

Contents

List of Figures.....	ix
1. Aims and evidence.....	1
1.1. Introduction.....	1
1.2. Aim of the research	1
1.3. Evidence.....	2
2. Existing categorisations for Pre and Dynastic Egyptian ships and boats.....	3
2.1. Background	3
2.2. Petroglyphs	3
2.3. Petrie's pots	6
2.4. Foliage and dating systems	12
2.5. Hull profiles, features and forgeries	14
2.5.1. Profiles	14
2.5.2. Features of forgeries.....	15
2.5.3. Forgeries of ceramic boats	19
2.6. Some concepts on Naqadian dating	20
2.7. Summary.....	21
3. Proposed categorisations for Pre and Early Dynastic watercraft	23
3.1. PED 1. The Sickle Boat	23
3.1.1. Complexity.....	23
3.1.2. Background	23
3.1.3. Foliage as sails?	25
3.1.4. Land based structures or watercraft?	26
3.1.5. Naqada hunting scenes and unusual deckhouses	28
3.1.6. A possible construction method for PED 1	30
3.2. The boats of Tomb 100	32
3.2.1. Background.....	32
3.2.2. Tomb 100 hull types.....	32
3.2.3. Black Boat the boat of Ra?	34
3.2.4. Modifications to the Black Boat	35
3.2.5. Constructional details and background.....	35
3.2.6. PED1 watercraft without distinguishing features	35
3.3. Were the PED 1 watercraft depictions of funerary objects?	36
3.3.1. Funerary or religious?	36
3.3.2. Orientation	37
3.3.3. Funeral voyages?	38
3.4. PED 2	39
3.5. PED 3	40
3.6. PED 4	42
3.7. PED 5	44
3.8. PED 6	46
3.8.1. Characteristics and the Qustul Censer	46
3.8.2. Item EA35324.....	47
3.9. PED 7	49
3.9.1. Characteristics	49
3.9.2. Was a ceremonial seat present on deck?	50
3.9.3. Boat from the Narmer palette	51
3.10. PED 8	51
3.10.1. Background	51
3.10.2. Status.....	51
3.10.3. Earlier representations of PED 8	52
3.10.4. Some constructional details	53

3.11. PED 9	53
3.12. PED 10	54
3.12.1. Characteristics	54
3.12.2. Earlier usage of a Middle Kingdom watercraft?	55
3.13. PED 11	57
3.14. PED 12	57
3.15. PED 13	58
3.15.1. Background	58
3.15.2. Boats from Tomb M25	58
3.15.3. Boat from Mastaba XXVI	59
3.16. PED 14	61
3.17. PED 15	61
3.18. PED 16	62
3.18.1. Characteristics	62
3.18.2. Timber or papyrus	63
3.19. Unusual and non-categorised	63
3.19.1. Golf Bag Boat	63
3.19.2. Unusual boat of King Den	63
3.19.3. The boats of the Gebelein Cloth	64
3.19.4. Thimble Ended Boat	66
3.19.5. Cargo boat, with pointed bow and stern	66
3.20. Papyrus and papyriform watercraft	66
3.21. Papyrus or papyriform?	69
3.22. PED 17, an additional Old Kingdom category	70
3.22.1. Background	70
3.22.2. Condition of the evidence	71
3.22.3. Other examples	71
3.22.4. Models	72
3.22.5. PED 17 hogging truss	72
3.22.6. Steering PED 17	73
3.23. Summary	73
4. Totems, finials, and figureheads	75
4.1. Background	75
4.2. Birds	75
4.2.1. Bird standing on the bow	77
4.2.2. Plovers	80
4.3. Animal based figureheads?	80
4.3.1. Sources	80
4.3.2. Antelope headed	81
4.3.3. Goat headed?	81
4.4. Foliage	81
4.4.1. Background	81
4.4.2. Triangular	83
4.4.3. Amorphous	83
4.4.4. Horn or frond topped finial	84
4.4.5. Palm fronds	84
4.4.6. Horns, or trees?	85
4.4.7. Headless	85
4.4.8. Trefoil	91
4.4.9. Finials and figureheads	91
4.4.10. Construction and retention of figureheads	93
4.4.11. Securing the Sahure figureheads to a Type V hull	95
4.4.12. Identification by crew members with their watercraft	98
4.4.13. Summary	98
5. Masts and rigging	101
5.1. Evidence	101
5.2. Tripod and bipod mast	101
5.3. Pole mast	101

5.4. Stepping the pole mast.....	103
5.5. Summary.....	106
6. Steerage, rudders and sails.....	107
6.1. Evidence.....	107
6.2. Rudders and helmsmen.....	107
6.3. Sails.....	108
6.4. Summary.....	108
7. Hull construction.....	111
7.1. Background.....	111
7.2. Abydos – Watercraft BG10	112
7.2.1. Technical aspects.....	112
7.2.2. The BG10 hull.....	113
7.3. Abu Rawash – Watercraft M06.....	119
7.3.1. Background.....	119
7.3.2. The M06 hull.....	120
7.3.3. Lashing channels and timber joints.....	120
7.3.4. Hull shape of M06	123
7.4. Abusir – Watercraft AS 54	125
7.4.1. Background.....	125
7.4.2. The AS 54 hull	127
7.4.3. Achieving the structural integrity of AS 54	127
7.4.4. Lacings or woven webbing?	128
7.5. Boats of non-timber construction.....	129
7.5.1. Background.....	129
7.5.2. Purpose.....	130
7.5.3. Replicate floor timbers.....	130
7.5.4. Access by stairs	132
7.5.5. Were timber boats interred in rock cut pits?	134
7.5.6. Stone boats.....	135
7.5.7. Brick boats	136
7.6. Summary.....	138
8. Paddling, rowing and towing	139
8.1. Paddling	139
8.2. Rowing.....	141
8.2.1. Grommets.....	141
8.2.2. Pivots and grommets.....	141
8.3. Rowing technology aboard Khufu II	142
8.3.1. Orientation	142
8.3.2. Constructional elements affecting the rowing of Khufu II	142
8.3.3. Oar spacing	142
8.4. Bulwarks, brackets and knees aboard Khufu II	144
8.5. Removeable bulwarks aboard Khufu II?	145
8.6. Seats aboard Khufu II?.....	146
8.7. Seats and side girders.....	148
8.8. Towing	151
8.9. Summary.....	152
9. Deck structures.....	153
9.1. Background	153
9.2. ED Type A. (1).....	153
9.3. ED Type A. (2).....	155
9.4. ED Type A. (3).....	155
9.5. ED Type A. (4).....	156
9.6. ED Type B.....	157
9.7. ED Type C.....	158
9.8. ED Type D	159
9.9. ED Type E.....	161

9.10. ED Type F	161
9.11. ED Type G.....	162
9.12. ED Type G (a)	164
9.13. ED Type G (b).....	165
9.14. Summary	166
10. Khufu II	167
10.1. Background.....	167
10.2. Construction of the deckhouse panels.....	167
10.3. The Baldachin	168
10.3.1. Elements of the baldachin	168
10.3.2. Timbers and assemblage of the baldachin.....	168
10.3.3. Baldachin deck panels	170
10.4. Deck curvature of Khufu II.....	170
10.4.1. Effects of deck curvature	170
10.4.2. Overcoming Khufu II's deck curvature.....	172
10.5. Structure of the Khufu II deckhouse	172
10.5.1. Bulkheads and beams	172
10.5.2. Level of recording and interpretation.....	173
10.5.3. Variations in structure.....	173
10.6. Structure of the bulkheads	174
10.6.1. The forward bulkhead.....	174
10.6.1.1. Structure.....	175
10.6.2. Securing the forward bulkhead.....	175
10.6.3. Discrepancies in the recorded literature	176
10.6.4. Doors	176
10.6.5. The partition bulkhead structure and doors	176
10.6.6. Securing the partition bulkhead.....	178
10.6.7. The aft bulkhead and doors	179
10.7. Structure of the deckhouse roof.....	181
10.8. Summary	183
11. Conclusions	185
Appendix A. A brief experiment	187
Appendix B. Technical terminology	191
Appendix C. Profiles of Reisner Types and ETH categories mentioned in this book	193
Appendix D. Map of primary find sites	197
Bibliography	199