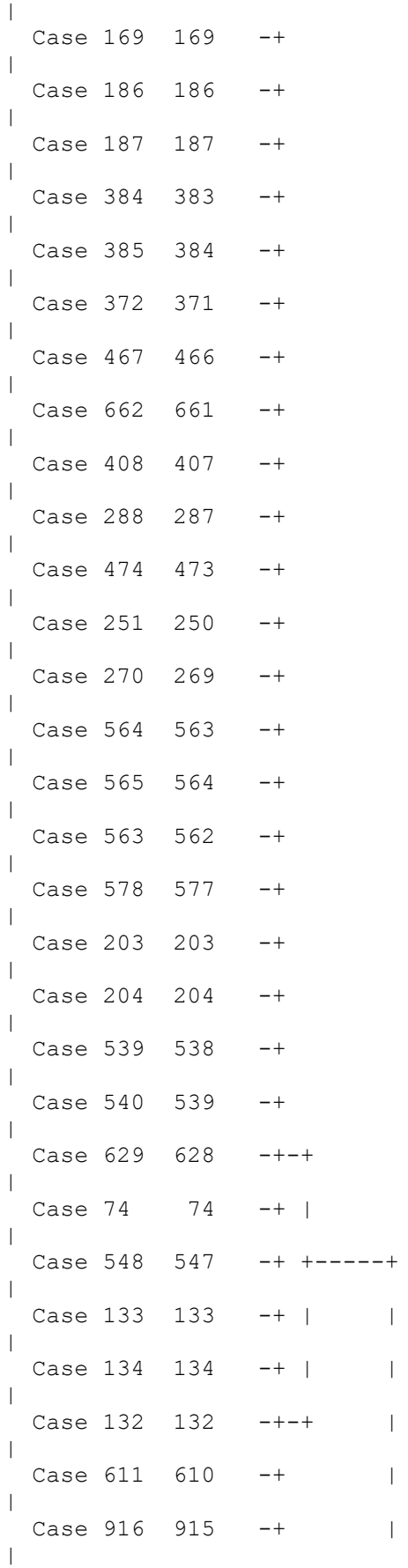
```
  Ca1029   1028   -+                    |
|
  Ca1035   1034   -+                    |
|
  Case 945  944   -+                    |
|
  Ca1028   1027   -+                    |
|
  Case 943  942   -+                    |
|
  Case 944  943   -+                    |
|
  Case 937  936   -+                    |
|
  Case 942  941   -+                    |
|
  Case 934  933   -+                    |
|
  Case 935  934   -+                    |
|
  Case 931  930   -+                    |
|
  Ca1133   1132   -+                    |
|
  Ca1178   1177   -+                    |
|
  Case 781  780   -+                    |
|
  Ca1059   1058   -+                    |
|
  Ca1090   1089   -+                    |
|
  Ca1057   1056   -+                    |
|
  Ca1058   1057   -+                    |
|
  Ca1001   1000   -+                    |
|
  Ca1056   1055   -+                    |
|
  Case 956  955   -+                    |
|
  Case 957  956   -+                    |
|
  Case 862  861   -+                    |
|
  Case 955  954   -+                    |
|
  Case 859  858   -+                    |
|
  Case 860  859   -+                    |
|
  Case 857  856   -+                    |
|
  Case 858  857   -+                    |
|
  Case 855  854   -+                    |
|
  Case 856  855   -+                    |
```

```
|
  Case 853  852   -+                    |
|
  Case 854  853   -+                    |
|
  Case 848  847   -+                    |
|
  Case 849  848   -+                    |
|
  Case 846  845   -+                    |
|
  Case 847  846   -+                    |
|
  Case 844  843   -+                    |
|
  Case 845  844   -+                    |
|
  Case 842  841   -+                    |
|
  Case 843  842   -+                    |
|
  Case 840  839   -+                    |
|
  Case 841  840   -+                    |
|
  Case 838  837   -+                    |
|
  Case 839  838   -+                    |
|
  Case 835  834   -+                    |
|
  Case 837  836   -+                    |
|
  Case 832  831   -+                    |
|
  Case 833  832   -+                    |
|
  Case 830  829   -+                    |
|
  Case 831  830   -+                    |
|
  Case 699  698   -+                    |
|
  Case 700  699   -+                    |
|
  Case 698  697   -+                    |
|
  Case 751  750   -+                    |
|
  Case 451  450   -+                    |
|
  Case 681  680   -+                    |
|
  Case 338  337   -+                    |
|
  Case 343  342   -+                    |
|
  Case 346  345   -+                    |
|
```

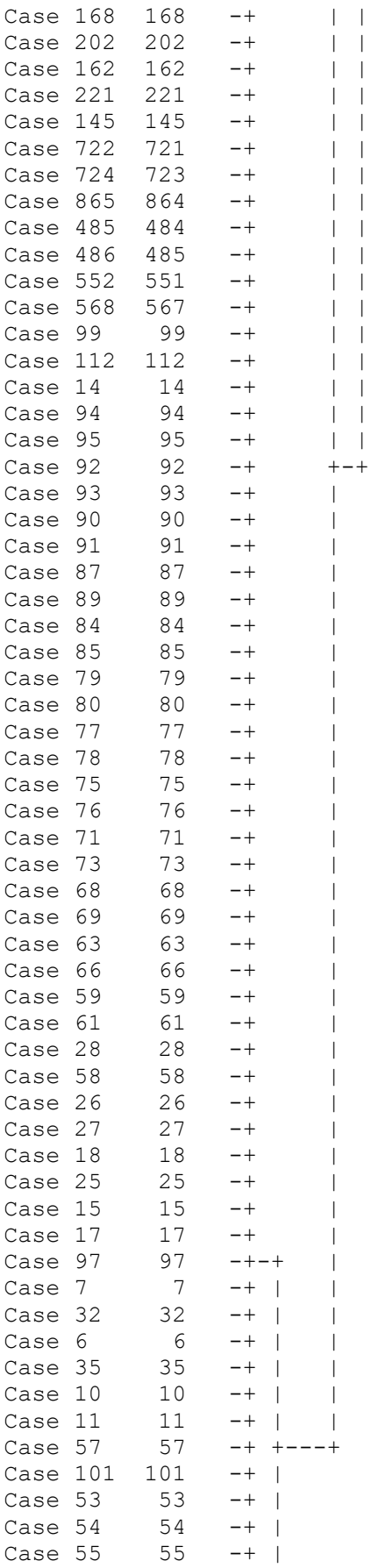

Case 341 340
Case 342 341
Case 340 339
Case 264 263
Case 350 349
Case 834 833
Case 977 976
Case 798 797
Case 360 359
Case 642 641
Case 359 358
Case 528 527
Ca1163 1162
Ca1183 1182
Case 711 710
Ca1161 1160
Ca1162 1161
Ca1158 1157
Ca1159 1158
Ca1156 1155
Ca1157 1156
Ca1154 1153
Ca1155 1154
Ca1142 1141
Ca1153 1152
Ca1084 1083
Ca1137 1136
Ca1082 1081
Ca1083 1082
Ca1000 999

```
|
  Ca1014   1013   -+
|
  Case 993  992   -+
|
  Case 999  998   -+
|
  Case 974  973   -+
|
  Case 976  975   -+
|
  Case 918  917   -+
|
  Case 932  931   -+
|
  Case 873  872   -+
|
  Case 875  874   -+
|
  Case 851  850   -+
|
  Case 871  870   -+
|
  Case 780  779   -+
|
  Case 799  798   -+
|
  Case 731  730   -+
|
  Case 779  778   -+
|
  Case 692  691   -+
|
  Case 800  799   -+
|
  Case 930  929   -+
|
  Case 250  249   -+
|
  Case 620  619   -+
|
  Case 244  243   -+
|
  Case 671  670   -+
|
  Case 680  679   -+
|
  Case 243  242   -+
|
  Case 663  662   -+
|
  Case 665  664   -+
|
  Case 651  650   -+
|
  Case 652  651   -+
|
  Case 618  617   -+
|
```

```
  Case 648  647   -+
|
  Case 602  601   -+
|
  Case 616  615   -+
|
  Case 596  595   -+
|
  Case 597  596   -+
|
  Case 523  522   -+
|
  Case 530  529   -+
|
  Case 416  415   -+
|
  Case 505  504   -+
|
  Case 367  366   -+
|
  Case 386  385   -+
|
  Case 320  319   -+
|
  Case 322  321   -+
|
  Case 299  298   -+
|
  Case 317  316   -+
|
  Case 289  288   -+
|
  Case 291  290   -+
|
  Case 286  285   -+
|
  Case 287  286   -+
|
  Case 263  262   -+
|
  Case 266  265   -+
|
  Case 261  260   -+
|
  Case 262  261   -+
|
  Case 259  258   -+
|
  Case 260  259   -+
|
  Case 249  248   -+
|
  Case 258  257   -+
|
  Case 245  244   -+
|
  Case 206  206   -+
|
  Case 209  209   -+
```

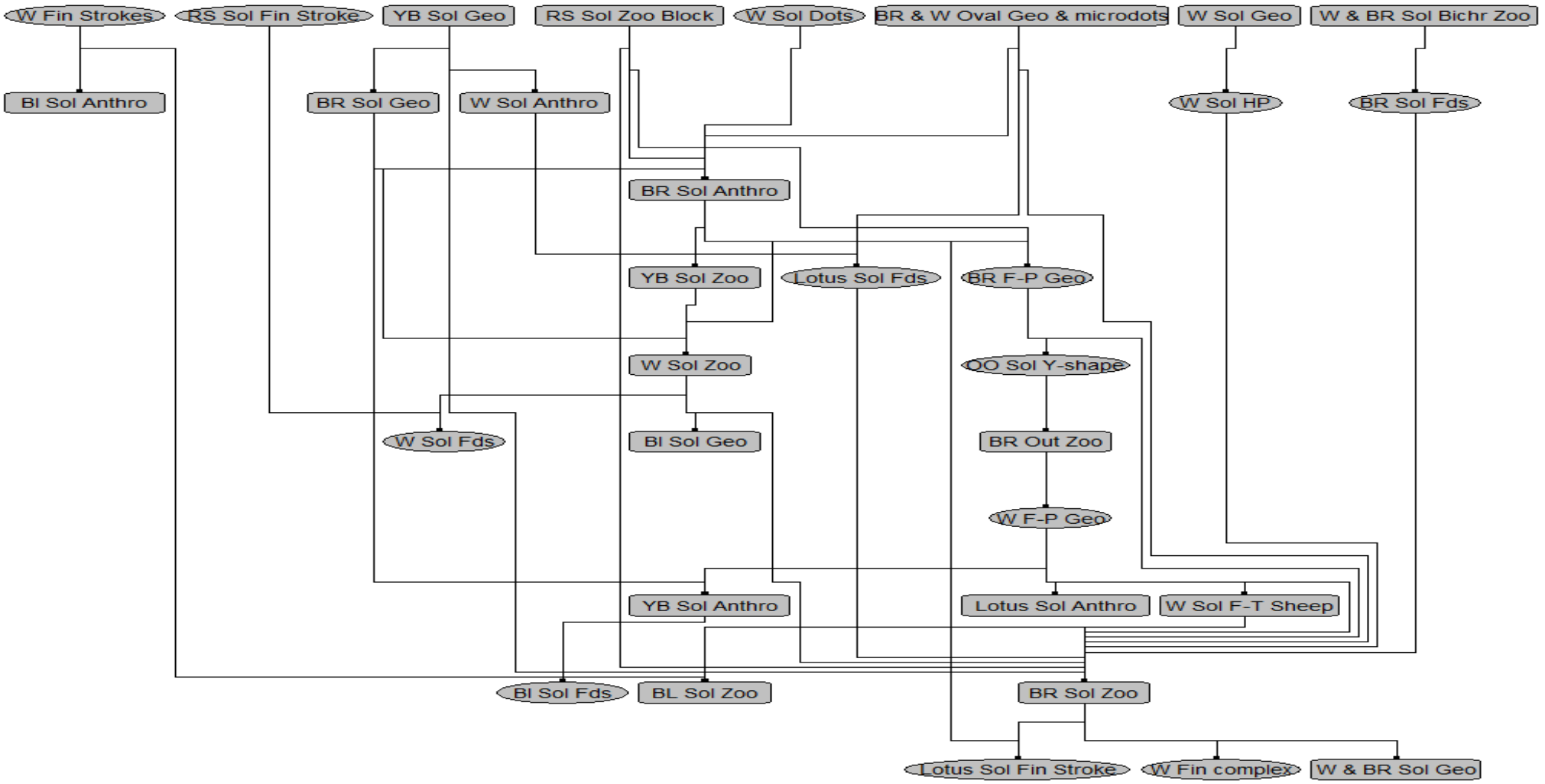

Case 169 169
Case 186 186
Case 187 187
Case 384 383
Case 385 384
Case 372 371
Case 467 466
Case 662 661
Case 408 407
Case 288 287
Case 474 473
Case 251 250
Case 270 269
Case 564 563
Case 565 564
Case 563 562
Case 578 577
Case 203 203
Case 204 204
Case 539 538
Case 540 539
Case 629 628
Case 74 74
Case 548 547
Case 133 133
Case 134 134
Case 132 132
Case 611 610
Case 916 915

```
  Case 546  545   -+       |
|
  Case 654  653   -+       |
|
  Case 461  460   -+       |
|
  Case 331  330   -+       |
|
  Case 332  331   -+       |
|
  Case 330  329   -+       |
|
  Case 201  201   -+       |
|
  Case 224  224   -+       |
|
  Case 358  357   -+       |
|
  Case 567  566   -+       |
|
  Case 189  189   -+       |
|
  Case 215  215   -+       |
|
  Case 114  114   -+       |
|
  Case 152  152   -+       |
|
  Case 163  163   -+       |
|
  Case 149  149   -+       |
|
  Case 167  167   -+------+ |
|
  Case 185  185   -+     | |
|
  Case 792  791   -+     | |
|
  Case 917  916   -+     | |
|
  Case 806  805   -+     | |
|
  Case 807  806   -+     | |
|
  Case 694  693   -+     | |
|
  Case 282  281   -+     | +-----------------------------------
-+
  Case 323  322   -+     | |
  Case 636  635   -+     | |
  Case 639  638   -+     | |
  Case 247  246   -+     | |
  Case 634  633   -+     | |
  Case 635  634   -+     | |
  Case 631  630   -+     | |
  Case 632  631   -+     | |
  Case 405  404   -+     | |
  Case 630  629   -+     | |
  Case 325  324   -+     | |
```


Case 168 168
Case 202 202
Case 162 162
Case 221 221
Case 145 145
Case 722 721
Case 724 723
Case 865 864
Case 485 484
Case 486 485
Case 552 551
Case 568 567
Case 99 99
Case 112 112
Case 14 14
Case 94 94
Case 95 95
Case 92 92
Case 93 93
Case 90 90
Case 91 91
Case 87 87
Case 89 89
Case 84 84
Case 85 85
Case 79 79
Case 80 80
Case 77 77
Case 78 78
Case 75 75
Case 76 76
Case 71 71
Case 73 73
Case 68 68
Case 69 69
Case 63 63
Case 66 66
Case 59 59
Case 61 61
Case 28 28
Case 58 58
Case 26 26
Case 27 27
Case 18 18
Case 25 25
Case 15 15
Case 17 17
Case 97 97
Case 7 7
Case 32 32
Case 6 6
Case 35 35
Case 10 10
Case 11 11
Case 57 57
Case 101 101
Case 53 53
Case 54 54
Case 55 55

```
Case 111  111   -+ |
Case 113  113   -+ |
Case 8      8   -+ |
Case 108  108   -+-+
Case 110  110   -+
Case 83    83   -+
Case 107  107   -+
Case 72    72   -+
Case 81    81   -+
Case 67    67   -+
Case 70    70   -+
Case 24    24   -+
Case 39    39   -+
Case 22    22   -+
Case 23    23   -+
Case 20    20   -+
Case 21    21   -+
Case 16    16   -+
Case 19    19   -+
Case 60    60   -+
Case 239  238   -
```

APPENDIX N


W Fin Strokes
RS Sol Fin Stroke
YB Sol Geo
RS Sol Zoo Block
W Sol Dots
BR & W Oval Geo & microdots
W Sol Geo
W & BR Sol Bichr Zoo
Bl Sol Anthro
BR Sol Geo
W Sol Anthro
W Sol HP
BR Sol Fds
BR Sol Anthro
YB Sol Zoo
Lotus Sol Fds
BR F-P Geo
W Sol Zoo
OO Sol Y-shape
W Sol Fds
Bl Sol Geo
BR Out Zoo
W F-P Geo
YB Sol Anthro
Lotus Sol Anthro
W Sol F-T Sheep
Bl Sol Fds
BL Sol Zoo
BR Sol Zoo
Lotus Sol Fin Stroke
W Fin complex
W & BR Sol Geo