Tracing Ancient Textiles: Production, Consumption and Social Uses in Chalcolithic and Bronze Age Cyprus (2800–1450 BC)

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Table of contents

List of figures 7
List of tables 12
Abstract 14
Declaration 15
Copyright Statement 15
Acknowledgements 16

PART I 17

Chapter 1 Introduction 17
1.1 Textiles in archaeology: a multifocal perspective on the past 19
   1.1.1 A pioneering perspective 20
   1.1.2 A gendered perspective 20
   1.1.3 A multidisciplinary perspective 22
1.2 Textiles and Cyprus 23
1.3 Thesis structure 26

Chapter 2 Theoretical Background 28
2.1 Technology and technique 29
2.2 Production and specialisation 30
   2.2.1 Specialisation and non-specialisation 32
   2.2.2 Indicators of specialisation 33
   2.2.3 Control and regulation 35
   2.2.4 Specialisation and non-hierarchical societies 38
2.3 Identity construction through crafting 40
   2.3.1 Basics of identity 41
   2.3.2 Work-based identities: how can they be defined? 42
   2.3.3 Artisan and matter 44
   2.3.4 Bodies and tools 46
   2.3.5 Specialisation and task division 47
   2.3.6 Skills, teaching, and learning 48
2.4 Production and relationality 51
   2.4.1 The entanglement 52
6.1 Textile production at Chalcolithic and Philia Kissonerga *Mosphilia*: techno-functional and contextual analysis of the indicators

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1.1 Stone spindle whorls and thread making</td>
<td>118</td>
</tr>
<tr>
<td>6.1.2 Terracotta spindle whorls between the Late Chalcolithic and the Philia</td>
<td>122</td>
</tr>
<tr>
<td>6.1.3 Bone needles</td>
<td>123</td>
</tr>
<tr>
<td>6.1.4 Tools and contexts</td>
<td>128</td>
</tr>
<tr>
<td>6.2 The Philia: techno-functional and contextual analysis of the indicators</td>
<td>130</td>
</tr>
<tr>
<td>6.2.1 Spindle whorls</td>
<td>131</td>
</tr>
<tr>
<td>6.2.2 Loom weights</td>
<td>135</td>
</tr>
<tr>
<td>6.2.3 Metal needles</td>
<td>136</td>
</tr>
<tr>
<td>6.2.4 Tools and contexts</td>
<td>137</td>
</tr>
<tr>
<td>6.2.5 The Anatolian socio-economic background of textile production</td>
<td>141</td>
</tr>
</tbody>
</table>

**Chapter 7 Early Cypriot to Middle Cypriot III/Late Cypriot IA Textile Production**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Marki <em>Alonia</em>: techno-functional and contextual analysis of the indicators</td>
<td>143</td>
</tr>
<tr>
<td>7.1.1 Techno-functional analysis</td>
<td>144</td>
</tr>
<tr>
<td>Spindle whorls</td>
<td>144</td>
</tr>
<tr>
<td>Loom weights</td>
<td>148</td>
</tr>
<tr>
<td>Needles</td>
<td>153</td>
</tr>
<tr>
<td>Fabric remains</td>
<td>156</td>
</tr>
<tr>
<td>7.1.2 Tools and contexts</td>
<td>157</td>
</tr>
<tr>
<td>7.2 Alambra <em>Mouttes</em>: techno-functional and contextual analysis of the indicators</td>
<td>161</td>
</tr>
<tr>
<td>7.2.1 Techno-functional analysis</td>
<td>162</td>
</tr>
<tr>
<td>Spindle whorls</td>
<td>162</td>
</tr>
<tr>
<td>Loom weights</td>
<td>165</td>
</tr>
<tr>
<td>Needles</td>
<td>167</td>
</tr>
<tr>
<td>7.2.2 Tools and contexts</td>
<td>167</td>
</tr>
<tr>
<td>7.3 Politiko <em>Troullia</em>: techno-functional and contextual analysis of the indicators</td>
<td>170</td>
</tr>
<tr>
<td>7.3.1 Techno-functional analysis</td>
<td>171</td>
</tr>
<tr>
<td>Spindle whorls</td>
<td>171</td>
</tr>
<tr>
<td>Needles</td>
<td>174</td>
</tr>
<tr>
<td>7.3.2 Tools and contexts</td>
<td>176</td>
</tr>
<tr>
<td>7.4 Sotira <em>Kaminoudhia</em>: techno functional and contextual analysis of the indicators</td>
<td>179</td>
</tr>
<tr>
<td>7.4.1 Techno-functional analysis</td>
<td>179</td>
</tr>
<tr>
<td>Spindle whorls</td>
<td>179</td>
</tr>
</tbody>
</table>
7.4.2 Tools and contexts

7.5 Erimi Laonin tou Porakou: techno functional and contextual analysis of the indicators

7.5.1 Techno-functional analysis
- Spindle whorls 189
- Loom weights and textile remains 194

7.5.2 Functional and contextual analysis of dyeing implements 197

7.5.3 Tools and contexts
- Settlement 202
- Cemetery 205

7.6 Kissonerga Skalia: techno functional and contextual analysis of the indicators

7.6.1 Techno-functional analysis
- Spindle whorls 209
- Loom weights 213
- Needles 215

7.6.2 Tools and contexts 216

PART III

Chapter 8 Textile Technology and Production. An Overview of the Indicators

8.1 The Pre-Philia 221

8.2 The Philia
- 8.2.1 Light whorls and wool 225

8.3 The Early Cypriot–Middle Cypriot III/Late Cypriot IA
- 8.3.1 Spindle whorls and spinning 227
- 8.3.2 Loom weights and weaving 232
- 8.3.3 Sewing and the finished products 234

Chapter 9 Productive Entanglements of Cypriot Textiles

9.1 The Pre-Philia and Philia
- 9.1.1 Settlements 236
- 9.1.2 Integrating the burial evidence 238

9.2 The Early Cypriot and Middle Cypriot III/Late Cypriot IA
- 9.2.1 Settlements 241
- 9.2.2 Social and ideological aspects of textile production 248
- 9.2.3 Integrating the burial evidence 252

Chapter 10 Textile Production and Society 258
10.1 The role of textile technology and production in the Late Chalcolithic/Philia transition

10.1.1 Which changes? 258
10.1.2 How? 258
10.1.3 From where and why? 263
10.1.4 By whom? 266

10.2 Embracing complexity: the Early–Middle Cypriot textile work and social transformations 267

10.2.1 A long-standing technology? 267
10.2.2 Where and how did manufacture take place? 269
10.2.3 Who were the craftspeople? 271
10.2.4 What is the link between textile production and socio-economic transformations? 273

10.3 Current interpretation and future research 277

Bibliography 280
Appendix I 331
Appendix II 354
Appendix III 377
Appendix IV 502
Drawings, detail plans, and photographs 525

Appendix I–IV: digital file. Link:

Word Count: 79,854
List of figures

1.1. Cover of 'Women's Work: The First 20,000 Years. Women, Cloth, and Society in Early Times' by Barber (1994) 21
1.2. Map of Cyprus 24
2.1. Tangram of clay entanglements at Çatalhöyük 54
4.1. Diagnostic parts of a spindle whorl 79
4.2. Representation of suspended spinning 81
4.3. Macro-areas of different textile technologies 82
4.4. Spindle whorl showing use-wear marks 83
4.5. Typological division of Cypriot spindle whorls 86
4.6. Terracotta models of spindles and metal spindles 90
4.7. Diagnostic parts of a loom weight 92
4.8. Drawing illustrating a warp-weighted loom 93
4.9. Detail of the perforation of a loom weight 94
4.10. Diagnostic parts of a needle 97
4.11. Use-wear and microwear types identified on bone needles 99
4.12. Needles from Khirokitia 100
4.13. Comb-shaped terracotta model 102
4.15. Data collected for spindle whorls, loom weights, and needles 108
4.16. Weight classes for spindle whorls and loom weights, and RS values 109
5.1. Topographic map of Cyprus with the areas considered in this study 111
5.2. Site chronologies 113
5.3 Aerial photos of Mosphilia, Marki, and Erimi 115
6.1. Mosphilia. Stone spindle whorls (beads of Types 4 and 5) 119
6.3. Mosphilia. Whorls’ weight classes 120
6.4. Mosphilia. Distribution of stone whorls in relation to use-wear 121
6.5. Mosphilia. KS1565 among terracotta whorls 121
6.6. Mosphilia. Terracotta spindle whorls 122
6.7. Mosphilia. Needles 124
6.8. *Mosphilia*. chronological distribution of needles  
6.9. *Mosphilia*. Eyelet parts of needles showing modifications  
6.10. *Mosphilia*. Needles from Period 3 showing microwear  
6.11. *Mosphilia*. Needles from Period 4 showing microwear  
6.12. Reconstruction of the Pithos House  
6.13. Philia whorls from Marki  
6.14. Decorated spindle whorls from Marki and *Skalia*  
6.15. Philia whorls. Histogram of weight classes  
6.16. Decorated and undecorated whorls by site  
6.17. Philia loom weights  
6.18. Philia metal needles  
6.20. Nicosia. Plan of T.4  
7.1. Marki. Spindle whorls  
7.2. Marki. Frequency of spindle whorls showing use-wear  
7.3. Marki. Frequency of spindle whorls by type  
7.4. Marki. Whorl types by periods  
7.5. Marki. Histogram of the weight classes (spindle whorls)  
7.6. Marki. Weight classes by periods  
7.7. Marki. Bar chart representing the RS values (spindle whorls)  
7.8 Marki. Scatterplot of whorls’ weights and diameters  
7.9. Marki. Ranges of the perforation diameters (whorls)  
7.10. Marki. Ranges of perforation diameters of perforations by periods  
7.11. Marki. Loom weights  
7.12. Marki. Histogram of the weight classes (loom weights)  
7.13. Marki. Ranges of perforation diameters (loom weights)  
7.15. Marki. Ranges of the length (needles)  
7.16. Marki. Ranges of eyelet diameters (needles)  
7.17. Marki. Scatterplot of length and eyelet diameter (needles)  
7.18. Marki. Ranges of cross-section diameters (needles)
7.19. Marki. Textile pseudomorph
7.20. Marki. Distribution of textile tools in domestic units
7.21. Marki. Undecorated spindle whors
7.22. Marki. Plan of Compound 29, Phase G
7.23. Alambra. Spindle whors
7.24. Alambra. Distribution of spindle whorl by type
7.25. Alambra. Frequency of spindle whors showing use-wear
7.26. Alambra. Histograms of the weight classes (spindle whorls)
7.27. Alambra. Scatterplot of whorls’ weights and diameters
7.28. Alambra. Ranges of whors’ diameters of perforation
7.29. Alambra. Histogram of the RS values (spindle whorls)
7.30. Alambra. Loom weights
7.31. Alambra. Needles D1, D12, and A37
7.32. Alambra. Plan of rooms yielding textile tools
7.33. Alambra. Ratio of decorated and undecorated whors
7.34. Alambra. Imported spindle whors
7.35. Politiko. Spindle whors
7.36. Politiko. Frequency of whors by type
7.37. Politiko. Weight classes (spindle whorls)
7.38. Politiko. Scatterplot of whor weights and diameters
7.39. Politiko. Ranges of perforation diameters (spindle whorls)
7.40. Politiko. Bone needles
7.41. Politiko. Metal needle PT-M1
7.42. Politiko. Ranges of eyelet diameters and cross-section (needles)
7.43. Politiko. Eyelet modification and microwear traces (needles)
7.44. Politiko. Textile tool concentrations in Southern Courtyard and Alleyway 13
7.45. Politiko. Ratio of decorated and undecorated whors
7.46. Sotira. Spindle whors
7.47. Sotira. Frequency of whors showing use-wear
7.48. Sotira. Frequency of spindle whorl by type
7.49. Sotira. Histogram of the whors’ weight classes
7.50. Sotira. Scatterplot of whorls’ weights and diameters
7.51. Sotira. Histogram of the RS values (spindle whorls)
7.52. Sotira. Ranges of whorls' perforation diameters
7.53. Sotira. Loom weights
7.54. Sotira. Bone and metal needles
7.55. Sotira. Distribution of textile tools in Area A
7.56. Sotira. Plan of Unit 7 with finds
7.57. Erimi. Spindle whorls from Unit SAIIB, Area A
7.58. Erimi. Frequency of spindle whorls showing use-wear
7.59. Erimi. Frequency of whorl types
7.60. Erimi. Frequency of whorl types per area
7.61. Erimi. Distribution of whorl weights by phase
7.62. Erimi. Weight classes of the spindle whorls from the workshop and domestic units
7.63. Erimi. Histogram of whorls’ weight classes (cemetery)
7.64. Erimi. Scatterplots of whorl weights and diameters
7.65. Erimi. Histogram of RS values (spindle whorls, settlement)
7.66. Erimi. Histogram of RS values (spindle whorls, cemetery)
7.67. Erimi. Ranges of whorls’ perforation diameters
7.68. Erimi. Loom weights
7.69. Erimi. Bar chart of weights of loom weights
7.70. Erimi. Weight and base thickness of the loom weights from Unit SAV
7.71. Erimi. Textile pseudomorph
7.72. Erimi. Unit SAI with installations related to textile dyeing
7.73. Erimi. Pithos A.354.SA4
7.74. Erimi. 3D image of Units SAI-III and SAVI
7.75. Erimi. Open and semi-open spaces WA I-IV
7.76. Erimi. Distribution of textile tools in the workshop’s units
7.77. Erimi. Ratio of decorated/undecorated whorls
7.78. Erimi. T.248. Cluster of spindle whorls
7.79. Erimi. Percentages of tombs with and without spindle whorls
7.81. Erimi. Plan of T.428
7.82. Skalia. Spindle whorls
7.83. Skalia. Frequency of spindle whorl of early type
7.84. Skalia. Frequency of whorls showing use-wear and no/undetectable
7.85. Skalia. Weight classes of spindle whorls
7.86. Ammoudhia. Weight classes of spindle whorls
7.87. Skalia. Scatterplot of whorl weights and diameters
7.88. Skalia. RS values of spindle whorls
7.89. Skalia. Ranges of perforation diameters of whorls from the final complex
7.90. Skalia. Loom weights
7.91. Skalia. Bent needle
7.92. Skalia. Occurrence of textile tools in the final complex
7.93. Skalia. Percentages of decorated and undecorated whorls
7.94. Skalia. Imported spindle whorls
8.1. KM1447 retrieved from the Ceremonial Area (Mosphilia) and the Ashalim spindle
8.2. Spindle whorls from EBA Anatolia and Cyprus with hollowed top
8.3. Distribution of weight classes between ECI and late MC in settlement sites
8.4. Plank-shaped figurines from Vounous and Lapithos and terracotta model AM816
9.1. Reconstruction of Viking Age clothing, note the spindle hanging from the dress of the woman. Archaeological Museum of Stavanger, Norway
9.2. Erimi. Comb-shaped pendant on the floor of Unit SAIIB
9.3. Lapithos. Plan of T.322B with the cluster of spindle whorls
10.1. Productive entanglements in the LChal
10.2. Web of interactions between Cyprus, Anatolia, and the Eastern Mediterranean during 3rd millennium BC
10.3. Productive entanglements in the Philia and EC–MC
10.4. Productive entanglements in the MC
List of tables

1.1. Schema of Cypriot chronology 23
2.1. Definitions of specialisation 31
2.2. Peacock’s taxonomy for the levels of specialisation (1982) 36
2.3. Costin’s parameters and different degrees of specialisation (1991) 37
2.4. Skill categories 49
3.1. Transformations over the Chalcolithic and Philia periods 59
4.1. Formulae for calculating the Moment of Inertia of spindle whorls 80
4.2. Diagnostic elements of needles and function 98
4.3. Individual data for specific indicators 107
6.1. Mospilia. Archaeological indicators for textile production 118
6.2. Table illustrating needles with eyelets preserved and intensity of eyelet modification 126
6.3. Table illustrating needles with tips preserved and intensity of tip modification 126
6.4. Mospilia. Contexts and chronology of the terracotta spindle whorls 130
6.5. Archaeological indicators for textile production in Philia sites 130
6.6. Minimum, maximum, and mean dimensions and weights of the Philia whorls 132
6.7. RS and MI values of the LChal and Philia whorls 133
6.8. Spindle whorls from the Philia tombs (tombs, whorl number, association with bodies, metal and stone ornaments) 138
7.1. Marki. Archaeological indicators for textile production 143
7.3. Marki. Loom weight P5395. Calculations of warp thread per loom weight and likelihood of successful loom setup 151
7.4. Marki. Loom weight P6193. Calculations of warp thread per loom weight and likelihood of successful loom setup 152
7.5. Marki. Loom weight P15106. Calculations of warp thread per loom weight and likelihood of successful loom setup 152
7.6. Marki. Table illustrating the units that yielded more than one whorl 158
7.7. Alambra. Archaeological indicators for textile production 161
7.8. Alambra. Correlation between whorls’ weight classes and MI values 162
7.9. Alambra. Loom weight E206. Calculations of warp thread per loom weight and likelihood of successful loom setup 166

7.10. Alambra. Loom weight E207. Calculations of warp thread per loom weight and likelihood of successful loom setup 166

7.11. Alambra. Table of buildings and rooms with textile tools from occupational floors 168

7.12. Politiko. Archaeological indicators for textile production 170

7.13. Sotira. Archaeological indicators for textile production 179

7.14. Sotira. Correlation between whorls’ weight classes and MI values 182

7.15. Sotira. Loom weight TC97. Calculations of warp thread per loom weight and likelihood of successful loom setup 184

7.16. Erimi. Archaeological indicators for textile production 188

7.17. Erimi. Correlation between whorl weight classes and MI values 192

7.18. Erimi. Group of loom weights from Unit SAV. Calculations of warp thread per loom weight and likelihood of successful loom setup 195

7.19. Erimi. Tombs with spindle whorls: number of spindle whorls per tomb, minimum number and biological sex of the individuals 206

7.20. Skalia. Archaeological indicators for textile production 208

7.21. Skalia. Correlation between whorl weight classes and MI values 212

7.22. Skalia. Loom weight KS171. Calculations of warp thread per loom weight and likelihood of successful loom setup 214

7.23. Skalia. Loom weight KS15. Calculations of warp thread per loom weight and likelihood of successful loom setup 214

9.1. Table illustrating the mean number of whorls per domestic unit in EC–MC III/LC IA settlements 242

9.2. Tombs from different periods and cemeteries showing an association between spindle whorls and the deceased 253
Abstract

Textiles and their manufacture represent a significant proportion of the material expression of past and present societies. Nonetheless, these organic artefacts and many aspects concerning their making are often archaeologically invisible and, for this reason, long neglected by scholars. A recent growing interest in textiles has shed completely new light on this topic. This doctoral thesis represents the first holistic study of textile production in Cypriot late prehistory, ranging between the Late Chalcolithic (ca 2800–2500/2300 BC) and the beginning of the Late Bronze Age (ca 1650–1450 BC). One of the aims of this work is to fill a gap in current research: whilst earlier studies on the subject have focused on single aspects of material culture at a single time, the panorama lacked a more systematic study for Bronze Age textiles in Cyprus. Drawing a comprehensive picture is, in fact, fundamental for defining the technological and socio-economic aspects related to this manufacture.

This study is conducted through two steps: the identification and examination of archaeological indicators that are useful for outlining textile production (tools, structures, fabric remains) and their contextual analysis. Settlement contexts are privileged over cemeteries, but the burial evidence is integrated into the picture as it provides unique information of social uses, especially considering the deposition of tools as grave goods. Through this, it has been possible to investigate and discuss productive dynamics and identity construction in relation to textile work. The discussion of these important socio-economic aspects is grounded both in the traditional theoretical debate around specialisation, utilitarian and prestige goods, and identity construction but also benefits from the concept of ‘productive entanglement’, derived from Hodder’s (2012) theory, that facilitates drawing out relational dynamics between all the components that played a role in the productive process.

Productive dynamics and the relationships between humans (workers, consumers) and things (tools, products, technologies, resources, etc.) are deeply entangled and contribute to the construction of prehistoric Cypriot society. Thus, textile production can be used as a privileged lens to tackle debated questions in Cypriot archaeology. In particular, this approach has offered the opportunity to re-discuss the possible input and modalities of the transition between the Chalcolithic and the Bronze Age, and the appearance and development of social complexity between the Early and Middle Cypriot periods.
Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning. However, I began to explore these themes in my MA dissertation, ‘Archeologia della Produzione Tessile: il Caso di Cipro nell’Età del Bronzo’, submitted for a degree of Laurea Magistrale (Master of Arts) in Archaeology and Ancient History at the Università di Torino in 2015.

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PART I
Chapter 1
Introduction

Ancient textiles were made with natural fibres (e.g. flax, wool, nettle, hemp, silk) using a wide range of techniques and methods for making thread, weaving, sewing, and decorating to produce materials of coarse and fine consistencies. This thesis aims to analyse these evanescent artefacts, their manufacture and social implications on Cyprus in Late prehistory. Before proceeding to examine the core object of this research, it is essential to provide the necessary background to situate this work in the wider context of textile studies. This can only be done by briefly outlining the importance of textiles and introducing past and current research lines on the subject.

Textiles surrounded ancient people (and continue to do so until today) as they covered a wide range of uses, from delicate clothing to coarse boat sails, and fulfilled basic human needs (Gleba and Mannering 2012, 1). For example, they keep the human body warm and protect it from external agents, or they can be used to carry, store, wrap or cover objects and furnish spaces. Large textiles may not only belong to a space but create it physically and symbolically: nomadic groups of Central Asia live in temporary settlements of yurts – tents covered with sheets of felt and decorated with woven bands that can identify the owner (Barber 2007, 177). Thus, it is clear that textiles also have social significance and can be used to send messages “from the moment they are seen” (Barber 2007, 173).

Among textiles, clothes play a crucial role as they are commonly associated with body aesthetics and self-representation. Social psychology of dress, for example, defines clothes as “an assemblage of modifications of the body or supplements of the body” (Roach-Higgin and Eicher 1992, 1; Johnson et al. 2014). Archaeological research has recently demonstrated that these ideas were already embedded in the use of clothing since the Palaeolithic, meaning that clothing met both practical and social needs, which led to archaic humans to cover their skin. Similarly, sophisticated needle types for decorating clothes, along with sewing needles, made

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1 Leather clothing was predominant in the Palaeolithic, and the appearance and use of the first textiles is dated to the Upper Palaeolithic (Gleba and Mannering 2012, 1).
their appearance in Upper Palaeolithic sites across the world (d'Errico et al. 2018, 72–73, 83). Since early times, the dressed body was thus used to build and display identities, translating values and meanings (age, gender, wealth, status, power, religion, ethnicity, etc.) into a non-verbal language (Sørensen 1997; Allerton 2007).

It has often been highlighted by scholars that practical and social purposes of textiles go beyond the objects themselves and also concern the manufacturing process (Barber 2007, 173). Andersson Strand et al. (2010, 150) define fabrics as “not simply a binary system of spun, twisted, or spliced fibres, but first and foremost a result of complex interactions between resources, technology, and society”, suggesting that the social significance of textiles is not only to be found at the point of consumption, but it is already embedded within their making. In this scenario, the production of these socially meaningful artefacts is relevant to the construction and definition of individual and group identities as much as wearing or displaying them. As part of the production process, it is worth highlighting that technical gestures of textile manufacture bear a strong visual impact that has greatly fed the collective imagery of many cultures. For example, the deeds, adventures, or tragic stories of mortal and goddess weavers – such as Greek heroines Penelope and Arachne, the Chinese Goddess Weaver, and Inca Mama Uqllu – are central in mythology, and Sleeping Beauty’s fatal touch of the cursed spinning wheel are certainly part of our childhood memories (Scheid and Svembro 2001; Weigle 2007). The figurative use of terminology related to textile work in ancient and modern European languages is also significant. The expression ‘weaving a plot’, for instance, is a synonym for planning, inventing or constructing a story, while ‘sewing pieces together’ means an effort to reconstruct a fact (Wilkinson 2002 for English expressions; Nosch 2014 for ancient Greek and Latin expressions). The technical gesture of textile production is thus often used to allude to major themes in human lives, such as the flow of life, its interruption and the construction and manipulation of reality, and textile artisans can be figuratively transformed from object maker to creator of life, death, and intricate reality.

As highlighted above, this thesis aims to analyse these important objects, their manufacture, and the role of textile craftspeople in a specific place and period, namely Late Chalcolithic to the end of the Middle Bronze Cyprus, touching upon the beginning of the Late Bronze Age (ca 2800–1650/1450 BC).
Overall, this thesis has five objectives:

1. To define textile technology and productive strategies within each period under study.
2. To explore changes and developments in textile production between periods.
3. To characterise and analyse work dynamics, level of specialisation, and the role of craftspeople within textile manufacture.
4. To investigate the socio-economic significance of textile manufacture and its products in Cypriot society and its role in the construction of the prehistoric social fabric and identities, and interpersonal relationships.
5. To highlight the role of textiles within the context of larger island-wide debates around increasing social complexity.

In the next sections of this chapter, an introduction to textile archaeology will be provided to situate this study in the broader context of this dynamic field. Then, the potential and significance of investigating textiles for Cypriot archaeology will be outlined more in detail.

1.1 Textiles in archaeology: a multifocal perspective on the past

As much as textiles can play a central role in material expression, they are often invisible in the archaeological record. Commenting on the beginnings of weaving in Europe, Barber (1991, 79) stated that “the problem may, of course, be one of preservation rather than existence”. These few but incisive words point to the main issue relating to the investigation of ancient textile production, and, most probably, one of the main reasons why textiles were frequently overlooked and neglected by archaeologists. Another reason of neglect was the mundane character of the most visible traces: textile tools appeared modest, domestic artefacts that could not measure up to elegant vessels, shiny weapons, or prestigious ornaments in importance. Despite a general lack of attention by the archaeological community as a whole, pioneers of archaeological textiles appreciated the importance of this material, giving rise to a niche discipline that has enormously increased within the last two decades (see below §1.1.3).

It is only recently that we have witnessed a full-scale, worldwide research ‘textile revolution’, which has dramatically changed the way scholars approach this archaeological category (Andersson Strand et al. 2010; Gleba 2011; Andersson Strand and Nosch 2015a). Most of all, recent studies in the field have advanced the archaeological perception of textile work and consumption. Textiles, in fact, were first considered too evanescent and not easily searchable
(therefore, unworthy). Now, they have turned to be a research challenge opening up to new possibilities and allowing scholars to expand their focus to include a series of archaeological materials, structures and contexts previously marginalised (Costin 2013, 180).

1.1.1 A pioneering perspective

It is indisputable that foundational work produced by pioneers of archaeological textiles already showed deep methodological awareness, as they considered ethnography and experimental work as research pillars alongside archaeological materials. Crowfoot (1931) was among the first researchers interested in ancient spinning: her comparative study of spinning methods and practices in modern Egypt and Sudan, and Pharaonic Egypt combines the analysis of the archaeological evidence with ethnographic observation. On weaving, Ling Roth’s (1918) study is one of the first dealing with ancient looms, while Hoffmann (1964) can be considered the pioneer of studies on the warp-weighted loom, a specific type of loom particularly diffused across ancient Europe and the Mediterranean. Her study utilises detailed descriptions and functional analyses of Norwegian traditional warp-weighted looms to explore the ancient ones in Europe and the Near East. Barber’s (1991) work on prehistoric textiles in the Aegean undoubtedly represents a divide for textile archaeology in the Mediterranean. Barber (1991) provided archaeologists with a first, systematic investigation of all the steps of textile manufacture – from fibre procurement to consumption – and set out a methodology for the analysis of the main categories of textile tools (e.g. spindle whorls and loom weights). Her work (1991, 283–298) also explored social aspect of textile production, in particular the conceptualisation of textile work as a woman’s work.

1.1.2 A gendered perspective

This gendered understanding of textile working was examined more fully in Barber’s influential 1994 monograph (Figure 1.1). This wide-ranging study provides insight into the archaeological and linguistic evidence to create a framework for inquiry about labour division in textile manufacture. Evidence from Palaeolithic to Classical times led the author to conclude that textile production was a woman’s work, especially – but not exclusively – in the domestic environment. This work had the merit to draw attention to the female perspective, long neglected by past scholarship; on the other, it cast the gender blanket over many textile aspects – both productive and social. Critics of Barber, for example, have pointed out that her
argument was largely based on cross-cultural comparisons and sources mediated by ideology (e.g. literature and art), which may distort the real relationship between work and gender; textile research should not be divorced from the particular socio-cultural backgrounds (Foxhall 1995, 426).

Costin (2013) extends this argument further by observing that archaeologists generally utilise a wide type of sources, such as epigraphy, literature, art representations, and archaeological finds. However, each of these are of course driven by viewpoints pre-determined by the author or artist’s cultural and socio-political environment, such as sense of morality, understanding of the organisation of work, society, the role of gender and perception of status. Most importantly, it must be kept in mind that such generalisations and assumptions create stereotypes that do not help our understanding of possible correlations between gender, task division and work organisation (Costin 2013, 196): gendered workforce and textiles are, in fact, culturally fluid concepts that cannot be coerced into a fixed model and used as a dress for any occasion. For this reason, the use of ethnographic analogies can and have contributed to a misleading picture of textile work as these ethnographic examples represent specific situations that are, instead, used as universally applicable (Costin 2013, 185). In response to these recommendations, it is thus essential to define the cultural background and try to understand whether association between gender and textile activities can be proposed based on the evidence available, rather than by imposing a specific, but perhaps actually entirely unsuitable, gendered model onto their record.
1.1.3 A multidisciplinary perspective

The foundation of the Centre for Textile Research at the University of Copenhagen in 2005 marked the most recent turning point in the history of textile research and the beginning of a global interest in textile studies. The Centre has encouraged the development of new methodologies and promoted several distinct projects on the study of a variety of aspects related to historical and archaeological textiles across the world (CTR 2005). In particular, the project ‘Tool and Textiles, Texts and Contexts’ (TTTC) (Andersson Strand and Nosch 2015a) set methodological standards for studies on textiles tools, experimental tests, use of written sources and contextual approaches. These standards are now universally adopted by archaeologists researching ancient textiles and will be further explored in Chapter 4. One other influential project – ‘Production and Consumption: Textile Economy and Urbanisation in Mediterranean Europe 1000–500 BCE (PROCON)’ – focuses on the impact of textile production and consumption in the development of early urbanised centres in Italy, Greece, and Spain (Gleba et al. 2013). The project has contributed enormously to our understanding of craft production, beyond its technical appearance, and offers a privileged lens through which socio-historical phenomena can be approached.

This recent dynamism in the field has led to an exceptional increase of textile-focused publications across the world. In parallel, the ‘natural’ inclination of textile research for cross-fertilisation with other disciplines has turned textile archaeology into an umbrella term covering an array of approaches and methods; literature reviews give a good idea of the richness of this field of study but are far from exhaustive (e.g. Gleba 2011). Recent works containing an analysis of textile publications are especially focussed on providing an overview of the main sources or analytical methods that can be used to investigate textiles (Andersson Strand et al. 2010; Gleba 2011). For example, one of the most developed research topics is the investigation of the archaeological evidence (namely, tools and textile remains). Many other studies have focused on terminology and the use of written sources, iconography, experimental replications, re-creation of ancient fashion, ethnography, and conservation (e.g. Gillis and Nosch 2007a; Michel and Nosch 2010). Separate mention should be made of archaeometry-based studies, which have developed an extremely wide variety of approaches, ranging from the application of chemical and molecular analyses, to isotopic tracing, radiocarbon, and microscopy. To mention a few select examples, SEM microscopy, X-ray
diffraction, and chemistry-derived methods have been used for the identification of textile fibres and microstructure of textile remains (e.g. Müller et al. 2006; Bergfjord and Holst 2010), while ancient genetics, proteomics, and analyses of the strontium signatures of wool have been especially applied to gain a better understanding of animal resources, treatments, and identification of imported materials (e.g. Frei et al. 2009; Sabatini et al. 2019; Brandt and Allentoft 2020; Di Gianvincenzo et al. 2020; Frei 2020;). Physics- and chemistry-based methods, such as high-performance liquid chromatography, ultraviolet-visible and mass spectrometry, are applied extensively to identify dyes from residues (e.g. Szostek et al. 2003). Detailed exploration of these aspects of textile research is beyond the scope of this thesis, however, relevant literature on the approaches adopted so far by Cypriot archaeologists and the methods used in this study will be summarised in the following section and scrutinised in greater detail in Chapter 4.

1.2 Textiles and Cyprus

Within the lively research field of textile archaeology, the aim of the present work to analyse textile production in prehistoric Cyprus. As anticipated, the main chronological focus will be on the Late Chalcolithic (LChal)/Philia and the Early (EC) and Middle (MC) Cypriot periods, while the Middle Cypriot III/Late Cypriot IA (MCIII/LCIA) transitional period will be touched upon in lesser detail (Table 1.1, Figure 1.2). The chronological framework of this work is primarily intended to cover the EC and MC. However, it is not possible to fully understand the transition to the Cypriot Bronze Age (i.e. the Philia period) without considering the previous period, namely the Chalcolithic. Similar considerations can be extended to the end of the MC, that cannot be adequately explained without a reference to the beginning of the Late Bronze Age.

<table>
<thead>
<tr>
<th>Period</th>
<th>Date (BC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late Chalcolithic (LChal)</td>
<td>2800 – 2500</td>
</tr>
<tr>
<td>Philia</td>
<td>2500 – 2350/2250</td>
</tr>
<tr>
<td>Early Cypriot I–III (ECI–III)</td>
<td>2350/2250 – 1950</td>
</tr>
<tr>
<td>Middle Cypriot I–III (MCI–III)</td>
<td>1950 – 1750/1650</td>
</tr>
<tr>
<td>Middle Cypriot III/Late Cypriot I (MCIII/LCIA)</td>
<td>1750/1650 – 1450</td>
</tr>
</tbody>
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*Table 1.1. Schema of Cypriot chronology for the periods in this study, with abbreviations (derived from Manning 2013; 2014)*
Earlier studies on the subject have focused on single aspects of textile material culture at a time. While incredibly valuable as they created typologies, characterised single classes of tools and evaluated their function (e.g. Crewe 1998; Walz and Swiny 2003; Frankel and Webb 2006a, 159–177; Webb and Peltenburg 2013), they unfortunately only provided glimpses on specific steps of the manufacturing process, meaning that there currently exists a lacuna for a more systematic and comprehensive study of prehistoric textiles in Cyprus which this thesis has set out to fill (see Chapter 4 for a more detailed discussion). The Late Bronze Age is beyond the chronological framework of this study, but it is worth noting that Cypriot sites of this period were included in the TTTC project (Smith et al. 2015a; 2015b). No wide-ranging study on textile manufacture has as yet been produced, but important specific contributions have been made as regards classes of materials, and outlines of textile production at single sites or at a regional level (Smith 2002, 2007; 2017; Smith and Tzachili 2012; Sauvage and Smith 2016). The first objective of this study is thus to pull together different ‘pieces’ of the Cypriot material textile culture to provide the discipline with a first comprehensive assessment of textile manufacture on Cyprus, utilising up-to-date methods designed by the most recent textile research.

!!!Figure 1.2. Map of Cyprus showing site localities mentioned in this study and periods!!!

In contrast with contemporary Bronze Age (BA) civilisations in the Mediterranean and the Near East, Cypriot late prehistory cannot rely on written documents, and archaeological finds
are our best source to investigate textile production. Among them are tools, structures, implements, and rare fabric remains. A representative cross-section of LChal and EC/MC settlements will serve as case studies: Kissonerga *Mosphilia* (*Mosphilia*), Marki *Alonia* (Marki), Alambra *Mouttes* (Alambra), Politiko *Troullia* (Politiko), Sotira *Kaminoudhia* (Sotira), Erimi *Laonin tou Porakou* (Erimi), and Kissonerga *Skalia* (*Skalia*). *Mosphilia* facilitates a multi-period perspective on the development of a Chalcolithic settlement throughout key periods, with well-documented LChal levels and a sequence extending up until the Philia (Bolger *et al.* 1998, 8–21). The remaining sites were chosen because they offer the most complete picture from among the EC/MC settlements, and the selection includes all sites investigated with modern archaeological methods. *Skalia* is the only settlement with a sequence securely extending from the late MC into the MCIII/LCIA transition, allowing us to extend our analysis into the transition to the LC period.

Whenever available, evidence from burial contexts from cemeteries related to these settlements was also included. Textile indicators will be examined under two main interrelated approaches, the techno-functional and contextual ones (e.g. Andersson Strand *et al.* 2010). The first perspective allows us to understand the function and technical information that can be retrieved from single indicators. The second approach focuses attention on the productive dynamics acting upon/within any one single socio-economic system. Combining the productive and socio-economic dynamics allows for a contextual approach, which, in turn, facilitates an investigation into the relationship of these interactions. Additionally, integrating settlement and burial evidence offers the opportunity to explore social aspects of textile manufacture and consumption in these two important domains, and to address issues regarding the nature, value and consumption of textile materials.

The approaches outlined, however, show at least two main caveats that must be considered. The first one pertains to the visibility of textile evidence within the archaeological record, and the second one concerns issues related to the contexts. Firstly, as previously explained, the poor visibility of archaeological textiles has long discouraged their study, and the Mediterranean climate of Cyprus does not facilitate the preservation of organic materials. Consequently, the complexity of textile work (as described in Appendix I) is not adequately represented in the record and only a limited number of activities can be detected. Secondly,
although Cypriot settlements offer good contextual data for a comparative approach, each settlement shows specific archaeological and research ‘stories’ that must be evaluated case by case. These include different types of occupation and abandonment, disturbance of the stratigraphy and surrounding landscape by anthropic and post-depositional events, and different recording strategies by archaeologists – all of which affect the artefact record in terms of quantity and quality (Frankel and Webb 2001). By conducting a personal analysis of all of the material, however, it was possible to partially mitigate for the latter factor. Additional limitations are specific to burial contexts: the Cypriot mortuary record often presents complex practices with multiple and secondary deposition, suffered from looting, had to endure variable preservation conditions as a consequence of geology and climate and was heavily impacted by past methods of excavations that particularly focused on skeletal material to the detriment of a more sophisticated understanding of the relationship between grave goods and individuals (Keswani 2004, 22–36; Douglas 2019, 21–24).

Research on the periods considered in this study has highlighted the importance of productive activities (§3.2), the value of goods and questions about identity as key theoretical notions that can be used in defining and understanding prehistoric Cypriot society, community life and its transformations. As will be explained in Chapter 3, these concepts are key to investigating major changes in material culture and practices, especially detectable in the periods that mark the ‘thresholds’ between the Chalcolithic and the EC and the end of the MC respectively, and relate to the debated emergence of social complexity and changes in the social fabric throughout the EC and MC. Although textiles and textile production often considered part of this picture, no systematic study has as yet investigated the role played by choices and dynamics related to textile work and its relationship to other contemporary material and social changes; and this, in turn, has limited a full understanding of textiles as a craft complex. This thesis thus sets out to remedy this gap and utilise textiles as a new lens through which to interpret Cypriot society.

1.3 Thesis structure
This thesis is divided into three main parts. Part I (Background) comprises Chapters 1 to 4. Part II (Presentation of data) incorporates Chapters 5 to 7. Chapters 8 to 10 constitutes Part III, which discusses and interprets the observed patterns, before concluding the thesis in Chapter
11. Having briefly introduced the potentialities of textiles as a research field in general and for LChal–MCIII/LCIA Cyprus between in particular (Chapter 1), the next chapter (Chapter 2) will set out the theoretical background for this work by exploring key issues, such as textile technology, production, and the identity of practitioners. This chapter will also reflect upon the possibility to read these concepts through the lens of materiality and relational theories. Chapter 3 will then explore the historical framework for the periods under study and investigate the main questions surrounding production and identity in Cypriot archaeology. The status of Cypriot textile research and the methodology used for the identification and examinations of archaeological textile indicators is the topic of Chapter 4. The selected case-studies will be introduced in Chapter 5, and the core data analysed in Chapter 6 (LChal and the Philia phase) and Chapter 7 (EC–MCIII/LCIA). Chapter 8 will outline textile technologies and production, while Chapter 9 will discuss the organisation and dynamics of textile work. Chapter 10 will then investigate nature and origin of technological and social innovations at the transition between the Chalcolithic and the BA, and community life in the EC and late MC periods, with a focus on interactions and the rise of social complexity. The last section of this chapter will bring together all of the strands of the argument and conclude with some final thoughts, including recommendations for future textile research on Cyprus.
Chapter 2

Theoretical Background

As introduced in the previous chapter, the main objective of this study is to explore a specific craft complex (textile production) within the prehistory of Cyprus. This chapter will present and discuss the theoretical concepts that facilitate our investigation of crafting as a lens through which to explore the island’s social, cultural, and economic dynamics. Crafting is generally read by archaeologist through two interpretative lenses: technology and specialisation. The two terms indicate a different attitude towards the perception of transformation or co-transformation of the material into an object: one, technology, focuses on the reconstruction of the technical actions of the making process, while the other, specialisation, investigates its organisation and economic context. Both are recognised as having strong social implications, but scholars tend to keep these two concepts epistemologically distinct although they are complementary and capture two fundamental and intertwined aspects of ancient manufacture (Kohring 2006, 62). Even when one of the two lenses is prioritised, their interrelatedness must always be kept in mind. An approach that can integrate these two aspects would thus best reflect the specificities of each viewpoint whilst, at the same time, taken into account their interrelation in revealing contexts of production and consumption.

This work will use a multifocal lens to read the dynamics of textile production, regularly shifting attention from one aspect to the other in order to illuminate the technological, economic and socio-symbolic context of Cypriot textile production and the identities of textile craftspeople through time. The first part of this chapter provides a basic definition of the concept of technology as utilised in this thesis, before delving more deeply into productive organisation and the identity of craftspeople in the second and third parts. Drawing on the concept of ‘productive entanglement’, the fourth part of this chapter will reflect upon the potential of investigating ancient craftwork as a series of relational aspects. The structure of this chapter also reflects the journey into theory that stands behind the present research. In particular, it explores both traditional definitions of the theoretical concepts used in this work
and the perspective of materiality and relational networks, that are central in the current trends of archaeological theory.

### 2.1 Technology and technique

Technology can be defined as a set of actions that can be performed on a material or “the material means of making” (Dobres and Hoffman 1994, 211; also: Lemonnier 1992, 2012, 298–299). It is the way in which the productive act can be approached and performed, and the selection of the technical actions from among all the possibilities and variabilities. Scholars have often stressed the difficulty of making a distinction between technique and technology (Clarke 2007, 66–67). Mauss (1948, 71–78; also: Schlanger 2006, 147–153) describes technology as “a science dealing with techniques”; hence, we have to recognise that these two concepts are in a close relationship with each other. Schlanger (2006, 2) makes this explicit by reflecting that “techniques are the object, and technology is its logos, its discourse, its disciplinary study. In this sense, technology is to techniques what musicology is to music, what climatology is to climate, or again what criminology is to crime”. In this respect, it is worth reflecting a technique cannot be disentangled from the activity in which it is performed (Ingold 1990, 7–8). I concur with this definition, which also forms the foundation for the understanding of technology and techniques in the present work.

When adopting the viewpoint of technology, the making of an object is often conceptualised as a *chaîne opératoire* (operational sequence), namely a series of technical actions underpinning the manufacture of an artefact (Soressi and Geneste 2011, 337). This notion allows researchers to break up the process into distinct crafting steps leading towards a final productive goal (Sellet 1993; Lemmonier 2004; 2012). The *chaîne opératoire* is often perceived to concern itself exclusively with technical aspects. However, craftspeople can potentially follow many different routes to derive at the same final object. Thus, understanding these choices and their technological and cultural background allows insights also about the social context. This link was already accepted by Leroi-Gourhan (1993) and developed further under the aegis of French tradition of prehistoric studies and ethnoanthropology awith the aim of emphasising the social importance of technical gestures (Audouze and Karlin 2017). The concept is deeply embedded in Mauss’ philosophy (1936; 1947; 1948; also quoted in Schlanger 2006, 97–140), which had given centrality to human bodies and bodily gesture and
movement as producers of realities (Soressi and Geneste 2011, 335–336). However, Mauss (1936, 365; also quoted in Schlanger 2006, 97–140) did not pay exclusive attention to the making of objects, but considered the multiplicity of human actions that can be performed on matter as producers of social and cultural significances and cultural productions at the same time.

Even though the chaîne opératoire does not necessarily depict a linear or anthropocentric process (namely, prioritising the human component over other factors), Ingold (2012, 433–435) has observed that it is intrinsically conceived as an hylomorphism, a way of thinking that depicts objects as ordered matter with a form imposed by the mind. Therefore, a rigid application of the chaîne opératoire can result in describing production as consequential and human-driven rather than processional and relational. To avoid this, production should be explored as a ‘broken’ series of relations between the artisan and the matter (Ingold 2012, 434). Placing even greater emphasis on the interplay between human and material, Kujipers (2018a, 74–76) argues that scholars should always find a way to emphasise the interaction between people and matter when the chaîne opératoire is used: for example, he suggests that investigating a productive process should equally be about which and how techniques are used, and the ‘response’ of the material (Kujipers 2018a, 75–76).

2.2 Production and specialisation

Specialisation has received great attention by archaeologists since Childe proposed that it was a driving factor in urbanisation and put it in a direct correlation with the rise of social differentiation and inequality (1950; 1964, 97–120). The notion of ‘surplus’ is the heart of Childe’s explanation of why cities emerged: the diversification of agriculture facilitated the production of food surplus, which set craftspeople free to engage full-time in the manufacture of non-subsistence items and led to the emergence of socio-political control over resources, productive means and the goods produced. Childe, a Marxist, was the first to view archaeological debates within the context of contemporary socio-economic theories and societal evolutionism (Patterson 2005, 308–309), and argued for a link between the organisation of ancient craft production and social hierarchies – a view that was destined to become a long-perpetuated concept within the discipline of archaeology (Costin 2005, 1035).
A theoretical landmark was created, and specialisation became an archaeological “holy grail” to be chased tirelessly (Day et al. 1997, 275).

<table>
<thead>
<tr>
<th>Definition</th>
<th>Key terms</th>
<th>References</th>
</tr>
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| “Craft specialization is here considered an adaptive process (rather than a static structural trait) in the dynamic interrelationship between a non-industrialized society and its environment. Through this process, behavioral and material variety in extractive and productive activities is regulated or regularized”. | • Process  
• Interrelationship  
• Environment  
• Regulated/regularised | Rice 1981, 219–220 |
| “Specialization involves economic differentiation and interdependence: the existence of individuals who produce goods or services for a broader consumer population. Specialisation is a continuum along which any economy can be gauged” | • Economic differentiation  
• Ratio producers/consumers  
• Continuum  
• Process | Brumfiel and Earle 1987, 5 |
| “Craft specialisation is the production of alienable, durable good for nondependent consumption”. | • Alienable, durable good  
• Nondependent consumption | Clark and Parry 1990, 297 |
| “A differentiated, regularized, permanent, and perhaps institutionalized production system in which producers depend on extra-household exchange”. | • Regularised/institutionalised  
• Differentiated  
• Permanent/System  
• Exchange | Costin 1991, 3 |
| “Craft specialization […] is defined as fashioning items at volumes above and beyond the needs of the producing individual or group for exchange with those engaged in complementary economic pursuits”. | • Beyond individual need  
• Exchange | Schortman and Urban 2004, 187 |

Table 2.1. Table illustrating the most recent and influential definitions of specialisation

The debate around specialisation and its socio-economic implications intensified between the 1980s and 1990s and was more recently resumed by Schortman and Urban (2004) and a collection of thematic papers published by American Archaeological Association (Flad and Hruby 2007). Table 2.1 summarises some of the most influential definitions of specialisation proposed from the 1980s onwards. The definitions highlight recurring key terms that are used to emphasise the pivotal concept around which this archaeological category is based. First, it can be noted that specialisation is often conceptualised as a process or system. This was most probably imprinted by neoclassical economics, which describe modern productive processes as a series of inputs (e.g. materials, workforce) that are transformed into outputs, object or services that can be consumed (Sieckles and Zelenyuk 2019, 9–19). In this picture, the value
of the initial material increases once transformed, acquiring additional value as useful for a specific purpose. Other key elements in these definitions are the role of consumption and exchange, and regulation, and control (including socio-political control). The following sections will look thoroughly at these important concepts and their role in the definition of specialisation.

2.2.1 Specialisation and non-specialisation

As evident from the definitions reported in Table 2.1, researchers agree that the presence of exchange as a step between production and consumption is fundamental to distinguish between specialisation and non-specialisation. This stems from the consideration that non-specialisation and subsistence are synonyms, both referring to the production of the minimum necessary to meet a basic household need. Satisfying a basic need does not require a specific formalised organisation or the need to uphold specific standards in relation to quality or quantity of products, and it can thus be defined as non-specialised (Arnold and Munns 1994, 475). Therefore, subsistence and non-specialisation refer to the manufacture of goods that are consumed by the producers and the people directly ‘dependent’ on their production (namely, members of the same family or kin of the producer). In contrast, the possibility of exchanging products is thought to go hand in hand with planning and organisation of the productive process. As a result, while there is only one type of non-specialisation (subsistence), there are many different ways of organising production, implying a great variety of types of specialisation (Clark 1995, 279).

Thus, if producing and exchanging surplus facilitates the definition of a boundary between non-specialisation and specialisation, one may be led to think that different degrees of specialisation are correlated to the volume of goods produced (quantity) and time spent producing (efficiency). Even though these can be indirect indicators, quantity and efficiency cannot be used alone to describe specialisation (Costin 2001, 289–291; 2005, 1069, 1074–1075). High quantities of goods certainly bring an economic advantage, but value also plays an important role in exchanges. Value placed on objects is cultural and depends on a series of factors: generally, they are linked to the idea of exclusivity and only a limited number of them is made exchangeable (Plourde 2009, 266) (§2.2.4). Valuable objects can be produced by highly specialised manufacture but in low quantities, and they can be highly time consuming
in terms of efficiency (Clark 1996). In fact, their high value can be also related their manufacture (e.g. the use of a specific technology or a certain type of material, fine working) or showing certain characteristics that distinguish or make them unique when compared to non-valuable objects: for example, they can be finely crafted or show special properties or materials (Plourde 2009, 266). Exchange and specialisation are related and co-define each other, but the variables that link these concepts are more complex than simply detecting and quantifying surplus.

Terms alluding to regulation or control of the manufacturing process are also crucial in the definitions of specialisation reported in Table 2.1. For archaeologists, this is not just a lens through which specialisation can be explored, but it is the pulsing core of the question. As introduced above, a link between craft specialisation and the emergence of societal hierarchy was argued for by Childe (1950). Whilst Childe’s correlation between political centralisation and specialised production has been developed, enriched by works previously mentioned that exemplify a vivid debate between the late 1980s and early 1990s, specialisation has always been envisaged as requiring some kind of basic control and organisation (e.g. Rice 1981; Peacock 1982; Brumfiel and Earle 1987; Costin 1991). Also, this phenomenon is generally understood as composed of many different levels, where lack of specialisation on one hand and full-time, highly specialised manufacture on the other only represent the extremes with most case studies falling in-between (Peacock 1982; Costin 1991). Generally, the definition of a degree of specialisation is achieved through the examination of a series of parameters correlated to the outcome, the time spent crafting, etc. that are combined with a certain level of control exercised over production. First, the parameters for the identification of specialisation will be presented; then it will be illustrated how they are traditionally linked to forms of control.

2.2.2 Indicators of specialisation

Standardisation is often recognised as one of main indicators of specialisation (Rice 1991; Orton 2013, 147–148; Earle 2018, 2). The concept generally refers to measures and morphological and formal characteristics of the products: the degree of variation of these elements within assemblages is used to assess the degree of similarity or difference between objects from site assemblages or in different regions (Orton 2013, 145). In particular, the
higher the level of specialisation, the lower should be the degree of differentiation among its products (Orton 2013, 147). Despite being commonly accepted as a way to ‘measure’ specialisation (e.g. Milograv and Vuković 2018), scholars debate the actual usefulness of this variable. One crucial question about standardisation is raised by Orton (2012, 439–440; 2013, 147, 149) and concerns the difficulty of measuring diversity in pottery when types and decoration do not necessarily reveal chronological, stylistic, or functional variation instead of productive ones (Orton 2013, 147–148). In addition, studying the variations in the degree of standardisation of Cycladic pottery cups, Berg (2004) demonstrated that standardisation can also depend on different social contexts of production rather than on the level of specialisation.2

For Costin (1991, 3, 11, 8, 11–14; 2001, 292–293; also: Costin and Hagstrum 1995, 620–621), it is not standardisation that should be considered the first indicator of specialisation, but the context of production. In her early works, this is defined as the socio-economic conditions that determine demand for a product, the type and nature of control over production, and the scale, intensity and concentration of productive activities (Costin 1991, 8) (see below). More recently, she identifies the context of production as the ‘production locus’, namely the productive space in terms of both its social and spatial meaning (Costin 2001, 293–295). In this case, the archaeological evidence, such as the occurrence of new artefacts of the same type or material, the presence of debris, by-products or discarded artefacts, is assigned the same importance to identify specialisation as establishing who regulated it. Other indicators considered in the literature are: the presence of different manufacturing traditions (identified through the final products or an analysis of tools), difference in technology, and proficiency in the use techniques, object quantity, distribution and consumption seen, again, in terms of standardisation, namely in patterns of homogeneity/heterogeneity of objects in assemblages (Day et al. 1997, 282–286; Orton 2012, 436–443; 2013; also: Crewe 2007, 22–23 for technology as an indicator of specialisation).

The scale or “constitution of productive units” considers the work group of artisans, their composition and size (Costin 1991, 29; 2001, 296–297). Equally relevant is the physical

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2 In this regard, Costin (2005, 1075) pointed out that the relation between standardisation and its social context is generally poorly defined; recent research has set out to fill this gap (Milograv and Vuković 2018).
location of manufacture (ranging from household to formally organised workspaces) where the production context allows inferences about task organisation and social relations between producers (Costin 2001, 296–297). Concentration and intensity are two other indicators of specialisation. Concentration refers to the distribution of artisans as nucleated or dispersed (Costin 1991, 13–15; 2001, 295–296). Some authors use the quantity of debris as archaeological markers for an assessment of these two parameters (e.g. Charlton et al. 1993, 155–160). However, this is difficult to assess through the archaeological evidence, but alternative sources (e.g. written documents) may provide this information (Costin 2001, 295). The level of intensity indicates part-time and full-time work and is also difficult to detect in the archaeological record (Costin 1991, 5–6, 6 fig. 1.2).

2.2.3 Control and regulation
Generally, control is envisaged at different levels, from self-management by artisans to the presence of a non-producing élite or institutional and state control. These possible, different forms of regulation and control are traditionally categorised as independent and attached – a distinction first introduced by Earle (1981) and quickly adopted in literature on specialisation (Brumfiel and Earle 1985; Clark and Parry 1990; Costin 1991; 2001; 2005).

This distinction is fundamentally based on the presence or absence of an entity outside of the production set-up. An attached production has clear links with that outside entity which an independent set-up does not. Independent specialisation is, in fact, conceptualised as internally regulated by groups or individual craftspeople with no administrators or institutions who set their productive targets and control resources, manufacturing steps, distribution (Brumfiel and Earle 1987, 5). In contrast, attached specialisation implies the presence of a non-crafting subject that may manage all aspect of production, and sets aims, standards, and behaviours (Brumsfield and Earle 1987, 5–6). These subjects can be differently identified, for example, as ‘patrons’, ‘élite’, or ‘institutions’, depending of course on the socio-political context in which this type of specialisation is located. In the context of attached specialisation, controlling entities gain power and status from regulating production, workers, products, and exchange networks (Costin 2005, 1070–1072). However, control over the productive process may not equate with control over the workforce and labour organisation but can be variously exercised.
over a series of related aspects, such as access to resources, means of production, technologies, regulation of distribution and consumption (Costin 2001, 297–298).

<table>
<thead>
<tr>
<th>Peacock 1982</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Household production</em></td>
<td>• simplest mode of production</td>
</tr>
<tr>
<td></td>
<td>• internal household consumption</td>
</tr>
<tr>
<td></td>
<td>• women as the producers</td>
</tr>
<tr>
<td></td>
<td>• sporadic in the Roman period</td>
</tr>
<tr>
<td><em>Household industry</em></td>
<td>• first level of specialisation</td>
</tr>
<tr>
<td></td>
<td>• non-essential for subsistence</td>
</tr>
<tr>
<td></td>
<td>• presence of skilled artisans</td>
</tr>
<tr>
<td><em>Individual workshops</em></td>
<td>• production lucrative</td>
</tr>
<tr>
<td></td>
<td>• markets economically relevant</td>
</tr>
<tr>
<td></td>
<td>• presence of skilled artisans, likely men</td>
</tr>
<tr>
<td><em>Nucleated workshops</em></td>
<td>• individual workshops clustered together</td>
</tr>
<tr>
<td></td>
<td>• cooperation between artisans and workshops</td>
</tr>
<tr>
<td></td>
<td>• possible competition</td>
</tr>
<tr>
<td><em>Manufactory</em></td>
<td>• presence of craftspeople in a single building</td>
</tr>
<tr>
<td></td>
<td>• highly specialised production</td>
</tr>
<tr>
<td></td>
<td>• production division into highly specialised tasks</td>
</tr>
<tr>
<td></td>
<td>• cooperation and high specialisation of workers</td>
</tr>
<tr>
<td><em>Factory</em></td>
<td>• fully developed factory system</td>
</tr>
<tr>
<td></td>
<td>• post-Industrial Revolution</td>
</tr>
<tr>
<td></td>
<td>• presence of machinery not powered by human or animal force</td>
</tr>
<tr>
<td></td>
<td>• presence of managerial and marketing structures</td>
</tr>
<tr>
<td><em>Estate production</em></td>
<td>• large-scale production</td>
</tr>
<tr>
<td></td>
<td>• non-skilled artisans, often subordinates or servants</td>
</tr>
<tr>
<td></td>
<td>• variable economic role</td>
</tr>
<tr>
<td><em>Military and other official production</em></td>
<td>• production undertaken by military forces for their needs</td>
</tr>
</tbody>
</table>

Table 2.2. Peacock’s taxonomy of specialisation in relation to pottery production in Roman times (after Peacock 1982)

Specialisation is depicted as a multilevel model and this has permitted researchers to build typologies in which different degrees of specialisation are labelled and linked to a series of indicators (Peacock, 1982, 6–11; Clark and Parry 1990; Costin 1991). One of the first categorisations of this kind was presented by Peacock (1982, 6–11) to frame his study of Roman pottery production. His model distinguishes between eight stages of work specialisation: household production, household industry, individual workshops, nucleated workshops, manufactory, factory, estate production, and military production (Peacock 1982, 6–11).
Table 2.2 lists key terms used for each definition. The key terms used to label the different levels of specialisation were derived from a pioneering work by van der Leeuw (1977) and would become part of the terminology traditionally used in scholarly literature on specialisation. Among the indicators that appear more frequently in this taxonomy are subsistence, internal/external consumption, task organisation, scale, skills/role of craftspeople, and the type of workspaces (Peacock 1982, 6–11). This model does not explicitly consider the presence of controlling entities as determinant for defining the level of specialisation; implicitly, however, categories such as estate and military production suggest certain degrees of control and regulation from external entities.

<table>
<thead>
<tr>
<th>Costin (1991)</th>
<th>Demand</th>
<th>Context and Concentration</th>
<th>Scale</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual specialisation</td>
<td>Subsistence, local consumption</td>
<td>Dispersed among non-specialists</td>
<td>Independent individual or households</td>
<td>Part-time</td>
</tr>
<tr>
<td>Dispersed workshop</td>
<td>Local consumption</td>
<td>Dispersed workshop, but concentrated specialists</td>
<td>Independent, non-domestic space</td>
<td>Not specified</td>
</tr>
<tr>
<td>Community specialisation</td>
<td>Regional consumption</td>
<td>Dispersed among non-specialists</td>
<td>Independent individual or households</td>
<td>Not specified</td>
</tr>
<tr>
<td>Nucleated workshops</td>
<td>Regional consumption and beyond</td>
<td>Aggregated workshops</td>
<td>Aggregated group of specialists</td>
<td>Not specified</td>
</tr>
<tr>
<td>Dispersed corvée</td>
<td>Local, reduced consumption</td>
<td>Dependent by élite or institutions</td>
<td>Independent individual or households</td>
<td>Part-time</td>
</tr>
<tr>
<td>Nucleated corvée</td>
<td>Not specified</td>
<td>Dependent by élite or institutions</td>
<td>Aggregated group of specialists in specific facilities</td>
<td>Part-time</td>
</tr>
<tr>
<td>Individual retainers</td>
<td>Not specified</td>
<td>Dependent by élite or institutions</td>
<td>Individual craftsmen</td>
<td>Full-time</td>
</tr>
<tr>
<td>Retainer workshops</td>
<td>Regional and beyond</td>
<td>Dependent by élite or institutions</td>
<td>Aggregated group of highly specialised craftsmen in highly specialised facilities</td>
<td>Full-time</td>
</tr>
</tbody>
</table>

Table 2.3. Costin’s parameters and different degrees of specialisation (after Costin 1991)

A decade later, a foundational paper by Costin (1991) re-adapted Peacock’s (1982) categories and incorporated Earle’s (1981) distinction between attached and independent production into a new taxonomy for specialisation. This model combines four descriptive parameters (previously described) – context, concentration, scale, intensity – to determine the level of
specialisation within a given socio-political context, and to establish whether entities internal or external to the manufacture regulate it (Costin 1991, 13–17). As a result, eight levels are recognised: individual specialisation, dispersed workshop, community specialisation, nucleated workshop, dispersed corvée, individual retainers, retainer workshops. As shown in Table 2.3, each level is described by the nature of the demand, the amount of time spent producing (part-time or full-time activity), the concentration/dispersion of specialists, and the physical and socio-political contexts of production. It can be noted that the last four categories are described as controlled by élite groups or state institutions and therefore seem to be exclusive of hierarchically structured societies. This classification raises central questions about whether parameters used in this model are suitable for investigating specialisation in non-hierarchical societies. In particular, it is unclear what relationship craft manufacture may have with power and control in non-hierarchically structured economies and societies (independent and attached). However, Costin’s model remains fundamental for all researchers dealing with the problem of define production and productive contexts in antiquity, and it will be also adopted in this study (Chapters 9 and 10).

2.2.4 Specialisation and non-hierarchical societies
Two questions emerge from the use of these classificatory systems by those who investigate non-hierarchical societies: are they necessarily less complex as they occupy fewer categories when compared to hierarchical societies? How can we understand the relationship between production and power? Can they transform each other? And how can production create power?

The first question revolves around the long-standing relation between institutionalised power/inequality and socio-political complexity (therefore, impacting on how specialisation has been conceptualised) and the assumption that the absence of institutionalised power is absence of power or inequality (Baysal 2013, 235; Hodder 2016, 72–73). In reality, no society – and not even groups of people – is completely immune to forms of differentiation and power dynamics (Baysal 2013, 235; Hodder 2016, 72–73). The fact that they may not be overtly ‘structured’ or may be less classifiable into categories means that incipient or failing institutionalisation may just make them more difficult to detect (Wiessner 2002; Baysal 2013, 235). In this regard, the introduction of the concept of heterarchy in the debate on the
emergence of social complexity has broken the equation ‘complex social organisation = hierarchy’. The term ‘heterarchy’ describes a process of creation of complex social dynamics without the presence of centralisation (e.g. Schoep and Knappett 2004). New social orders can start from bottom up or top-down pushes, and these pushes can produce a hierarchical order – if the new system show centralised, vertical social relations– or an heterarchical one – if the new system has de-centralised or multicentrered, horizontal social relations (Schoep and Knappett 2004, 21–24, 30–31). Despite the appearance, heterarchy and hierarchy are not opposing concepts; instead, they are complementary. Considering the emergence of palatial society in Minoan Crete, Schoep and Knappet have masterfully demonstrated that these are two sides of a “dual process” (2004, 24–25). A series of changes in settlement patterns, architecture, production and administration, and burial practices in Prepalatial Crete (ca 3000–2000/1900 BC) foreshadow dynamics that can be seen in the subsequent Palatial periods, namely before the appearance of a centralised entity (Schoep and Knappet 2004, 25–30). The co-existence of the the heterarchical and hierarchical dimensions thus corresponds to the rejection of a ‘punctual’ turning point from social ‘simplicity’ to complexity (Schoep and Knappet 2004, 30–31).

Returning to the link between power and production, Baysal (2013, 239) suggests that archaeologists should refine their parameters and use Clark’s (2007, 20) paradigm of ‘things, persons, values and surplus’: the key starting point would thus be that of establishing the presence of a surplus with an attributed value (which can be subjective or cultural) to exchange with another surplus recognised as having equal value. Willingness to take part in goods exchange to satisfy demand, the use of specific knowledge to achieve this goal, and value-adding modifications to the materials to satisfy are the prerequisites for the emergence of specialisation (Baysal 2019, 239). In this model the value may correspond either or both to quantity and quality of goods. As already noted, producing a quantity of goods that exceeds one’s needs produces an economic advantage with possible social implications; when it is about the quality or value of goods produced and exchanged, the advantage can be economic, but it is also – or mainly – social. This last is crucial in changing social dynamics.

This conceptualisation of power dynamics in relation to craft manufacture and the use of production as an economic and socio-political means is widely known as ‘prestige goods
theory’. This theory, recently summarised and re-discussed by Schortman and Urban (2004, 190–195; 2016, 227–228) and Plourde (2009), has a long history in the scholarly debates around craft production (e.g. Earle 1991, 2001; Arnold 1996; Hayden 1998, 2001). The core concept behind this economic model is that not all goods have the same social value, and this may not be directly related to the economic worth of an object. It refers, instead, to the social significance of objects, namely objects’ ‘capability’ to construct or affect the social representation of individuals or groups in building, maintaining or re-defining their relations (Plourde 2009; Urban and Schortman 2012, 227–228). These can be, for example, exotic, rare artefacts (Helms 1994), labour intensive objects, or items with meaningful characteristics within a specific mindset, or a special version of a common object.

This object interference can happen in different ways, but it is clear how it interfaces with the presence or creation of forms of power and inequality: by accessing or controlling the production of such artefacts individuals or institutions also gain an access to mechanisms of creating and manipulation of identities and social relations (Schortman and Urban 2004, 191–192). Individuals longing for an enhancement of their social position and influence are often defined as aggrandisers, a term introduced by Hayden (1998), and use, consciously or unconsciously, prestige objects as a means of social competition to gain importance and power (Plourde 2009, 273–274).

Regarding the topic of this study, clearly textiles with the range and scope for embellishment, display and assertion of difference, can be a powerful medium for material expressions of power or skill and are therefore an important avenue for investigating wider social questions. As it will be further clarified in the next chapter, society in Chalcolithic and Early and Middle Bronze Age Cyprus is largely depicted as egalitarian, and different social transformations can be observed. It is therefore essential to provide the theoretical tool to discuss textile production in relation to the socio-economic backgrounds of the island societies (Chapters 9 and 10).

### 2.3 Identity construction through crafting

Before exploring crafting as a relational phenomenon, concepts facilitating a reconstruction of the identity of producers will be investigated. In particular, I will consider whether and how ancient identities could be forged in relation to actions – making, producing – instead of qualities or states. The following reflections can be applied to generally investigate the identity
of producers in relation to different kinds of crafts. However, it is important to keep in mind that these concepts will be examined in relation to crafting of textiles and applied to the Cypriot case study in Chapters 9 and 10. This section will also touch upon the impact of work-based identities on personhood, namely the “the condition or state of being a person” (Fowler 2004, 4). Prior to this, it is necessary to defined what identity is, how it can be constructed, and what work or craft-based identities are.

2.3.1 Basics of identity

Psychologists and sociologists describe the construction of the ‘self’ as a process of definition through comparison with the outer world (Terenzi 2006; McLeod 2019). This central component of the self is generally explained as the ‘sameness’: an individual connects with a group that shares their characteristics or values (Díaz-Andreu et al. 2005, 1; Insoll 2006, 2). Identity, however, can also be forged by opposition: this means that individuals would develop an awareness that they are in some way different from others. Identity formation can thus occur in two ways, by comparing (identification) or confronting (individualisation) ourselves with the ‘other’. The first mechanism stands behind the construction of group identities, while the second process describes the formation of individual identity (Terenzi 2006).

In his masterpiece, the novel ‘One, No One and One Hundred Thousand’ (1994), the Italian writer Luigi Pirandello lucidly reflects that each individual has one body but infininitely more identities. If the construction of identity is based on a relational response to the multiplicity of elements that co-exist and interact with us, then it is logical to think that we can construct more than one aspect of our identity – or more than one identity – in relation to them. Identities do not only depend on the type of relationship between the self and the elements that facilitate a process of identification or individualisation, but they are co-constructed or modified by the perceivers of these relations, regardless of their possibility to act upon them. This has a large impact on the formation of the so-called ‘social identity’, which is the collective recognition that an individual belongs to a pre-defined category in their society (McLeod 2019). Being both a constructed and ever evolving aspect, it is evident that identity is not an “inborn character” and cannot be possessed (Lipkin 2010, 26). Instead, it is a rather unstable facet that transforms, mingles with or dissociates from other elements of a person as they progress through life (Gosselain 2000, 208; Díaz-Andreu et al. 2005, 1–2; Insoll 2006, 6).
2.3.2 Work-based identities: how can they be defined?

Archaeologists have often researched ancient identities within a series of domains that are thought to be ubiquitously present in world societies, such as gender, age, status, and ethnicity (Jones 1997; Díaz-Andreu et al. 2005; Insoll 2006). These categories have also been used to re-construct the identity of craftspeople. For example, Costin (2001, 282–285; 2005, 1053) mentions age, gender, status, and ethnicity, as the main ‘components’ to consider when re-constructing the identities of artisans. Looking through multiple identity lenses is a difficult (and virtually infinite) procedure, and most writers or disciplines tend to focus on one aspect over others – it was already noted in Chapter 1.1.2 that gender has been the preferred lens to approach the identity of textile workers (Costin 2013). Also, even though valuable in portraying an identikit of the artisans, these elements do not explain if (and how) the identity of artisan is formed in relation to their specific craft: in other words, our criteria may determine whether a potter was male or that a weaver was female, whether they were a young person or an elder, but do not clarify whether and why an individual was actually identified as a potter, a weaver, or a blacksmith.

In order to understand what work-related identities are and understand how they are formed, it seems beneficial to consider ‘communities of practice’, a concept elaborated in the field of social learning theories and first developed to study apprenticeship as a learning model (Lave and Wenger 1991; Wenger 1998; 2003; Lave 2008; Wenger-Trayner 2015; Wenger-Trayner et al. 2015). A community of practice describes a group of people that share an interest in the same domain or an endeavour that all members want to pursue: all members of a community of practice are practitioners and contribute to the collective aim by sharing, for example, experience, expertise and ways of doing something or achieving an aim, creating and using tools, and any other material or immaterial means that help the cause (Lave and Wenger 1991; Wenger 1998; 2003; Lave 2008; Wenger-Trayner 2015; Wenger-Trayner et al. 2015). As such, members are experienced practitioners linked together through learning and by sharing information and practice through time. To become part of a community of practice, Lave and Wenger (1991, 34–37) explain that a newcomer engages in a process called legitimate peripheral participation: in other words, the novice engages with experienced practitioners through practice – generally by being allowed to carry out minor, easy, non-harmful tasks that contribute to the final work goal. This way of learning, defined as ‘situated learning’, is not
exclusively cognitive nor a purely hands-on approach: instead, it is relational and depends on the context of social relations as the newcomer engages with the experienced practitioners through practice (Lave and Wenger 1991, 32–34; Lave 2008). In so doing, the newcomer does not just learn the basics of a certain type of practice but assimilates and reproduces behavioural sets, codes, norms, values and beliefs (Lave and Wenger 1991, 32–34; Lave 2008).

Even though mainly describing a learning process, this concept has many social implications, among which is the construction of identity. Gaining knowledge and learning are in fact both part of becoming and belonging to what someone is willing to learn. In other words, these two activities can stimulate identity-making processes. From the viewpoint of identity-creation, being a member of a community of practice equates to one identifying with its fellow members. This does not necessarily mean that all members are equal: members of the same community of practice may not have the same role, task, or status (Wenger-Trayner 2015). Becoming a member of a community means to acquire a new identity through emulation of and identification with experienced practitioners, and this produces an alignment to principles and commitments of the community (Wenger-Trayner et al. 2015, 21–22, 25). Learning and acquiring specific competences thus leads to the acquisition of a status (membership) and legitimacy (Wenger-Trayner et al. 2015, 14).

In the volume ‘Communities of Practice: Learning, Meaning, and Identity’, Wenger (1998) introduced two concepts particularly useful to further define the construction of a worker’s identity. One of these is the ‘landscape of practice’, a metaphor-like notion used to describe the multiplicity of practices that ‘populate’ our world. The other one is ‘knowledgeability’ which indicates the relations between a person and the practices across the landscape. Learning is pictured as a journey through this landscape: in this landscape of practices, we engage and interact with them, and knowledgeability allows us to recognise the boundaries between practices: it is the level of identification or dis-identification of individual to communities and acceptance/rejection by a community of practice that forge a specific identity in relation to practice (Wenger-Trayner et al. 2015, 20–25). Whilst social identity begins to be formed when somebody joins a community of practice, personal identity is built through moving in the landscape of practices, where one can experience a multiplicity of identification.
and dis-identification to practices and communities (Wenger 1998, 13; Wenger-Trayner et al. 2015, 24–25). Moving across the landscape of practices produces identity work, namely changes, negotiation, and transformation of identity in accordance with the different types of engagement and alignment to behaviours, norms, values relating to different practices (Wenger-Trayner et al. 2015, 19–25, 151–152).

With this in mind, the following sections will be tailored to explore crafting as one of the many practices that one may encounter in the landscape of practices. From this and the general definition provided at the beginning of this part, two elements seem to emerge in relation to crafting as possible anchors for comparison and contrast: the practice itself (in this case, the making), and the social context. Before moving on, it is worth making one more reflection and explore the relation between work-based identity and personhood.

In the landmark volume “Personhood in Archaeology”, Fowler (2004, 14) highlights the inseparability of personhood from “other factors of identity” (gender, status, etc.). These identities impact of the perception, self-perception and expression of the human self as multiple and divisible. The ways identities and the divisible parts of personhood interacts are culturally mediated and subject to changes. In this regard, what it has been stanken as typical of identity formation (namely, walking through the ‘landscape of practices’) can be extended to the relation between the formation of a specific part of the divisible personhood. Fowler (2004, 27) specifies that “trends in social practice exist alongside specific concepts of the person in modes of personhood” (Fowler 2004, 27). It can be thus argued that the identity of being a craftsperson is part of one of these ‘trends’ that contribute to forge, dismantle and rebuild personhood. This complex process is contextual and relational: as already noted, an essential role in the creation of the self is played by the interaction of what surrounds us (Fowler 2004, 13–30). This is a key point when a relational, materiality-based approach (§2.4.2) is adopted and will be also crucial to consider in regards of different productive and social contexts (see Chapter 9).

2.3.3 Artisan and matter
Artisan and matter are protagonists in crafting, and, depending on the types of craft practiced, tools can also be part of this system. Regarding tools, there is a debate about whether or not they stand between matter and a person or whether they are an extension of the person’s
capacities (Ingold 2000, 315–316, 319–321; Diprose 2014, 42 [on Merleau-Ponty’s philosophy]; Elkholy 2016, 145). For this reason, their role will be discussed separately (§2.3.4). A craft activity makes matter and the craftsperson relate, and their relation is expressed through the crafting performance. Much debate has arisen around whether the practitioner transforms the material into an object or whether crafting is mutual ‘becoming’ or co-creation where neither human nor material is in charge (Ingold 2013, 35–38; Carvajal Lopez 2019, 83–84). Leaving the debate aside for a moment, if we consider identity, the answer does not matter as it is the performative act that enable comparison or confrontation between the two elements and, hence, how an identity can be forged.

Budden and Sofaer (2009) observe that a person can be called a potter when the crafting performance (making the vessel) is socially translated into the definition of the maker as a potter. In abstract, crafting activates a mechanism of identification between the artisan and the transforming matter through the action, which can build a personal identity – as it is experienced by the artisan – and a social one. For Budden and Sofaer (2009, 11–14), building a social identity can also include a form of public acknowledgment by an ‘audience’ of non-producers. In more practical terms – if we apply the lens of the community of practice – we need to understand when exactly a potter becomes defined as such in the eyes of others/in their own eyes. When has he/she acquired enough skills, competences, and ‘alignment’ to become a member-practitioner of a community of practice? Obviously, this cannot happen at the first crafting attempt. Before examining this question in more detail (§2.3.5) and reflecting upon the role of tools and skills in this process of identity definition (§2.3.4), it is worth briefly exploring how artisans engage with the matter, and, in more general terms, how people engage with the material world.

The Material Engagement Theory (MET) is a reference point in current archaeological theory (Malafouris 2013). This theoretical framework acknowledges cognition as the means through which humans extend towards the outside, and the mind entangles with the material world (Malafouris 2013, 57–86). In this view, cognition is not just defined as the relation between the human mind and material culture; rather, it is better described as the entanglement of the human mind with the material world (Malafouris 2013, 57–86). Co-interaction between the mind and material culture implies that humans engage with things not by acting upon them but
together with them (Malafouris 2013, 144–149). For Malafouris (2013, 144–149), intentionality and affordance are key in this interaction; however, these are not innate qualities in things or humans but are trigged by the context and the engagement itself. The social world is thus “activity-centred” where activity is “a hybrid state of affairs” (Malafouris 2013, 149). Looking at crafting, it is thus possible to define the making act as the encounter between the artisan’s mind and the material. As we will see in the next section, though, crafting is not exclusively about the mind nor involves solely transforming matter. Crafting tools and the artisan’s body also play a crucial role in producing objects and identities.

2.3.4 Bodies and tools
Tools can co-participate in the making action, and there are some craft activities that cannot be performed without a tool: clearly, it is not possible to shape a piece of incandescent metal without anvil and hammer. The relationship between tools and the artisan’s body is thus extremely powerful and suggestive under the viewpoint of identity: it is the combination of body and tool that enables the artisan to craft objects that the body alone could not achieve. Latour’s (1994, 176–177) example of the man with a gun is oft-cited to illustrate this question: when confronted with a man holding a gun which one – man or weapon – is responsible for shooting. The French sociologist’s answer is simple: they are co-responsible. Guns cannot shoot people if nobody has pulled the trigger. Likewise, a man cannot shoot and kill another man without a gun (Latour 1994, 176–177). It is the relationship between the two that changes each other into a man who shoots with a gun. The question here is not about the limitations of free will: Latour was aware that not all human-weapon relationships end in shootings. Instead, it is about the dynamics of the action itself: when a shooting happens, it is only because a specific network or ‘entanglement’ of elements (see below §2.4). Intermingling with the gun gives the man and the gun the new, symmetrical identity of killer. From the point of view of the man, becoming a killer means identifying himself as a man with a gun.

As previously noted, however, an identity can also be constructed through the perception of the action from the perspective of an audience of people that are themselves practitioners or possess knowledge of the practice. In the latter scenario, people tend to locate the subject of the action and recognise themselves in the performer. In this case, Latour’s gun is easily translated into a sort of witness of the action performed, of which it can become a symbol.
Nonetheless, when craftsmanship is concerned, somebody cannot just buy a tool in order to be a craftsperson in his own eyes or in the eyes of others. This, again, can be read through the lens of the community of practice: what is required for this to come into being is the acquisition of competence and accountability in performing a practice that, in this case, requires the use of a tool (Wenger-Trayner 2015, 14, 24). Using this lens, the productive space is the stage where craft action is performed and becomes visible to an audience. Regarding textile production, it is especially worth noting some specific aspects of this craft that could have played a role in the definition of the textile producers’ identity. Many textile tools are portable (spindles, needles) or can be dismantled and re-assembled (looms): the activities performed with these implements can thus be easily moved from a ‘stage’ to another one with a different visibility. Also, textile work is time-consuming: for example, thread makers will often use every occasion to spin more thread. Because the general audience can see craftspeople in constant association with their tools, tools are therefore crucial to the construction of a social identity based on textile work. This fundamental concept will be further explored and applied to an archaeological case in Chapter 9.

Moving then to the possible change of identity of tools (namely, a possible process of symbolisation that may occur), it is worth noting that this can frequently happen when crafting is concerned. An example of this is in the historical context of the Medieval guild system in north Italy (Greci 2015). Here, we find a systematic use of craft tools in guild signs: crafting tools were chosen by the guild to represent themselves practicing a specific craft (Greci 2015). The symbol of a particular tool also had the purpose to communicate to non-practitioners the presence of craftspeople or an atelier. In this case, a tool represents a community of practice as it is entangled with the competence of the practitioner and its compliance to rules, values and the code of the community of practitioners. Specific relations between tools and craftspeople and tool symbolisation can be identified in the Cypriot record and will be discussed in Chapter 9.

2.3.5 Specialisation and task division

Section 2.1 explored that a chaîne opératoire includes different steps that correspond to different work tasks, types of expertise, and tools used for these tasks. These steps are likely performed by different artisans in specialised production, while a single producer may execute
all the different work steps in non-specialised manufacture. Despite being rooted in our post-industrial revolution way of thinking, evidence from archaeology can lead us to assume that this may have also been the case in the past. Building upon this argument, work specialisation can thus contribute to the construction of work-related identities.

This kind of identity, however, is not exclusively a reflection of a distinction between specialised and non-specialised artisans, but rather is established in relation to the task performed. When textiles are concerned, for example, it will be explained in Chapter 4 that spinning and weaving are two different, but essential steps in textile production. In a specialised system, intensively performing one or the other activity would have produced two different identities, namely those of ‘spinner’ and ‘weaver’ respectively. Such a distinction is, for example, clearly indicated in the Linear B tablets that provide deep insights into the complex organisation of the textile production at the Mycenaean palaces. In these epigraphic documents, different kinds of textile workers, such as combers, spinners, weavers and fullers, are clearly distinguished from each other through their professional designations, according to the task performed, the technique used or the type of cloth made (Del Freo et al. 2010, 345–346). This kind of identification of the workers is a useful functional administrative tool in the eyes of the administration of the palatial productive system; in parallel, however, it is also the recognition by authorities of a specific work-related identity.

As said above, task differentiation is admitted in the community of practice model (§2.3.2): if craftspeople performing different tasks are assigned a different identity, this suggests that more than one level of a community of practice exists, namely levels in which workers feel, or are perceived as, part of the same circle because they perform a certain task with more specific aims (e.g. making thread, weave a fabric, cleansing wool). A practitioner can thus build more than one work-related identity or express it at different levels.

### 2.3.6 Skills, teaching, and learning

The relationship between identity and craft specialisation outlined above is not the only one possible. Kujipers (2018a, 44; 2018b, 552) has recently proposed that key in the definition of a craftsperson’s identity is not so much the organisational system in which they operate but rather the skill level achieved. Recognition of the level of skill achieved by an artisan encompasses both their material specialisation, the social value assigned to this skill and the
products so created (Kujipers 2018a, 44–45). The author has identified four categories to describe levels of skill to replace the traditional simplistic binary construct of non-specialists versus specialists (Kujipers 2018b, 562–563) (Table 2.4).

<table>
<thead>
<tr>
<th>Skill level</th>
<th>Skill type</th>
<th>Production result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amateur</td>
<td>Basic, not fully embodied motor skills</td>
<td>Faults, mistakes</td>
</tr>
<tr>
<td>Common craftsperson</td>
<td>Fully embodied motor skills</td>
<td>Good quality, but not original</td>
</tr>
<tr>
<td>Master crafter</td>
<td>Higher than usual skills</td>
<td>Higher standards than usual</td>
</tr>
<tr>
<td>Virtuoso</td>
<td>Outstanding skills</td>
<td>Exceptional standards, innovative</td>
</tr>
</tbody>
</table>

*Table 2.4. Skill categories (after Kujipers 2018b, 562–563)*

The main purpose of these categories is to identify different types of craftspeople through an analysis of their products. However, skill can also be central in the construction of an artisan’s identity, especially when the skill level of an artisan is acknowledged by society (Kujipers 2018a, 44–46). This perspective frees us from the preconceived notion that a specialised craftsperson must work full-time within a designated workspace and specific organisational context. Instead, we can now also conceptualise craftspeople who stand out from others due to their skills, and this may occur even in contexts of non-specialised production. This more nuanced approach opens up the possibility that artisans’ identities can be differently perceived, constructed and represented in line with their level of skill and their degree of (in)dependence. The potential of this recognition is particularly great for archaeology as these distinctions may be reflected in the archaeological record, especially in contexts where we find an intentional physical correlation between people and tools, such as, for example, in burial contexts (Rengifo Chunga and Castillo Butters 2015).

Kujipers’ inclusion of apprentices among the category of ‘amateur’ (2018a, 231–232; 2018b, 562) stimulates further reflection on the relationship between skills and the creation/coming into being of an artisan, both in practical and identity-related terms. Even though both apprentice and non-professional do not yet have fully embodied motor skills, it strikes me as problematic to group them together for the purpose of our discussion on identity formation. Although apprentices and non-professionals potentially achieve the same in the level of skill, the expectation that they themselves and society have are different: one will remain an amateur who may dabble in something in their spare time, the other has made a commitment to engage with the profession and hopes to develop into a professional over time.
Being an apprentice means that one has made a firm commitment to follow a formative path and acquire specific skills through training. This corresponds to a preliminary social status – not yet a member of the community of practice – which correlates with a preliminary identity of ‘an artisan in the making’. Therefore, it is likely that non-professionals and apprentices are perceived differently by the non-practitioners and practitioners alike as there are different social expectations for the future role that an apprentice will inhabit in society. Pre-requisite to the formation of a full artisan identity is to pass through the formational period and leave behind this preliminary identity before acquiring a new one in a process similar to a rite of passage as described by Van Gennep (1960). It is also worth remarking that, in parallel, experienced craftspeople assume the additional identity of a teacher when they teach apprentices.

Concerning the identities of teachers and learners, it can also be noted that situated learning depends on contexts, and identity formation which develops strong social interaction and transformation, and it is also related to specific behaviours and ways of doing. To recall, Wenger’s (1998) metaphor of navigating through the landscape of practice, an experienced practitioner can encounter and engage with other contexts, types or practices or ways to perform a practice: the identity of teacher and learner are not distinguished or opposite but can be ‘accumulated’ in the same person through a long journey of identifications and confrontations.

The way apprenticeship is conceptualised in the framework of the community of practice is as a moment of learning and strong identity formation through practice: it is by attempting to practise, helping with minor tasks, and interacting with experienced practitioners that a newcomer acquires a set of competences (skills, techniques), behaviours (embodied gesture), and values (Wenger-Trayner et al. 2015, 21–25). Even though the time required to learn can vary and depend on the type of practice, it is evident that performing cannot be reduced to one performance alone. However, there can be a single, symbolic or threshold-like moment in which one is formally acknowledged as experienced practitioner: one can think, for example, of the final, ‘flawless’ graduating performance at the end of a degree in theatre, dance or music.
2.4 Production and relationality

The last part of this chapter will explore production through the lens of materiality, intended as the expression of the relationships between humans and non-humans (Knappett 2007; Boivin 2008; Harris and Cipolla 2017, 89–90). The objective is to find a model that can illustrate the dynamics of production and how the productive entities – humans (producers, traders, consumers, organisers, etc.) and things (raw materials, products, tools, techniques, competences, exchange systems, etc.) – relate and create the phenomenon that we call ‘production’. It is within this framework, in fact, that I will attempt to provide an overall interpretation of Cypriot textile production in Chapters 9 and 10.

Materiality and relational networks are a family of theories that have had a strong impact in archaeology in recent years. Even though each displays specificities, these can be classified into two broad lines of thought: symmetrical archaeology (Knappett 2005) and new materialism (Coole and Frost 2010; Parikka 2012). Both understand humans and non-humans as relational entities with the same potentialities of producing agency to create interactions. Symmetrical archaeology tends to depict reality as networks of balanced relationships between humans and things. From this background, for example, Actor-Network-Theory (ANT) describes socio-material interaction between objects and people (the actants), in which the actants are called ‘nodes’ and the links between them express the possible connections that they can develop, and agency is spread across the network (Knappett 2005; 2008; 2011).

In contrast, new materialism focuses on the ‘becoming’ and admits asymmetry and disorder (Harris and Cipolla 2017, 131–132, 144). Reality is understood as the constant transformation of its constitutive elements in which boundaries between each one of these are difficult to define (Hodder 2018a, 54–55). Ingold’s (2007; 2010, 11–13) meshwork, in which agents emerge from interaction, is one the most influential examples of this vision. In an imagined dialogue between a SPIDER and an ANT, Ingold (2008) compares the two points of view of networks and meshwork, impersonated by the two arthropods, and makes the SPIDER say:

*The world, for me, is not an assemblage of heterogeneous bits and pieces but a tangle of threads and pathways. Let us call it a meshwork, so as to distinguish it from your network. My claim, then, is that action is not so much the result of an agency that is*
distributed around the network, but emerges from the interplay of forces that are conducted along the lines of the meshwork (Ingold 2008, 212).

It is crucial to note that, for the SPIDER/Ingold, the meshwork is “the world, for me”; network and meshwork are two conceptualisations of the world based on how we – as researchers and human beings – understand and represent reality. I concur with Hodder and Mol (2016, 1068) that “real-world practices” are extremely complex, and we should adopt an approach enabling us to represent this complexity. Complexity is for me asymmetry and variety, globally non-hierarchical relations that can be occasionally hierarchical, ordered or symmetrical. The example of the man and the gun made by Latour, one of the main theorists of ATN, was proposed above to describe how a symmetrical relationship between the craftsperson and their tools can forge a new identity (§2.3.4). In my view, however, this may not be the same for other types of relationships – symmetrical or asymmetrical – which result in a global view of reality or a phenomenon that comprises multiple relations (e.g. production) which are asymmetrically articulated. As we will see in the next sections, Hodder’s (2012) entanglement approach provides a model that would allow me to investigate the asymmetrical reality and complex dynamics of the productive processes. The approach has many points in common with Ingold’s meshwork. However, entanglement has been adopted for this study because it was specifically designed for interpreting archaeological ‘realities’.

2.4.1 The entanglement

The entanglement conceptualises reality as sets of relationships of dependence between humans and things. Four main relations can be identified, and these correspond to the four possible constellations into which these two categories can be combined: things depending on things (T–T), things depending on humans (T–H), humans depending on things (H–T), and humans depending on humans (H–H) (Hodder 2012, 2016, 2018a). These are described as the expression of two forms of dependence, named dependence and dependency (Hodder 2012, 17–18, 2018a, 77, 90–91). Dependence references the human condition of relying on things for all kinds of needs, from staying alive to being enabled to perform a variety of actions (Hodder 2012, 17–18, 2018a, 77, 90–91). Amongst the dependences that we experience daily are, for example, the need for food and water to make our bodies ‘work’, or words to communicate with each other (Hodder 2012, 17–18). This relation can be generic or
contingent, namely it can be between a human and a specific thing in a specific place/time (Hodder 2012, 17–18): for example, while writing this section, I am relying on the only laptop I have in my office, and this chapter would not be written on this day in this place without this specific device.

Dependency, on the other hand, defines more complex, two-part linkages in which humans and things enable or produce relations by mutually depending on each other (Hodder 2012; 2016; 2018a). Dependency is not reliance but rather a form of constraint through reliance. The higher the degree of constraint, the more is there an ‘entrapment’ of things and humans within relational dynamics: it is the “tautness” of the entanglement that is responsible for all the possible combined relationships between humans and things and the longue durée of the phenomenon or piece of reality that an entrapped variety of entities produce (Hodder 2012, 95, 103–105). In the entanglement, all types of relationships are determined by a certain degree of dependence or dependency, two forms of reliance that produce different relational effects, namely, the potential and the constraint effect (Hodder and Mol 2015, 1067).

A practical, archaeological example of entanglement provided by Hodder (2012, 181–205; also: Hodder and Mol 2016) is based on clay entanglements at Çatalhöyük. As represented in Figure 2.1, clay, humans, and other things engage and produce multiple relations (also: Boivin 2008, 134–138 on the materiality of soil in Neolithic eastern Mediterranean): the necessity and decision by inhabitants of this Neolithic site to build a house with mud-architecture engages them with a specific use of the landscape and resources. In the early levels of the site, clay with high organic contents is entangled with the exploitation of the same dry land that produced the raw materials for the mud-architecture as well as cooking technology, which foresees the use clay balls to heat food (Hodder 2012, 153, 182). The entanglement with clay continued – albeit altered – in the more recent levels of the settlement. The urgency to find a more suitable building material changes the way humans engage with the landscape, allowing them to obtain a clay with different properties. The change in house building materials is the result of the socio-economic effort to collect sandier clay which also made available a clay type suitable for fire resistant container (Hodder 2012, 44, 183). Archaeological evidence informs us of a transformation in cooking technologies: clay balls are replaced with cooking pots that could be placed over a fire at the same time when a new mudbrick type became
popular (Hodder 2012, 60, 83, 138–157). These are only a few of the main entanglements observed at Çatalhöyük, and following the entangled lines converging around clay, we uncover a world where this material, other things, and the humans play their role and get continuously trapped in the web of dependences that they create.

Figure 2.1 Tanglegram of clay entanglements in early levels of the settlement at Çatalhöyük (from Hodder 2012, 181 fig. 9.2)

The use of conceptual maps to represent the links outlined in the clay example is an essential method of analysis within this relational theory. The specific visual means adopted to describe entanglements is defined as ‘tanglegrams’ and depicts all recognised combinations of dependence/dependency relations between humans and things (Hodder 2012, 183–184, 181 fig. 9.2; Hodder and Mol 2016, 1067, 1071) (Figure 2.1). Most importantly, what tanglegrams immediately communicate is not single-link relations but the general entanglement and the complexity of entanglements or areas of entanglements (Hodder 2012,
Tanglegrams ultimately capture the essence of entanglement as a combination of connections that result in the “caught-up-ness” of entities and “messiness” of relationships rather than a research tool to impose and order reality (Hodder 2012, 222; 2018a, 74–75; Hodder and Mol 2016, 1068):

*Entanglement is about being caught up in real things in specific conjunctural ways that come about through complex interactions. It is not bounded, schematic, theoretical. It describes the ways in which we live our lives struggling between webs of demand and potential, making do, working it out, unclear what is happening much of the time, not knowing the results of our actions or why. We can never mop up all this mess* (Hodder 2012, 222).

Having briefly illustrated the fundamental ideas behind the entanglement, the next section will explore how this theory can contribute to the aim of this work. The model, in fact, conveniently facilitates an investigation of production as a materiality web in which multivocal interrelationships between humans and things can be tracked down. This will allow me to explore the dynamics between the elements that can be detected archaeologically for prehistoric Cyprus and evaluate how these transform through time in the web of production and expand to incorporate relations that go beyond production as traditionally defined.

2.4.2 The productive entanglement

In the entanglement theory, production is conceptualised as a T–T dependency, where a series of ‘productive things’ (e.g. materials, tools, knowledge, abilities) interact in the making of ‘product things’ for human use (Hodder 2012, 42–43). Humans, however, are not separate from these interactions. For Hodder (2012, 41), things relating to each other in productive links correspond to Heidegger’s idea of ‘equipment’: they create a network of tools ‘ready-to-hand’ for humans to interact with and manipulate (Heidegger 2005). Recently, the notion of ‘the general entanglement’ has been introduced in the entanglement theory to characterise this entirety of relationships produced by the entanglement of humans and things (Hodder 2018b, 1075). This concept can be compared to Ingold’s environment, which is also understood as a meshwork of interrelation and transformation of all the possible elements (humans, material and non-material things) that construct it (Ingold 1992; 2000). As humans we are ‘in the world’: we can perceive our surroundings and produce relations, but we cannot perceive the
general, boundless environment as we are a portion of it and occupy a point of view within it. In my view, production should be read as a specific perspective that can be adopted within the total entanglement: it is itself a web of interactions part of and intermingled with the total entanglement within which we can observe combinations of reliance and dependencies between humans and things within a broader, more complex web of reliance and dependencies (the general entanglement).

The productive entanglement understands the inter-dependence of productive entities and would allow us to consider all its aspects (e.g. the scale of production, technological choices, socio-economic implication, work-related identities), even when these may not be immediately clear when analysed as single phenomena. As a result, it facilitates a fluid outline of the productive reality and its dynamics. Compared to taxonomical or process-like approaches (e.g. the application of indicators of specialisation and the chaîne opératoire), the entanglement allows researchers to consider the ‘messy’ component of productive relations, avoiding too rigid a narrative and univocal interpretation.

Looking at productive entanglements does not stand in opposition to the use of parameters and definitions traditionally employed to investigate production and specialisation. Instead, it is an alternative way of approaching, combining and understanding the value of these indicators. It is only by disclosing their web of relations that we can understand, for example, if a high quantity of tools, standard or variable products, or a concentration of facilities in a specific place can be related to specialisation or exist in that form because of their dependence from other factors. These parameters and labels are also things that find themselves entangled in the picture. They do not have a value per se, and only their connections allow us to define their actual role. Tracing relations between humans and things may easily lead us to consider issues explicitly part of, tangentially related or perhaps even entirely outside the traditional domain of production. It is important to be aware that production is considerably more than just socio-economic relations but rather that it brings together material and immaterial things, artefacts, concepts, ideas, mechanisms, representations, and, of course, humans that interact to build the SPIDER’s web. Investigating these relations is key to try and answer the research questions set in this project (§1.2). The complexity of textile production that this study aims to explore is suited to this approach: work dynamics, specialisation, and the role of the craftspeople can be
outlined as single questions and elements that co-define and co-construct each other and the productive reality. The relations between them can be followed from production and textiles to society and more complex, interpersonal dynamics.
Chapter 3

Historical Perspectives and Debated Issues in Cypriot Archaeology

The two previous chapters have set the scene for the main protagonists of this study, textiles (Chapter 1) and production (Chapter 2). The current one provides a third foundational layer to this work, offering an historical perspective of Cyprus between the LChal and the beginning of the LC. The first part will explore narratives and debates in Cypriot archaeology. The second part will investigate how the concepts of production and work have been used by archaeologists as an interpretative lens through which Cypriot prehistory has been recounted so far.

3.1 Background and debated issues

3.1.1 The Late Chalcolithic and the Philia

The LChal and the Philia are relatively short periods that characterise the 3rd millennium on Cyprus. Both periods are, to varying degrees, delineated by a complex array of technological, socio-economic traits, often described as homogenous and innovative (Crewe 2015a, 131–139 with references). The developments occurring in these two periods are key to understanding the transition from the Chalcolithic to the BA.

The Philia culture (the Philia) was identified by Dikaios (1946, quoted in Webb and Frankel 1999, 4) in the 1940s while excavating a group of tombs at the eponymous village of the Ovgos valley. This and other north and central Cyprus cemeteries yielded material culture displaying peculiarities. This was especially evident for pottery, a monochrome ware belonging to the EC Red Polished (RP) horizon, but displaying distinctive features (Webb and Frankel 1999, 14–23). For Dikaios (1962, 202–203), this distinctive ware was the precursor of the EC RP, and he interpreted the Philia as preceding the EC. Stewart (1962, 296), instead, proposed that it was a regional and contemporary variation of the ECI–II RP. In the late 1990s, Webb and Frankel (1999) defined all aspects of the Philia material culture and described the Philia as a cultural system with chronological and cultural implications. In parallel, a growing interest in the Chalcolithic allowed scholars to shed new light on a period neglected by early research and open up a debate on the relations between the two periods (Peltenburg et al. 2013, 1). Although it is now accepted that the Philia represents the beginning of the Cypriot
BA, the archaeological evidence is ambiguous as regards the chronological relationship between the LChal and the Philia (Knapp 2013a, 265; Peltenburg 2013, 1; Webb 2013a, 137).

<table>
<thead>
<tr>
<th>Architecture</th>
<th>MChal</th>
<th>LChal</th>
<th>Philia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standardised round houses with central platform</strong></td>
<td><strong>Roundhouses, but less standardised architecture</strong></td>
<td><strong>Multi-roomed, rectilinear domestic units</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agriculture</th>
<th>Hoe-based</th>
<th>Hoe-based</th>
<th>Plough-based. Possible introduction of new crops, use of backed sickle blades and changes in soil exploitation.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deer hunting as fundamental meat resource. Wild-like species of ovicaprids.</strong></td>
<td><strong>Reduction in deer hunting and more emphasis on pig rearing. Wild-like species of ovicaprids.</strong></td>
<td><strong>Re-introduction of cattle, introduction of donkey and new ovicaprid species.</strong></td>
<td></td>
</tr>
<tr>
<td>- Predominantly RW pottery with painted motifs, common symbolism across sites</td>
<td>- Predominantly monochrome RB/B pottery (different clay composition and shapes)</td>
<td>- Predominantly Monochrome RPP pottery, uniform across the island</td>
<td></td>
</tr>
<tr>
<td>- Metal: no smelting, only personal ornaments</td>
<td>- First metal tools, possible beginning of metallurgy</td>
<td>- Intensification of metallurgy</td>
<td></td>
</tr>
<tr>
<td>- Textile evidence not investigated</td>
<td>- Textile evidence not investigated</td>
<td>- Appearance of textile tools related to low whorl spinning and use of the warp weighted loom</td>
<td></td>
</tr>
</tbody>
</table>

| Pottery, metallurgy and other crafts | | |
|-------------------------------------| | |
| **Predominantly RW pottery with painted motifs, common symbolism across sites** | **Predominantly monochrome RB/B pottery (different clay composition and shapes)** | **Predominantly Monochrome RPP pottery, uniform across the island** |
| - Metal: no smelting, only personal ornaments | - First metal tools, possible beginning of metallurgy | - Intensification of metallurgy |
| - Textile evidence not investigated | - Textile evidence not investigated | - Appearance of textile tools related to low whorl spinning and use of the warp weighted loom |

<table>
<thead>
<tr>
<th>Food and drink consumption</th>
<th>No particular emphasis</th>
<th>Increase of drinking and storage vessels</th>
<th>Secure evidence for boiling food (cooking pots, heating structures)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Burial practices</th>
<th>Predominantly intra-mural pits, wall graves, primary depositions, grave goods are scarce</th>
<th>Predominantly intra-mural pits cut above walls and floor with primary depositions and chamber tombs with few grave goods</th>
<th>Extra-mural, clustered pit, or rock-cut chamber tombs with a complex array of grave goods with primary and secondary depositions. Rare intra-mural pithos burials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uniformity in symbolism (cruciform figurines) and ideology</strong></td>
<td><strong>Disappearance of cruciforms</strong></td>
<td><strong>Diffused presence of stone, shell and metal ornaments. New annular pendant form</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1. Differences in material culture and socio-economic transformations over the Chalcolithic and Philia periods (derived from Frankel 2000; Steel 2004, 106–118; Webb 2013a; Peltenburg 2018, 456–457)
The material culture, technologies and socio-economic strategies of these two periods show differences when compared with the preceding Middle Chalcolithic (MChal) period, and scholars largely agree that the origin of these changes was due to Anatolian influence (e.g. Frankel et al. 1996; Frankel and Webb 2007; Knapp 2013a, 265; Webb 2013a; Bachhuber 2014; Crewe 2015a; Peltenburg 2018). Debate, however, is still ongoing on the definition and role played by the LChal and the Philia in the developments leading to the start of BA on Cyprus. This mainly regards the degree and modalities of interaction with the external world, and how the relationship between these two periods is conceptualised (Crewe 2015a; Webb 2018b, 5/31; Peltenburg 2018). Three different positions can be identified within the current discussion and will be explored in the next sections along with a contextualisation the distinctive traits of these periods (the main ones are reported in Table 3.1).

Long-lasting in the Philia debate is Frankel and Webb’s explanation of the Philia as the result of a migration or colonisation of households from southwest Anatolia (Frankel et al. 1996; Frankel 2000; Webb 2002; 2007; 2013a; Webb and Frankel, 1999; 2007; 2011). Attracted by the opportunity of exploiting the island’s copper ores, Anatolian groups are considered responsible for bringing to Cyprus new technologies, behaviours and beliefs, and transforming local populations through the dynamics of acculturation-enculturation. In this view, community ‘transposition’ is the best model to explain relatively sudden changes. Based on a concept elaborated by the sociologist Bourdieu (1997) for the transmission of everyday practices, ‘transposition’ is here understood as the perpetuation of an imported habitus within the household (Frankel 2000). This major change is identified as the Philia, and transformations visible during the Chalcolithic are understood as minor, ‘explorative’ contacts between the Cypriots and the people beyond the sea (Webb 2013a). The distinctive Philia RP ware, produced in a geographically restricted area and spread ubiquitously throughout the island, epitomises the capillary network of interaction between communities within the island (Webb and Frankel 1999, 14–31; Dikomitou-Eliadou 2013; 2014). The exploitation of copper resources is often mentioned as the incentive for intense mobility and creation of inter- and intra-island networks (Webb et al. 2006; Webb 2018b, 5/31), facilitating the engagement in broad, international trade networks occurring in the Mediterranean at that time and having metals as the protagonist artefacts (Şahoğlu 2005, 340, 354).
Emphasising the Anatolian contribution, this model inevitably sees the whole Chalcolithic as a unique cultural horizon to be read in opposition to the new Philia lifestyle. As it can be observed from Table 3.1, however, the LChal shows continuity, but also substantial differences when compared to the previous MChal (Peltenburg 2013; Peltenburg 2018, 456–457). The latter period is normally understood as a period of cultural unity with communities displaying the same array of material culture and practices, and a shared symbolism (Peltenburg 2018). In the MChal, the material spaces of the community are villages made up of mono-cellular buildings (roundhouses) as the material translation of the social organisation (Chapter 5.2). The Red-on-White ware (RW), displaying a complex but uniform repertoire of shapes and painted decorations, characterises the pottery assemblages across the island (Peltenburg 2013, 339–341). Concerning ideological aspects, a shared system of values is used to express MChal cohesion, as exemplified by the ‘cruciform’ figurines. These representations of female bodies (when sex is indicated) show a great variety in terms of details and execution, pointing to non-standardised, if not personalised, manufacture and use (Bolger 2013, 8–9). However, their fundamental design, gesture and material used (generally picrolite) show a uniformity in the way identity is expressed and shared (Peltenburg 2018). In contrast, the LChal is recognised as geographically dispersed, with a series of changes in the material culture showing uneven expression at different sites and different times (Bolger and Peltenburg 2014, 194). It is in this period that the Red-and-Black Stroke Burnished ware (RB/B), with its distinct monochrome surface and Anatolising character, replaces the RW. The repertoire of this new ware, utilising iron-rich clay, is characterised by the presence of drinking sets and bowls, likely to be correlated to drinking and eating practices. Another aspect of the material culture that displays major changes is that of self-representation: the cruciforms disappear and new types of ornaments (annular pendants) appear in the archaeological record along with an increased presence of metal artefacts and an occasional presence of seals, all showing Anatolian-derived traits (Bolger 2013).

Whilst the diffusionist model rejects an interpretation of these changes as having the same impact as those occurring subsequent to a migration/colonisation (Webb 2013a), Peltenburg and Bolger have stressed that the Philia phenomenon is deeply rooted in the substantial transformations occurring during the LChal (Bolger 2007; 2013; Peltenburg 2007; 2018; Bolger and Peltenburg 2014). The innovations present in the LChal record are, in fact, not
insignificant and have been connected to mechanisms of inter-site differentiation, competition, aggrandising behaviour, and re-definition of personal and community identities (Bolger 2013; Bolger and Peltenburg 2014). These factors would have led the LChal communities to show a growing interest in participating in international exchanges and adopting a new ideological system. In this sense, they could not just have preceded but actually initiated the Philia ‘phenomenon’ (e.g. Bolger 2013; Peltenburg 2018). Deepening this analysis, Crewe (2015a) remarks that the appearance of Anatolian-styled drinking vessels and personal objects in Late Chalcolithic and the Philia correspond to display forms to be read within the context of the Anatolian Trade Network, in which feasting has been considered as a vehicle for spreading ideas and practices (Şahoğlu 2005).

Regarding the sequence, it is difficult to establish the relationship between the LChal and the ‘mature’ Philia as the only site where both periods are attested is Mosphilia, a site located far from the original Philia core area (Chapter 5, Appendix II). As further specified below, the Philia RP appeared in the material record of the site in Periods 4b and 5, but only makes up a small percentage of the pottery assemblage (Peltenburg 2018). For Bolger and Peltenburg (2014, 191), this signifies different “modes of integration and rejection” of the innovative styles and components, with the beginning of the BA arising from the negotiation of these aspects. In this view, a movement of people from Anatolia is not excluded as it acknowledges the role copper played in trade networks, but the real stimulus for the changes is seen as the will to engage with the ‘new’, external world.

A third line of thought has been proposed by Knapp (2008, 106–130; 2013a, 264–276). Drawing on post-colonial theories, Knapp (2008, 106–130; 2013a, 264–276) reads the Philia as an example of a hybrid culture. He argues that no Philia innovation is purely ‘Anatolian’: instead, they are ‘Anatolising’, meaning that they show mixed traits. In this case, the Philia material culture is read as a complex result of social interaction which presupposes a multifocal, dynamic interaction between LChal people and external communities. Knapp is also open to the possibility that Anatolia may not be the only propulsive centre in the Eastern Mediterranean during the Early BA. The Philia is understood as only one of the Aegean/Eastern Mediterranean mixed cultures appearing in mid-3rd millennium BC (e.g. Broodbank 2000). In this respect, it is also worth noting that scholars have pointed to
influences from other Mediterranean regions (e.g. Syria) to explain the presence of materials with modified appearance (Bolger 2013). It should be born in mind that Knapp developed this conceptualisation of the Philia based on his previous influential works (Knapp 1990; 1993) in which metallurgy and agropastoral resources were thought to play a different but crucial role in social transformations, and this view is still present in his later interpretations (§3.2).

3.1.2 Cyprus between the Early Cypriot and the beginning of the Late Cypriot

If uniformity is a distinctive trait of the mature Philia, the ECI–II witnesses the rise of profound differentiation in the material culture occurring in geographically bounded areas (Webb and Frankel 2013b, 62). The formation and nature of regional cultures is still a matter of debate, but scholars seem to agree that two macro areas of cultural discontinuity can be recognised. These areas correspond geographically to the north coast and a vast area comprising the central Mesaoria plain and the south-west of the island (Webb and Frankel 2013b, Peltenburg and Bolger 2014; Peltenburg 2018). Nonetheless, no dramatic breaks seemed to have occurred in settlement occupation between the Philia and ECI–II, as demonstrated by the stratigraphic sequences of the settlements of Marki and Skalia, and the continuity in occupation suggested by funerary evidence at Sotira (Appendix II). The only significant shift in occupation is perhaps visible at the north coast, where Vasilia – a strategic centre during the Philia – is abandoned and Bellapais Vounous (Vounous) starts acquiring a major role in the area (Webb 2018b, 6/31). Because the associated settlement was not excavated, the evidence for this rise in importance is, however, only based on the cemetery and the rich funerary display from the ‘Site A’ burials (Stewart and Stewart 1962). Because the focus of early research was on cemeteries – no settlements were excavated before the island’s invasion in 1974 – it deeply affected the nature of the archaeological record on the north coast and the east of the island.

The identification of these regional cultures is mainly based on the style and manufacture of the ceramic artefacts. For Webb and Frankel (2013b, 64–70), this phenomenon should be read as a different regional development of the Philia RP, signifying that the island-wide Philia network had collapsed. In contrast, Peltenburg and Bolger (2014) argue that only the north coast RP was derived from the Philia RP, while the ‘mottled’ RP diffused in the centre and south-west of the island developed from the LChal RB/B. It might be worth noting that the
first appearance of the DP ware, a distinctive product of the south and west coast, can also be
dated to the ECI–II (Crewe 2014, 145). In Cypriot archaeology, differences in material culture
due to regionalism are thought to reflect socio-cultural differences on a geographic base (Frankel 2009, 15).

Returning to the differences in the north/south networks, it can be observed that sporadic
imitations or imports of north coast items at Psematismenos Trelloukkas (Psematismenos) on
the south coast (Webb and Frankel 2013b, 73, 74 fig. 13) and Skalia in west Cyprus
(Appendix II) may hint at the fact that the preceding long-distance networks had not been
completely dismantled. The presence of few but significant metal objects with non-Cypriot
metallic compositions at Vounous might also indicate that contacts with external networks
were maintained, even though more limited or even only occasional (Webb et al. 2006; Crewe
2015, 144–145; Webb 2018b, 7/31–15/31). However, it is only from the ECIII that both intra-
island and inter-regional trade relations seem to be resumed at a larger scale. For Frankel and
Webb (2007, 52), the fact that the regional ceramic styles appear as more uniform in this
period is the main clue to interaction. The increasing presence of shapes derived from north
coast prototypes all across the island may suggest that the old networks were fully restored,
prompted again by the proactive north coast, with copper as the key resource capable to attract
networks (Frankel and Webb 2007, 52; also: Knapp 2013a, 321). This fluctuation between
uniformity and regionalism of material culture is typical of Cypriot pre- and protohistory.
Another differentiation into two macro-areas of pottery tradition is identified in the
MCIII/LCIA transitional period when monochrome wares characterise west Cyprus and
painted pottery appears in the east of the island (Steel 2004, 150; Frankel 2009). However,
distinctive styles of particular areas or sites are also detectable in periods of connection and
relative uniformity: this is the case, for example, with the MC pottery production at Deneia
(Frankel 2009, 23; Webb 2009).

Diversifications in the funerary ritual between the north and south-west macro-areas are also
considered as a marker of regionalism. Differences in burial architecture, use and value of the
ceramic and metal artefacts, the presence of consumption of food and drinks, particularly
visible in funerary rituals and burial architecture, have been correlated with a different ritual
behaviour (Webb and Frankel 2013b, 68–69). On the north coast, cemeteries show large
multiple chambers which functioned as competitive display arenas of grave goods, including special and prestige objects, and ritual practices (e.g. reopening, redepositions and feasting) and have been read as reflecting the emergence of social complexity and, possibly, revealing the presence of élite groups claiming control over land and resource (Keswani 2004, 74–78; 150–154; 2005, 348–349; Knapp 2013a, 321–322). The link between burial rituals and social complexity is of course mediated by ideology and distinguishing between real and displayed socio-economic differentiation may be difficult. In contrast to cemeteries, which are places of construction and negotiation of social identity despite regional variations (Keswani 2004, 150–154; Webb and Frankel 2007), little evidence is available from settlements. Settlements suffer from the fact that community spaces or strategies are barely identifiable, especially when a series of household units continued to be used through time and display similar domestic assemblage and practices (§5.2; Appendix II). Whether this was also the case on the north coast is difficult to state as no settlements have as yet been investigated.

The MC has been often understood as the continuation of the EC village-based, egalitarian society and subsistence economy. In this sense, it is meaningful that Knapp’s chronological subdivision labelled the EC–MCII as a single period, the Prehistoric BA (Knapp 2013a, 27 tab. 2). At the end of the period, abrupt and violent changes would have led into important social transformation, ultimately the prelude to the LC distinctive traits such as social stratification, internationalism, and the rise of productive control and urban centres (Knapp 2013a, 348–349). Nonetheless, the recent increase of data for the period has led to a more nuanced understanding of the MC as a period with distinctive socio-economic features and differing strategies.

Two apparent social realities coexisted in the initial and middle part of the MC, namely the one of settlements displaying a ‘traditional’ EC organisation (e.g. MC Marki, Alambra) and the other of sites manifesting new spatial arrangements, such as community gathering and production areas (e.g. Ambelikou Aletri [Ambelikou], Erimi, Politiko) (see Chapter 5). In parallel, the role of Lapithos Vrysi tou Barba (Lapithos) has been re-evaluated as central to the control of metallurgical resources and for the resumption of stable, possibly hierarchical, internal and external networks (Webb 2018b, 18/31–23/31). These considerations are undoubtably crucial for a definition of the period that takes into account the increasing
complexity of social relations. However, we must keep in mind that we rely only on cemetery evidence.

Until recently, the MC was generally interpreted as a period of little transformation and the MCIII/LCIA as a period of rapid changes or the formative phase that led to the rise of urban centres on the island (Knapp 2013b; Fischer 2014, 186–190; also: Negbi 2005). In contrast, within the last years, a growing number of scholars have proposed that fundamental changes in society started already throughout the MC and continued into LC, and urbanisation can be read as a gradual development that started in MC and gathered greater pace in LC (Crewe 2017; Bombardieri 2017a, 362–363; Bombardieri and Graziadio 2019, 68–83). Scholars emphasising this slow formation of complexity have based their analyses on the following markers: specialised architecture, monumental architecture, settlement structure and function, change in productive strategies, presence of interpersonal violence, intensification of storage, surplus production, and the development of exchange networks (Crewe 2007; 2017; Bombardieri 2017a, 362–363; Bombardieri and Graziadio 2019; Monahan and Spigelman 2019).

The appearance of specialised/working areas as early as the MCI–II (Ambelikou [Webb and Frankel 2013a]) is now largely accepted and confirms that communities did not rely exclusively on an agropastoral, household-based economy in the MC (Crewe 2017, 147; Bombardieri and Graziadio 2019, 74–75; Frankel 2019, 33–34). However, a certain variation in the nature, location and characteristics of specialised areas is visible in the second category of sites. While these areas can be identified as structured workshops in some cases (Ambelikou, Erimi), they simply appear as large, ‘public’ courtyards with or without annexes and installations in other instances (Politiko). Although community and working activities seem to have taken place in these spaces, their significance cannot be immediately related to the production of surplus and exchange in all cases (Chapters 5 and 9). In addition, differences in the size, design and location of these complexes and their relation to domestic areas can be observed. Notwithstanding, these sites are generally understood as reflecting a new social organisation, in which community-led work activities have a cohesive function (Crewe and Hill 2012; Bombardieri 2013; Falconer and Fall 2014).
The presence of non-domestic, possibly specialised, areas is also characteristic of the MCIII/LCIA transitional period. Two examples are the late use episode of the final phase complex at Skalia and the multifunctional workshop in Area III at Enkomi (Crewe 2017). However, possible direct developments of the MC and later non-domestic spaces have not been fully clarified and further research is needed. Concerning architecture and many other aspects of the material culture, the MCIII/LCIA also exhibits traits of discontinuity. For example, the most distinctive type of building in this period is called a ‘fortress’, an architectural category that actually comprises a variety of plans, dimensions, locational settings, and, most probably, functions (Monahan and Spigelman 2019, 134). Despite being diverse categories, ‘fortresses’ nevertheless show an innovative spirit, contributing to the construction and communication of a different sense of landscape, possibly correlated to a period of socio-political instability (Monahan and Spigelman 2019, 154–155). The presence of large walls, pre-planned features, such as built platforms, levelling and foundation cuts in the kafkalla bedrock are also characteristic elements of the architecture of these transitional sites (Crewe 2017, 148–149), marking a profound divide from the agglomerative nature of the EC/MC settlements such as Marki, Sotira, and Alambra. Monumental-like structures and site planning are other remarkable features appearing from the early phases of the MC. For example, the bedrock cutting for the outline of building units produced a regular, planned design of the workshop complex at Erimi whose beginnings can be radiocarbon dated to the late ECIII (Sciré Calabrisotto and Fedi 2017) (Chapter 5.1).

The increasing occurrence and capacity of storage vessels from the ECIII/MCI onwards is another crucial aspect to evaluate (Frankel and Webb 2006a, 129; Crewe 2017, 142). Its strategic importance seems to grow throughout the MC, as these vessels are a stable presence in the specialised areas. MC pithoi, however, may not be exclusively connected with surplus storage as there is no evidence for actual storerooms in the period. Two interpretations can be put forward: on the one hand, a higher presence of storage vessels implies the management of large quantities of goods – meaning an increase in storage capacity and a change in storage practices (Frankel and Webb 2006a, 129; Crewe 2017, 142). On the other, their uneven distribution in the community spaces and relations with other working installations suggests that they may have been ‘active’ elements within productive activities – meaning that their function may have not always been the one of long-term storage (Muti 2019). At Erimi, for
example, *pithoi* seem to have been used for the preparation of colouring substances or as dye vats (§7.5.2). In contrast, well-organised storerooms have been detected at MCIII/LCIA Aghios Sozomenos and Phlamoudi *Melissa*, implying the use of these spaces for long term storage of large quantities of goods (Horowitz 2018; Pilides, personal comment, 12/07/2019). Also dating to the transitional period is a new type of smaller storage vessel, the Plain White *pithos*, which can be moved more easily, possibly indicating an intensification of commercial networks (Crewe 2017, 142). In the MC–LC transition, in fact, maritime traffic was particularly active between the Levant and the eastern regions of the island (e.g. Crewe 2012), and this would have paved the way for a full engagement of the island in international exchange routes in the Late Bronze Age (e.g. Steel 2004, 169–171; Crewe 2007, 12–16; Knapp 2013a, 416–432). The external contacts with the Levant and other Mediterranean areas (e.g. Anatolia, the Aegean) played a fundamental role in the economic and social dynamics of the island. In this scenario, it is worth noting the potential of the realm of textiles, with luxury or utilitarian textiles (fibres, threads, fabrics, finished clothes, etc.) is so far little considered for Cyprus (Knapp 1991 is a notable exception).

To conclude our short introduction to this debated moment of transition, it is worth quoting Webb’s (2018b, 23/31) words concerning the relation between the MC and LC periods:

> *What happened on Cyprus ca. 1700 BC was a major shift that ultimately led to the rise of complex urban polities at Enkomi and elsewhere in the LBA. It may, however, be best understood as a relocation, reorganisation, and further development of systems and structures (coastal outlet/specialised production/distance procurement network), together with accumulated social and institutional knowledge, which existed on the north coast in the MBA and likely already in the EBA.*

Even though different sites and regions may have played a different role, it seems now clear that the MC already exhibited most of the elements in architecture and material culture indicative of social transformation towards complexity well before the beginning of the LC. Bearing this in mind, the transitional MCIII/LCIA can no longer be understood as a short period of sudden change. Nevertheless, it preserves a distinct character and shows differences in the nature and manner in which these markers manifested themselves in the archaeological record. Retracing patterns of continuity and discontinuity between the two periods can help to
reconstruct the processes that led to the rise of urban society on the island, but it may also be beneficial to note that this likely involved un-linearity, attempts and failure, and that the proposed indicators of social complexity do not necessarily have to be defined as direct precursors, but rather indicators of a long formation period (much longer than previously visible) of the developments observable in the LC. As it will be discussed in Chapters 9 and 10, changes and continuity in textile production can be understood only through the incorporation of the evidence for these broader social transformations, and, vice versa, textiles can offer a new perspective to tackle socio-economic developments.

3.2 Work, production, goods and identity between the Late Chalcolithic and Middle Cypriot III/Late Cypriot IA: past and current applications of these concepts in theorising prehistoric Cyprus

The second part of this chapter will examine how theoretical concepts relevant to this study (Chapter 2) have been understood in Cypriot archaeology and applied to the investigation of historical dynamics previously illustrated. Problem-oriented research appeared in Cypriot archaeology between the late 1980s and early 1990s, whilst a culture-historical approach dominated early studies, with fieldwork reports and materials sequencing occupying a great part in the literature (Knapp 1994, 398; 2013a, 21–22). This development in research must be read within the context of the application of theoretical archaeology in the 1980s that encouraged Mediterranean and Near Eastern archaeologists to consider frameworks derived from social sciences, economy, and philosophy to interpret archaeological data. Within this framework, it is notable that most of the work has been done on pottery, being the most plentiful and best-preserved artefact.

The question of the emergence of social complexity in late prehistoric Cyprus immediately became a topic of early scholarly debate and the main research topic throughout these decades. Pioneering studies were mainly based on LC urban centres: for example, Keswani (1989a) studied differentiation in the Enkomi burial architecture using presence and quantity of valuables as indicator of the presence of hierarchies and social stratification. Taking a similar approach, her doctoral thesis embarked upon an exploration of the relationship between mortuary practices and status in the EC/MC cemeteries (Keswani 1989b). For the periods considered in this project, Knapp (1986; 1988; 1990; 1993), Manning (1993), and Peltenburg
(1993; 1996) are also amongst the initial proponents of this line of investigation. In a series of influential works, these authors argued that the beginning of the BA and the EC–MC should be understood in light of rising social complexity, with production seen as one of the driving factors of, and reflecting, social transformations.

Regarding the rising of social complexity, Knapp (1990; 1993) stressed the importance of establishing a link between production and power to understand the EC–MC and LC periods. This relationship was defined with reference to the prestige goods theory as formulated in the early works by Brumfiel and Earle (1987) and Schortman and Urban (1987), namely that control over strategic resources behind precious or socially important goods, their productive means and exchange networks is directly correlated to the presence of power groups. Knapp (1990; 1993) used the prestige goods theory to interpret the significance of metallurgy as the manufacture that triggered social transformation between the Chalcolithic and BA and throughout the EC–MC, by means of the control of resources and production. He also introduced to Cypriot archaeology the concept of subsistence economy as a contrasting concept. In general, thus, Knapp (1990; 1993) conceptualised the Philia and EC–MC as periods in which élites begin to emerge in direct correlation to production, consumption and circulation of prestige goods (understood as economically and socially valuable objects) and of the development of new means for agricultural subsistence. These mechanisms of incipient social complexity, though, were regarded as not having developed completely until the LC (Knapp 1993, 99–101). Similarly, Manning (1993) understood the role of production as a competitive means for the emergent élite to gain power during the Philia, especially emphasising control and management of new farming resources and agricultural means. Concerning agropastoral resources, these two authors make reference to Sherratt’s (1981) formulation of the ‘Secondary Products Revolution’ as a set of innovations linked to the appearance of new domesticated species, especially cattle and donkey (Knapp 1990, 155–159; 1993; Manning 1993, 44–49): this concept has been largely accepted and incorporated into the narrative by Cypriot archaeologists (Knapp 2008, 78–81; Frankel 2000, 176–177; Falconer and Fall 2013a).

Further exploring the link between control of resources and goods and power dynamics, Peltenburg (1993; 1996) extended the perspective illustrated above to earlier stages of Cypriot
prehistory, anticipating one of the main ideas that he would develop throughout the years. He suggested that patterns of diversity in the archaeological record (e.g. different distribution of artefacts in domestic contexts and grave goods in burials) of Neolithic and Chalcolithic sites could be read as indicators of social differentiation and the existence of power dynamics that fluctuated before being institutionalised in later periods. Peltenburg (1993) also reflected on the possible existence of mechanisms of control, the importance of external contacts and feasting as a means of manifestation and negotiation of power dynamics. In his early publications on the Philia transition, he argued that this phenomenon could be explained by the emergence of élite behaviours, already attested during the LChal, as well as socio-political competitions through the production and consumption of prestige goods (Peltenburg 1996). Helms’ (1979) and Earle’s (1989) early prestige goods economic models are used to support the emergence of asymmetry in LChal groups through strategies of control over the production of valuable goods and aggrandising behaviour of individuals or families (Peltenburg 1996, 19–21; Peltenburg et al. 1998a, 258). However, Peltenburg’s views on how the Chalcolithic social dynamics transformed and interfaced with the BA developed over time. In his more recent publications, he proposed the idea of fluctuating power dynamics during the Chalcolithic period – even though these may not necessarily imply a direct or permanent correlation to social stratification (Peltenburg 2018; also: Bolger 2007; 2013). Peltenburg and Bolger also argue for a greater social/symbolic character of the objects that show innovative elements, and highlight the importance of concepts of consumption for display and re-definition of personal and group identities intra- and inter-island (e.g. Bolger 2013; Peltenburg 2018).

Concerning the connection between LChal/Philia transition and valuable materials, it is worth noting that Frankel and Webb’s model has also stressed the decisive role of the island’s metal and copper resources (§3.1.1). However, the focus on this and other types of manufacture, including textiles (Table 3.1), is mainly based on technological aspects (e.g. transfer of motor skills, technical habits) and everyday practices, rather than on economy-related questions (e.g. Frankel 2000; Webb 2007; see Webb 2013b, 61–64 for metallurgy). In their understanding of the phenomenon, the two authors have often remarked that most changes occurring in the Philia do not pertain to prestige items or technologies but to a range of “merely different ways of doing things” in everyday life (Frankel and Webb 2013, 202–204).
With respect to the EC–MC, more attention to ‘everyday life’ is detectable from the late 1990s and early 2000s. The first settlement excavations undertaken with modern archaeological methodologies occurred in these decades and shifted the focus from prestige economies to village-based communities, such as, for example, Alambra (Coleman et al. 1996), Marki (Frankel and Webb 1996; 2006a), and Sotira (Swiny et al. 2003) (Appendix II). The organisation of these settlements and associated domestic contexts, in fact, does not offer evidence for social differentiation, suggesting that these communities were predominantly kin-based and essentially egalitarian (Frankel and Webb 2006a, 305–319; also: Knapp 2013a, 345). This led Knapp (2013b) eventually to reconsider his previous understanding of the rise of social complexity in Cypriot prehistory, concluding that none of the aspects of the EC–MC material culture can be correlated with complex societies. The appearance of social stratification is therefore pushed towards the end of the MC, conceptualised as the real, punctuated “moment of change” (Knapp 2013b, 39–40).

Notwithstanding this new narrative of EC–MC society, the interpretation of settlements stood and still stands in stark contrast with that offered for the burial evidence in the same years. As mentioned above, Keswani (1989b; 2004, 63, 74–83; 2005) has read the presence of rituals involving a large number of grave goods and complex funerary practices, such as secondary deposition and mortuary feasting, through the lens of social competition. In this picture, grave goods play an essential role in display and competition for status; status differentials are created in the burial arena, and the display of goods reflects actual control over resources and production (Keswani 2004, 63, 67, 74–83, 81–82; 2005). This view is still largely accepted: for example, Webb (2018b) has recently linked the elaborated ritual of north coast cemeteries and metal display in tombs to forms of expression and legitimation of authority. Despite his more recent understanding of the EC–MC social dynamics, Knapp (2013a, 346; 2013b, 24–25) continues to conceptualise the mortuary evidence as related to the promotion of authority and social inequality.

Regarding production, the EC–MC settlements provided limited or no evidence of activities beyond the domestic level (§5.2), and the household is considered the primary economic unit for production and consumption at these sites (Frankel and Webb 2001; 2006a, 311–313; Knapp 2013b, 39). Pottery, food production, lithic manufacture and other activities were
portrayed as non-specialised, with a small degree of intra-household organisation to increase efficiency (Frankel and Webb 2001, 126–127; 2006a, 312). By comparing the narratives adopted for the EC–MC and the LC, it is worth adding that the discussion of households and gendered domestic production is a typical aspect of the narratives and interpretations of the Chalcolithic and EC–MC periods, and less so in the LC (e.g. Bolger 2003, 37–38; Webb 2009, 264–265; 2015, 375–379). Despite an urgent need to test the validity of the egalitarian model and the use of the gendered approach just described, until recently, little had been done to investigate different types of EC–MC manufacture in terms of organisation and dynamics of production (Knapp 2013a, 322–332). Closing this knowledge gap is therefore one of the aims of this thesis.

As far as textile production is concerned, studies have been focused on materials and technologies (Chapter 4), rarely considering the point of view of specialisation and productive dynamics; this is probably due to the common understanding of this manufacture as mundane and mostly relegated to households (Frankel and Webb 2006a, 312; also: Steel 2016, 528; Webb 2016c, 381–383;). In this regard, an interesting point is raised by Smith (2002, 298–299) in her analysis of the changes in workspaces for textile production throughout the LC. She observes that domestic patterns of the previous EC–MC should be more carefully analysed: she noted that one thing is to recognise the function of the space where production is carried out, and one other thing is to assess the level of specialisation. It is worth noting that Smith (2002, 282, 286–289, 285 fig. 1) adopts Costin’s taxonomy of the degree of specialisation (explained in §2.2.3), that foresees the possibility of producing surplus within domestic spaces. Drawing on Barber’s (1994) understanding of textile production as women’s work (introduced in §1.1.2), Smith (2002) does not only investigate the textile ‘productive locus’ but her primary aim is to explore the role of women in textile production within different workspaces. Following a comparison of the evidence from domestic and working spaces at Kition, she concludes that task division and the possible involvement of both genders occurs in the LC specialised spaces (Smith 2002, 304–306).

Reflecting Barber’s ideas (1994), it is also interesting to note that the social significance of Cypriot textile tools is particularly embedded within the gendering of material culture. For example, Webb (2007, 23) identifies women’s everyday textile practice as responsible for
technology transfer in the LChal/Philia transition. Frankel and Webb (2006a, 175) have also recognised the regional variability in the shape and decoration of EC–MC whorls and considered these tools as personal items that can be connected to the movement of spinners, namely women, that entered a new community through marriage. In general, the significance of textile tools in the burial record has been connected to the presence of women or the items have been considered their personal belongings (Webb 1992; 2015, 378, 381–383; Keswani 2004, 76). Only recently have researchers begun to reflect upon the link between these tools and personhood and personal identity, opening up the possibility that these tools held meaning connected to their function prior/unrelated to deposition as grave goods and their relation with the deceased (Douglas 2019, 184–188; Douglas and Muti 2019; Muti et al. 2019).

A similar interest in exploring the identity of craftspeople can be found in more recent literature, especially concerning pottery (Webb 2010; 2016a). In addition, ongoing projects at Erimi (Bombardieri 2017a), Skalia (Crewe 2014), Politiko (Falconer and Fall 2013; 2014), and the restudy of documentation from old excavations (Ambelikou [Webb and Frankel 2013a]) have substantially enriched the evidence for MC production, stimulating new research on the relation between communal spaces and work activities. Regarding pottery manufacture, Webb (2010; 2016a) has recently researched the expression of individual and collective identities of the potters in the Cypriot record; specifically, at ECI–II Vounous and Psematismenos, and MC Deneia. She identified an opposing relationship between potters and products: complex, and, in some case, unique decorations and vessel compositions typical of the Vounous assemblage are connected with the presence of skilled or specialised practitioners, specific consumers and practices of consumption (Webb 2016a, 60–61). In contrast, the lack of stylistic variation at Psematismenos led her to exclude the presence of skilled/specialised potters (Webb 2016a, 61). At MC Deneia, the identification of a community-distinctive style led Webb (2010, 175–180) to propose a crafting corporate identity that act at a collective level in the Deneia community, in which, however, individual signatures seem also to emerge.

Moving to consider the MC complexes, in which evidence for textile production is generally plentiful (Chapters 7.3, 7.5, 7.6), the following sections will explore how scholars have conceptualised work activities identified in these spaces. The first one to be considered is
Ambelikou, a site that yielded two distinct productive areas for metallurgy and pottery production (Webb and Frankel 2013a). A scale beyond domestic production is recognised for both the manufactures, although not at a large scale (Webb and Frankel 2013a, 219, 221–223). Whilst more emphasis is put on technological aspects of metallurgy, the characterisation of the level of specialisation for the pottery workshop is based on the examination of traditional parameters, such as the context of production – with particular reference to the organisation of the workspace, type and standardisation of products, frequency, and scale (Webb and Frankel 2013a, 206–219). Pottery production is characterised as probably seasonal and aimed at satisfying the needs of the community, and either conducted by a member of the community or an itinerant artisan (Webb and Frankel 2013a, 219). Metallurgy could have also been seasonal but possibly required more efforts from the local community, and the organisation of the workspace and facilities and the type and quantity of tools is connected to cooperation a presence of specialised/expert craftsmanship (Webb and Frankel 2013a, 223–225). The strategic position of the site both in relation to metallurgical sources and exchange networks can hint to the involvement and collaboration between community members (Webb and Frankel 2013a, 222–225).

Erimi, an MC site with a large area dedicated to textile production, defined as a workshop complex, will be explored in detail in Chapters 7 and 9 (Bombardieri 2013; 2014; 2017a). This definition is mainly based on the organisation of the productive spaces (Bombardieri 2013; 2017a, 350, 353), though, implicitly, it also refers to the level of specialisation as questions concerning the value of products and the participation in exchange networks are taken into account. However, the definition of a ‘workshop’ was derived without reference to the theoretical literature on specialisation as discussed in Chapter 2 and it is therefore impossible to know which productive indicators were considered and what their significance was. Other publications are more explicit and explore the social mechanisms acting within the Erimi community with reference to Lave and Wenger’s (1991) ‘community of practice’ concept (Bombardieri 2014; 2017a, 353–355; 2019b, 63–64; also: Bombardieri and Muti 2018a) (§2.3.2). Here, community identity and bonds are understood as deeply related to and constructed through textile work: textile activities involved the majority of the available workforce and enabled the development of community targets; this, in turn, facilitated the creation of a strong sense of community, shared ideology and an interest in the transmission of
skill and knowledge (Bombardieri 2014; 2017a, 353–355; Bombardieri and Muti 2018a). The identification of a textile workshop at Erimi has also contributed to a revised understanding of EC–MC textile production as exclusively female work. Even though this traditional conceptualisation of textile work continues to be applied to domestic contexts, the utilisation of a mixed workforce is highly likely for specialised manufacture as already proposed by Smith for the LC (2002, 304–306; also: Webb 2016c, 381–383; Muti 2017a, 231–232).

Only preliminary studies are available for Skalia and Politiko, but lines of interpretation have been clearly set by the excavators. At Skalia, production and consumption of alcoholic beverages and roasted meat have been identified in the large final MC/LCIA complex and have been read through the politico-economic lens of the ‘empowering feasts’ (Dietler and Herbich 2001), in which communal feasting can act as a form of compensation for labour and an occasion for social display and visibility to the sponsors (Crewe and Hill 2012, 233–234; Crewe 2017). These work-exchange mechanisms offer the opportunity to investigate incipient forms of inequality that is present in a non-aggressive and non-evident way in community-oriented contexts (Crewe and Hill 2012, 233–234, following Dietler and Herbich 2001, 240–246). Concerning Politiko, a series of open spaces dedicated to a range of communal activities, including textile production and processing of deer meat, were detected (described in more detail in Appendix II). The current interpretation of these spaces is primarily social and connected with the expression of group identity and, as at Skalia, communal feasting (Falconer and Fall 2013a; 2014, 176). Evidence for a metallurgy workshop was identified within the courtyard of a domestic space in a different area of the settlement (Falconer and Fall 2013a, 113; 2014, 178); again, this productive space is defined as a ‘workshop’, but, as for Erimi, without reference to the theoretical literature on specialisation.

To sum up, the themes of production, prestige goods, and work-related identities are crucial for the interpretation of different periods in Cypriot prehistory: in some cases, they have been differently understood and applied by archaeologists, while the main use of these concepts appears generally accepted and well established. However, a review of current literature has highlighted the necessity of a more theory-based definition of specialisation for the MC complexes, and clarification and uniformity in the use of ambiguous terms such as ‘industrial’ and ‘workshop’ is needed. Current projects have established the foundation for research into
the exploration of ancient production, productive organisation and dynamics, and the identity of craftspeople. These important themes, observed through the lens of textile production, will be further examined in the third part of this work. Before doing so, it is necessary to investigate in detail Cypriot textile production. The following chapter, Chapter 4, will conclude the first part of this work by providing the fourth foundational layer of this study. Specifically, it will introduce the archaeological indicators selected to facilitate an analysis of Cypriot textile production and the methods set out for analysing them.
Chapter 4

Methodology and the Cypriot Record

The methodology used to re-trace Cypriot textile production is inspired by the foundational work ‘Tools, Textiles, and Contexts. Textile Production in the Aegean and Eastern Mediterranean Bronze Age’ (Andersson Strand and Nosch 2015a). As introduced in Chapter 1.3, this study has provided researchers with innovative, essential tools to investigate the material expression of this ancient technology. This chapter illustrates how and which archaeological indicators for textile production have been identified and the two main methods adopted to scrutinise them. Specifically, it will explore the material culture that can be connected to textile manufacture in terms of types, function, and use (techno-functional analysis) and their contexts (contextual analysis). The textile indicators presented in this chapter were identified by examining the Cypriot record and general features and specificities of the record will be outlined for each category identified. Appendix I outlines the main steps of the textile chaîne opératoire in prehistory, along with tools, techniques and modern terminology that can be associated with each manufacturing step. The following sections will thus define the indicators for textile production, characterise each type of indicator, explain the significance of techno-functional and contextual analysis of textile indicators, and describe the strategies adopted for the construction and use of the dataset on which this study is based.

4.1 Archaeological indicators of textile production

It was noted in Chapter 1.2 that the periods considered in this study lack written sources, relevant iconography and any other evidence that may facilitate our understanding of textiles. Instead, evidence for the study of textile production can only be obtained from archaeological materials. These mostly consist of tools and structures that can be divided into two main types, namely ‘specific’ or ‘non-specific’ indicators. Specific indicators are implements that have a primary function within a textile activity, and once defined as textile tools, they can be identified as such in any context. In contrast, tools and installations with a use that cannot be primarily associated with a textile activity are considered non-specific, and their connection to textile production has to be deduced from contextual information. This criterion was elaborated for this study and may not be universally applicable: archaeological materials can present ambiguous characteristics or can be expediential/multifunctional tools (Barber 1991,
It must be also born in mind that the specific indicators are amongst the most common textile tools in archaeology, but not the only ones (see Appendix I). In addition, textile remains act as an independent category of indicators (products) and are examined in more detail in Appendix IV.

4.2 Specific indicators

4.2.1 Spindle whorls and spinning tools

The first category of textile tools identified is that of spinning tools. Spindle whorls are small, vertically pierced artefacts of different shapes mounted on a shaft; namely, a device used for making thread from fibres (Figure 4.1). Together, the whorl and shaft, are assembled in a spindle, the device par excellence for thread making in antiquity. A non-essential complement to this tool is the distaff, another stick to which supply fibres are wound during spinning (Barber 1991, 28–29; Rahmstorf 2015a, 10). All parts of a spindle can be made of perishable materials. Often, however, spindle whorls are crafted from a range of non-perishable materials (e.g. stone, terracotta) which are more commonly retrieved.

![Diagram of a spindle whorl]

Figure 4.1. Diagnostic parts of a spindle whorl

Whorls are an important part of the spindle as their function is to act as a flywheel and provide extra weight and stabilise the spindle’s rotation (Firth 2015, 154). Given their specific task, the mass has been recognised as an essential functional parameter since the earliest studies on spinning technology (Barber 1991, 43) and by recent experimental research (Grömer 2005; 2016, 85–88; Ciccarelli and Perilli 2017, 160). More specifically, it is known that the mass³

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³ Mass and weight have two different meanings in physics, but these terms are used as synonyms in this study.
affects the spun yarn in so far as light-weighted whorls (generally of <30g) can be associated with the production of thin yarn, preferably from short fibres, while heavy classes are used to spin thick threads (Grömer 2005, 110, 111 fig. 6; Andersson Strand 2015, 48). Overly heavy whorls, in fact, would break thin yarn while spinning it, while overly light artefacts would not provide the right tension for long fibres. Spindle whorls’ perforations provide indirect evidence of the thickness of the shafts used: whorls must be stable on the shaft to avoid the tool wobbling; therefore, the shaft cannot be much thinner than the perforation, even though small pieces of wood or other materials can be inserted to stabilise the ‘system’ (Crewe 1998, 61).

Recent studies on the ‘physics’ of spinning have stressed that spindles operate in a dynamic way, namely rotating, but the mass can only describe their steady ‘condition’ (Verhecken 2009, Firth 2015, 154). The Moment of Inertia (MI) was introduced for a more accurate evaluation of the whorls’ movement (Verhecken 2009; Chmielewski and Gardyński 2010). In physics, the MI is used to evaluate the angular momentum of a rotating object, that is the rate of its rotation and change in speed: the higher this value, the higher a torque is needed to make the tool spin. Normally, high MI values are correlated with slow rotating spindles, which are more suitable to produce yarn from thick, less flexible fibres. In contrast, fast spindles can optimally spin thin, short, and more flexible fibres (Chmielewski and Gardyński 2010; Sauvage and Smith 2016, 196; Smith 2017, 172). Scalar MI values of standard geometrical solids can be calculated by using formulae (Smith 2017, 172 tab. 1) (Table 4.1). As it can be observed from the formulae reported in Table 4.1, the shape of solids affects their movement: traditional archaeological typologies can thus be helpful not only to categorise these artefacts but also to understand their function.

<table>
<thead>
<tr>
<th>Whorl shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conical, truncated biconical</td>
<td>( W(R^2/2) )</td>
</tr>
<tr>
<td>Biconical, spherical</td>
<td>( W \left[ 0.75 \left( R^2/2 \right) \right] )</td>
</tr>
<tr>
<td>Cylindrical</td>
<td>( 0.5 \cdot WR^2 )</td>
</tr>
</tbody>
</table>

*Table 4.1. Table of the formulae used to calculate the Moment of Inertia of spindle whorls (W=weight, R=radius) (from Firth 2015, 154; Sauvage and Smith 2016, 196; Smith 2017, 172 tab.1)*

Concerning other two ‘steady’ parameters, diameter can influence the whorl’s operation, while height is less indicative as a functional parameter (Barber 1991, 53). A correlation between the diameter width and the rotational speed has been noted: whorls with the same weight but a
larger diameter require more time to complete a full twist around their axis, while tools with narrower diameters are fast, completing multiple full twists within the same time (Barber 1991, 53; Frankel and Webb 2006a, 173).

Further exploring this relation, Chmielewski and Gardyński (2010, 876) observe that the ratio between the height and diameter of a spindle whorl is indicative of its speed (ratio of speed \( \text{RS} \)). The two authors explain that an enlargement of the whorl diameter produces an increase of angular mass (Chmielewski and Gardyński 2010, 876). Therefore, if the torque value is to be maintained, extra weight must be added to the tool, and an increase of the height must take place. Calculating the ratio between the height and diameter of a whorl helps to describe the tendency of whorls to rotate slowly (small values) or fast (high values). This method is particularly beneficial to investigate possible strategies behind the manufacture of spindle whorls (Chmielewski and Gardyński 2010, 876). It has been observed, in fact, that traditional spinners are often not aware of the exact weight of the tools they use (Ciccarelli and Perilli 2017, 158); instead, changes in height and diameter are more easily detectable, and controlled during manufacture and use. More generally, it must be kept in mind that current research largely bases its understanding of spinning on mathematical parameters, but yarn production also depends on other factors, such as the quality and preparation of fibres and the choices and preferences of spinners, unfortunately elusive in the archaeological record (Kania 2013).

Different spinning technologies can be adopted when spinning with a whorl. Drop spinning, namely the use of a spindle to pull out and twist the fibre in a thread, was probably one of the most common in the prehistoric Mediterranean (Andersson Strand 2015, 45–46, 46 fig. 2.10). In drop spinning, the spindle can hang free (suspended spinning) or rotate with one end touching a surface or within a container (supported spinning) (Andersson Strand 2015, 45–46, 46 fig.
2.10) (Figure 4.2). The adoption of either of these techniques can affect spinning and its products. For example, spindle whorls used to spin thin thread can be heavier in supported spinning. As an alternative to drop spinning, splicing is another technology for thread making and has recently caught the attention of textile scholars (Gleba and Harris 2018) (Appendix I). In splicing, fibres are individually hand joined, and, only after that, a spindle can be used to provide an additional twist to the pre-formed thread (Barber 1991, 44–51; Gleba and Harris 2018, 2329, 2341). This thread making technology is typically plant bast fibre-based because flax and other vegetable materials have longer and easier to join fibres than animal fibres (Gleba and Harris 2018).

Figure 4.3. Barber’s macro-areas related to the use of different textile technologies and fibres (from Webb 2002, 367 fig. 4)

The position of spindle whorls on the shafts is one other relevant question. Whorls can be attached to the lower part of the shaft (low-whorl spinning), the high end (high-whorl spinning) or at mid-shaft (mid-whorl spinning) (Barber 1991, 43; Lassen 2013, 79), and the furnishing of spindles is a cultural choice and has no effect on spinning (Andersson Strand 2015, 47). The adoption of either low or high whorl spinning separates two macro-areas with different spinning cultures: the former is popular in Continental Europe and the northern Mediterranean; the latter is practised in the Levant, Mesopotamia and Egypt (Barber 1991, 51–65; Webb 2002, 366) (Figure 4.3). One other aspect that is generally considered a cultural signature is the clockwise or anticlockwise direction of the spindle’s rotation (Barber 1991,
The anticlockwise rotation produces ‘Z-spun’ thread, while clockwise spinning produces a ‘S-spun’ thread (Andersson Strand 2015, 47, 47 fig. 2.12), and a geography-based preference for one or the other was observed by Barber (1991, 60–61) in the Mediterranean region. Anticlockwise rotation was considered typical of the northern Mediterranean and clockwise rotation in Egypt and the Levant. This, however, is not confirmed by more recent surveys of textile remains from across the Mediterranean, which have provided a larger quantity of samples and revealed a more nuanced picture (Skals et al. 2015). Barber (1991, 66) herself, however, had already observed that certain fibre types as well as being left- or right-handed can influence the spin direction (Barber 1991, 66–67; Anderson Strand 2012, 33–34).

4.2.2 Use-wear and spindle whorls

The analysis of use-wear traces offers the possibility to obtain complementary information on the techno-functional aspects of spindle whorls. Cypriot archaeologists have been pioneers in examining and interpreting these kinds of marks on whorls (Frankel and Webb 1996, 194; Crewe 1998, 60–62). Only recently, textile specialists have become more interested in this aspect to develop general guidelines to investigate archaeological assemblages (Forte and Lemorini 2017). Early studies by Frankel and Webb (1996, 194) and Crewe (1998 60–62) have reported that the most common use-wear mark on whorls is an area of chipping and abrasion around their narrow terminals (Figure 4.4). This was interpreted as the result of the insertion of the whorl in the lower part of the spindle with the narrow terminal downwards. Crewe (1998, 61) also recorded less regularly distributed ‘indentations’ around the perforations at broad terminals, possibly caused by the insertion of materials to stabilise whorls on the shafts (Crewe 1998, 61). Areas of attrition were also detected on the

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4 Flax shows a natural tendency to twist in a specific direction (Barber 1991, 66).
slip of the whorls’ extremities and related to the friction caused by yarn when passed around the diameter of the tool (Crewe 1998, 61).

More detailed information on the origin and types of wear traces in low-whorl spinning was recently provided by Forte and Lemorini (2017). In their experimental study, different whorl types were reproduced and used by experienced spinners to observe the formation of use-wear (Forte and Lemorini 2017). The results of these tests definitively prove that use activities cause abrasion around the whorls’ terminals, as observed on the Cypriot examples. The insertion of the shaft, in fact, creates “rounding of the protruding parts”, and “spall detachment” around the instruments’ perforations (Forte and Lemorini 2017, 174, 170 fig. 1e-f). It was also specified that intensity or frequency in the use of these tools produces a levelling of the terminals (Forte and Lemorini 2017, 174, 170 fig. 1e-f, 175 fig. 5c-f). Abrasion and consequent levelling of the round terminals is thus caused by use, while chipping is the consequence of the insertion of the shaft (Forte and Lemorini 2017, 174). The appearance of these two use-wear marks on the Cypriot sample can be read as the combination of two actions, preparation and use of the whorls. When chipping is particularly evident, it may be suggested that the whorl was frequently removed and reinserted onto the shaft. Abrasion around the maximum diameter as a type of wear is not mentioned by Forte and Lemorini (2017). Nonetheless, it can be noted that the thread wrapped around the maximum diameter is firmly fixed and does not rub onto the body. It is thus unlikely that it can visibly modify a ceramic surface as proposed by Crewe (1998, 61).

4.2.3 Cypriot spindle whorls

Having outlined spindle whorls, their function and diagnostic aspects, we will move on to consider the Cypriot record. It is commonly believed that spindle whorls are not visible in the Cypriot record before the beginning of the BA, and the Philia examples are considered the first well-attested spinning tools on the island (Crewe 1998, 14; Webb 2002, 366–367). As shown in Table 3.1, their appearance in the Cypriot record has been interpreted as the introduction of the low-whorl spinning technique on Cyprus (Frankel 2000, 172–173; Webb 2002; 2007, 23; Webb and Frankel 2007, 200). Chalcolithic and BA discs with drilled holes made of stone or terracotta (modified sherds) have been occasionally discussed in literature as potential whorls (Webb 2002, 366–367 with references; also: Bombardieri and Muti 2018b, 32–33). These
artefacts appear suitable to operate as whorls for their shape and dimensions but show more irregular or hourglass perforations, which are often slightly to distinctively off-centre (Bombardieri and Muti 2018b, 33 fig. 1). A similar debate has been raised for discs retrieved, for example, from Aegean and Near Eastern contexts (e.g. Gibbs 2008; Rahmstorf et al. 2015, 271; also quoted in Bombardieri and Muti 2018b, 32–33). Experimental tests conducted on replicas from these areas have demonstrated that the insertion of wedges in the perforations of such discs reduces dysfunctional oscillations when mounted on spindles has encouraged to propose an identification of the discs as whorls (Gibbs 2008; for the insertion of materials to reduce wobbling see also: Crewe 1998, 12, 14; Frankel and Webb 2006a, 169–171; Rahmstorf 2015a, 5). In this light, Bombardieri and Muti (2018b, 32–33) proposed that further research was needed to assess whether this could also be the case of Cypriot prehistoric discs. Nonetheless, upon personal observation of samples from Mosphilia and Erimi, the Cypriot discs often display thin edges at perforations, and the insertion of materials may not be effective in stabilising them. Therefore, spinning would be exceedingly difficult and impractical, leading me not to classify them as whorls. In contrast, other categories of perforated objects could have functioned as whorls in the Chalcolithic, and their potential as textile tools will be explored in Chapter 6.1.1. Concerning the EC–MC examples, it can be additionally observed that efficient whorls of all shapes, including discoidal types (Crewe 1998, 22 fig. 4.1; Frankel and Webb 2007, 127–128), are abundantly present in the record (see below), and there would be no need to use such impractical, less occurring objects.

As anticipated, whorls are common finds in Philia and EC–MC domestic and burial contexts (Crewe 1998, 36–38) and were first recognised by Dikaios (1940) among the materials retrieved from Vounous. These objects have often attracted the attention of different scholars, culminating in a dedicated monograph by Crewe (1998). First studies on this class of materials focused on creating typologies. Dikaios (1940, 136) organised the record on categories describing shapes and materials of whorls retrieved from single sites (Vounous, Episkopi Phaneromeni [Phaneromeni] and Sotira), while Dikaios and Stewart (1962, 173, 349) and Åström (1972, 155–157) took into account the sites excavated by the Swedish Cyprus Expedition between 1927 and 1931. Before Crewe’s categorisation, Swiny (1986, 100–101), and Walz and Swiny (2003, 401) also elaborated typologies based on the record of single sites (Phaneromeni and Sotira). Considering 616 objects, Crewe’s (1998, 21–22, 22 fig. 4.1, tab. 85
4.1) typological division is the one currently in use (Figure 4.5). Four primary categories in this taxonomy indicate the shape (conical/spherical, biconical, truncated biconical, and cylindrical), while a series of secondary and tertiary categories are distinguished on the base of the carination and ends. The ‘double’ spindle whorls can be considered as an additional, rare type not formally included in Crewe’s typology but appearing in her catalogue (Crewe 1998, 99, 188, figs. A.218, A2.32). This type consists of the reduplication of two whorls of the same type connected at one end (Muti 2017a, 224).

This classification has been largely adopted by archaeologists, even though only primary types are generally used (Frankel and Webb 2006a, 159; Muti 2017a, 219). In regard to Crewe’s types, similarities in shape can be noted between Types I and III, and Types II and IV. Types I and III are both characterised by one broad and one narrow terminal, and the most visible difference between the two is the presence of the carination. Their shape facilitates their insertion in the spindle with the broad terminal upwards, and this is also supported by the fact that use-wear traces tend to concentrate in this area (§4.2.2). Although Type III is defined as ‘truncated biconical/ spherical’, its shape is related to Type I. Types II and IV do not display one end larger than the other and can be mounted either way up in a spindle. Crewe’s typology is thus not fully functional to investigate the relationship between the shape and operation of whorls, which would be better expressed by two macro-categories (Types I+III and Types II+IV). However, it helps to retrace in more detail comparisons between assemblages and changes through time with more ease than the macro-categories would allow for. Also, as it is currently universally adopted in the literature,
proposing an alternative system of classification may not be beneficial and could generate confusion.

Swiny’s (1986, 98–99) study of Phaneromeni whorls was pioneering in proposing a functional approach to the study of these artefacts, measuring the functional parameters. Developing such a functional approach further, more recent classifications have been based on the distribution of whorls by weight and height/diameter; in particular, Frankel and Webb (1996, 191–197; 2006a, 159–175) and Crewe (1998) have followed Barber’s (1991) method. Focusing on the problem of distinguishing beads from whorls, Swiny (1986, 98–99) and Walz and Swiny (2003, 401–402) came to the conclusion that functional spindle whorls must have a minimum weight of 10/15g and minimum diameter of 20mm. However, recent experimental tests conducted have definitively proven that even very light objects (≥ 4g) can function as effective spindle whorls (Olofsson et al. 2015). These considerations eradicate the need to debate this question in relation to the Cypriot assemblage as no objects weighing less than 4g and crafted with a perforation suitable for a spindle shaft are present in the record. Other attributes often used as distinctive criteria for differentiating between whorls and beads pertain to the shape and location of the perforation. Hourglass shaped and off-centre perforations were also considered incompatible with the use of an artefact as a spindle whorl as they make spindles excessively wobbly or unbalanced (Crewe 1998, 11–12). Again, experimental tests have demonstrated that these characteristics may not entirely rule out the use of a perforated object as a spinning tool (Gibbs 2008, 91). In addition, no whorls show evident hourglass perforations in the Cypriot record; slightly hourglass or off-centre holes are visible but generally not extreme enough to affect their efficiency. Light whorls frequently show the same typical use-wear traces as heavier examples but remain generally rare in the Cypriot record. Beads/toggles can be distinguished by an excessively narrow perforation and a lack of use-wear (Frankel and Webb 2006a, 158; Bombardieri and Muti 2017, 249–250). Obviously, it cannot be excluded that light artefacts, even though primarily functioning as whorls, were also used as beads or toggles (Frankel and Webb 2006a, 160–161).

Many authors have observed that the size of whorls’ perforation may vary by a few millimeters when the two ends are compared (Swiny 1986, 99; Mogelonsky and Bregstein 1996, 206; Crewe 1998, 23; Frankel and Webb 2006a, 171–172). Frankel and Webb (2006a,
hypothesise that this indicates that spindles with different shapes had been used. This claim is supported by metal spindles and terracotta models which show the diameter slightly tapering at terminals or mid-shaft. However, perforations were made before firing, and a difference in the hole’s diameter between the two terminals is primarily indicative of the type of shaft used for piercing the objects and the piercing direction: given that the difference is minimal, this does not imply that whorls with these characteristics were used with specific shafts. In fact, wedging materials could be used to fill the gap when necessary (e.g. Frankel and Webb 2006a, 172).

Most EC–MC whorls are made of terracotta, but stone and rare bone examples have also been recorded (Crewe 1998, 26–27; Karageorghis and Webb 2011, 77–80; Bombardieri and Muti 2017, 248–249). Terracotta whorls are generally referred to using the main ware classes used for pottery, namely the RP, Black Polished (BP), Brown and Drab Polished (DP) wares (Crewe 1998, 24–25; Falconer and Fall 2013a, 110; Muti 2017a, 219). Nevertheless, Frankel and Webb (2006a, 159–160) noted that the Marki tools showed different fabric colour and fabric composition when compared with the local wares and therefore rejected the adoption of the pottery ware. However, the fabric composition is an informative indicator for the identification of imported spindle whorls and their provenance, and evidencing similarities with pottery wares – which show evident regionalism in the EC/MC period – is helpful to recognise imports (Crewe 1998, 50).

Decoration is another highly distinctive trait of the whorls from the periods considered. Percentages of decorated artefacts vary through time, but generally correspond to ca 70% of whorl site assemblages from the end of the EC onwards (Muti 2017a, 230–231). Decorative patterns typically consist of incised and impressed geometrical motifs filled with a white paste (generally, single or multiple lines, zigzags, dots, circles, herringbone, hatched bands, etc.) (Crewe 1998, 43–58). The variety of motifs and their composition is exceptionally great, especially when compared to other areas of the Mediterranean and the Near East (Andersson Strand and Nosch 2015a). Cypriot early types, however, show a less varied recurrence of incised motifs (Frankel and Webb 2006a, 160–162), of which the origin and significance will be analysed in more detail in Chapter 6. A classification of the most recurrent decorative motifs was proposed by Crewe (1998, 43–58, 56–58 tabs. 7.3–7.7), who also noted a regional
variation in the selection and composition of the decorative patterns, which can be considered additional evidence for the provenance of the artefacts.

As regards chronological markers, the Philia and early EC types show characteristic shape and decoration that allow archaeologists to assign them securely to a time period (Crewe 1998, 63; also: Frankel and Webb 2006a, 172; Peltenburg and Webb 2013, 274–275). In contrast, ECIII–MC spindle whorls are not secure chronological indicators. While some shapes (truncated biconical/spherical) and more differentiation in terms of size and decoration seems characteristic of this period, it is generally difficult to narrow their chronology to a single period (Crewe 1998, 32–36). As observed by Frankel and Webb (2006a, 165, 172), however, some “chronological definition” can be observed when contextual information is available and they can be placed in a sequence at a single site, such as at Marki. No systematic study of textile tools has been conducted for the MCIII/LCIA. Changes in pottery ware and styles are visible in this period, and this also affected terracotta whorls: for example, whorls at Phaneromeni show similar fabric characteristics to late local wares derived from RP and DP as described by Herscher (1976, 11). Following a first preliminary analysis, MCIII/LCIA whorls from Nitovikla (Crewe 1998, 93–94), Enkomi’s early levels (Dikaios 1969–1971, 624–631), Skalia (§7.6.1), Phaneromeni (Swiny 1986, 98–106) and Galinoporni (Crewe 2009, 93) can be classified using Crewe’s typology (1998, 22 tab. 4.1, fig. 4.1). Overall, however, a more systematic study is needed, especially regarding their function.

### 4.2.4 Cypriot spindles

Further important evidence of spinning practice is provided by two metal spindles and two terracotta skeuomorphic models (Figure 4.6). One metal spindle, furnished with a biconical whorl, is part of the Zintilis collection (Webb 2002, 364–365; Lubsen Admiraal 2004, 252 [n. Z.776]) (Figure 4.6c). The second example, without a whorl, was found within a group of metal artefacts in Lapithos T.201 (Webb 2018c, 45 [n. T.201/47]) (Figure 4.6d). Both have long shafts tapering at the ends and with an incised groove along the upper extremity, and the Zintilis spindle displays a cross-diameter evidently thinner than the perforation of the whorl

5 A third model from Vounous T.164B was reported by Stewart and Stewart (1950, 239). The artefact was not illustrated in the publication and was thought lost (Crewe 1998, 8). It has recently been located in the Cyprus Museum by R. Laoutari and is currently under study. The model is fragmentary and depicts a spindle with a biconical whorl at the lower terminal (Laoutari, personal communication, 13/06/2020).
mounted on it. Landenius Enegren (2018, 34) argues that this artefact may not have functioned as a spindle but as a distaff. The spinning tool, nonetheless, shows traces of mineralised thread (not ‘fibre’ as reported in Lubsen Admiraal 2004, 252) immediately above and below the spindle whorl, which is not compatible with the distaff use proposed by Landenius Enegren. In this regard, it is also worth noting that Webb (2018c, 46, 43 fig. 4.43–45) has recently interpreted three metal rods with discs, also retrieved from Lapithos T.201, as distaffs, and these implements could have been part of the EC/MC spinning kit. Finally, both the metal spindles show grooves for facilitating twisting S-thread, and this was recognised by Barber as a characteristic of spindles (Barber 1991, 58–59, fig. 5.20–22).

Figure 4.6. Terracotta models of spindles and metal spindles: a. terracotta model T.29/46 (Vounous); b. terracotta model T.92/6 (Vounous) (note that the object is broken and mended at one end); c. metal spindle with spindle whorl (note traces of mineralised thread around the metal shaft and a groove at the upper end) of unknown provenance (‘Zintilis Collection’, Cycladic Museum of Athens); d. metal spindle from T.201/47 (Lapithos) with detail of the grooved end (from Webb 2018c, 46, 43 fig. 4.43–45, photo courtesy of J.M. Webb)
Whilst the metal spindles display similar characteristics, the terracotta models represent different types, showing a different positioning of the whorls (Figure 4.6a,b). Even though T.92/6 is broken at one end, its shape seems comparable with the one of the metal counterparts, with the whorl placed at mid-shaft (Stewart 1962, fig. 90.6). Sauvage (2014, 220–221) is probably right in orienting the spindle with the preserved end upwards. This is, in fact, supported by the conical spindle whorl mounted on the spindle with its narrow terminal downwards. This re-orientation, however, cannot be considered proof that high-whorl spinning was practised since the upper part was longer than the preserved section (Figure 4.6b). In contrast, T.29/46 depicts a spindle with a truncated biconical whorl mounted at the very bottom of the lower end of the shaft (Dikaios 1940, pl. LVI). There is little doubt about the orientation of this object as it would be impractical to have a whorl mounted so high without even a little portion of the shaft protruding to attach the thread (Crewe 1998, 8).

Landenius Enegren (2018, 34, 36) has recently put forward the possibility that high-whorl spinning was practiced in the EC–MC, proposing that it was derived from the Egyptian tradition. Her argument is based on the presence of S-spun thread in fabric remains from Vounous, Lapithos and Korovia Palaeoskoutella (Palaeoskoutella) (Landenius Enegren 2018) (Appendix IV). As previously noted (§4.2.1), the direction of the spin is not a secure indication of the spinning tradition. For example, S-spun and plied threads are visible in fabric remains from the BA Aegean and Greece, namely areas of proven low-whorl spinning culture (Spantidaki and Moulherat 2012, 187–194). Possible evidence for the presence of high-whorl spinning in the LC (Sauvage 2014, 220–221) and traditional modern craft (Swiny 1986, 99–100) do not prove that the same spinning modality was practised on the island in the EC–MC period.

It is not impossible that two spinning cultures fluctuated or co-existed in the long Cypriot textile history, as these examples suggest, but the evidence presented to support high-whorl spinning in the EC–MC is weak. The available evidence points more securely to low-whorl spinning practice with at least two types of spindles, differently furnished with whorls at low- or mid-shafts, with the latter typical of the Anatolian tradition (Lassen 2013, 79). Likewise, the groove along the upper end of the shafts is a characteristic of Cypriot spindles that

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6 This orientation is also supported by the presence of a perforation hole at the shaft’s extremity (Crewe 1998, 8). It is interesting to note that this feature is also recurring on upper parts (rim, upper neck) of small flasks.
overlaps with the Egyptian tradition. For example, Egyptian wooden spindles from Amarna show this feature, although they are shorter (Kemp and Vogelsang-Eastwood 2001, 263–265, 274 fig. 8.2, 279–280 figs. 8.4–5). However, this similarity does not necessarily imply a direct Egyptian origin of the Cypriot spindles especially since direct contact with the Pharaoh’s land is not documented for the EC–MC period.

4.2.5 Loom weights and the warp-weighted loom

The second category of specific indicators are loom weights (Figure 4.7). Similar to spindle whorls, these tools do not function alone, but are part of a more complex device which is often archaeologically invisible. In fact, loom weights are the only component of the warp weighted loom that survives in the areas where organic materials are poorly preserved and indirectly prove the presence of this large textile implement in the archaeological record (Mårtensson et al. 2009, 374). As described in more detail in Appendix I, a warp weighted loom is a type of loom in which the warp is attached to a vertical wooden bar supported by two poles (Figure 4.8), and the role of loom weights in this system is to apply tension to the warp threads (Andersson Strand 2015, 52–54). For this reason, it is essential to measure the loom weights’ mass to calculate this force (Mårtensson et al. 2009, 375; Firth 2015, 158–187).

![Diagram of loom weight](image)

*Figure 4.7. Diagnostic parts of a conical loom weight (Cypriot type)*

Experimental tests have made it possible to assess the tension grams required by threads of different thickness, enabling researchers to calculate the number of warp threads that can be attached to a single loom weight and assess the relation between the weights and types of fabric that can be woven (Mårtensson et al. 2009, 378) (Appendix I). The general principle is
that fine thread requires less tension than thicker yarn; however, this may also depend on the elasticity of fibres (Andersson Strand 2015, 53). It must also be also noted that loom weights are attached as opposing rows and a minimum number of two rows of loom weights is necessary to weave a basic type of fabric (‘tabby’). In fact, the primary function of a loom is to mechanically cross at least two rows of warp threads to insert the weft (Appendix I).

Figure 4.8. Drawing illustrating a warp-weighted loom with two rows of ‘torus’ loom weights (from Andersson Strand 2015, 51 fig. 3.18 b)

The precise shape of loom weights is not particularly relevant; it is their maximum thickness that affects the loom setup and woven products (Mårtensson et al. 2009; Firth 2015, 168). Different thicknesses can influence the operation of the warp weighted loom in many aspects, but an even distribution should always be maintained for a loom to work optimally (Mårtensson et al. 2009, 388–389). Non-optimal setups, which are likely to produce faults or be ineffective, are when the total thickness of the loom weights in each row exceeds or is shorter than the fabric width (starting border and warp threads) (Mårtensson et al. 2009, 388–389). It has been experimentally observed that there is an optimal number of threads per weight and exceeding this may also negatively affect both weaving and its outcome (Mårtensson et al. 2009, 389–390). Weaving tests have also proven that more than 30 threads per loom weight are impractical as this does not permit an even distribution of the warp
threads. The distribution of threads per loom weight is therefore assessed as optimal when it includes 5 to 29 threads, possible (30–40 threads), and unlikely (> 40 threads) (Mårtensson et al. 2009, 389–390, 392).7

4.2.6 Use-wear and loom weights

Few studies deal with the possibility of investigating use-wear marks on loom weights. Cheval (2008, 20–21, 23) and Boertien (2016) have observed traces produced during the manufacture of the tools, such as the striations caused by the insertion of a stick to make the perforations, and the so-called ‘suspension marks’. The latter appear in the form of abrasion and slight deformation of the upper part of the suspension holes produced by direct or indirect (through a cord) attachment of the warp threads to the weight (Cheval 2008, 23). Similar traces were identified on some EC/MC loom weights from Marki (Frankel and Webb 2006a, 176) and, more recently, on terracotta replicas used for experimental tests (Ulanowska 2020, 134, 135 fig. 12.6) (Figure 4.9). These marks can potentially be used to evaluate if and to what extent loom weights were used but do not provide any additional information on their function.

![Figure 4.9. Detail of the perforation of loom weight P8459 (Marki). Note slight wear marks (abrasion) around the upper part of the perforation](image)

4.2.7 Cypriot loom weights

Similar to spindle whorls, loom weights are first recognised on Cyprus from the Philia and have been considered an indicator for a technology change, namely the introduction of the warp-weighted loom (Frankel 2000, 172–173; Frankel and Webb 2006a, 175–177; Webb 2007, 23). In contrast to whorls, however, these artefacts are almost exclusively from

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7 These calculations are made for wool threads of a specified thickness and may vary with different fibres and thicknesses (Mårtensson et al. 2009, 393).
settlement contexts. For the periods considered in this study, the Cypriot record does not offer a wide variety of weaving tools. Loom weights were typologised by Åström (1972, 157) into four types based upon their shape: these are ‘roughly conical’ (Type I), ‘squat truncated pyramidal’ (Type II), ‘oval’ (Type III), ‘discoidal’ (Type IV) (Åström 1972, 157). However, Types II, III, and IV are only attested of Kalopsidha and Agios Iakovos, whose small assemblages were used by Åström to extrapolate this classification and reflect the situation of a later MC and early LC site. Philia and EC/MC sites have yielded only artefacts of Åström’s Type I (Figure 4.7).

Conical in shape, these weights display either a flat or round base with a circular maximum diameter (which correspond to the weight’s thickness) and a pointed or flattened upper terminal (Frankel and Webb 2006a, 175–177; Muti 2017c, 237). The circular perforation is located below the pointed terminal, and, in some cases, a vertical grooved incised prior to firing is visible between the upper terminal and the perforation (Frankel and Webb 2006a, 176). They appear as large, generally heavy artefacts made of sun-dried or low-fired clay, and their preservation is poor. Weights and measurements of these tools are reported in publications from the late 1980s onwards (Swiny 1986, 107–108; Mogelonsky 1996, 234–235; Frankel and Webb 1996, 197–199; Walz and Swiny 2003, 397–398; Frankel and Webb 2006a, 175–177; Webb et al. 2013, 174–175), but no attempts at evaluating their function have generally been made. Frankel and Webb’s (2006a, 176–177) report on the Marki loom weights is an exception, and weight classes were used to determine the possible fabric types produced (following Barber 1991, 104).

Researchers working on Cypriot materials have unanimously recognised these clay weights as loom weights (see references above). It must be noted, however, that similar clay artefacts from other areas are sometimes described as ‘potential’ loom weights, especially when they are sporadic or non-in situ finds (e.g. Rahmstorf et al. 2015, 272–273). This work sides with the traditional interpretation of these artefacts as loom weights for the following reasons: 1) the presence of use-wear and the groove proves their function as hung objects; 2) relatively homogenous measurements of weights and bases (see Chapter 7); 3) contextual evidence: weights found in row on a floor are reported from a floor excavated in the MC complex at

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8 Only one example is known from T.37 at Vounous (Dikaios 1940, 79, pl. LIX.15).
Pyrgos Mavroraki (Belgiorno 2009, 55), and this is generally considered proof of the presence of a loom abandoned in situ (Barber 1991, 102). The context is within a room with other evidence for textile production; unfortunately, no full report is available for this site. Recent research at Erimi identified at least two clusters of artefacts with similar parameters (therefore, these tools are used as sets). Particularly interesting is that spinning tools were also found within these clusters (Muti, personal analysis, 12/08/2019).

One other category of artefacts – namely, stone suspension weights weighing less than 1kg – have been proposed as potential loom weights (Frankel and Webb 2006a, 230–232; Falconer and Fall 2013a, 113). These objects are natural stones showing variability in shape, thickness and mass measurements that should be homogenous for tools operating as a set of loom weights (Mårtensson et al. 2009). Additionally, even though no preservation issues seem to affect these artefacts, they only occur infrequently, and no preservation issues can be adduced because of the material. For example, only 24 stone weights weighing less than 1.2kg were recorded from all units of all periods at Marki (Frankel and Webb 2006a, 230). Even though an expediential use of these objects as loom weight cannot be excluded, these artefacts are not considered as having a primary function as weaving tools.

4.2.8 Needles

The third specific textile indicator are needles. Needles have been included as specific indicators because they can be associated with a definite range of textile activities, namely joining, weaving or decorating pieces of fabric with threads. Needles are not exclusively used in textile production but can also be found in leather working. Nevertheless, some characteristics of these tools and, if detectable, use-wear, can help us assess their use.

Less effort has been made by archaeologists to understand these tools, compared to the other specific indicators, and the publication of these small objects in site reports is still not systematic, as was common for all categories of textile tools in past works (Gleba 2008, 157; Rahmstorf 2015a, 2, 12). Nevertheless, as outlined in Chapter 1, needles are one of the earliest tools specifically designed for making clothes that appear in the archaeological record across the world (Beaudry 2006, 45–46; d’Errico et al. 2018).

Needles are made of different materials: pre- and protohistoric examples are found crafted from antler, bone, and metal, and it is also likely that perishable materials, such as wood and
straw, were used (Donnanno 2011, 65; Beaudry 2006, 45–46, 65). Needles cannot tell us about the great variety of different sewing and embroidery techniques and stitch types for which they were used as this can only be detected from fabric remains (Rösel-Mautendorfer 2016, 216). However, they can provide us with clues on the ‘purpose’ that a needle may have served (Beaudry 2006, 51) and indirect evidence on the characteristics of the thread used. As Beaudry (2006, 79) noted, archaeological needles cannot be typologised by using criteria established for mass-manufactured objects for hand-sewing but the basic types have not changed up until the present. Researchers can thus look at the modern classification and retrieve useful information to explore possible functions. Table 4.2 summarises the most recurrent characteristics of modern needles for general or specialised purposes. On this basis, the diagnostic parts of these objects that should be considered are described below as well as needle types related to a possible activity, function or the characteristics of the sewn fabrics and thread used (Figure 4.10).

Starting from the upper part of the tool, the shape of the butt can be a distinctive and chronologically sensitive element of the needle (e.g. Legrand-Pineau 2009 119, 120 fig. 8) that does not affect its operation. In contrast, the eyelet is a highly diagnostic part of needles which can be characteristic of a certain function (e.g. for sewing, beading, embroidery [Table 4.2]) and provides indirect evidence for thread thickness used as the thread could not have been thicker than the perforation. It is interesting to note in this respect that modern sewers recommend leaving the thread free to run easily though the eyelet, meaning that the thread used is generally thinner than the diameter of the eyelet (Donnanno 2011, 66). The shape and size of cross-sections and tips can provide additional technical information on needles. The thickness and shape of cross-sections can be indicative of the textile object and type of fabric material on which needles are used (Andersson Strand 2015, 58): thin cross-sections are normally used for light fabrics and fine work (e.g. fine stitching and embroidery, beading), and they may be ineffective or break when used for dense, heavy fabrics (Donnanno 2011, 65–66).
On the contrary, flat sections are not generally related to sewing but are more suitable for weaving (Donnanno 2011, 65–66). As far as tips are concerned, it is beneficial to keep in mind that round and pointed tips are the most recurrent types in needles for generic uses and may also be connected to different sewing activities (Donnanno 2011, 65–66).

<table>
<thead>
<tr>
<th>Activity</th>
<th>Tip</th>
<th>Eyelet</th>
<th>Cross-section</th>
<th>Length</th>
<th>Other characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewing</td>
<td>R, P</td>
<td>S, M, L, E</td>
<td>R</td>
<td>All</td>
<td>Eyelets generally elongated</td>
</tr>
<tr>
<td>Tapestry</td>
<td>B</td>
<td>Lo, E</td>
<td>R</td>
<td>Lo</td>
<td>-</td>
</tr>
<tr>
<td>Quilting</td>
<td>P</td>
<td>S</td>
<td>R</td>
<td>Sh</td>
<td>-</td>
</tr>
<tr>
<td>Weaving</td>
<td>R</td>
<td>L</td>
<td>F</td>
<td>All</td>
<td>-</td>
</tr>
<tr>
<td>Upholstery</td>
<td>R, P</td>
<td>S, M, L</td>
<td>R</td>
<td>Lo</td>
<td>Bent</td>
</tr>
<tr>
<td>Pleating/decorative stitching</td>
<td>R, P</td>
<td>S</td>
<td>R</td>
<td>Lo</td>
<td>-</td>
</tr>
<tr>
<td>Beading</td>
<td>R, P</td>
<td>S</td>
<td>R</td>
<td>S</td>
<td>Generally short and with fine cross-sections</td>
</tr>
<tr>
<td>Embroidery</td>
<td>R, P</td>
<td>E</td>
<td>R</td>
<td>All</td>
<td>Longer eyes than general purpose sewing needles. All the other characteristics are similar</td>
</tr>
<tr>
<td>Darning</td>
<td>P</td>
<td>E</td>
<td>R</td>
<td>L</td>
<td>-</td>
</tr>
<tr>
<td>Leather</td>
<td>T</td>
<td>S, M, L</td>
<td>T</td>
<td>All</td>
<td>Cutting, triangulated tips, and robust cross-sections</td>
</tr>
</tbody>
</table>

Table 4.2. Table illustrating the diagnostic elements of needles and their possible relations to a specific activity or function (S= small, M= medium, L=large, R=round, F= flat; B= bent, Lo= long; E= elongated; P=pointed; T=triangular) (after Beaudry 2006, Donnanno 2011 65–66)

4.2.9 Use-wear, microwear and needles

Traceology is an extensively used analytical method for investigating the function and uses of bone tools (Almeida Évora 2015). Concerning needles, a foundational study of use-wear and microwear was undertaken by Legrand (2007, 76–83; 2008). Before illustrating this methodology, it must be noted that similar methods of investigation have not been developed for metal needles. Despite the absence of specific experimental studies, it is unlikely that soft materials, such as threads and fabric, would have produced the plastic deformations and marks (e.g. notches, depressions, striations) observed in relation to the use of metal artefacts (Sáez et al. 2015).

Concerning the bone tools, Legrand’s work consists of a detailed comparative analysis of microwear traces detected on the archaeological tools and the wear pattern produced by the use of identical replicas by experienced artisans in selected activities (Legrand 2007, 76–83;
She examined all examples of modifications visible on these tools, including the deformation of the surface or diagnostic areas, the type and extension of marks, and their ‘topography’ (Legrand 2007, 29–36). Shape alteration and progressive rounding of pointed tips and different degrees of shape to the eyelet perforations were associated with different intensities of needle use, from new to intensively used (Legrand 2007, 30–31). Four microwear patterns were identified and related to possible functions of the tools and the material used (flax, bark fibres, leather) as a result of the comparison with the use-wear detectable on the tool replicas (Legrand 2007, 29–36, 76–83; 2008, 446–447).

Figure 4.11. Use-wear and microwear types identified on Neolithic bone needles and related to the use of vegetable materials: 1=Type V.1, 2=Type V.2, 3=Type V.3 (Legrand 2008, 448 figs. 9, 10, 449 fig. 11)

The first and second type of microwear identified are characterised by the presence of an irregular surface, smooth and highly polished, with rises, multidirectional striations, and voids (Figure 4.11). These features are particularly recurrent on shafts and tips. The only difference between these two pattern types is the frequency of voids and a more homogenous organisation of scratches in the second type (Legrand 2007, 29–36, 78–80 Types V.1–2; 2008, 446–447). These microwear patterns are comparable with the ones present on needle replicas used for the weaving and sewing of linen fabrics (Legrand 2007, 40–42; 2008, 448–449). Experiments were also conducted with bark fibres and leather. Deeper striations and more evident depressions than those detected for the other two types are related to the use of bark

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9 The study is based Neolithic needles from the Cypriot site of Khirokitia, but it is universally applicable to this category of materials from different time periods and areas (Legrand 2007, 76–83).
fibres (Legrand 2007, 79–80 Type V.3; 2008, 449) (Figure 4.11). Marks produced by contact with leather were recorded as deeper, longitudinal striations with a frequent presence of micro-craters (Legrand 2007, 80 Type V.4, 80 figs. 130–131). Micro chipping was additionally observed along the profile of the tools and is the best indicator for possible preferred directional use of needles (Legrand 2007, 31).

4.2.10 Cypriot needles

Needles appeared in the Cypriot archaeological record from the Aceramic Neolithic (ca 8500–5200 BC) (Bombardieri and Muti 2018b, 33–34) and are common finds also in the Chalcolithic record (Figure 4.12). Their quantity at Chalcolithic sites, however, varies considerably from site to site. The needle assemblages at Mosphilia (Croft 1998a, 199; 1998b, 242) and Souskiou Laona (Croft 2019, 293–296) contained hundreds of examples, whilst only few examples were retrieved from Lemba Lakkous (Croft 1985, 201), Politiko Kokkinorotsos (Webb et al. 2009, 219), and Erimi Bamboula (Dikaios 1936, 50). Chalcolithic needles are typically made of animal bone and no attempts have been made to create an island-wide typology. This may be because their morphological variability is limited (Croft 1998b, 242; Bombardieri and Muti 2018b, 40). Differences in dimensions and type of cross-sections have been noted and, in some cases, correlated to possible textile activities (Bombardieri and Muti 2018b, 40). However, there are no systematic studies exploring the use and significance of these artefacts.

Figure 4.12. Needles from Neolithic Khirokitia (Bombardieri and Muti 2018b, 35 fig. 3)
Bone needles continued to be in use in the EC–MC. The published sample is small and consists of two needles from Sotira (Croft 2003, 448) and four from Marki (Frankel and Webb 2006a, 193, 195), and this perhaps explains why these artefacts only appear in catalogue descriptions and why no more detailed study has as yet been conducted. Metal needles are present from the Philia period and are relatively common finds in burial and settlement contexts throughout the EC/MC period (Weinstein-Balthazar 1990, 411 tab. 165). Whilst there is no general classification for the EC/MC bone needles, the metal counterparts were categorised by Catling (1964) of belonging to one type displaying “slender round shafts” and oval or rectangular eyelets (Weinstein-Balthazar 1990, 380). A possible additional type, characterised by an elongated end, has been attested in MC tombs in Lapithos and seems to be the predecessor of an early LC type showing similar features (Webb 2018a, 189–190).

4.3 Non-specific indicators

The previous sections have introduced three categories of specific indicators of textile production and the section to follow will deal with non-specific indicators. A series of different implements will be grouped in this category, giving an insight into the large quantity and diverse nature of tools and structures that could have played a role in textile manufacture.

4.3.1 ‘Other’ tools and implements and the Cypriot record

The use of large quantities of water characterises different textile activities, from the cleansing or treatment of raw materials, such as wool and flax, to dyeing and fulling (Alberti 2007; 2008, 27, 31). Installations for water processing such as basins, wells, drainage channels, essential for many aspects of daily living, can thus be used for many textile activities in domestic and specialised spaces. As for the preparation of fibres, a series of specific, non-specific or even expedient tools such as clubs, knives, combs and brushes were likely used to collect and process wool or bast fibres (Andersson Strand 2012, 25–32).

Concerning dyeing, organic or inorganic traces of mordants or dyes are considered the only direct proof of the presence of this activity in the archaeological record (Alberti 2008, 26–27), while dyeing tools and structures correspond to multifunctional objects and installations, often characteristic of domestic assemblages. The identification of sources (e.g. archaeobotanical and faunal remains) for making the dyes (in particular, if not edible or used for other purposes) can be also considered primary evidence of textile dyeing. As described in detail in Appendix
I, to dye fibres, threads or fabrics, first the dye substance must be prepared. This activity would vary depending on the type of raw material used to create the colour but would generally involve activities such as cutting, stripping and grinding plants, animals or minerals (Alberti 2008, 27–28, 31). In these cases, tools such as knives or ground stone grinders, pestles and small querns can be used (Alberti 2008, 27–28, 31). As boiling textile materials in the dye bath is essential to dyeing, cooking pots and firing installations are used for this (Alberti 2008, 31). Most of these indicators (e.g. hearths/ovens, basins, cooking ware, liquid processing vessels, grinding and cutting tools) represent some of the most typical items for essential activities in prehistoric settlements on Cyprus (e.g. Coleman et al. 1996; Swiny et al. 2003; Frankel and Webb 2006a) and elsewhere, and their functions (heating, water processing, cutting, etc.) cannot be exclusively assigned to textile production.

*Figure 4.13. RP comb-shaped model (from Morris 1985, 139 fig.5b)*

Indirect reference to the possible use of combs as textile tools comes from a motif typical of the EC–MC iconography; a motif that finds itself reproduced in terracotta models and stone pendants. It is the so-called ‘comb-shaped’ motif, representing a comb with vertical teeth (Karageorghis 1991, 46). It has frequently been interpreted as the representation of a wool comb or a weft beater (Peltenburg 1981, 23; Lubsen Admiraal 2004, 20; Knox 2012, 141; Bombardieri 2014). Concerning the association with wool, it must be remarked that this kind of comb is suitable for the preparation of both flax and wool, and its shape alone cannot point towards a specific fibre (Figure 4.13) (Appendix I). However, a clue that may connect these tools to wool preparation is the association of a comb-shaped applique with the representation
of a woolly quadruped on a decorated bowl from Tomb 1 (‘tomb’ henceforth abbreviated as ‘T.’) at Marki Vounaros (Karageorghis 1958, 148–149; Knox 2012, 141).

4.4 Textile remains and the Cypriot record

As they are the final products of textile manufacturing, fabric remains will be considered as a distinct category. This kind of material is rare and delicate, and its preservation depends on environmental/contextual conditions, namely factors that can reduce or eliminate the organism responsible for the degradation of organic materials (Grömer 2016, 22–23). In particular, dry or cold, or anaerobic environments, micro-environments, and pre-, post- depositional factors that reduce the living conditions of the microorganisms or transform the organic nature of the remains (e.g. carbonisation, mineralisation) enhance preservation (Gleba 2011, 6–9; Grömer 2016, 22–32) (Figure 4.14). In some cases, ancient fabrics disappear completely but leave impressions on soft materials, such as clay (Gleba 2011, 8). Although they may help to preserve a textile object, the factors mentioned above may alter it significantly. Nonetheless, textile remains can illuminate various aspects of textile production, such as the type of fibre used, characteristics of threads (twist, tightness, plying, presence of spliced thread), the fabric (weave), and the presence and type of stitching or decoration (Jones et al. 2007, 11–12; Skals et al. 2015, 61; Gleba and Harris 2019).

Skals et al. (2015) published a recent survey of textile remains in the prehistoric Mediterranean, and the volume ‘Textiles and Textile Production in Europe from Prehistory to AD 400’ (Gleba and Mannering 2012) collates an analysis of European archaeological textiles. Some of the Cypriot artefacts were included by Skals et al. (2015, Appendix B). No fragments of fabrics are known from the Chalcolithic period, while partial catalogues of EC–MC remains have been compiled by Åström (1964), Pieridou (1967), and Landenius Enegren (2018). These also provide a technical analysis of the artefacts, while microscopy has only been used in the more recent studies (Landenius Enegren and Vanden Berghe 2016; Landenius Enegren 2018). For the purpose of this thesis, I scrutinised available excavation reports and studied unpublished materials from ongoing excavations to obtain an up to date catalogue of 14 artefacts. A complete analysis is provided in Appendix IV and remains from Marki and Erimi are also presented in Chapters 7.1.1 and 7.5.1. The artefacts are then considered in the final discussion (Chapters 8 and 9).
Figure 4.14. Detail of a fabric pseudomorph on dagger C.118 from T.26 at Kalopsidha (Ashmolean Museum), photograph and microscope pictures (magnification 20x [meter bar: 10mm] and 300x [meter bar: 300µm])

4.5 Methods of analysis

This section will move on from indicators to methods of investigation and will explain the two analytical and complementary steps that will be conducted to examine the Cypriot record: the techno-functional and contextual approach respectively. Concerning textiles, a techno-functional analysis can be defined as a study of how single categories of tools and structures could operate within a specific textile activity (following Rahmstorf’s [2015a, 14] ‘material-typological’ and ‘functional-experimental’ approaches). This kind of analysis can be conducted by looking at the functional parameters, use-wear traces and all characteristics of the artefacts that may facilitate an understanding of their function, use and, possibly, the type of products they can be associated with. The main parameters and types of wear traces for techno-functional investigation were previously illustrated for each category of indicators, and it will be further explained how these will be considered in the next section.

A contextual approach is particularly beneficial for investigating quantification, distribution and occurrence of tools, implements and structures in time (phases) and space (within building units, rooms, tombs, etc.) and to highlight relationships between textile indicators, indicators
of other activities and the type and function of the spaces (Rahmstorf 2015a, 14; Chapin 2016, 11–12). As observed above (§4.3), context is particularly important when investigating non-specific textile indicators, such as tools, materials, or structures. Contextualising textile indicators is not only key to reconstruct the dynamics of textile production within architectural spaces or sites, but it is also complementary to understanding how single categories of textile indicators operated. As explained, textile tools could either operate in groups or could be part of a set. Recording associations of loom weights, for example, allows the researchers to establish whether they could be part of the same loom setup by looking at their functional parameters (§4.2.5). Likewise, detecting the findspot and the degree of variability within a group of loom weights can indicate the presence of a loom or, if, for example, the weights were kept in storage (Barber 1991, 102; Rahmstorf 2015a, 8–9).

A crucial question concerning textile tools and their contexts regards the portability of spindle whorls and needles, and the fact that even large implements, such as looms, can be dismantled and reassembled in a different space from the one where they were retrieved (e.g. Barber 1991, 102). However, it is also important to consider the wider nature of their locations in relation to the layout of sites, as well as their relationship with individual units. As it will be shown in Chapter 9, for example, some LChal and EC–MC villages do not have community or working areas, and, despite the portable nature of textile tools, the household still remains the best location for such activities.

Combining an analysis of the function of textile tools and structures provides crucial information on productive organisation and specialisation. As seen in Chapter 2, criteria such as frequency, concentration and standardisation of tools and products can help to assess the level of specialisation but must be considered within the broader context to be reliable. More importantly, the notion of context should not be limited to the physical space of archaeological finds, but also extended to their relational space. Relations between objects, structures, and space itself best reflect what a specific ‘portion’ of ancient lives looked like and, as observed in Chapter 2.4, production is embedded in it. As beautifully explained by Chapin (2016, 11–12), the final aim of a contextual analysis for textile archaeologists is to investigate how this manufacture and its products “functioned in their human and physical environments, diachronically, in relation to what is known of existing economic and social structures” and
explore their many “entangled, relational, flexible, fluid” aspects. This understanding of the context allows the researcher to combine material and abstract relations, describing the entanglement of textiles and their manufacture and social, economic, symbolic, and technological aspects.

4.6 Recording strategies and use of the data

So far, this chapter has analysed the indicators of textile production and correlative methods of investigation. This last section will describe the strategies used for data recording and the use of data collected. The study is based on a total number of 870 artefacts, most of which belong to the category of specific indicators described in §4.1. Special objects related to textile production were also included (namely, textile remains, spindle models, metal spindles). One of the main objectives of this research project was to conduct a personal analysis of textile indicators by examining artefacts both from old and ongoing excavations. Except for materials that were not available for analysis, all objects included in this study were recorded and studied by the author in museums on Cyprus and in the United Kingdom.10 In total, 607 spindle whorls, 104 loom weights, and 142 needles from a sample of seven major settlements (Mosphilia, Marki, Sotira, Alambra, Politiko, Erimi, and Skalia) and four additional sites (the ‘Philia cemeteries’ [Chapter 6]) were analysed.11 In addition, 14 textile remains, two spindle models and one metal spindle were personally examined. The identification of non-specific indicators and the contextual analysis of the artefacts studied in museums was conducted using publications and site databases.

Objects examined were photographed, measured, and recorded in Microsoft Excel spreadsheets, and organised by site and object categories (Appendix Tables III.2–26). This first step of the analysis allowed me to collect information to investigate individual categories of textile indicators. As a second step, tables regarding contextual associations between tools and contexts and the nature of the contexts were compiled (Appendix Tables III.27–44). This facilitated the examination of all types of indicators in their context. Tables listing the unit (building, space, or tomb) yielding the analysed indicators, quantities and associations of tools belonging to the same or different categories were also compiled. Information regarding the

10 The location of artefacts in museums and objects unavailable for inspection are specified in Appendix III.
11 All analysed first-hand with the exception of artefacts that were not available for viewing (see Appendix III), the whorl assemblage from Kissonerga Ammoudhia and the Zintilis spindle.
type (secure, contaminated, superficial) and nature of deposit (floor, surface, filling, from a structure) was also included. It is worth reiterating that settlements were prioritised as case studies, and the burial evidence examined only when related to the selected settlement.

<table>
<thead>
<tr>
<th>Spindle whorls</th>
<th>Loom weights</th>
<th>Needles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generic information</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>preservation</td>
<td>preservation</td>
<td>preservation</td>
</tr>
<tr>
<td>type</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Functional parameters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>measures: Ht and Max D</td>
<td>measures: Ht and base D (thickness)</td>
<td>measures: L, D cross-section</td>
</tr>
<tr>
<td>Wt (preserved and reconstructed)</td>
<td>Wt (preserved and reconstructed)</td>
<td>-</td>
</tr>
<tr>
<td>Perf D</td>
<td>Perf D</td>
<td>eyelet P</td>
</tr>
<tr>
<td><strong>Additional information</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>decoration</td>
<td>presence of groove</td>
<td>material</td>
</tr>
<tr>
<td>material and fabric</td>
<td>-</td>
<td>shapes of butt, tip, and CS D</td>
</tr>
<tr>
<td><strong>Use-wear</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surface wear-marks visible to the naked eye</td>
<td>surface wear-marks visible to the naked eye</td>
<td>surface wear marks visible through microscopy</td>
</tr>
</tbody>
</table>

Table 4.3. Individual data for specific indicators (Ht=height, Max D= maximum diameter, D=diameter, Wt=weight, Th= thickness, Perf D= diameter of perforation, L= length, CS D= diameter of cross-section, Eyelet P= eyelet perforation)

The following paragraphs illustrate in more detail the type of data recorded for each of the indicators selected. Generally, functional parameters were privileged over other elements (e.g. decoration). Use-wear was considered as part of the functional analysis of the tools in order to investigate functional parameters. The degree of preservation (<1/3, 1/3, 1/2, 2/3, almost complete, complete) is reported for all types of artefacts to assess the level of integrity. Type is only reported for spindle whorls, and Crewe’s (1998, 22 fig. 4.1, tab. 4.1) primary types are used (§4.2.3): as noted above (§4.2.7), only one loom weight type is attested in the Cypriot record, and no systematic formal variation could be observed for needles. Measurements were taken following the parameters established by Andersson Strand and Nosch (2015b, 146) to analyse the operation of textile tools using the methods described in this chapter and summarised in Table 4.3 and Figure 4.15.

Additional information for spindle whorls concerns material (terracotta, stone, other material), decoration (decorated/undecorated) and fabric (local/imported). For the decorated artefacts, a brief description of patterns observed is reported as an additional note. This information is considered as possibly related to or indicative of the significance of these tools: it will be thus
kept separate from the techno-functional analysis in Chapters 6 and 7. Loom weights are locally made and undecorated, and only the presence of grooves to accommodate warp thread was described as possible additional element. Information concerning the material (bone/metal) and shape of cross-section is always reported for needles.

The type and extension of use-wear was observed for whorls according to the criteria discussed above (§4.2.2). Possible use-wear traces are also reported for loom weights but not used in the site analysis (Chapters 6 and 7) as it does not add information on the operation of these tools. Use-wear of diagnostic parts (tips and eyelet) was detected and reported for bone needles as well as microwear traces observed on the surface. These were then evaluated by applying Legrand’s procedure and adapt it to the Chalcolithic and BA sample (§4.2.9). A portable microscope Veho Discovery VMS-004 Deluxe was used and use-wear was observed at 20x–30x and microwear at 200x–300x and, in some cases, 400x as these objects could not be taken out of museums. While this instrument allowed me to observe features, it did not have the same resolution as a non-portable microscope, and the degree of precision is therefore less detailed.
Other objects examined for this study were measured and described, and weight classes identified for spindle whorls and loom weights, and RS values are reported in Figure 4.16. Concerning the textile remains, guidelines for documentation were retrieved from Jones et al. (2007, 12), that are described in more detail in Appendix IV. Fabric and fibres were also observed through the microscope at the same magnifications reported for the needles.

<table>
<thead>
<tr>
<th>Weight classes (spindle whorls)</th>
<th>Weight classes (loom weights)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–18g: light</td>
<td>0–400g: light and medium</td>
</tr>
<tr>
<td>19–36g: medium light</td>
<td>401–800g: medium</td>
</tr>
<tr>
<td>37–54g: medium</td>
<td>801–1200g: medium heavy</td>
</tr>
<tr>
<td>55–72g: medium heavy</td>
<td>1201–1600g: heavy</td>
</tr>
<tr>
<td>73–90g: heavy</td>
<td>1601–2000g: very heavy</td>
</tr>
<tr>
<td>91–120g: very heavy</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 4.16. Weight classes for spindle whorls and loom weights and RS values identified in the dataset (h= height; Max D= maximum diameter)*

Non-specific tools and structures were researched alongside categories that have already been associated with textile activities in the literature, such as fibre preparation, dyeing, washing, and drying (Alberti 2008). Concerning dyeing, no direct proof (traces of mordants or dyes) has been identified in Chalcolithic and EC/MC contexts. The identification of dyeing was thus based on the following two main criteria: 1) association with significant archaeobotanical or archaeozoological traces that have been used as sources for textile dyes, 2) features that indicate use beyond the typical domestic production, in particular association with all the tools, categories of vessels and tools and correlated activities that are present in the dyeing process, and other textile tools that can hint at high intensity of textile activities. Literature was also scrutinised to look for water-processing and drying installations in relation to textile production. It is evident that, according to these criteria, it is not possible to identify such
activities in non-specialised contexts as structures and implements for liquid processing, drying, etc. are characteristic of an array of domestic purposes. The methods described in this chapter for the identification and analysis of textile indicators will be applied in the next part of this study and constitute the core methodologies on which the analytical section is based.
PART II

Chapter 5

Case Studies

The second part of this thesis concerns the analysis of the indicators of textile production described in the previous chapter (Chapter 4) at seven sites (Mosphilia, Marki, Alambra, Politiko, Sotira, Erimi, and Skalia). Additional data from other sites yielding Philia tombs will also be considered in Chapter 6 to include all the available information from across the island for this key period. This short chapter introduces the location, chronology, and major developments in the organisation of these settlements, while the core data will then be analysed in Chapter 6 (LChal and the Philia phase) and Chapter 7 (EC–MCIII/LCIA). More detailed information regarding individual sites can be found in Appendix II. As noted in Chapter 3, early archaeological focus was on cemeteries, and settlements were excavated prior to 1974. There are no available case study settlements for inclusion on the north coast or the far eastern regions, limiting our understanding of settlements to specific areas of the island.

5.1 Case studies. Location and chronology

Figure 5.1. Topographic map of Cyprus showing the regions considered in this study (1. Central Cyprus, 2. Kouris Valley, 3. the coastal area at Kissonerga, west Cyprus)
Marki, Alambra, and Politiko are situated 25km south of Nicosia, at a short distance from each other, in an area where the farming land of the Mesaoria plain meets the foothills of the Troodos mountains (Coleman et al. 1996, 1, figs. 1–2; Frankel and Webb 2006a, 1–3; Falconer and Fall 2013a, 103) (Figure 5.1). The area is mainly characterised by agricultural land with large inland rivers, up-slope orcharding, herding resources, and proximity to copper deposits (Xenophontos 1996, 17–18). The sites show a similar topography, being located on sloping terraces near the rivers Alikos, Yalia, Tremithos and Pediaios and their tributaries (Coleman et al. 1996, 11–16; Frankel and Webb 2006a, 1–3; Falconer and Fall 2013a, 103). Marki was founded in the Philia and occupied continuously until its gradual abandonment in the MCII (Frankel and Webb 2006a, 36–37). Politiko flourished between the ECII and MCIII (Falconer and Fall 2013a, 106). In contrast, Alambra is a single-period settlement dating to MCII (Coleman et al. 1996, 332–340) (Figure 5.2).

The additional Philia contexts considered in this work are also mainly located in central Cyprus. Philia Laksia tou Kasinou [Laksia] (Dikaios 1962, 176, 161–165 [reported as ‘Philia Vasiliko’]; Webb and Frankel 1999, 11)12 and Deneia Kafkalla [Kafkalla] (Nicolaou and Nicolaou 1988; Webb and Frankel 1999, 8) are situated in the Ovgos valley, while the tombs of Nicosia Ayia Paraskevi [Nicosia] were identified in the southern outskirts of modern capital city (Hannessy et al. 1988; Webb and Frankel 1999 10–11).

Sotira and Erimi, and the Philia tomb excavated at Bamboula, are located in the geographically distinct area of the Kouris catchment (modern district of Limassol), one of the largest river basins on the island (Figure 5.1). The area is mountainous and dominated by steep valleys that alternate with isolated limestone plateaux (Sciré Calabrisotto et al. 2017, 277–281). Farmland occupies the lower valley, while the mid- and upper-upper valley is characterised by shallow soils and grazing land (Andreou 2015, 209–213). Sotira was founded on a series of gently sloping terraces rising along a small tributary river of the Kouris. The site displays two main phases, dating to the ECI–II and ECIII, but the first occupation of the site appears to have been as early as the Philia, and Philia burials were identified in Cemetery A (Swiny et al. 2003, 105–107, 111–114, 117–120, 129–132). One Philia tomb was also

12 Webb and Frankel (1999, 11) observed that Dikaios’ T.5 was probably located within the area of Vasiliko-Kaftali. This tomb was in fact found 100m far from the other Philia burials (Webb and Frankel 1999, 11). However, all the tombs excavated by Dikaios are indicated as ‘Laksia’ in this work.
identified at the LC settlement site of Episkopi Bamboula [Bamboula], in the lower Kouris Valley (Benson 1972, 10 [erroneously dated ECII–III]; Webb and Frankel 1999, 8–9). Erimi extends over a limestone plateau dominating the mid-valley (Swiny et al. 2003, 1–3; Bombardieri 2017a, 6, 2 fig. 1.1). It was occupied throughout the MC period (Webb 2017b, 205), with a first visitation of the site possibly starting in the ECIII (Figure 5.2).

*Mosphilia* and *Skalia* lie at a short distance from each other on a series of hill terraces to the right and left banks the Skotinisi stream in the modern village of Kissonerga (Paphos), and are within one km from the coast (Maliszewski 2018, 91–92) (Figure 5.1). Prehistoric sites in west Cyprus have an agriculture-based economy, but the nearby shore could have provided easy access to an additional source of food and also other raw materials (Maliszewski 2018). *Mosphilia* is the longest-lived prehistoric settlement investigated on the island, showing a sequence of five major phases (Periods 1–5), with Neolithic deposits at the bottom and the Philia at the top of the sequence (Peltenburg et al. 1998a, 8–14; 22–23; 240–259). Periods 2 to 4 represent the actual Chalcolithic sequence (Peltenburg et al. 1998a, 22–64). The earliest occupation of *Skalia* overlaps with the end of *Mosphilia*, as it dates back at least to the Philia, and continues until the MCIII/LCIA transitional period, during which the settlement was abandoned (Crewe 2014, 137; 2015b, 355–356) (Figure 5.2).

![Figure 5.2. Chronologies of settlement sites](image)

5.2 Settlement development throughout the Chalcolithic and Early–Middle Cypriot

*Mosphilia* is one of the best-known examples of a Chalcolithic settlement, displaying a typical organisation of agglomerated buildings with a circular plan and *pisé* walls on stone basements (Peltenburg et al. 1998, 25–52, 55–56, 239–254) (Figure 5.3). This distinctive type of habitation, known as a ‘roundhouse’, started being developed in the MChal (Period 3) and
continued into the LChal (Period 4). The interior space of a MChal roundhouse is organised according to a recurrent pattern: a hearth is centrally placed and functions as the central point around which the space is divided into sectors, each with a specific purpose (i.e., domestic activities, sleeping) (Peltenburg et al. 1998a, 238–239, 239 fig. 14.2). No ‘public’ spaces such as squares or working areas can be detected. Nonetheless, occasions of possible collective or extra-household participation can be inferred. For example, a series of pits excavated in the ‘Ceremonial Area’ yielded materials that can be related to ceremonial or ritual activities (e.g. anthropomorphic figurines and vessels, a roundhouse model, a large shell, fire-cracked stones) (Peltenburg 1991a). Concerning the organisation of the settlement, building differentiation can be observed from the end of the MChal. In the LChal, some units appear larger in size and yielded a different quantity and type of material culture when compared to the ‘average’ structure. An oft-cited example of this phenomenon is Building 3, also known by the name of ‘Pithos House’ because of the large number of storage vessels retrieved from within it. An exceptional concentration of lithic tools, different types of ornaments, and metals characterises the material assemblage associated with this building (Peltenburg et al. 1998a, 37–43; 252–253, also: Papacostantinou 2013, 146–149). As explained in Chapter 3, the emergence of an aggrandising attitude was recognised as factors that triggered the adoption of new practices, technologies and materials in the LChal, and the Pithos House can be understood as the material expression of this social behaviour (Peltenburg et al. 1998, 258; 2018). However, buildings show an overall reduction in size at the end of the period, suggesting that the possible attempt at social differentiation was scaled down (Peltenburg et al. 1998, 258).

It was anticipated that the Mosphilia sequence ends with a Philia occupation, but no structures were preserved due to extensive ploughing (Peltenburg et al. 1998a, 52–53). Remains of Philia architecture have been detected at Skalia, less than 1km from Mosphilia, and display a rectilinear architecture of mudbricks on a stone foundation (Crewe 2015a, 139–144); as noted in Table 3.1 (Chapter 3.1), this kind of architecture was recognised as one of the foremost innovative elements introduced in this period. Philia domestic units with comparable architecture were also recognised at the beginning of the sequence at Marki (Frankel and Webb 2006a, 37–38, 290–291). These units appear as spaced out by external spaces, possibly shared by different households to conduct activities (Frankel and Webb 2006a, 290–291).

\[13\] See Appendix II for alternative interpretations and a discussion of this context.
The EC and MC levels at Marki occupied most of the sequence and were extensively investigated (Frankel and Webb 1996, 2006a) (Figure 5.3). Marki, EC Sotira and MC Alambra are examples of small/medium sized villages with a similar organisation, namely an agglutination of single- or multi-roomed buildings with a domestic function (Coleman et al. 1996; Swiny et al. 2003; also: Webb 2009).

Figure 5.3. Aerial photos of Mosphilia (left), Marki (centre), and the workshop complex at Erimi (right) (from: Croft et al. 1999, 58 fig.41; Frankel and Webb 2006a, digital appendix; photo archive of the Erimi Archaeological Project, courtesy of L. Bombardieri).

At Marki, an important role is also played by courtyards, placed before the entrance of one or two households. The walled nature of these spaces suggests the need and sense of private space and architectural isolation, reflecting the social organisation of this community around the household (Frankel and Webb 2006a, 313, 317–318). Artefacts and fixed installations were systematically found in inner spaces at all these sites and can be referred to as domestic activities, including food preparation, small storage and craft manufacture (Coleman et al. 1996, 33–108; Swiny 2003; Frankel and Webb 2006a, 312–313). The construction and maintenance of buildings at Marki was conducted autonomously by the owners, resulting in a lack of overall settlement planning: for the excavators, this lack of regulation indicates the absence of authority and little collective decision making (Frankel and Webb 2006a, 318). These considerations can be extended to Sotira and Alambra, even though a few spaces could have had a function as different from domestic ones (e.g. Unit 12 at Sotira and Room 8 at Alambra) (Coleman et al. 1996, 85–91; Swiny 2008, 49). Despite variation in size, shape and layout displayed by rooms in domestic buildings, these sites are likely to reflect a similar organisation as village communities (e.g. Knapp 2013a, 281–293, 297–298).

Continuity in the organisation of the household spaces is visible throughout the MC, as demonstrated by the domestic architecture exposed at Erimi and Politiko (Falconer and Fall
In addition, community spaces and complexes become a more visible and more important part of the settlement plan throughout the MC. These spaces are differently laid out and used. The Ermi complex was conceived as a series of roofed and open units used primarily for work activities (mainly, textile production) (Bombardieri 2017a, 21–58) (Figure 5.3). Enclosed courtyards, large open spaces, and a few roofed units characterise the final complex at Skalia, where the preparation and consumption of collective meals and alcoholic beverages played a major role, and other working activities have been detected (Crewe et al. 2008; 201; Crewe and Hill 2012; Crewe 2014). At Politiko, two walled courtyards stand out for their concentration of specific classes of materials, such as textile and lithic tools, deer bone, anthropomorphic figurines, and gaming stones. Food preparation, textile and other working activities characterise the function of these spaces, which also were arenas for inter-personal interaction (Falconer and Fall 2013a, 2014).

Finally, it is worth observing that settlement and cemeteries follow different trajectories within the periods considered in this study, and changes in the funerary practices can be detected. There are only few extra-mural cemeteries linked to EC–MC sites (Appendix II). Not all, unfortunately, provide us with good archaeological information as they suffered extensive looting or were excavated with old methods (e.g. Marki Davari [Sneddon 2002]). The preserved contexts display burial architecture and ritual typical of the EC–MC, namely pit or chamber tombs with single or multiple, primary or secondary inhumations provided with grave goods (Keswani 2004). In contrast, MChal and LChal funerary customs can be distinguished by intra-mural burials placed beneath the house floors at Mosphilia, differences in tomb types and an increase of frequency in the deposition of grave goods (Peltenburg et al. 1998a, 8–92, 252; Keswani 2013, 165–186).

Having established the core features of the sites in this brief chapter, the following chapters will explore the organisation of domestic and community spaces and how they played a fundamental role in the organisation of textile activities – first for the Chalcolithic and Philia (Chapter 6) and then for the BA (Chapter 7). Finally, the thesis will then reverse its viewpoint and utilise the dynamics of textile work as a unique lens through which to investigate the social fabric of Cypriot communities.
Chapter 6

Chalcolithic and Philia Textile Production

The aim of this chapter is to provide a first outline of LChal textile production and re-evaluate the indicators for the Philia period. As noted in Chapter 4.2.3 and 4.2.7, scholars tend to agree that spindle whorls and loom weights appeared in Cyprus at the beginning of the BA (Crewe 1998, 14–15; Frankel and Webb 2006a, 169; Peltenburg and Webb 2013, 271, 276). For this reason, textile production has remained uninvestigated before the Philia as it is thought that no evidence is available (e.g. Webb 2007, 20 tab. 1). Being generally understood as a period of technological innovations (§3.1), the ‘sudden’ appearance of textile tools in the Philia has encouraged researchers to read the emergence of these tools as markers of a change in textile technologies (Webb 2002).

The (apparent) lack of overt evidence for textile tools in the LChal does not imply that the textile production was less sophisticated. This chapter thus intends to fill this gap in research. A first definition of the Chalcolithic textile tradition will be achieved through an investigation of the site of Mosphilia and the identification and analysis of textile indicators. Throughout, our main focus will be on the LChal, however, MChal materials (in particular, needles) from the site will also be considered. This will enable us to identify and define a broader Chalcolithic textile tradition (henceforth also termed ‘Pre-Philia’) which the LChal was part of. In addition, these two periods show discontinuity, and their similarities and differences play a crucial role in understanding the transition to the BA (§3.1). The Philia is based on assemblages from Marki, Skalia, Sotira, and the top levels of Mopshilia (Chapter 5). As observed in the previous chapter, additional Philia materials from crucial contexts (Laksia, Kafkalla, Bamboula, Nicosia) were included to provide a more complete picture of the period.14

6.1 Textile production at Chalcolithic and Philia Kissonergera Mosphilia: techno-functional and contextual analysis of the indicators

The following sections provide a technical and contextual analysis of the two main indicators for textile production identified for the Pre-Philia, namely spindle whorls and needles. The

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14 Data from all sites are reported in Appendix III.
same indicators and loom weights are available for the Philia and will be discussed in the second part of this chapter. Given the domestic nature of the contexts and the lack of more specific evidence to support the presence of non-specific indicators, and it was not possible to identify textile activities other than the ones listed in Tables 6.1 and 6.5.

<table>
<thead>
<tr>
<th>Tool, structure</th>
<th>Indicator</th>
<th>Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Specific</td>
<td>Spindle whorl</td>
<td>Thread making</td>
</tr>
<tr>
<td></td>
<td>Specific</td>
<td>Needle</td>
<td>Weaving (?), sewing, etc.</td>
</tr>
</tbody>
</table>

*Table 6.1. Mosphilia. Archaeological indicators for textile production*

**6.1.1 Stone spindle whorls and thread making**

More than 500 bead-like artefacts were recovered at Mosphilia. The majority of beads consist of small artefacts (made of shell, animal bone, faience) which can undoubtedly be classified as ornaments (Peltenburg and Tite 1998a, 192–195; 1998b, 236–238, pl. 37.1-6; fig. 99.1-17). A sub-group of perforated artefacts made of basalt or soft stone (chalk) and mainly retrieved from LChal contexts is also included within this artefact category (Peltenburg and Tite, 1998b, 236–238, pl. 37.1–6; fig. 99.1–17).15 Objects belonging to this latter group, however, appear to be significantly larger when compared to the rest of the beads, and this has led me to re-evaluate them as possible spindle whorls (Bombardieri and Muti 2018b, 40). This possible interpretation was already voiced by the excavators, who stated that “perforated chalk globular stone […] may have served a different purpose” and “they may, nonetheless, have functioned as whorls” (Peltenburg and Tite 1998a, 192; 1998b, 236). It was thus decided to analyse all beads belonging to Types 4 (thick oblate), 5 (globular), and 6 (truncated biconical) in order to assess whether an alternative interpretation as spindle whorls can be put forward for them and, if so, how these tools were operated (Figure 6.1).16

Pierced artefacts must display a minimum weight and a functional perforation to operate correctly as spinning tools (§4.2.1): specifically, experimental tests have set minimum mass values for functional spindle whorls between 4g and 8g (Olofsson et al. 2015, 82–83). The Mosphilia artefacts show dimensions (Ht mean 21.4mm; Max D mean 29.4mm) and weight ranges not only beyond the minimum values (§4.2.1) but also comparable with the functional

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15 One whorl is from a 3B mixed context in Building 855. The remainder four are from the topsoil (Appendix Tables III.27–28).

16 See Peltenburg and Tite 1998b, 236 for the typological classification.
parameters of some EC–MC categories (Crewe 1998, 28–29, 28 fig. 6.1, 29 fig. 6.2). As regards weight, at least three classes can be identified, and the presence of light to medium weight classes (0–36g, 37–72g) indicates the possibility of spinning short to medium length fibres and the production of fine and medium thread (Grömer 2016, 85–90) (Figure 6.3).¹⁷ In addition, despite being drilled and having a slightly hourglass shape, the perforations of these stone objects do not prevent them from being used on a spindle.

![Stone spindle whorls (beads of Types 4 and 5)](image1.png)

*Figure 6.1. Mosphilia. Stone spindle whorls (beads of Types 4 and 5)*

![Stone whorl KM2369 with use-wear (chipping/spall detachment) around the perforation](image2.png)

*Figure 6.2. Mosphilia. Stone whorl KM2369 with use-wear (chipping/spall detachment) around the perforation*

Further and more definitive evidence of their use as spinning tools can be found in the existence of use-wear traces typically developed by soft-stone whorls around their perforations (§4.2.2) (Figures 6.2, 6.4): distinct regular chipping and an area of slight, circular abrasion was attested around perforation margins of artefacts KM1565 and KM2369, while less extended

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¹⁷ See below Table 6.7 for RS and MI values and comparison with the Philia terracotta whorls.
regular chipping, with or without abrasion, was also detected around one or both perforations of some of these artefacts. These traces are identical but less deep than the use-wear marks identified on the EC–MC terracotta spindle whorls (Crewe 1998, 60–62). The fact that a chalk spindle whorl may produce similar wear patterns to a terracotta one is reasonable to hypothesise: in fact, on the Mohs hardness scale, calcite, the mineral component of chalk, is classified as 3 (semi-hard), while clay minerals fall between 1 and 3 (soft to semi-hard) (Cuomo di Caprio 2007, 73–74). Clay composition, however, may vary significantly in quantity and type of minerals, and the above values are only indicative, and the significance of less clearly visible use-wear traces in terms of use cannot be established. Not only does the presence of these kinds of traces allow us to confidently interpret these artefacts as whorls, but, contrary to traditional scholarly assumptions, it also suggests that the low-whorl spinning technique (§4.2.2–3) was practised already in the LChal.

Figure 6.3. Mosphilia. Graph illustrating the weight classes identified for the stone whorls and the distribution of artefacts for each class (n= 22)

One other characteristic of the artefacts (especially of Type 5) that is worth further reflection is the shape, which shows marked similarities to the biconical or globular shapes of undecorated Philia examples (Frankel and Webb 2006a, 160) (Figure 6.5). Undecorated Philia whorls are generally slightly heavier than their decorated counterparts (Frankel and Webb 2006a, 160), and their measurements are comparable to those of the Mosphilia stone whorls. Interestingly, these similarities are apparent when comparing the chalk whorls to the Philia

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18 Graham (2013, 180) observed the same type of use-wear on EC–MC stone whorls retrieved from Ammoudhia.
assemblages from other sites as well as undecorated whorls recovered from the latest levels of the occupational sequence at *Mosphilia* (see below §6.1.2, §6.2.1). The recent publication of the final site report of Souskiou *Laona* provides the best comparanda for these artefacts: pierced stone artefacts from these sites are globular in shape and show a weight range between 23g and 47g (Peltenburg 2019, 225). Again, Peltenburg (2019, 225) categorised these objects as beads but remarks that “their use as whorls remains a possibility”.

![Pie chart](image.png)

*Figure 6.4. Mosphilia. Pie chart with percentages and distribution of stone whorls in relation to use-wear traces (n= 22)*

![Image](image.png)

*Figure 6.5. Mopshilia. Stone whorl KS1565 (left) among terracotta spindle whorls*

The chronology presented for the stone whorls anchors these objects to the LChal or, possibly, late phases of the MChal (Peltenburg 2019, 225). However, this does not mean that spindle whorls only appeared in the Cypriot archaeological record from this period onwards. KM1447, a low fired artefact of conical shape with a central, vertical perforation that comes from the terracotta building model recovered in Unit 1015 of the Ceremonial Area, may be a clue to the presence of these objects even before the LChal (Peltenburg 1991, 12–71) (see

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19 Spindle whorls can be made of perishable materials (e.g. wood).
Figure 8.1, Chapter 8). Initially, Peltenburg (1991a, 69) proposed that the artefact could have been an actual or model spindle whorl, imagining that these were the norm in the Chalcolithic, but, more recently, the complete absence of similar tools from the record has led scholars to reject the original interpretation (Peltenburg and Webb 2013, 271). Nonetheless, the shape, dimensions, and weight of KM1447 is compatible with those of an operational spindle whorl, and Peltenburg’s first suggested identification of this object as a spindle whorl should not be ruled out (Bombardieri and Muti 2018b, 39). Definitive proof of the use of KM1447 as a spindle whorl could have been provided by the identification of typical use wear traces: upon examination, unfortunately, KM1447 appeared damaged around its narrow perforation, and the deep chipping present on this part of the object seems post-depositional.

6.1.2 Terracotta spindle whorls between the Late Chalcolithic and the Philia

Turning to the final phase of the settlement, it is worth also including in this analysis six terracotta spindle whorls recovered from Mosphilia (Peltenburg et al. 1998a, 199). These are biconical or globular/spherical objects with height, diameter and mass measurements comparable to the whorls retrieved from Philia contexts all across the island (mean Ht 24.5mm, mean Max D 27.8mm, mean Wt 17.1g) (Figure 6.6). All of the Mosphilia whorls show use-wear traces in the form of chipping around perforations, although not always very intense, suggesting that they were mounted on the spindle and used in the same manner as the later EC–MC whorls.

![Terracotta spindle whorls](image)

Figure 6.6. Mosphilia. Terracotta spindle whorls KM573, KM946, KM1305, KM1307, KM1677, KM2367

20 A total of seven whorls were retrieved from Mosphilia (Peltenburg et al. 1998a, 199): KM102 is a surface find, and, most probably, dated to a later period. Therefore, it was excluded from this analysis.
Four whorls are decorated and two are undecorated. The decoration is incised and filled with a white paste anticipating a long-lasting tradition which would persist throughout the whole EC–MC period (Crewe 1998, 43). KM946 and KM1305 show horizontal parallel/spiral lines on half or the entire body, which is a typical decoration of ‘mature’ Philia spindle whorls (Frankel and Webb 2006a, 160) (§6.2.1). KM2367 and KM573 were identified as typical Philia examples based on decoration and fabric (Peltenburg et al. 1998a, 199), while the undecorated whorls are made in the local fabric.

6.1.3 Bone needles

*Mosphilia* yielded the largest sample of bone needles for the Chalcolithic period (172 artefacts) (Croft 1998a, 199–200; 1998b, 242), and the majority is equally distributed between Periods 3a and 3/4 (Figures 6.7–6.8). The assemblage is very fragmentary and, overall, does not present significant variability through time. The eyelet part, which permits secure identification of the function of these tools, is not preserved for most of the artefacts. Tips and central shaft, however, can be confidently classified as needles by their dimensions: for example, Croft (1998b, 242) identified a maximum value of 5mm for the diameter of needles and considered incomplete artefacts with larger diameters to have been pins. This classification criterion may be accepted with a caveat: if it is reasonable to think that overly thin shafts are ineffective as pins, the opposite is not true as large and flat needle types exist for specialised functions (§4.2.8). Needles at *Mosphilia* vary significantly in length, with complete examples ranging between 18.7mm and 54.5mm (Croft 1998b, 244) (Appendix Table III.8), and artefacts of all sizes were retrieved from all periods. Two types of cross-sections can be identified, namely round and oval/flattened oval. Differences in the shape of cross-sections may also be indicative of a differentiation in tool use and the type of material sewn as needles for sewing fabrics tend to have round sections, while needles for leather nowadays have triangular tips and triangular or flat sections (Table 4.3 [§4.2.8]).

Generally, long needles have round, thin sections, while small and medium needles can have thin, round or flat oval sections. These characteristics presuppose that they served different functions and had a different handling and movement when used: short and thin needles can be used for embroidery, but this craft of decorating textiles can only be proven by direct evidence that is so far absent from the Cypriot record. However, it seems reasonable to
propose that these needles were used for delicate work. Concerning the eyelets, Croft (1998b, 244) reports that their perforations range between 0.6mm and 1.8mm, with the majority being 0.9–1.1mm. In my analysis, some examples displayed slightly smaller perforations of 0.4mm and 0.5mm. Even though this is only a few tenths of a millimetre, this detail may be significant to identify the thread thickness produced and used in the Chalcolithic: in spinning tests, for example, thread with a diameter ≤0.5mm is considered fine by Grömer (2005, 111, 111 fig. 6) (Appendix I).

![Figure 6.7. Small, medium and long bone needles from Mosphilia (top to bottom: KM2092, KM3062, KM3225, KM3240, KM1411)](image)

Sixty-six out of 83 analysed needles were also examined microscopically, generally at 20–30x and 200–300x and, in some cases, 150x and 400x magnifications. The remaining 17 presented too much surface damage to provide results. The surface of another 13 needles was completely unreadable, and four needles did not show any types of trace. Modifications of eye and tip

![Figure 6.8. Pie chart illustrating the chronological distribution of bone needles at Mosphilia (n=83)](image)
parts are visible at 20–30x and 150x resolution (Figures 6.10–6.11). Concerning the use-wear around the edge of eyelets, Legrand (2007, 31, 31 fig. 23.1–3) has observed that the use of bone needles produces a progressive smoothing of the perforation margins, the erasure of drilling marks and elongation of the shape towards the butt; also, intense use can lead to the breakage of the butt part. The eyelet perforations of the *Mosphilia* needles show progressive smoothing of the drilling marks and may appear horizontally or obliquely elongated, showing irregular margins in some cases (e.g. KM1505; KM3063; KM2078; KM2013) (Table 6.2, Figure 6.9).

As to intensity, the majority show an intermediate stage of alteration comparable, albeit with some differences, to Legrand’s modification n.2 (Legrand 2007, 30–31, 31 fig. 23.2). Generally, however, the *Mosphilia* needles show similar types of use modification but to different sides or directions. Even when the tip part is preserved, tips are incomplete as they are very fragile. Notwithstanding, alteration in the form of smoothing was detectable for the examples reported in Table 6.3 (from all periods identified at the site), with most showing moderate wear. In this regard, it has been noted that tip smoothing is recurrent when a needle is used to sew vegetable fibres (Legrand 2008, 448).

*Figure 6.9. Eyelet parts of needles KM3097, KM1408, KM1505 showing modifications (enlargement or elongation) of the eyelet*
Microwear traces were more difficult to assess as the analysis was conducted with a portable microscope that cannot provide the same definition as a non-portable one (§4.6). The following observations must thus be considered an initial attempt to look at this important evidence. The surfaces of the needles are generally well-polished (Croft 1998b, 244), but the bone texture or manufacture traces (vertical striations) from object shaping are visible (Figures 6.10–11). Fifty-one out of 66 needles showed a differing degree of smoothing of these traces. The presence of multidirectional, straight striations (mostly vertical and oblique) of different lengths and frequency, but generally fine, was also assessed (Figures 6.10–11). These are most often visible on the lower half of needles or across the shafts. In some cases, areas of parallel striations are visible, and this may indicate that the tool was used with a specific movement or toward a single direction (e.g. KM1734; KM2093; KM2213; KM3664). These marks can be compared with the ones identified by Legrand (2007, 78–81) as Types V.1 and V.2 on the Cypriot Neolithic assemblage (§4.2.9), but it was not possible to divide them into the types that she has proposed. Based on experimental tests conducted on linen fabrics with flax thread, Types V.1 and V.2 are related to the use of needles for sewing, and, perhaps, weaving fabrics (Legrand 2007, 78–80; Legrand 2008, 448–449). Tests were also undertaken on bark fibres and leather: the first displayed more frequent striations and cavities, while the second one showed more regular, longitudinal and deeper striations and frequent cavities (Legrand 2007, 79–80 Types V.3–V.4, 80–81 figs. 129–131) (Figure 4.10).
Figure 6.10. Examples of needles from Period 3 showing microwear traces on the bone surface (smoothing of manufacturing marks, slight superficial striations, and small cavities) (magnification 250x) and detail of tips displaying different levels of modification (magnification 150x). Bar meter reference: 100 μm

Figure 6.11. Examples of needles from Period 4 showing microwear traces on the bone surface (smoothing of manufacturing marks and slight superficial striations) (magnification 250x) and detail of tips displaying different level of modification (magnification150x). Bar meter reference: 100 μm

These wear patterns were generally not detected on all of the examples analysed, and only four needles may show deeper marks that can be compatible with these uses (Appendix III). It is
thus possible to suggest that bast fibres were primarily used for textile production at *Mosphilia*. In this regard, needles also allow us to reflect on the possible Pre-Philia spinning practices as the exploitation of this type of plan fibre opens up different possibilities of thread making technologies: splicing and spinning, each comprising a variety of techniques and both potentially involving the use of spindle whorls, could have been used (Leuzinger and Rast-Eicher 2011; Gleba and Harris 2019) (discussed in §8.1). It cannot be excluded, however, that needles were also used in contact with other materials, but not frequently enough to develop use-wear.

6.1.4 Tools and contexts

Needles come from secure, mixed or contaminated contexts at *Mosphilia*. At least 16 artefacts were retrieved from occupational floors within domestic buildings (roundhouses), while the majority was found in pits or dispersed in the outside areas (Appendix Tables 27–28). The stone whorls were mainly from LChal inner units or mixed deposits (Appendix Tables 27–28). For most of these objects, thus, contextual information only reveals that they were used and discarded, as one would expect in a village where mundane, small and easily breakable (bone needles) tools are concerned. While needles belong to all periods identified on the site, it is extremely significant that the majority of whorls (ca 80%) appear in LChal contexts of Period 4 (Peltenburg and Tite 1998b, 238, 236 tab. 20.3). This means that these objects appear simultaneously with other notable changes in the village’s material culture, such as the introduction of the RB/B ware, the appearance of new classes of ornaments, and the increase of copper use (§3.1). Considering all these changes, the context of stone whorl KM822 is noteworthy as it was retrieved from the so-called ‘Pithos House’...
(Building 3, Period 4A) (Peltenburg et al. 1998a, 37–44) (Figure 6.12). Remarkably, one other stone whorl (KM566) was also retrieved from the floor of Building 86, overlying B3.

As discussed in Chapter 5.2 (also: Appendix II), this exceptional roundhouse yielded a rich assemblage with large quantities of pottery, bone tools, ground stone and lithic objects, which allowed the excavators to identify a series of different activities carried out in the building, such as flint knapping, red ochre grinding, food preparation and storage (Peltenburg et al. 1998a, 40–41). Given the presence of the whorl and seven needle fragments, it is now possible to suggest that also textile production occurred (Peltenburg et al. 1998a, 43).

It is worth noting especially that onsite manufacture of a new type of ornaments occurred at Pithos House (Peltenburg et al. 1998a, 190–191). The presence of needles and whorls in such a dynamic context – one that is anticipating future developments in the production of objects related to bodily identity and self- or social representation – is significant and will be discussed in Chapter 9.

One whorl (KM2319) and 13 needles were retrieved from burial contexts, all dated to Period 4 (Baxevani et al. 1998, 87–101). As stated in Chapter 3.1.1, regular deposition of a limited number of grave goods started occurring from the LChal. This new pattern has been interpreted as one of the innovative aspects linked to status expression of LChal individuals and is a new development that distinguishes this period from the previous one. Unfortunately, needles occurring in burial contexts were often found in fills and considered as part of the backfill (Baxevani et al. 1998, 119). It is therefore not possible to establish whether these objects were intentionally placed in the burial, but their presence in the Pithos House may lead scholars to reconsider this option as a possibility. KM2319, in contrast, was found among the grave goods of T.561, a single female burial (Peltenburg et al. 1998b, 98). Although significant, it would be speculative to argue for the existence of textile-related symbolism on the basis of this one unique find.

Turning now to terracotta whorls, it is worth noting that none was found in situ. KM1677 was retrieved from the topsoil, while four whorls come from contaminated contexts dated to Periods 4b and 5 (Miles 1998a, 360, 366, 371; 1998b, 402; Peltenburg et al. 1998a, 199)

21 Six out of seven needles (KM1021, KM5191-3, KM5198-9) were extremely fragmentary and were only recorded. They were all retrieved from the main floor (Floor 1) of the roundhouse (Peltenburg et al. 1998a, 43) where they had probably been used and discarded.
(Table 6.4). Even though they are from disturbed contexts, as the majority of the most recent levels of *Mosphilia* are, these whorls can be considered contemporary to the other Philia material that appears on the site from Period 4b onwards (Peltenburg *et al.* 1998a, 256–258, 256 tab. 14.7).

<table>
<thead>
<tr>
<th>Object Number</th>
<th>Unit Number</th>
<th>Context type</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM573</td>
<td>66</td>
<td>General, contaminated</td>
<td>5</td>
</tr>
<tr>
<td>KM946</td>
<td>445</td>
<td>General, contaminated</td>
<td>4b/5</td>
</tr>
<tr>
<td>KM1305</td>
<td>814</td>
<td>General, contaminated</td>
<td>4</td>
</tr>
<tr>
<td>KM1307</td>
<td>814</td>
<td>General, contaminated</td>
<td>4</td>
</tr>
<tr>
<td>KM1677</td>
<td>0</td>
<td>Topsoil</td>
<td>-</td>
</tr>
<tr>
<td>KM2367</td>
<td>798</td>
<td>Wall (part of Wall 866), secure</td>
<td>4</td>
</tr>
</tbody>
</table>

*Table 6.4. Mosphilia. Contexts and chronology of the terracotta spindle whorls*

The only terracotta spindle whorl that stems from a secure context is KM2367 (Peltenburg *et al.* 1998a, 199). This artefact was found inside Wall 798, part of Wall 866 and ascribed to Period 4b (Miles 1998a, 371; 1998b, 407; Peltenburg *et al.* 1998a, 199, 258). It is interesting to note that Wall 866 is immediately above another wall dated to Period 4a (Wall 1165) and below Wall 261, a secure context dated to Period 4b (Miles 1998a, 371, 376). Considering its position in the chronological sequence, and because no Philia RP pottery was found in association with Wall 866, the structure might pre-date Period 4b. Also, as the artefact was found in the wall and shows traces of use-wear, it seems likely that it was used before the construction of the wall.

**6.2 The Philia: techno-functional and contextual analysis of the indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Tool, structure</th>
<th>Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific</td>
<td>Spindle whorl</td>
<td></td>
<td>Thread making</td>
</tr>
<tr>
<td>Specific</td>
<td>Loom weight</td>
<td></td>
<td>Weaving</td>
</tr>
<tr>
<td>Specific</td>
<td>Needle</td>
<td></td>
<td>Sewing, etc.</td>
</tr>
</tbody>
</table>

*Table 6.5. Archaeological indicators for textile production in Philia sites (Marki, Skalia, Laksia, Sotira, Nicosia, Kafkalla, Bamboula)*

The second part of this chapter describes and contextualises the indicators for textile production identified for the Philia (Table 6.5). Before proceeding with the analysis, it is necessary to point out two limitations concerning the record of this period. First, the quantity
of tools retrieved from across the island is generally low, and the number of loom weights and needles is not statistically meaningful to allow a techno-functional analysis. Second, contexts — especially settlements — are, unfortunately, few and poorly known for this period (§6.2.4).

use-wear.

6.2.1 Spindle whorls
Sixty-six terracotta spindle whorls of Philia date have been discovered from settlement (Marki, Skalia, Sotira) and burial (Laksia, Sotira, Nicosia, Deneia, Kafkalla, Bamboula) contexts across the island (Figures 6.13–14). Whilst objects from tombs can be securely dated to this period, most of the Philia-style whorls are from later deposits in these settlements. These artefacts can be confidently identified as Philia types due to their distinctive characteristics (Crewe 1998, 63; Frankel and Webb 2006a, 160–162).

![Figure 6.13. Undecorated spindle whorls from Marki (top line: P13058, P16305, P16306; bottom line: P12238, P15764, P16241)](image)

Figure 6.13. Undecorated spindle whorls from Marki (top line: P13058, P16305, P16306; bottom line: P12238, P15764, P16241)

Early deposits are not always neatly distinguishable in stratigraphy of prehistoric settlements in Cyprus (Frankel and Webb 2006a, 162) and taphonomic processes can easily act on spindle whorls by moving them upwards or downwards in the stratigraphy (Bombardieri and Muti

22 Whorls “of certain or probable Philia type” are discussed together in the Marki volume, even though only five out of 26 artefacts were retrieved from Philia contexts (Frankel and Webb 2006a, 160–162, 161–162 tabs. 5.5–5.6); the same can be observed at Skalia (Crewe 2015a, 144). Philia whorls were also recognised at EC Sotira (Walz and Swiny 2003, 409–411, TC13, TC15, TC19, TC21; Muti forthcoming, TC55, TC71, TC74, TC89, TC91). Some undecorated whorls from Skalia and Sotira were recognised as potential Philia types based on their shape, fabric, and comparanda from secure contexts. However, distinguishing between undecorated Philia and early ECI whorls may be challenging, and it cannot be excluded that some of the selected whorls are later examples.
2018b, 31). Nonetheless, the relatively significant number of Philia whorls from later deposits (notably, in the following ECI–II period levels) may point to more prolonged use, and, possibly, transference of these artefacts. Also, undecorated early EC types seem to derive from or imitate Philia types. As a consequence, a distinction between Philia and ECI–II objects based on style alone might not always be possible.

![Biconical spindle whorls with typical horizontal, parallel lines from Marki and Skalia](left to right: P9885, P15246, P9573, KS401)

The Philia whorls are biconical or globular (Type II; Crewe 1998, 22 Fig. 4.1, tab. 4.1), and 70% of the total sample examined show wear marks around the perforation at one or both ends, indicating that most probably the whorl had been mounted on the lower part of the spindle (low-whorl spinning) (§4.2.1–3). Use-wear was also noted on whorls from burial contexts (Appendix III), revealing that the artefacts from the tombs had been used as tools before they were deposited as grave goods.

<table>
<thead>
<tr>
<th></th>
<th>Min. value</th>
<th>Max. value</th>
<th>Mean value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (mm)</td>
<td>10</td>
<td>37</td>
<td>23.4</td>
</tr>
<tr>
<td>Max. Diameter (mm)</td>
<td>14</td>
<td>39</td>
<td>27.3</td>
</tr>
<tr>
<td>Weight (g)</td>
<td>3.7</td>
<td>42</td>
<td>17.2</td>
</tr>
</tbody>
</table>

*Table 6.6. Table illustrating the minimum, maximum, and mean dimensions and weights of the Philia whorls*

These spinning tools appear as a relatively homogenous group of small objects where the majority belong to the very light/light classes, suggesting that their operation was relatively uniform (Table 6.6, Figure 6.15). In addition, they display low MI values, generally under 30g/cm², and RS values between 0.60 and 1 (typical of whorls that do not have diameters larger than their heights), that can be associated with fast rotating objects (Table 6.7) (Appendix Tables III.3–6). These functional parameters can be compared with the ones shown
by LChal stone whorls (Table 6.7). The diameters of the central perforation are narrow, ranging between 3mm and 8mm, and indicate that thin, probably short, shafts were used. Shafts should be proportionate to the dimensions of the whorls (Firth 2015, 155), and the Philia spindles (shafts and spindle whorls) appear as well-balanced tools.

### Table 6.7: Table illustrating RS and MI values of the LChal and Philia whorls

<table>
<thead>
<tr>
<th>Weight class (g)</th>
<th>Stone whorls (LChal)</th>
<th>Terracotta whorls (Philia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very light to medium-light (0–18)</td>
<td>RS (h/D) 0.65–0.8</td>
<td>MI (g/cm²) 4–12</td>
</tr>
<tr>
<td>Medium and medium-heavy (19–36)</td>
<td>RS (h/D) 0.65–1</td>
<td>MI (g/cm²) 13–67</td>
</tr>
<tr>
<td>Medium and medium-heavy (37–54)</td>
<td>RS (h/D) 1.1</td>
<td>MI (g/cm²) 88</td>
</tr>
</tbody>
</table>

The examination of the functional parameters confirms that the Philia whorls were light spinning tools, as already noted by Crewe (1998, 32–36) and Frankel and Webb (2006a, 160–162), while calculation of the MI and RS values allows a more sophisticated understanding of the rotational movement and speed of Philia spindle whorls. Light whorls are normally related to the production of fine thread (Andersson Strand 2015, 48). However, spindles can be furnished with more than one whorl, and the Philia whorls may have been used in groups and thus not been exclusively used to produce thin yarn.

Decorated whorls appear as slightly more common than undecorated ones, but this may be because the linear but highly distinctive patterns allow archaeologists a more secure chronological attribution of these artefacts when found in later contexts (Crewe 1998, 63).
However, it is worth noting that undecorated tools come almost exclusively from settlements; the only undecorated whorl from a burial context was recovered in T.15 at Sotira (Swiny and Herscher 2003, 131–132; Walz and Swiny 2003, 410, 407 fig. 9.1) (Figure 6.16). The almost exclusive presence of decorated whorls in burial contexts may be indicative of a possible distinction in the value of the two categories of objects.

![Figure 6.16. Number and distribution of decorated and undecorated whorls by site](image)

The most recurrent decoration appearing on the Philia whorls is composed of horizontal parallel lines running over all or over half of the body creating a sort of spiral. Most often, these spirals are composed of interrupted or partially overlapping lines. Other motifs are arrangements of short parallel solid or angled lines (e.g. T2/19–22; P9572, P16498). In this regard, it is worth reminding the reader that the Philia whorls recall earlier and contemporary Anatolian prototypes but show very distinctive style features, especially concerning the decoration (Rahmstorf 2015b, 153–154, 154 fig. 4). It is also worth noting that spindle whorls displaying an Anatolising style have been retrieved from across the Aegean contemporary with when LChal and Philia whorls appeared on Cyprus (Sotirakopoulou 2008, 544–545; Rahmstorf 2015b, 153–155, 154 fig. 4).

The Philia spindle whorls are made of fine, soft or medium fabric, are buff to grey in colour, and have lustrous slips. These fabric types are the same for all Philia whorls across the island, confirming that whorls – as is also the case with most of the Philia pottery vessels and artefacts – originated from a single or a restricted number of productive centres in a specific area, tentatively identified as the Ovgos valley (Dikomitou-Eliadou 2013; 2014, 203, 205,
Fabrics of some whorls from Sotira (TC23) and Skalia (KS3, KS337 [Crewe 2015a, 144, 143 fig. 12e-f]), however, have a distinct composition which resembles the typical local fabrics in the following period. Remarkably, all these whorls are undecorated, while decorated examples, especially whorls showing spiral patterns, are imported objects at these sites. Even though no archaeometric analyses of whorl fabrics have been conducted, it can be suggested that spindle whorls from Philia sites may reflect the same situation identified for cooking pots at Marki, where it was possible to identify a distinction between imported and locally produced vessels (Dikomitou-Eliadou 2013; 2014, 201–207).

6.2.2 Loom weights

Only three objects from Philia levels at Marki can be identified as loom weights (Frankel and Webb 2006a, 176). Similar to the later EC/MC examples, these Philia weaving tools are made of coarse sun-dried or low-fired clay and are very fragile. The fact that these artefacts were not deposited as grave goods, along with the very limited number and exposure of Philia settlement contexts, may have contributed to reducing their archaeological visibility (Figure 6.17). P14150 is the only almost completely preserved artefact, while P16615 was found in a very fragmentary state. Both are conical in shape, and P14150 shows the same diagnostic characteristics of the later EC/MC weights, such as a flat base, a rounded apex, and a round perforation above it (Frankel and Webb 2006a, 176). In contrast, P16475 is considerably smaller, with an unusually large perforation, when compared to the other later Philia weights (see Chapter 7). P16475 has no comparison in the Cypriot record, and its identification as a weaving tool is uncertain. For this reason, and the fact that the Philia sample is extremely limited, it cannot be securely established whether the Philia loom weights were lighter tools than those from the following periods, as suggested by Frankel and Webb (2006a, 176).

As for the adoption of the spinning technology, the warp-weighted loom is thought to have been derived from Anatolia (Frankel et al. 1996, 43–44). It is worth remarking, however, that the Anatolian ‘background’ has not been sufficiently explored in terms of tools and production, unlike the technology itself (e.g. Webb 2002). Unfortunately, no studies offering a complete overview on textile production in BA Anatolia are available. However, the Cilician

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23 It is unlikely that all of the Marki whorls were imported. However, the Marki artefacts show light brown to grey, fine and medium fine fabrics, and it was not possible to securely distinguish local whorls from ‘classic’ Philia fabrics.
and western Anatolia sites (e.g. Tarsus [Goldman 1956, 323], Karataş [Warren 1994, 205], Demircihöyük [Bachhuber 2014, 342; Sari 2018, 215–216]) can be taken as examples to point out that many types of loom weights were in use in EBAI–II Anatolia; of these, pyramidal, rectangular, conical, and crescent-shaped ones are the most common shapes. When measurements are available, as for the artefacts from Demircihöyük, loom weights cover a wide range of weight classes – from less than 100g up to 1000g. Variability in shape and weight demonstrates not only that fabric production was diverse, suitable for weaving different fabric types and possibly utilising different weave techniques, but also that weight types may have been used for specific purposes. These are fundamental elements to consider when comparing the Anatolian and Cypriot traditions, as will be done in Chapter 10.1.3.

![Figure 6.17. Marki. Philia loom weights P16475 and P16615](image)

### 6.2.3 Metal needles

Marki is also the only site that has yielded Philia needles: nine metal examples were from contexts dated to the settlement’s periods A and B (Frankel and Webb 2006a, 186) (Figure 6.18). No bone needles are currently known from Philia contexts, but the presence of such artefacts from the ECI–II levels at Marki (Croft 2006, 193–194) suggests that the production and use of these tools continued beyond the Chalcolithic (§7.1). M38 is the only artefact whose eye part is not preserved and might be either a needle or a pin, the latter object type being rather common finds in Philia metal assemblages, especially – but not exclusively –

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24 The fact that Anatolian loom weights are not identical to the Philia ones was already noted by Frankel et al. 1996, 44. It is, however, stressed that they belong to the same technological domain.
within burial contexts (Weinstein-Balthazar 1990, 411 tab. 165). M48 can be more securely identified as a needle as it shows a slight incurve which is likely to be the very lower part of the eyelet hole (contra Frankel and Webb 2006a, 186).

![Figure 6.18. Marki. Philia metal needles (M19, M29, M31, M34, M38, M44, M46, M48)](image)

Overall, the Marki needles show round or oval sections and round eyelet perforations (Frankel and Webb 2006a, 186). The tools are prevalently long needles, with length measures ranging from 53mm to 98.5mm, their cross-sections vary between 1mm to 3mm, and the diameters of perforation are between 0.5mm and 1.5mm (Frankel and Webb 2006a, 186). In contrast to the Mosphilia bone needles, the metal examples from Marki represent a more homogenous type of artefact – namely, long needles with possible generic sewing functions. However, differences in the perforation diameters can be correlated with the use of thread of different lengths: while thread of various thickness could be used with needles displaying larger diameters, only thin thread can fit through eyelets with 0.5mm wide perforations.

6.2.4 Tools and contexts
Textile tools from settlement contexts that can dated to the Philia are related to episodes of use and abandonment of domestic structures and external areas (Frankel and Webb 2006a, 160, 186 tab. 5.19; Crewe 2014, 142–144; 2015a, 144). Alternatively, they were found in later, or mixed deposits (as noted for spindle whorls [§6.2.1] or discarded materials – e.g. needles M34, M38 [Frankel and Webb 2006a, 29–87, 186 tab. 5.19]). As such, they confirm a primary
use of these tools for household activities, but do not provide any additional indications regarding productive aspects or their social use context. More interesting in this respect are the tools from burial contexts. Unfortunately, as no loom weights or needles were retrieved from burials, and the following paragraphs will only deal with spindle whorls. It must be also borne in mind that we know little about the mortuary treatment during the Philia: the majority of human remains from crucial contexts were not analysed (Keswani 2003, 191–192). In most cases, only tomb plans and context descriptions are available, and it is difficult or impossible to establish the exact posture of the deceased, type of deposition, and association with grave goods (Keswani 2003, 191–197). However, a successful attempt at reconstructing associations between bodies and metal objects was made by Mina (2014, 236). A reconstruction of the possible location of spindle whorls in the Philia burials and object associations follows the same methodological principles and will be presented in the following paragraphs.

<table>
<thead>
<tr>
<th>Site</th>
<th>Tomb Number</th>
<th>Condition of preservation</th>
<th>Number of whorls</th>
<th>Proximity to bodies</th>
<th>Presence of/association with stone or metal ornaments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laksia</td>
<td>T.1</td>
<td>Partially disturbed</td>
<td>2</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>T.2</td>
<td>Possibly/partially intact</td>
<td>4</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>T.4</td>
<td>Possibly/partially intact</td>
<td>5</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>T.5a</td>
<td>Disturbed</td>
<td>1</td>
<td>N/A</td>
<td>N</td>
</tr>
<tr>
<td>Nicosia</td>
<td>T.4</td>
<td>Possibly/partially intact</td>
<td>1</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Kafkalla</td>
<td>T.166</td>
<td>Disturbed</td>
<td>1</td>
<td>?</td>
<td>Y</td>
</tr>
<tr>
<td>Sotira</td>
<td>T.15</td>
<td>Intact</td>
<td>1</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Bamboula</td>
<td>T.1</td>
<td>Disturbed</td>
<td>1</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

Table 6.8. Spindle whorls from the Philia tombs (tombs, whorl number, association with bodies, metal and stone ornaments [Y=yes, N=no, N/A= not applicable]) (after Benson 1972, pl. 37; Hannessy et al. 1988, 14–16, 50 fig. 5a; Nicolaou and Nicolaou 1988, 105; Dikaios 1962, 176, 161–165 figs. 75–79; Swiny and Herscher. 2003, 131–132)

Eight out of 30 excavated Philia tombs were found with spindle whorls (Webb and Frankel 1999, 8–13; 2007, 191 fig. 1). Table 6.8 summarises the main elements (frequency of deposition, proximity to human remains and other grave goods as represented in plans). As it can be observed from this table, T.1, T.2, T.4 at Laksia and T.4 at Nicosia are worthy of further investigation as they can shed some light on the role of these objects within the burial
'narrative' and may reveal more on the social importance of textile activities (discussed in Chapters 9 and 10).

Concerning the tombs excavated at Laksia, Dikaios’ plans show some distinction between vessels and other grave goods within the burial space (Dikaios 1962, 161–165 figs. 75–79). In T.2, spindle whorls were found associated with stone and metal ornaments, such as annular pendants, earrings, and pins, and these artefacts were the only ones retrieved from the space occupied by the human remains (Dikaios 1962, 162 fig. 76) (Figure 6.19). A similar situation exists for T.4, even though the exact location of the whorl is difficult to determine. In the plan, number 15 indicates a jug, while elsewhere the number is assigned to the only spindle whorl retrieved from the tomb. All the small finds, however, appear to have been located within the immediate vicinity of the body (Dikaios 1962, 164 fig. 78). In T.1, instead, the location of only one out of the two whorls discovered is reported on the tomb plan (Dikaios 1962, 161 fig. 75), and the artefact (T1/20) is drawn as associated with stone ornaments but not in correlation with the deceased.

T.4 at Nicosia is one other meaningful context, representing a possible single inhumation with grave goods concentrated to the east of the burial space (Hennessy et al. 1988, 14–16, 50 fig. 5a) (Figure 6.20). Vessels and ornaments seem deliberately separated in two groups, and spindle whorl T4/16 is included within a high concentration of ornaments. The human remains
are described as very fragmentary, but they were mainly retrieved from the same area of the ornaments, which may help to retrace the original position of the body (Hennessy et al. 1988, 14–16, 50 fig. 5a).

![Figure 6.20. Nicosia. Plan of T.4, location of spindle whorl T.4/16, and whorl T4/16 (plan from Hennessy et al. 1988, 50 fig. 5a)](image)

No conclusions about the gender identity of these postulated Philia spinners can be drawn as the human remains found in these tombs have not been analysed by osteologists. The only osteological data available for the Philia period are from T.15 at Sotira, a multiple burial with two male adults and a young female (Schulte Campbell 2003, 424–430; Swiny and Herscher 2003, 131). Unfortunately, no whorls appear to have been directly associated with these skeletons (Swiny and Herscher 2003, 130 fig. 3.5) (Table 6.8). A recent reinterpretation of these contexts, however, has highlighted the possibility that the whorl, a copper knife and few other artefacts may have been deposited with a skull belonging to one of the male individuals as these finds appear to have been pushed to the back of the chamber to make way for the other bodies (Douglas 2019, 181).

Notwithstanding limitations, attempts at locating spindle whorls within the burial space can be made, and a correlation with bodies and ornaments seems to emerge from the examples proposed. It is also interesting to note that whorls retrieved from Philia burials generally show light use-wear, suggesting that they were used before being buried as grave goods (Appendix III). It may thus be inferred that these were personal possession of the deceased. Given the
scarce contextual data available for the Philia, these represent an important piece of evidence to investigate the role of textile craftspeople in society. These aspects will be discussed in Part III, along with the data concerning the EC–MC.

6.2.5 The Anatolian socio-economic background of textile production

Before continuing our analysis of the Cypriot record, it is beneficial to briefly introduce the context of textile production in mid-3rd millennium Anatolia to contextualise the Cypriot evidence in the LChal/Philia, given its widely-recognised derivation from Anatolian prototypes. This will facilitate a discussion on the possible nature and developments of textile manufacture in the LChal/Philia transition (Chapter 10.1).

Textile production is highly visible at different key sites in south and west Anatolia, and has been identified in minor and major centres, such as, Troy I–III, Alişar Hüyük, and Demircihöyük, to mention just a few (Richmond 2006; Bachhuber 2016). For Richmond (2006, 221), the nature of production was extensive but essentially domestic, and the distribution of textiles was part of local networks (Richmond 2006, 221). A different picture has been recently outlined (Bachhuber 2014, 149; 2016; Britsch and Horejs 2020) in which textile production has a strategic economic importance and socialising value for Anatolian communities, and specialisation seemed to emerge. At Demircihöyük, for example, the organisation of textile manufacture reveals a strategic exploitation of textile resources to produce different types of fabrics, from everyday garments to valuable dyed textiles (Bachhuber 2016, 357–359). In situ remains of a warp-weighted loom in association with gold beads in a Troy II house destroyed by fire indicates the level of the richness of precious fabrics in Anatolia (Blegen et al. 1950, 350; Barber 1991, 172; Richmond 2006, 208–209).

Crucially, at this and other sites in west Anatolia (e.g. Aphrodisia) higher concentrations of textile tools were detected in the same buildings in which food production and consumption appeared to have taken place at a larger than domestic scale (Bachhuber 2014, 149; 2016, 356). In such contexts, textile production is read as a “social-corporate activity” (Bachhuber 2016, 356) in which productive dynamics of textile work function as a facilitator of social encounters and collaboration. In other words, textile manufacture is generally placed in the house, but its productive goals and social significance transcend the domestic sphere. Social-corporate activities and consumption are correlated with control over resources and productive
means: food consumption is an occasion for feasting and display (Dietler and Herbich 2001), and textiles could have played the same role in display.
Chapter 7

Early Cypriot to Middle Cypriot III/Late Cypriot IA Textile Production

This chapter continues the analysis of textile tools and contexts that began with a discussion of the Chalcolithic and the Philia in the preceding one. This current chapter focuses on an examination of the indicators for textile production from the EC to MCIII/LCIA. Sites selected as case studies have already been introduced in Chapter 5. They will be examined in detail in the next sections; they are organised by region (Mesaoria plain, Kouris valley, west coast) and chronology (starting from the settlement showing the earliest occupation).

7.1 Marki Alonia: techno-functional and contextual analysis of the indicators

<table>
<thead>
<tr>
<th>Tool, structure Indicator</th>
<th>Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific</td>
<td>Spindle whorl</td>
<td>Thread making</td>
</tr>
<tr>
<td>Specific</td>
<td>Loom weight</td>
<td>Weaving</td>
</tr>
<tr>
<td>Specific</td>
<td>Needle</td>
<td>Sewing</td>
</tr>
<tr>
<td>Product</td>
<td>Fabric</td>
<td>-</td>
</tr>
</tbody>
</table>

*Table 7.1. Marki. Archaeological indicators for textile production*

The first case study is Marki. The textile assemblage of this site is the largest ever recorded for an EC–MC settlement, displaying 243 artefacts: 128 spindle whorls, 76 loom weights, and 34 bone and metal needles (Frankel and Webb 2006a, 160–177, 185–186, 192–196). A small fabric fragment, preserved as a pseudomorph attached to metal razor M43, was also retrieved and represents the only fabric remain from a settlement (Frankel and Webb 2006a, 18). Indicators for textile production are present in all the periods identified at Marki (Table 7.1). Because of its long stratigraphical sequence and multiphase nature, this site is ideal to study tool change in a domestic context through time.

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25 Spindle whorls and loom weights from the initial three excavation seasons can also be found in the first monograph dedicated to the site (Frankel and Webb 1996, 191–199). Tools dated to the Philia were presented in the previous chapter and have been excluded from the artefact total.
7.1.1 Techno-functional analysis

Spindle whorls

Varying quantities of spindle whorls were retrieved from all occupational levels at Marki (Frankel and Webb 2006a, 160–169) (Figure 7.1). The MCII assemblage is considerably smaller than those of the ECI–II and ECIII–MCI. This is because the MCII level corresponds to the last occupational phase and the possible subsequent abandonment of the village, corresponding to the best excavated layer at the top of the sequence. Because it is uncertain whether the MCII level is a true abandonment period or an artefact of archaeological recovery, it will be considered separately from other periods.

Figure 7.1. Marki. Spindle whorls P16304, P 14079, P14328, P8422 (ECI–II) (top) and P7272, P8467, P8545, P6044 (ECIII–MCI–II) (bottom) (drawings from Frankel and Webb 2006a, figs. 5.10–13)

Figure 7.2. Marki. Frequency of spindle whorls showing use-wear or no or undetectable use-wear ($n=128$)
Some general remarks can be made about the assemblage: whorls generally show typical use-wear marks around the perforations at narrow terminals. This is what would be expected from tools from a settlement as they are typically functional and used objects (Figure 7.2). The areas of use-wear can display different extension and depth: deeper and wider traces can be correlated with intensive or prolonged use of the artefacts.

![Pie chart](image)

*Figure 7.3. Marki. Frequency of spindle whorls by type (n=128)*

Conical/hemispherical whorls (Type I) are the most frequently occurring type and dominate the assemblage in the ECI–II, while an increase in the occurrence of Type III can be noted in the ECIII–MCI period (Figures 7.3–4) (also: Frankel and Webb 2006a, 162–163, 165). Biconical/spherical (Type II) and cylindrical whorls (Type IV) are less popular and show low percentages in the different ECI–MC periods. Regarding weight (Figures 7.5–6), very light and light spindle whorls are the most frequently occurring classes in the ECI–II, as already stated by Frankel and Webb (2006a, 162–165). Nonetheless, all weight classes are present, with the only exception being the very heavy examples (> 90g). The ECIII–MCI whorls are more evenly distributed among light, medium and heavy classes. It is noteworthy that the 18–36g weight class remains the most popular category throughout all periods, including the MCII. The relationship between weight and diameter shows that light and medium whorl diameters are < 60mm, while medium heavy and heavy classes display a more varied range of diameters (Figure 7.8).
Figure 7.4. Marki. Frequency of whorl types by periods (n=128)

Figure 7.5. Marki. Histogram of the weight classes (n=122)

Figure 7.6. Marki. Weight classes by periods (n=122)
Concerning the rotation, MI values of ECI–II whorls range between 5.6g/cm² and 112.4g/cm² (mean: 44.6 g/cm²), while ECIII and MCI–II show more differentiated rotational inputs and their values are generally higher (between 9.3g/cm² and 319.5g/cm², mean: 90.7g/cm²). RS values of early whorls are homogeneously distributed across the classes, indicating a different proportion between height and diameter and hence differences in the rotational speed. Instead, most ECIII and MCI–II show values between 0.66 and 0.88, suggesting that a medium/fast rotation for these tools was preferred (Figure 7.7).

Differentiation between the ECI–II and the later periods can be made through shaft thickness which are considerably thinner in the ECI–II, but range between 8mm and 14mm in the ECIII and MC phases (Figures 7.9–10). The overall appearance and operation of the ECI–II spindles,
even when using spindle whorls of the same weight, may thus have been different. Although earlier whorls tended to be lighter, spindle whorls at Marki can be associated with the production of a vast range of yarn types for all functions from fine to very thick thread.

Figure 7.9. Marki. Variation ranges of the diameters of perforations (n=128)

Figure 7.10. Marki. Variation ranges of the diameters of perforations by periods (n=128)

Loom weights
The Marki assemblage of loom weights is the largest on the island but very fragmentary, hampering an analysis of the operation of these tools (Figure 7.11). Only a limited number are complete or sufficiently preserved for a confident reconstruction of weight and thickness (base diameter). Six weights are complete, seven are more than two thirds preserved, and 17
correspond to more than one third or one half of the original objects (Frankel and Webb 2006a 175, tab. 5.4).

Figure 7.11. Marki. Selection of loom weights (top: P16357, P12404, P16013, P2001, P16322; bottom: P12404, P10855, P10857, P8457, P8923)

Ca 80% of these artefacts (60) come from contexts dated to ECIII–MCI; earlier EC levels yielded only four examples, and one loom weight came from a MCII unit (Frankel and Webb 2006a, 176). Frankel and Webb (2006a, 176, 177 fig. 5.10) identified three weight categories (500–1000g, 1000–1500g, and 1500–2000g) among the complete and nearly complete objects. The categories used in this study have slightly narrower ranges of 400g and are based on a larger sample of 30 loom weights for which these measurements could be obtained. Peaks in very heavy categories (> 1200g) are evident. Lighter loom weights fall into categories normally considered as heavy (400–800g, 800–1200g) and would have been suitable to produce coarse fabrics as high tensions requires the use of thicker threads (Andersson et al. 2015, 193) (Figure 7.12). As the early examples do not exceed 1000g, Frankel and Webb (2006a, 176) suggest that an increase of the mean weight throughout time is visible. However, as noted for the Philia sample (§6.2.2), the ECI–II assemblage is too small to allow quantitative analysis. Even if ECIII–MC loom weights tend to fall into heavier categories, the weight of some tools overlaps with earlier examples.
Figure 7.12. Marki. Histogram of the weight classes for the loom weights (n=60)

Loom weights typically work as sets but the majority of those found at Marki – and, generally, in EC–MC sites – were single objects; very few groups (maximum four artefacts) are recorded (Frankel and Webb 2006a, 176–177). The three largest groups of loom weights were retrieved from Units L-I and XCVI-5, in phases F-1 and H-I (ECIII–MC I), and IX-5, phase G-I (MCII). Given the fragmentary state of some of the objects in these groups, it is not possible to evaluate the relationship between their weights and base thicknesses, and verify whether they had been used as a set (e.g. Erimi [§7.5.1]). Complete loom weights from different classes, even if single finds, were used as examples for the calculation of warp tension (Tables 7.2–5). This allows us to understand which fabric types were more likely woven, and whether there were differences in loom setups. Loom weights weighing less than 800g could have been used with tensions between 30g and 60g, artefacts belonging to the 800–1200g category could be optimally operated with a tension of 50–60g (Tables 7.2–3), and very heavy loom weights (1200–2000g) (Tables 7.4–5) can be associated with very high tensions of more than 60g or 70g. Yarn used as the warp for this extremely heavy category must have been sufficiently strong to bear these tensions without breaking or excessive stretching (Andersson et al. 2015, 193). Generally, all these categories are suitable to produce coarse fabrics using thick thread, but the last two seem to be specifically targeted at the production of particularly ‘heavy’ fabrics.
<table>
<thead>
<tr>
<th>Warp thread tension</th>
<th>10g</th>
<th>20g</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
</tr>
</thead>
<tbody>
<tr>
<td>WrT/LW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>752/10 = 75.2</td>
<td>752/20 = 37.6</td>
<td>752/30 = 25</td>
<td>752/40 = 18.8</td>
<td>752/50 = 15</td>
<td>752/60 = 12.5</td>
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<tr>
<td>WrT/ 2 LW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>75 x 2 = 150</td>
<td>38 x 2 = 76</td>
<td>25 x 2 = 50</td>
<td>19 x 2 = 38</td>
<td>15 x 2 = 30</td>
<td>13 x 2 = 26</td>
</tr>
<tr>
<td>WrT/cm</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>150/7.7 = 19</td>
<td>76/7.7 = 10</td>
<td>50/7.7 = 6</td>
<td>38/7.7 = 5</td>
<td>30/7.7 = 4</td>
<td>26/7.7 = 3</td>
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<tr>
<td>Loom setup</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Optimal</td>
<td>Optimal</td>
<td>Possible</td>
<td>Possible</td>
</tr>
</tbody>
</table>

Table 7.2. Marki. Complete loom weight P8459. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weight in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup

<table>
<thead>
<tr>
<th>Warp thread tension</th>
<th>10g</th>
<th>20g</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
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<tbody>
<tr>
<td>WrT/LW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1205/10 = 120.5</td>
<td>1205/20 = 60.2</td>
<td>1205/30 = 40.1</td>
<td>1205/40 = 30.12</td>
<td>1205/50 = 24.1</td>
<td>1205/60 = 20</td>
</tr>
<tr>
<td>WrT/ 2 LW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>121 x 2 = 242</td>
<td>60 x 2 = 120</td>
<td>40 x 2 = 80</td>
<td>30 x 2 = 60</td>
<td>24 x 2 = 48</td>
<td>20 x 2 = 40</td>
</tr>
<tr>
<td>WrT/cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>272/7.7 = 35</td>
<td>120/7.7 = 15</td>
<td>80/7.7 = 10</td>
<td>60/7.7 = 8</td>
<td>48/7.7 = 6</td>
<td>40/7.7 = 5</td>
</tr>
<tr>
<td>Loom setup</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Possible</td>
<td>Optimal</td>
</tr>
</tbody>
</table>

Table 7.3. Marki. Complete loom weight P5395. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weight in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup

<table>
<thead>
<tr>
<th>Warp thread tension</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
<th>70g</th>
<th>80g</th>
</tr>
</thead>
<tbody>
<tr>
<td>WrT/LW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1460/30 =</td>
<td>1460/40 =</td>
<td>1460/50 =</td>
<td>1460/60 =</td>
<td>1460/70 =</td>
<td>1460/80 =</td>
</tr>
</tbody>
</table>
Table 7.4. Marki. Complete loom weight P6193. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weight in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup

<table>
<thead>
<tr>
<th></th>
<th>48.6</th>
<th>36.5</th>
<th>29.2</th>
<th>24.3</th>
<th>20.8</th>
<th>18.2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WrT/ 2 LW</strong></td>
<td>49 x 2 = 98</td>
<td>37 x 2 = 74</td>
<td>29 x 2 = 58</td>
<td>24 x 2 = 48</td>
<td>21 x 2 = 42</td>
<td>18 x 2 = 36</td>
</tr>
<tr>
<td><strong>WrT/cm</strong></td>
<td>98/8.4 = 12</td>
<td>74/8.4 = 9</td>
<td>58/8.4 = 7</td>
<td>48/8.4 = 6</td>
<td>42/8.4 = 5</td>
<td>36/8.4 = 4</td>
</tr>
<tr>
<td><strong>Loom setup</strong></td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Possible</td>
<td>Optimal</td>
<td>Optimal</td>
</tr>
</tbody>
</table>

Table 7.5. Marki. Complete loom weight P15106. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weight in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup

<table>
<thead>
<tr>
<th>Warp thread tension</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
<th>70g</th>
<th>80g</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WrT/LW</strong></td>
<td>2018/30 = 67.2</td>
<td>2018/40 = 50.4</td>
<td>2018/50 = 40.36</td>
<td>2018/60 = 33.6</td>
<td>2018/70 = 28.8</td>
<td>2018/80 = 25.2</td>
</tr>
<tr>
<td><strong>WrT/ 2 LW</strong></td>
<td>67 x 2 = 134</td>
<td>50 x 2 = 100</td>
<td>40 x 2 = 80</td>
<td>33 x 2 = 66</td>
<td>29 x 2 = 58</td>
<td>25 x 2 = 50</td>
</tr>
<tr>
<td><strong>WrT/cm</strong></td>
<td>134/8 = 17</td>
<td>100/8 = 13</td>
<td>80/8 = 10</td>
<td>66/8 = 8</td>
<td>58/8 = 8</td>
<td>50/8 = 6</td>
</tr>
<tr>
<td><strong>Loom setup</strong></td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Possible</td>
<td>Possible/Optimal</td>
</tr>
</tbody>
</table>

Figure 7.13. Marki. Variation ranges of perforation diameters of the loom weights (n=30)
Perforation diameters range between 5–10mm and 10–15mm (Figure 7.13). They are large enough to attach the loom weight directly to multiple threads of the warp or tie a cord around the hole to suspend them from a selected group of warp threads. Some of the Marki weights show vertical grooves from the apex to the perforation, which seem expedient to ensure more stability of the weights when attached to the warp threads, especially during the change of shed (also: Frankel and Webb 2006a, 176). Grooves may also have facilitated the loom set up, as large and heavy loom weights are normally more difficult to arrange. As regards the placement of perforations, they are placed between 30mm and 70mm below the apex (also: Frankel and Webb 2006a, 176). Depending on the location, weights may have been more stable and balanced or less. Marked differences between the locations of perforations possibly indicates that weights belonged to different sets. As observed in Chapter 4, the more homogenous sets of loom weights are the more uniform the distribution and the more balanced a tension can be applied to the warp thread.

*Needles*

Thirty metal and four bone needles not only cast some light on sewing but also provide indirect evidence for the types of thread and fabrics used at Marki (Figure 7.14). Unfortunately, only tips are preserved for eight of the artefacts. These fragmentary artefacts were categorised as needles by Frankel and Webb (2006a, 189, 188 tab. 5.21) and will be included in this analysis, with the caveat that they might have been part of other pointed objects (e.g. pins).

*Figure 7.14. Marki. Selection of bone and metal needles (object numbers indicated on the picture)*
As with spindle whorls and loom weights, needles were retrieved from all levels of the settlement. The vast majority is dated to the ECIII–MCI, and only two examples were from ECI–II levels and one from a MCII context (Frankel and Webb 2006a 188–189, 188 tab. 5.21). This unbalanced distribution does not allow us to trace possible changes in the tool design through time.

![Figure 7.15. Marki. Variation ranges of the length in metal needles (complete and almost complete artefacts; n=21)](image)

![Figure 7.16. Marki. Variation ranges of the eyelet diameters in metal needles (n=22)](image)

Frankel and Webb (2006a, 189) describe the ECIII–MCI/II metal needles as “similar in form and shape to their Philia and ECI/II predecessors”, but “generally longer and thinner”. However, the Philia needles and the two ECI–II examples show mean lengths only slightly shorter than later artefacts. Likewise, they are comparable in cross section diameters (1mm to 2mm) to later examples (§6.2.3). Referring to their lengths, they fall into the two main
categories identified for ECIII–MCI/II needles (Figure 7.15). The majority of the ECIII–MCI/II needles show eyelets with diameters ranging between 0.5mm and 1.5mm (Figure 7.16). Only four of the earlier needles had the upper end preserved, and their holes are 0.5mm and 1.5mm in size.

Bearing in mind the limitations imposed by the small quantity of surviving needles, Marki needles do not seem to show a marked change through time. This does not necessarily mean that sewing, in terms of gestures and techniques, remained unchanged. Nonetheless, the fact that tools with a perforation between 0.5mm and 1.5mm continue to occur throughout all periods highlights that they were used for a specific and enduring range of threads. The perforation range ensured that a variety of thread thicknesses could be accommodated, with a preference for medium and medium thick thread. Thinner thread can evidently pass through larger eyelets, but needles of these lengths and thicknesses are not optimal for sewing fine fabrics (Figure 7.17). As light thread is not suitable for sewing medium and heavy fabrics, all the needles were most likely used for medium to coarse fabrics and with the use of at least medium thick thread. As indicated by Figure 7.18, the thickness of the cross sections is not directly related to an increase in length, possibly meaning that needles of different lengths but with the same thicknesses were used for sewing fabrics of the same density.

*Figure 7.17. Marki. Scatterplot illustrating the relationship between length and eyelet diameter in metal needles (n=22)*
Some needles are bent (e.g. M11, M17, M18). It is not always possible to recognise whether the bending was intentional, accidental, or post-depositional. Modern bent needles are of different design and normally intended for upholstery and tapestry. If modification of the Marki needles was intentional, they would have been re-adapted for more specific sewing activities. Little stylistic variation can be observed between the Marki needles: when preserved, butts are generally either flattened or round, but this does not seem to be a chronologically-sensitive characteristic. The cross-sections are generally oval, but bone needles appear wider and flatter than their metal counterparts. The length of the only complete bone needle example is 80mm and it is therefore shorter than the mean length of metal needles (98mm). Upon observation under microscopy (300x), two bone needle fragments show possible use-wear with marks comparable to the ones observed for the Chalcolithic sample (§6.1.3) and typically produced by contact with vegetable fibres. Given their flat cross-sections, these could have been used, for example, to weave corded textiles.

Fabric remains

A small fragment of a textile pseudomorph was found on metal razor M43 from Unit XCIV-2 (ECIII/MCI–II) (Frankel and Webb 2006a, 189, pl. 53) (Figure 7.19). The whole fragment, belonging to a textile in contact with the metal artefact or used to wrap it, shows a total of four warp threads and three weft threads only. The thread diameter is ca. 0.8/0.9mm, and the fibre type is unknown. The direction of spin is barely visible but seems clockwise (‘Z’); if so, it would be different from the other EC–MC pseudomorphs (Landenius Enegren 2018, 30–32).

26 The use-wear marks observed are very slight due to the poor preservation of the objects’ surfaces.
All EC–MC textile fragments, however, have in common the weave technique which is tabby (Appendix IV). Even though the fragment is very small, it is important as the only textile remains so far discovered from a settlement context.

Figure 7.19. Marki. Textile pseudomorph on metal razor M43. Microscope picture: detail of the mineralised textile (20x [bar meter 10 mm])

7.1.2 Tools and contexts
Thirty-one out of the 54 excavated units, most of which are part of Compounds 3, 8, 9, 13, 24, 29, and 32, produced textile tools (Appendix Tables 33–34). These were found particularly concentrated in interior spaces, but some spindle whorls and loom weights were also retrieved from secure contexts in open areas, especially courtyards (Frankel and Webb 2006a, 160) (Figures 7.20, 7.22). In the majority of cases, textile tools are isolated finds, and groups of the same tool types or associations with different textile artefacts only occur occasionally. However, these connections have proven crucial to understanding the nature and organisation of textile production at Marki, especially when they belonged to use and abandonment contexts (Frankel and Webb 2006a, 160).
Spindle whorls were found more frequently as single objects. However, some significant ‘groups’, occasionally in association with other tools, were retrieved within single units. Assemblages of whorls do not exceed four tools, but more often contain two artefacts (Frankel and Webb 2006a, 160) (Table 7.6). Webb (2018a, 273) has recently noted that single chamber tombs excavated by Markides at Lapithos produced the same number of whorls and proposed that spinning sets used by single spinners may be composed of two to four whorls. Concerning possible spinning kits at Marki, it can be observed that whorls from the same domestic units can generally be classified into different weight categories: for example, the four spindle whorls from Unit X-5 belong to four different weight classes (very light, medium, heavy, and very heavy). When found in pairs, whorls belong to light and medium classes but never to heavy-weighted categories. Very heavy and very light whorls, which correspond to the most specialised categories, appear in groups of three or four. Given the quantity and types of spindle whorls, it can thus be hypothesised that these potential kits could satisfy the yarn need of a household, allowing the spinners to obtain threads of various thicknesses from different fibre types.

<table>
<thead>
<tr>
<th>Period</th>
<th>Units with two whorls</th>
<th>Units with three whorls</th>
<th>Units with four whorls</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECI-II</td>
<td>CHA-1, C-I, CXX-10</td>
<td>CII A-1</td>
<td>-</td>
</tr>
<tr>
<td>ECHII-MCI</td>
<td>XVI-3, 603, LXI-2, L-4, L-7, LXII-5, LXII-6, XIII-5, LVII-5, CII-2, XC-I, XCVI-5, CXXI-2</td>
<td>X-5, XCV-2</td>
<td>LXVI-5, CXX-4</td>
</tr>
<tr>
<td>MCH</td>
<td>CIII, CIII-1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Table 7.6. Marki. Table illustrating the units that yielded more than one whorl*

The Marki whorls are classified into sub-groups according to shape and decoration, with many of them sharing similar arrangements of decorative motifs (Frankel and Webb 2006a, 159–175). Whorls retrieved from the same units do not normally belong to the same sub-groups and look different in terms of shape and decoration. In some cases, however, they show recurrent motifs, even though they belong to different sub-groups: for example, whorls P16042, P16043, and P1097 from Unit CXX-4 are all characterised by arcs on broad terminals and zigzags on bodies.
Undecorated whorls are distributed equally among groups, with generally one or, more infrequently, two undecorated examples per unit (Figure 7.21). As noted in Chapter 3.2, regional pottery styles emerged from the EC, and the adoption or development of characteristic regional shape and decoration types of spindle whorls mirrors this pattern (Frankel and Webb 2006a, 174–175). The presence of stylistic feature typical of the neighbouring areas (north and south coast respectively) led Frankel and Webb (2006a, 175) to suggest a more dynamic and intense interaction between Marki and other centres, starting from the ECIII. Specifically, they relate the appearance of north and south-styled whorls to the movement of spinners, who, in the minds of the authors, were women moving to a new community as brides (Frankel and Webb 2006a, 175) (Chapter 3.2). This question will be further discussed in Chapter 9. For the purpose of this overview chapter, it is important to note that it is not possible to identify individuals or determine their gender on the basis of the Marki record alone. As also suggested by Frankel and Webb (2006a, 175), whorls with similar forms and decorations could be related to kin groups and social identity. According to this logic, spindle whorls from the same contexts should be associated with the kin groups who lived in those spaces, and, therefore, would show more homogeneity in terms of decoration and shape. At Marki, however, these kinds of patterns are not immediately detectable, and whorls
displaying similar decoration only rarely come from the same household units or areas. The majority of whorls at Marki were made in a local fabric, though some certain or possible imports exist (e.g. P3814, P7272; P9757, P8422, P14224, P14429, P14000) which, according to style and fabric types, came from the north coast.

Figure 7.21. Marki. Undecorated spindle whorls P11207, P7357, P7356, P11673 (EC I–II and EC III/ MCI–II)

Figure 7.22. Marki. Plan of Compound 29, Phase G with artefacts found on the floor (textile tools are highlighted) (modified from Frankel and Webb 2012, 482 fig. 5)
As regards loom weights, little information can be deduced from those found in groups because of their very fragmentary state. Needles are often single finds at Marki (Appendix Table III.33). However, the association of loom weights with spindle whorls and needles in Units L-1, L-2, and XCVI-5 suggest (as expected) that tools for spinning, weaving and sewing were part of the household assemblage (Appendix Tables III.33–34). In addition, non-specific indicators could not be identified as used for textile production, lacking direct proof that some typically domestic artefacts (e.g. cooking pots, liquid processing vessels and installations) were also employed in textile activities. The fact that some units yielded more tools or more complex associations can only be related to the “depositional history” of the compounds and does not refer to a different level of specialisation as clearance of units upon refurbishment or abandonment is documented at Marki (Frankel and Webb 2006a, 29–88). For this reason, a higher presence of spindle whorls and loom weights than average may not be indicative of an increased level of specialisation.

The fact that textile tools were found predominantly in interior spaces may indicate that these correspond to working areas, as evidenced for many domestic activities at Marki (Frankel and Webb 2006a, 311–313). Nevertheless, we must bear in mind that textile tools are very rarely found in use or in situ but are most often found in their storage places or displaced. In addition, the presence of spindle whorls and loom weights in courtyards may indicate that outside spaces were also used for textile production. In any case, given the fact that the Marki courtyards were walled and probably used by a restricted number of families of the same kin, textile production seems to be firmly linked to the private sphere (Appendix II).

### 7.2 Alambra Mouttes: techno-functional and contextual analysis of the indicators

<table>
<thead>
<tr>
<th>Tool, structure</th>
<th>Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific</td>
<td>Spindle whorl</td>
<td>Thread making</td>
</tr>
<tr>
<td>Specific</td>
<td>Loom weight</td>
<td>Weaving</td>
</tr>
<tr>
<td>Specific</td>
<td>Needle</td>
<td>Sewing</td>
</tr>
</tbody>
</table>

*Table 7.7. Alambra. Archaeological indicators for textile production*

The next site examined is Alambra (Table 7.7). Sixty-five spindle whorls were reported as collected by the Cornell team from survey and excavations in Areas A and C (Mogelonsky and Bregstein 1996, 205), while all four loom weights were retrieved from Area A (Mogelonsky
Five bone and six metal needles were recovered from Area A and the tombs (Coleman et al. 1996, 121, 134–136).

7.2.1 Techno-functional analysis

Spindle whorls

The majority of spindle whorls at Alambra are truncated biconical/spherical (Type III), while the remaining types are almost equally represented in the assemblage (Figures 7.23, 7.24). Approximately 55% of the whorls from the settlement and survey show use-wear around the narrow perforations (Figure 7.25). It must be noted, however, that the assemblage includes many fragmentary artefacts, upon which use-wear is impossible to detect.

Figure 7.23. Alambra. Selection of spindle whorls of different types and sizes (top: E67+E68, E75, E53; bottom: E50, E32, E42, E33)

<table>
<thead>
<tr>
<th>Weight class (g)</th>
<th>MI (g/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very light to medium-light (0–36)</td>
<td>10.5–46.8</td>
</tr>
<tr>
<td>Medium and medium-heavy (37–72)</td>
<td>49–184.3</td>
</tr>
<tr>
<td>Heavy and very heavy (73–120)</td>
<td>143.7–532</td>
</tr>
</tbody>
</table>

Table 7.8. Alambra. Correlation between whorls’ weight classes and MI values

---

27 E67 and E68 were considered distinct artefacts (Mogelonsky and Bregstein 1996, 205) but are, in fact, two joining halves of the same object.

28 Additional textile tools (one whorl, an unspecified number of loom weights and one needle) were retrieved from the ‘Gjerstad’s House’, but their whereabouts are unknown and descriptions are not provided (Gjerstad 1926, 19–27, 34; Stewart 1962, fig. 95.16; see also Crewe 1998, 94 ‘ALAMBRA 1’, fig. A2.16).
Figure 7.24. Alambra. Pie chart illustrating the distribution of spindle whorl by types (n=64)

Figure 7.25. Alambra. Frequency of spindle whorls showing use-wear or no/undetectable use-wear (n=65)

Whorls’ heights range between 6mm and 53mm (mean: 33.6mm), and maximum diameters vary between 13mm and 58mm (mean: 39mm). Graphs illustrating the weight classes elaborated for the whole assemblage (Area A, other trial trenches, and survey) and spindle whorls from Area A show very similar tendencies: in both cases, almost 50% of whorls belong to light (18–36g) and medium (37–54g) classes (Figures 7.26). The category of very heavy whorls (> 90g) is also well-represented, with a larger percentage than at contemporary sites (e.g. MC Marki [§7.1.1]), increasing the mean value to 57g. Figure 7.27 compares weights and diameters of spindle whorls, showing that the diameter tended to increase with weight. Tools weighing 30–50g show a varied range of diameters, suggesting that they can be related to a different outcome.
Heavy whorls tend to have larger perforations than lighter artefacts, meaning that they necessitated thicker and probably longer shafts for operating optimally. So far, these are the largest perforations registered in the EC/MC record. In general, the Alambra whorls show perforations between 10mm and 14mm, suggesting a preference for relatively thick shafts (Figure 7.28). The RS graph shows a neat peak for medium values, indicating that whorls displayed a proportional height:diameter ratio, and MI values range between 10.5g/cm² and 532g/cm² (Table 7.8, Figure 7.29). These values suggest that spindles rotated with different speeds, but most were not too fast rotating tools. In general, the Alambra assemblage is suitable for spinning a great variety of yarn products, including thin thread, and, possibly, with different types of fibres. However, the high presence of very heavy tools suggests that a significant part of yarn production was aimed at making or plying thick thread.
Figure 7.28. Alambra. Variation ranges of spindle whorls' diameters of perforation (n=57)

Figure 7.29. Alambra. Histogram illustrating the distribution of spindle whorls based on the RS values (n=47)

Loom weights

Loom weights are rare and fragmentary finds at Alambra. E206 and E207 are from the occupation floor of Room 8 (Mogelonsky 1996, 234), but it is unlikely that they belonged to the same set as their reconstructed mass indicates that one had twice the weight and their base diameters (thickness) varied by 20mm. Instead, E208 and E209 belong to the same weight class as E207 (Figure 7.30). Calculations of warp threads per loom weight and cm² were made for E206 and E207 to determine the best loom set up, assuming that loom weights of the same type and weight would have been used (Tables 7.9–7.10). Loom weights weighing 550g would optimally work with a warp thread tension of 40g, while loom weight weighing 1000g would work with a warp thread tension of 50g and 60g. Warp tensions of 50–60g can be associated with the production of tabby fabrics with 3 or 4 threads per cm², while the
application of higher tensions would probably result in a coarse but not necessarily dense fabric (Mårtensson et al. 2009, 389–390).

![Figure 7.30. Alambra. Conical loom weights (E206–209)](image)

<table>
<thead>
<tr>
<th>Warp thread tension</th>
<th>10g</th>
<th>20g</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
</tr>
</thead>
<tbody>
<tr>
<td>WrT/LW</td>
<td>534/10 = 53.4</td>
<td>534/20 = 26.7</td>
<td>534/30 = 17.8</td>
<td>534/40 = 13.3</td>
<td>534/50 = 10.6</td>
<td>534/60 = 8.9</td>
</tr>
<tr>
<td>WrT/LW 2</td>
<td>53 x 2 = 106</td>
<td>27 x 2 = 54</td>
<td>18 x 2 = 36</td>
<td>13 x 2 = 26</td>
<td>11 x 2 = 22</td>
<td>9 x 2 = 18</td>
</tr>
<tr>
<td>WrT/cm</td>
<td>106/7 = 20</td>
<td>54/7 = 10</td>
<td>36/7 = 7</td>
<td>26/7 = 5</td>
<td>22/7 = 4</td>
<td>18/7 = 3</td>
</tr>
<tr>
<td>Loom setup</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Possible</td>
<td>Optimal</td>
<td>Possible</td>
<td>Unlikely</td>
</tr>
</tbody>
</table>

*Table 7.9. Alambra. Loom weight E206. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weighs in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup*

<table>
<thead>
<tr>
<th>Warp thread tension</th>
<th>10g</th>
<th>20g</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
</tr>
</thead>
<tbody>
<tr>
<td>WrT/LW</td>
<td>1003/10 = 100.3</td>
<td>1003/20 = 50.1</td>
<td>1003/30 = 33.4</td>
<td>1003/40 = 25.7</td>
<td>1003/50 = 20</td>
<td>1003/60 = 16.71</td>
</tr>
<tr>
<td>WrT/LW 2</td>
<td>100 x 2 = 200</td>
<td>50 x 2 = 100</td>
<td>33 x 2 = 66</td>
<td>26 x 2 = 52</td>
<td>20 x 2 = 40</td>
<td>17 x 2 = 34</td>
</tr>
<tr>
<td>WrT/cm</td>
<td>200/7 = 29</td>
<td>100/7 = 14</td>
<td>66/7 = 9</td>
<td>52/7 = 7</td>
<td>40/7 = 6</td>
<td>34/7 = 5</td>
</tr>
<tr>
<td>Loom setup</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Possible</td>
<td>Optimal</td>
<td>Optimal</td>
</tr>
</tbody>
</table>

*Table 7.10. Alambra. Loom weight E207. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weight in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup*
Needles
Six complete or fragmentary metal needles (A37, A4–A8) from T. AL. 104 and the settlement are listed in the final site report (Coleman et al. 1996, 121, 134–136) (Figure 7.31). Regarding the fragmentary artefacts, only A4 can be securely classified as a needle as it is an eyelet part. The remainder are metal tips which may have belonged either to needles or pins (Weinstein-Balthazar 1990, 237, 403, tab. 160; Coleman et al. 1996, 135). Regardless of their ultimate type, the diameters of their cross sections (1.5–3mm) indicate that they were suitable to sew or fasten medium and, perhaps, relatively dense fabrics without damaging the weave. In contrast, A37 shows a thicker cross-section (4mm). This complete artefact can be categorised as a long needle with a slightly elongated eyelet (2.8x1mm) and could have been used on less dense fabrics.

Figure 7.31. Alambra. Complete bone needles D1 and D12, and metal needle A37
Bone needles D2, D3, D11 are a thick with large perforations and could have been used to sew coarse, open fabrics, matt/corded textiles, or as a weaving/tapestry needle, while the wedge-shaped examples (D1 and D12, and fragmentary D15) were more suitable for working harder materials (basketry, leather?). Microscopy was conducted on these objects to detect use-wear traces, but the surface of all the examined tools were extremely damaged: no or very scanty traces (incoherent striations) could be observed, and their interpretation remains uncertain.

7.2.2 Tools and contexts
Tools for textile production are present at Alambra but are not distributed evenly across the site. Textile tools appear to have been particularly common in Area A where it they have been found in most units (Coleman et al. 1996, 37–107). Concerning the location of spindle whorls, 48 were found inside the buildings, but only 25 were from stratified contexts (Appendix Tables 35–36). Table 7.11 lists tools found in occupational floor layers. In general, spindle whorls were found on floors only in seven rooms belonging to four buildings; the remainder
were mainly from the stratified fillings above floors. As only one occupational phase is
normally detected at Alambra, these artefacts were likely to have belonged to the units’
assemblages.

<table>
<thead>
<tr>
<th>Building</th>
<th>Room</th>
<th>Textile tools from floors</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2</td>
<td>1 (N)</td>
</tr>
<tr>
<td></td>
<td>2'</td>
<td>2 (S)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1 (S)</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>1 (S)</td>
</tr>
<tr>
<td>III</td>
<td>9</td>
<td>1 (S)</td>
</tr>
<tr>
<td>IV</td>
<td>8</td>
<td>1 (S) + 2 (L)</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>1 (S)</td>
</tr>
<tr>
<td>V</td>
<td>15/18</td>
<td>1 (S)</td>
</tr>
<tr>
<td>VI</td>
<td>17</td>
<td>1 (S)</td>
</tr>
</tbody>
</table>

Table 7.11. Alambra. Table of buildings and rooms with textile tools from occupational floors (L=loom weight, N=needle, S=spindle whorl)

As observed for Marki, whorl assemblages from the same units or buildings show different
weights and may therefore have been part of a domestic kit with tools suitable for different
making different types of threads (§7.1.2). Loom weights E206 and E207 were from Room 8
in Building IV, from the same context as spindle whorl E21, while the E208 and E209 were
not found in association with other textile tools. Needles were mostly retrieved from the fill
deposits of the same rooms that yielded other textile tools, but only D2 was from a floor.
Given the shallow nature of archaeological deposits at Alambra – typical also of many other
single-phased EC/MC sites (e.g. Sotira) – whorls from fill layers are likely to belong to the
domestic units from which they were retrieved (Figure 7.32).

Concerning the social context of spindle whorls, it can be noted that the assemblage shows a
high percentage of undecorated objects, especially when compared with Marki, Sotira and
Erimi (for which undecorated whorls are generally around 30%) (Figure 7.33). In addition, the
decorated examples display minimal, often roughly executed motifs, suggesting that this was
not an important aspect of these tools at Alambra. Instead, seven whorls (E42, E18, E23, E25,
E27, E52, E32) with more detailed decoration are probably imported from the north coast as
their fabric is typical of that area (Figure 7.34). These artefacts indicate contact with the north
coast, and a probable presence of spinners from that area. Their appearance, which is very
different from the local style, highlights the deep differences in style, and, possibly, also in the 
social meaning of these objects between the two neighbouring regions.

Figure 7.32. Alambra. Plan illustrating which rooms yielded textile tools from floors or fills (from  
Appendix Table III.36)

Figure 7.33. Alambra. Pie chart illustrating the ratio of decorated and undecorated whorls (n=77)
Figure 7.34. Alambra. Spindle whorls imported from the north coast (AO275 and AO397)

Turning to the burial contexts, two of the six tombs excavated by the Cornell team, T.AL.102 and T.AL.104, offer additional information to explore the significance of textile production at this site. Whilst neither of the tombs yielded spindle whorls, one metal (A37) and one bone needle (D11) were discovered from T.AL.104, while two bone needles (D12–13) were from T.AL.102 (Coleman et al. 1996, 118, 121). The two tombs belong to the same cluster and are spatially associated (Coleman et al. 1996, 118). T.AL.102 is intact with a male burial and scattered human remains from a secondary deposition of a woman. The two bone needles were found 45 cm from the skull of the primary burial, in association with another four copper artefacts, which are thought to belong to the deceased male (Coleman et al. 1996, 118; Domurad 1996, 515–516). Although partially looted, the metal and bone needles from T.AL.104 can also be related to a male individual (Coleman et al. 1996, 121; Domurad 1996, 516–517).

7.3 Politiko Troullia: techno-functional and contextual analysis of the indicators

<table>
<thead>
<tr>
<th>Tool, structure Indicator</th>
<th>Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific</td>
<td>Spindle whorl</td>
<td>Thread making</td>
</tr>
<tr>
<td>Specific</td>
<td>Needle</td>
<td>Sewing (weaving, etc.)</td>
</tr>
</tbody>
</table>

Table 7.12. Politiko. Archaeological indicators for textile production

The site of Politiko is divided into Politiko West and Politiko East. A significant number of spindle whorls (40) and needles (15) represents the textile production at Politiko. However, no terracotta loom weights were discovered. The Politiko material has not been fully published, but a preliminary account and interpretation of these tools are available in the form of articles
(Falconer and Fall 2013a, 110, 113; 2014, 172, 175–176). The following sections therefore represent the first complete analysis of the textile assemblage (Table 7.12). As the stratigraphy of the site is currently under study, the contextual analysis must be considered as preliminary. Phases W1–W5 refers to the stratigraphy of Politiko West: W1 is the most recent phase investigated, while W5 the oldest one identified (Falconer et al. 2014, 4).  

7.3.1 Techno-functional analysis

Spindle whorls

The whorl assemblage comprises 37 objects from Politiko West and three from Politiko East. The material from the latter area was unavailable for analysis, but according to site documentation includes only three small fragments. Artefacts from Politiko East are few and incomplete, permitting little insight into textile production in this area. Our discussion will therefore be mainly based on the sample from Politiko West (Figure 7.35). In general, the fragmentary nature of the assemblage affected the visibility of use-wear traces, which could not be detected on a relevant number of spindle whorls due to the scarce conservation of terminal parts. For the same reason, it is not always possible to identify the whorls’ shape and obtain full measurements. Concerning the near-complete artefacts, most showed typical chipping and abrasion around narrow terminals, with an extended area of abrasion observable in a few cases. The fact that most of the whorls lack complete measurements affected the calculations of the RS and MI for a number of whorls, and the details that could be obtained are not representative of the entire assemblage.  

Conical/hemispherical (Type I) and truncated biconical/spherical (Type III) whorls combined correspond to 87% of the assemblage (Figure 7.36). Heights range between 18mm and 48mm (mean 33.9mm), and maximum diameters vary between 19mm and 58mm (mean: 41.5mm). In terms of weight, medium and medium light weighted whorls are the most common classes (Figure 7.37). However, the presence of medium heavy and heavy whorls is significant as whorls weighing more than 73g represent 38% of the sample. Moreover, the relatively high occurrence of very heavy examples (> 90g), a category that is significant at nearby Alambra.

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29 Only W1 and W2 have been fully exposed over the entire area investigated (Falconer et al. 2014, 4).
30 A modified sherd was also considered a possible whorl. As explained in Chapter 4.2.3, we excluded this category of artefacts from this study.
31 MI and RS values that could be calculated are reported in Appendix Table III.12.
but less frequently recorded at contemporary sites across the island, is noteworthy (Crewe 1998, 34 fig. 6.5).

Figure 7.35. Politiko. Examples of spindle whorls from phases W1, W2, W3, and W5 at Politiko West

As noted already for Alambra (§7.2.1), the occurrence of heavy examples can be correlated to the production of thick thread or twine. Weight classes identified at Politiko West show a different distribution through time (Figure 7.37): while in periods W2 and W3 whorls are more equally distributed across different weight classes, medium light and medium whorls seem prevalent in period W1. A peak for heavy whorls is detectable in period W5. In addition, Figure 7.38 indicates that medium light to medium heavy classes generally display diameters between 30mm and 50mm. Diameters of perforation range between 4mm and 16mm, with the majority falling in the 10–12mm and 12–14mm categories (Figure 7.39) – heavy whorls tend

Figure 7.36. Politiko. Frequency of whorls by type (n=40)
to show larger perforations than small and medium tools, meaning that they were mounted on thicker shafts.

Figure 7.37. Politiko. Bar chart of the weight classes of the whorls retrieved from the South Courtyard by phase (n=30)

Figure 7.38. Politiko. Scatterplot of whorl weights and diameters (n=30)

Figure 7.39. Politiko. Variation ranges of perforation diameters in spindle whorls (n=35)
**Needles**

Fifteen fragmentary or complete bone needles and two metal examples were retrieved from Politiko (Figures 7.40–41). The assemblage is composed of objects different in shape and measurements and can be roughly divided into two main types that reflect different functions. One category of needles is a wedge-shaped tool with relatively thick, flat cross-sections, which may not exclusively correlate with textile production. These wedge-shaped tools show the same shape and characteristics as modern basketry needles, and they may have been used in this way. However, it must be noted that only two of them preserve a circular perforation, with a diameter of 4mm, and they are both relatively small artefacts, which seem preferable for finer work (Figures 7.42–43).

![Wedge-shaped or flat bone needles](image1)

*Figure 7.40. Politiko. Wedge-shaped or flat bone needles (PT11.28, PT11.114, PT11.30, X010.10.1, PTOB.002, PT11.24, PT11.28; PT11.22)*

![Metal needle PT-M1](image2)

*Figure 7.41. Politiko. Metal needle PT-M1*

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32 The majority come from Politiko West, and they were mainly concentrated in Alleyway 13 (phases W1, W2, W3, W5) (Appendix Table III.38).
The second category includes long or short needles with round or oval cross-sections and round eyelet perforations measuring ca 3mm (Figure 7.42). Based on their characteristics, these tools could have been used for operating on open, coarse fabrics with threads of a thickness up to 3mm or as weaving needles.\(^{33}\) The larger examples might have been used for tapestry. Two more bone needles are short and have thin cross-sections and small perforations; these are the only examples that may have been used for finer fabrics or for adding decoration. The only complete metal needle (PT-M1) is comparable to the Marki examples in terms of type and dimensions. The round perforation of PT-M1 has a diameter of 1mm, which falls into the Marki range, and its characteristics suggest that it could have functioned similarly to the Marki counterparts, most likely in relation to medium fabrics and using threads 1mm/less than 1mm thick.

Given the high quantity of deer bone retrieved from the Southern Courtyard (see Appendix II), it is tempting to hypothesise that some needles were also used for leather working; however, the use-wear analysis did not produce secure evidence of this. Three bone awls retrieved from these spaces may provide a further clue of this kind of activity (Falconer and Fall 2013a, 109 tab.5). Concerning use-wear, only slight modifications of eyelets could be detected for the bone needles (Figure 7.43). Microwear traces (especially, multi-directional striations) were visible across the surface of these tools, suggesting that they had contact with vegetable fibres (Legrand 2007, 79–80). However, when compared to the marks observed on the Chalcolithic sample, use-wear traces appeared fainter (§6.1.3).

\(^{33}\) Modern weaving needles show comparable form and variability in size.

175
7.3.2 Tools and contexts

The majority of whorls (76%) and needles (95%) come from open spaces at Politiko West, especially concentrated in the Southern Courtyard (Figure 7.44). In contrast, only one whorl was recovered from the adjacent Northern Courtyard. Alleyway 13, running along the south side of the Southern Courtyard, also yielded incomplete whorls and needles (Falconer and Fall 2013a, 109 tab. 5). One needle (P-TOB001) and three whorl fragments were collected from the domestic spaces excavated at Politiko East. Even though this is the only domestic context excavated at Politiko, the number of tools discovered is comparable to the average retrieved from Marki (§7.1.2) and Alambra (§7.2.2) units.

As for the South Courtyard, the presence and concentration of textile tools in this community space is undoubtedly noteworthy. Falconer and Fall (2014, 175) note that the whorl assemblage is not the result of discard activity but can be related to the primary use and abandonment of these tools. It must be stressed, though, that whorls and needle fragments

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34 Note that 70% is the percentage reported for whorls in Falconer and Fall 2013a (109 tab. 5; 2014, 175, 175 tab. 2). This number does not take into account the most recent finds, while this thesis considers the whole assemblage.
were retrieved from different occupation levels of the courtyard and the nearby alley. On the one hand, this could suggest continuity in the use of this space for textile activities. On the other, it cannot be established whether the tools retrieved from the levels below the top are residual. The fact that a large number of these artefacts is broken or incomplete may be a clue to the possible use and discard of these tools once they have become unserviceable.

Figure 7.44. Politiko. Southern Courtyard and Alleyway 13 (from Falconer and Fall 2013a, 105 fig. 7) and textile tool concentrations

When standardisation of products is considered, the presence of whorls with different functional parameters may be a clue of non-specialised production. Also, if we take into account their occurrence by phase, whorls range from a minimum of two in levels W3 and W5 to a maximum of 14 artefacts in level W2 (Appendix Table III.38). Although the concentration is equal or larger than the one in a domestic assemblage (e.g. Marki [§7.1.2]), it is smaller when compared to other MC complexes (see Skalia [§7.6.2]). Likewise, the needles show a range of different characteristics that make them suitable for different purposes, from fine works to sewing or weaving coarser fabrics, and, perhaps, other crafts (matt weaving, basketry).
Concerning the whorls retrieved from the Southern Courtyard, Falconer and Fall (2014, 175–176) have stressed that a concentration of such tools in a communal space can have a strong social significance. In particular, they argue that the value of these objects may have been related to the identity and social behaviours of the groups operating in this space. If decoration can be taken as an identity marker for spinners (e.g. the recurrence of motifs reflects a personal or family repertoire [Frankel and Webb 2006a, 175]), it should be noted that the ratio between decorated and undecorated whorls is higher than at contemporary sites (e.g. MC Marki [§7.1.2], Alambra [§7.2.2], and Erimi [§7.5.3]) (Figure 7.45). In this regard, it is significant that a high number of whorls (ca 29%) show fabric and decoration typical of the north coast and can be classified as imports (e.g. PT.T64; PT.T76; PT.T90 [Figure 7.36]). The presence of these objects suggests an intense connection with the north coast, and, perhaps, possibly frequent movement of spinners from that area.35

![Pie chart illustrating the ratio of decorated and undecorated whorls (n=40)](image)

Whilst no structures were found in the Southern Courtyard, other finds can help us set textile production within its wider social context of the Politiko community. Falconer and Fall (2013a; 2014) report a particularly dense deposition of animal bones in the courtyard, with a notable percentage of fallow deer. In addition, the occurrence of anthropomorphic figurines and gaming boards has led the excavators to interpret this courtyard as a focal, ‘public’ place for the local community (Falconer and Fall 2013a, 2014). Likewise, the presence of animal bones has been interpreted as meat preparation and consumption in the context of community feasting (Falconer and Fall 2013a, 114) (Appendix II). As will be discussed in more detail in

35 PT.T64 is the only whorl that pre-dates the MC (and should probably be dated to the ECIII) but comes from the latest level identified in the courtyard.
Chapter 9, the nature of this context indicates that textile activities appear deeply embedded in the community’s life and were conducted in a space different from households and together with other communal activities.

7.4 Sotira Kaminoudhia: techno-functional and contextual analysis of the indicators

<table>
<thead>
<tr>
<th>Tool, structure Indicator</th>
<th>Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific</td>
<td>Spindle whorl</td>
<td>Spinning</td>
</tr>
<tr>
<td>Specific</td>
<td>Loom weight</td>
<td>Weaving</td>
</tr>
<tr>
<td>Specific</td>
<td>Needle</td>
<td>Sewing, decorating?</td>
</tr>
</tbody>
</table>

*Table 7.13. Sotira. Archaeological indicators for textile production*

Textile production is documented by a significant presence of spinning, weaving and sewing tools in all the investigated areas at Sotira, namely 77 whorls, five loom weights and three needles (Table 7.13). Three whorls out of 77 were retrieved from tombs, and the remainder are from the settlement (Croft 2003, 448, 254 fig. 6.16: Swiny 2003b, 376, 381, 382 fig. 8.1; Walz and Swiny 2003, 397–398, 409, 408 fig. 9.2; Muti forthcoming). Only two whorls from the settlement can be securely dated to Phase I (ECI–II) (Walz and Swiny 2003, 410–411), while another 12 whorls were assigned to the Philia/early EC based on their style (Chapter 6). The ECI–II sample is thus too limited to conduct an analysis by periods, the earliest occupational levels of the settlement also showed no evidence of loom weights or needles (Croft 2003, 448; Swiny 2003b, 376; Walz and Swiny 2003, 398). However, despite the overall quantity of artifacts, no installations or any other type of archaeological indicator of textile manufacture were identified.

7.4.1 Techno-functional analysis

*Spindle whorls*

Almost half spindle whorls (47%) out of total number in the Sotira assemblage are truncated biconical (Type III) and complete diameters vary between 30mm and 51mm (mean 34mm) and heights between 10mm and 39mm (mean 24.5mm) (Figures 7.46, 7.48). A large part of

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36 One of these (TC23) is from a Philia tomb. This and a group of spindle whorls from the settlement showing distinctive Philia morpho-typology were included in the dataset of Chapter 6.

37 It must be noted that potential ECI–II types were retrieved from later contexts; these artefacts may have been re-deposited or kept in use for a long time.
the assemblage consists of fragmentary, damaged or encrusted artefacts, but characteristic use-wear (chipping and abrasion) around narrow perforations is often visible (Figure 7.47).

Figure 7.46. Sotira. Conical and truncated biconical spindle whorls (TC14, TC58, TC82, TC40, TC86). Note use-wear and extensive areas of abrasion at low terminals

![Figure 7.46. Sotira. Conical and truncated biconical spindle whorls (TC14, TC58, TC82, TC40, TC86). Note use-wear and extensive areas of abrasion at low terminals](image)

Figure 7.47. Sotira. Frequency of spindle whorls showing use-wear or no/undetectable use-wear $(n=55)$

Some whorls (TC14, TC40, and TC86) display exceptionally deep and extensive abrasion that reduced their heights and flattened their narrow ends. This kind of use-wear was probably produced by attrition against another surface and may shed more light on spinning practices or reveal a secondary use of these spinning tools. As to the first possibility, it could be the result of more than one spindle whorl having been mounted on a shaft where the two extremities of the two spindle whorls were directly placed one over the other and experienced intensive...
use. Alternatively, this wear type could be related to a secondary or parallel use of the artefacts as small grinders or pounders, even though no pitting marks or striations were observed.

Concerning weight, different classes can be identified at Sotira, ranging from very light to medium heavy. A peak in the light whorls is visible, and heavy objects are rare occurrences (Figure 7.49). However, the weight/diameter ratio suggests that whorls between 30g and 40g could have operated differently as they show a more varied range of diameters (Figure 7.50). RI values are mainly distributed between medium and high classes, indicating that the whorls did not have diameters larger than their heights and therefore acted as, tendentially, moderately fast to fast rotating tools (Figure 7.51). MI values range between 2g/cm² and

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38 Examples of archaeological and ethnographical spindles with two or more whorls are known (Ciccarelli and Perilli 2017, 148–149). We also have evidence of the peculiar ‘double’ type in the Cypriot spindle whorl record (§7.5.1). Although a rare occurrence, it could also reflect this use.
130g/cm² and confirm this trend: overall, they are considerably lower than the Alambra values, and comparable to the ones recorded for the Marki EC whorls (Table 7.14). Concerning whorl perforations, the diameters are relatively variable and range between 3–4 mm and 11–12mm (Figure 7.52). As already noted (§4.2.1), the weight of spindle whorls and the length of the shaft are correlated: the lighter the spindle whorl, the shorter and lighter is the shaft (Firth 2015, 155); at Sotira, the shafts were relatively short and light. In general, spinning practices at Sotira seem oriented toward the production of fine and tight, and medium yarn.

![Graph showing scatterplot of whorls' weights and diameters](image1)

**Figure 7.50. Sotira. Scatterplot of whorls’ weights and diameters (n=60)**

<table>
<thead>
<tr>
<th>Weight class (g)</th>
<th>MI (g/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very light to medium-light (0–36)</td>
<td>2–51.8</td>
</tr>
<tr>
<td>Medium and medium-heavy (37–72)</td>
<td>49.3–183.1</td>
</tr>
<tr>
<td>Heavy and very heavy (73–100+)</td>
<td>127–284</td>
</tr>
</tbody>
</table>

**Table 7.14. Sotira. Correlation between whorls’ weight classes and MI values**

![Graph showing histogram of RS values](image2)

**Figure 7.51. Sotira. Histogram representing the RS values of spindle whorls (n=47)**
Figure 7.52. Sotira. Variation ranges of whorls’ perforation diameters (n=60)

Loom weights

The five Sotira loom weights are very fragmentary. TC1-2, TC70, TC72, and TC96 are upper parts of conical weights in the local, coarse fabric, showing perforations of 10–15 mm with slight use-wear traces (Figure 7.53). TC97 is two-thirds preserved and was used to calculate the warp tension. Table 7.15 shows that the weight, within a set, would have operated with the same tensions observed for the Marki examples which fall in the 500–1000g category (§7.1.1).

Figure 7.53. Sotira. Loom weights TC1-2 and TC97

39 Published as representing two different artefacts, but it is most probably only one (Walz and Swiny 2003, 409).
### Table 7.15. Sotira. Loom weight TC97. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weights in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup. Calculation made on reconstructed weight (682g) and thickness (70mm). WrT= warp tension; LW= loom weight

<table>
<thead>
<tr>
<th></th>
<th>10g</th>
<th>20g</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
</tr>
</thead>
<tbody>
<tr>
<td>WrT/LW</td>
<td>682/10</td>
<td>682/20</td>
<td>682/30</td>
<td>682/40</td>
<td>682/50</td>
<td>682/60</td>
</tr>
<tr>
<td></td>
<td>68.2</td>
<td>34.1</td>
<td>22.7</td>
<td>17</td>
<td>13.64</td>
<td>11.3</td>
</tr>
<tr>
<td>WrT/2 LW</td>
<td>68 x 2 = 136</td>
<td>34 x 2 = 68</td>
<td>23 x 2 = 46</td>
<td>17 x 2 = 34</td>
<td>14 x 2 = 28</td>
<td>11 x 2 = 22</td>
</tr>
<tr>
<td>WrT/cm</td>
<td>136/7 = 19</td>
<td>68/7 = 10</td>
<td>46/7 = 6</td>
<td>34/7 = 5</td>
<td>28/7 = 4</td>
<td>22/7 = 3</td>
</tr>
<tr>
<td>Loom setup</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Optimal</td>
<td>Optimal</td>
<td>Possible</td>
<td>Possible</td>
</tr>
</tbody>
</table>

**Needles**

Three needles were identified and collected at Sotira: M30 is a metal tool, while B1 and B5 are made of bone (Croft 2003, 448, 254 fig. 6.16; Swiny 2003b, 376, 381, 382 fig. 8.1) (Figure 7.54).40 The bone needles are longer than the metal one, but all show thin, round cross-sections and tiny eyelets. M30 is broken through the eyelet, which is represented by a slight incurve and cannot be measured accurately. However, the perforation must have been very thin as its preserved width is 0.5mm. The eyelet diameters of needles discovered from the site confirm that very thin threads were used at Sotira.

The thread thicknesses suggested by the eyelet measures match those produced by spinning with 10–40g whorls in experimental tests (Grömer 2016, 110–111, 111 fig. 6), which also correspond to some of the most recurrent whorl weights at Sotira. The needle type, with a fine, round cross-section, leads us to the conclusion that these tools were used for sewing fine fabrics, such as fine embroidery and beading. Although rarely preserved, embroidery is attested in the BA Mediterranean (Spanditaki and Moulherat 2012, 187), but no fabric remains from Cyprus show traces of this decorative technique (Appendix IV). The manufacture of

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40 Unfortunately, B1 and B5 were not available for examination, and no microscopic analyses could be conducted.
stone beads and other personal ornaments is particularly evident at Sotira, and a large quantity of blank, unfinished, and finished artefacts was dispersed throughout the site (Swiny 2003a, 233–235; 2008, 48). Even though the needle sample is small, it can be tentatively proposed that ornament and textile production may have intersected at some stage in the making of strings for bead necklaces, and the use of ornaments or beads to decorate fine fabrics or pieces of clothing.

![Figure 7.54. Bone needles B1 and B5 and metal needle M30 (re-drawn from Croft 2003, 254 fig. 6.16; Swiny 2003b, 382 fig. 8.1)](image)

7.4.2 Tools and contexts

Thirty out of 54 units identified at Sotira yielded spindle whorls. Seventeen inner rooms produced one spindle whorl, while five contained two whorls (Appendix Table 39). Eight units had three or more whorls, and the largest group is of six whorls. Spindle whorls were also found in units with a probable function other than domestic, such as Units 2, 8, and 12 (Appendix II). A significant number of whorls was retrieved from alleyways (Units 13, 32, 33, 37, 42, 46); they can be considered as discarded as most of them are fragmentary (Swiny 2008, 47–48). Loom weights and needles were retrieved from floors or were found among occupational debris in the same units that yielded spindle whorls. Figure 7.55 illustrates the distribution of textile tools in the units of the main area investigated at Sotira (Area A). Needle M30 and loom weight TC96 were from Unit 7, which also yielded three spindle whorls.
TC1-2 comes from Unit 1, where an interesting concentration of whorls and a bone needle existed (Swiny 2003a, 14), while loom weight TC72 was found in a room that yielded only one whorl (Unit 10, Area C).

As noted for Alambra (§7.2.2), the shallow stratigraphy of single-phased sites with no post BA levels above (Herscher and Swiny 2003, 499–502) leads to the conclusion that artefacts likely belonged to the last use phase of the units in which they were found. In contrast with the assemblages discussed earlier, the sudden abandonment of the site produced archaeological contexts that reflect typical domestic units in their assemblages (Appendix II). Most of these displayed concentrations of pottery (amphorae, bowls, jugs, cook pots) and ground stone tools associated with a few installations (generally benches). This is the case, for example, for Unit 7, described as a multi-functional purpose space (see Marki units for comparison [§7.1.2]) (Swiny 2003a, 9–74) (Figure 7.56), where all the categories of textile tools were retrieved. Interestingly, the room also yielded a discrete cluster of picrolite ornaments (Swiny 2003a, 24), and this may be considered further proof that ornament and textile production were connected at Sotira.

Figure 7.55. Sotira. Distribution of textile tools from floors and upper levels of units in Area A, Phase II (late EC)
Spindle whorls from the same unit frequently show different weights and may be considered sets for spinning different types of yarn (Appendix Table 13). It must also be noted that some evidence of clustering was detected in Unit 57, where three whorls were concentrated in an area to the south of the unit (Swiny, personal comment, 27/07/2017). Units with larger whorl assemblages have more than one medium light whorl, which can be related to the necessity of manufacture of more quantities of medium/medium fine yarn than finer or coarser thread. Whorls from the same unit generally display different shape and decoration, and undecorated whorls represent 25% of the assemblage, as at Marki in the ECIII (Frankel and Webb 2006a, 174). Whorls at Sotira are primarily made in local fabric, though one example (TC86) appears finer and had been imported from the north coast.

Figure 7.56. Sotira. Plan of Unit 7 with finds: spindle whorls TC16, TC24 and TC25 are marked in blue, needle M30 is highlighted in red. Not on plan: loom weight fragment TC96 (Swiny 2003a, 83 fig. 2.7)

The only textile tools recovered from Cemetery A are three spindle whorls, two from within two tombs and one from the topsoil (Walz and Swiny 2003, 401–411): TC23 is from Philia T.15 and was found placed apart from the human remains and the rest of the grave goods concentrated in the west part of the tomb (Swiny and Herscher 2003, 129–132, 130 fig. 3.5)
Only one spindle whorl was recovered from an ECIII tomb (T.12) and its location within the burial is described as “nearer the centre”, where the fragmentary human remains and most of the grave good was found (Swiny and Herscher 2003, 124, 125 fig. 3.4). It is not clear, however, whether this object was placed in direct association with the deceased (Swiny et al. 2003, 124, 125 fig. 3.4).

7.5 Erimi Laonin tou Porakou: techno-functional and contextual analysis of the indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Tool, structure type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific</td>
<td>Spindle whorl</td>
<td>Thread making</td>
</tr>
<tr>
<td></td>
<td>Loom weight</td>
<td>Weaving</td>
</tr>
<tr>
<td>Non-specific</td>
<td>Ground stone grinding tool</td>
<td>Dyeing</td>
</tr>
<tr>
<td></td>
<td>Ground stone pounding tool</td>
<td>Dyeing</td>
</tr>
<tr>
<td></td>
<td>Cooking pot</td>
<td>Dyeing</td>
</tr>
<tr>
<td></td>
<td>Water processing vessel</td>
<td>Dyeing, washing</td>
</tr>
<tr>
<td></td>
<td>Storage vessel</td>
<td>Dyeing</td>
</tr>
<tr>
<td></td>
<td>Heating installation</td>
<td>Dyeing</td>
</tr>
<tr>
<td></td>
<td>Water processing installations</td>
<td>Dyeing, washing, fulling?</td>
</tr>
<tr>
<td></td>
<td>Grinding installation</td>
<td>Dyeing</td>
</tr>
<tr>
<td></td>
<td>Post hole</td>
<td>Drying</td>
</tr>
<tr>
<td>Product</td>
<td>Mineralised pseudomorph</td>
<td>Fabric</td>
</tr>
</tbody>
</table>

Table 7.16. Erimi. Archaeological indicators for textile production

Erimi covers the whole MC period, with two occupational phases (A and B) recognised at the workshop complex (Bombardieri 2017a, 23). Excavations at Erimi have produced exceptional evidence for textile production (Table 7.16): 95 terracotta and two stone spindle whorls, six loom weights, and a fabric pseudomorph were retrieved during the 2008–2014 seasons (2008–2014 seasons published in: Bombardieri and Muti 2017, 248–249; Muti 2017a). A series of non-specific indicators could also be recognised as part of textile activities conducted in the ‘workshop complex’ (Muti 2017b; Bombardieri and Muti 2018a, 27–30) which include tools and installations, their spatial and functional associations, and archaeobotanical data retrieved – the latter providing clear evidence of dyeing (Muti 2017b; Bombardieri and Muti 2018a, 27–30).

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41 The object is not described and has no catalogue number as it was accidentally destroyed during cleaning (Swiny and Herscher 2003, 126).
42 A group of enigmatic objects with a shape similar to EC–MC loom weights but unperforated were also collected from the workshop complex. These are not functional weaving tools and will not be considered in this analysis (Muti 2017c).
7.5.1 Techno-functional analysis

*Spindle whorls*

Spindle whorls come from different areas of the settlement (Area A/‘workshop complex’, Trench 2) and tombs (Area E) (Figure 7.57). Tools displaying use-wear traces are frequent both in the settlement and tombs indicating that the Erimi whorls had been used in the settlement before they were buried as grave goods (Figure 7.58). Therefore, the entire assemblage will be considered in the analysis. Biconical/spherical and truncated biconical/spherical shapes (Types II and III) are the most popular types – together they represent more than 80% of the whorls (Figure 7.59). Both types were commonly used in the settlement. However, biconical spindle whorls are much more frequent in the settlement, while truncated biconical whorls are more common finds in burials (Muti 2017a, 221 fig. 6.1) (Figure 7.60), indicating that a selection of a certain type was undertaken specifically for the burial context. Concerning types, it is also worth mentioning the presence of a ‘double’ whorl (T.231.14) (Type IVe), composed of two spherical whorls attached to one terminal. This is a rare type with few comparanda, most of which are unprovenanced (Bombardieri 2013, 8).

*Figure 7.57. Erimi. Spindle whorls from Unit SAIIb, Area A (top: 499.3, 426.1, 430.1; bottom: 430.2, 419.14–15, 342.126)*

*Figure 7.58. Erimi. Frequency of spindle whorls showing use-wear or no/undetectable use-wear (n=95)*

189
Concerning the whorls’ function, Figure 7.61 shows that there is almost no difference in weight distribution between phase A and B in the workshop complex, hinting that the activities undertaken remained the same throughout both phases.\(^{43}\) Figures 7.62–63 show that medium and medium-heavy weight classes are prevalent in both the settlement and cemetery, and quantity of light and heavy whorls could indicate that some of Erimi’s tool categories had more specific productive targets (specifically, the production of fine and coarse yarn). Generally, however, scatterplots comparing weights and diameters demonstrate that whorls

\(^{43}\) This is a first attempt to understand whether there is a distinction between the two phases. It should be borne in mind that the sample for phase B is still rather limited.
belonging to the same weight classes can have different diameters, and this may result in different outcomes (Figure 7.64). Thread-making activities appear thus less targeted to specific yarn types than argued in the previous analysis of the 2008–2014 record (Muti 2017a, 231). Parameters describing rotation seem to confirm the trends identified when analysing weight classes. RS values show peaks of between 0.67 and 0.88, indicating that whorls’ diameters were not larger than their heights, and MI values range between 15g/cm² and 248g/cm² (mean: 104 g/cm²) (Table 7.17; Figures 7.65–66). The Erimi whorls are medium to fast rotating tools, and faster when compared to contemporary Alambra. Measurements of the perforation diameters indicate that spindle shafts had thicknesses of 8–10mm or 10–12mm, and it can be hypothesised that spindles of different sizes were in use at Erimi (Figure 7.67).

Figure 7.61. Erimi. Distribution of whorl weights by phase (A: n=22; B: n=6)

Figure 7.62. Erimi. Comparison of the weight classes of the spindle whorls from the workshop (n=28) and domestic units (n= 9)
Weight class (g) | MI (g/cm²)
---|---
Very light to medium-light (0–36) | 9.9–54.7
Medium and medium-heavy (37–72) | 37.1–191
Heavy and very heavy (73–100+) | 118–293

Table 7.17. Erimi. Correlation between whorl weight classes and MI values

Figure 7.63. Erimi. Histogram of spindle whorl weight classes (cemetery) (n=43)

Figure 7.64. Scatterplots of whorl weights and diameters in the settlements (left) (n=37) and cemetery (right)(n=43)
Figure 7.65. Erimi. Histogram representing the RS values (workshop complex and domestic units) (n=37)

Figure 7.66. Erimi. Histogram representing the RS values (cemetery) (n=43)

Figure 7.67. Erimi. Variation ranges of perforation diameters in spindle whorls (n=95)
As areas with distinct functions have been identified in the settlement, it is worth undertaking a deeper analysis by dividing the settlement assemblage into whorls retrieved from the workshop complex and from Trench 2 respectively, so far the only domestic area in the settlement which yielded spindle whorls. Remarkably, no whorls between 37g and 54g, namely the most popular weight class in the workshop, have been recovered from the domestic units in Trench 2. This may indicate a differentiation in yarn production between the workshop and the settlement. With the sample relatively small, these results can only be preliminary at this stage.

_Loom weights and textile remains_

A concentration of loom weights was found in Unit SAV and an extension excavated north of this unit (Bombardieri 2018, 9) (Figure 7.68). Complete or reconstructed weights of these tools vary between 590.4g and 1163.6g (Figure 7.69). Except for the heaviest one (P210), they can be grouped into one weight class, meaning that they could be used together in the same loom setup. Figure 7.70 describes the relationship between weights and thicknesses, confirming that loom weights P215–P218 can be considered a set or part of a set. These weights would work with a warp thread tension of 50–60g and may work with a tension of 40g, and a tabby fabric woven with a warp tension of 50–60g would have three or four threads per cm² (Table 7.18). Notably, the Erimi examples fall in the same categories as the EC–MC weights (e.g. Marki [7.2.1]).

_Figure 7.68. Erimi. Loom weights P217, P218, and P216_
Figure 7.69. Erimi. Bar chart of weights of loom weights from Unit SAV

Figure 7.70. Erimi. Relationship between weight and base thickness of the loom weights from Unit SAV

<table>
<thead>
<tr>
<th>Warp thread tension</th>
<th>10g</th>
<th>20g</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wrt/LW</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>717/10 = 71.7</td>
<td>717/20 = 35.85</td>
<td>717/30 = 23.9</td>
<td>717/40 = 17.9</td>
<td>717/50 = 14.34</td>
<td>717/60 = 11.95</td>
<td></td>
</tr>
<tr>
<td><strong>Wrt/2LW</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 x 2 = 144</td>
<td>36 x 2 = 72</td>
<td>24 x 2 = 48</td>
<td>18 x 2 = 36</td>
<td>14 x 2 = 28</td>
<td>12 x 2 = 24</td>
<td></td>
</tr>
<tr>
<td><strong>Wrt/cm</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>144/7 = 20</td>
<td>72/7 = 10</td>
<td>48/7 = 7</td>
<td>36/7 = 5</td>
<td>28/7 = 4</td>
<td>24/7 = 3</td>
<td></td>
</tr>
<tr>
<td><strong>Loom setup</strong></td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Likely</td>
<td>Optimal</td>
<td>Optimal</td>
</tr>
</tbody>
</table>

Table 7.18. Erimi. Group of loom weights from Unit SAV. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weight in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup. Calculations made on average Wt.
Fragments of a textile pseudomorph and a mineralised thread were noted on the surface of long pin M6 from T.429 (Figure 7.71) (Appendix IV). The fabric is tabby woven, with a thread count of 8/10 threads per cm². A warp tension of 10g–30g would ideally be required to weave a similar fabric with the loom weights analysed above, which, instead, are best operated with higher tensions. If the Erimi loom weights had been used with a tension between 10g–30g, the number of threads per tool would have been too high, resulting in possible mistakes and faults, and making weaving very difficult or ineffective (Mårtesson et al. 2009). It thus seems unlikely that the range of weights retrieved from the workshop – as well as other EC–MC examples analysed so far – produced a fabric with these characteristics.

Concerning the fabric threads and the single thread, it appeared as S-twisted, with a medium to loose twist, and some unplied threads. The presence of un-twisted thread has been noted for other EC–MC pseudomorphs and reconstructed as the possible presence of spliced yarn (Landenius Enegren 2018, 30–34). No analysis of fibre identification has been conducted on the Erimi sample. However, in the case of the un-plied yarn being spliced, this would suggest linen as the most likely material used. Again, this seem to contradict the evidence in the workshop, in which dyeing, commonly connected to wool as the main fibre source (Militello 2014, 266), is attested as one of the main activities (see below). Nonetheless, the remains on M6 possibly belonged to a mortuary shroud as the pin was found amongst a concentration of...
human remains of a female individual (Bombardieri 2016, 11) (Appendix IV), and might therefore not be representative of the main production at Erimi.

7.5.2 Functional and contextual analysis of dyeing implements

A series of non-specific implements can be used in textile production, but identification of their textile function is difficult and depends on contextual information and multi-disciplinary analyses (§4.1). This section illustrates the data and contextual relationships that have allowed the excavators to identify implements for dyeing activities at Erimi, and the possible functions of non-specific tools and installations.

Unit SAI seems to have played a central role in textile dyeing in both the main occupational levels detected (Figure 7.72), as is evidenced by the presence of heating and liquid processing installations and containers (Bombardieri and Muti 2018a, 27–28). In phase B (the older layer), the key-features are a circular hearth (Ft.42) and an installation composed of a large, relatively shallow rectangular basin (1.08m x 0.9m; depth 0.16m) with a deep circular pit (diameter 0.42m; depth 0.54m) attached to its south-east corner (Bombardieri 2017a, 30, 30 figs. 3.15, 3.16, 31 fig. 3.18; Bombardieri and Muti 2018a, 27, 29 fig. 4). The two components have a total capacity of 150l and are likely to have operated in a complementary manner (Bombardieri 2017a, 30). Spatial connection between Ft.42 and Ft.43 can also be noted, suggesting that the two installations – even though designated to different activities (heating and liquid processing respectively) – were possibly involved in sequential or correlated productive steps. Another installation which can be spatially and functionally related to these features is a mortar-like basin (Ft. 44) (Bombardieri 2017a, 33, 32 tab. 3.1).

In contrast to the overall poverty of organic remains on floors at Erimi, the fill of Ft.43 was rich in archaeobotanical residues: more than 100 nutlets of the Boraginaceae family, genera Echium and Lithospermum, were detected (Vassio and Bombardieri 2014, 294; Scirè Calabrisotto et al. 2017, 282–283, 288–292 tab. 9.2). Even though analyses to identify the species are still ongoing, the nutlets appear similar to those produced by wild plants (e.g. Echium glomeratum or ‘viper’s bugloss’), that can be used in textile dyeing as a red or purple red colouring substance extracted from the roots (Vassio and Bombardieri 2014, 294; Scirè Calabrisotto et al. 2017, 282). An even larger concentration of the same nutlets was recovered from Ft.46, a circular basin located west to Ft.43 (Bombardieri 2017a, 30–31). The function of
this structure is uncertain, but, given the content of its filling and its location in the room, its function appears linked to Ft.43. In addition to installations, phase B also had a number of relevant artefacts: a dolerite pounder, a ground stone hammer found nearby Ft.44, and a fragmentary large jug (Bombardieri 2017a, 33; Webb 2017b, 157, 160 fig. 4.23; 2017c, 207, 215, 214 fig. 5.3). Phase B of Unit SAI is thus characterised by activities involving pounding, liquid processing and heating. All these elements support – although indirectly – the presence of activities related to textile dyeing (Appendix I).

![Figure 7.72. Erimi. Unit SAI (workshop complex) with installations (heating structures, basins and pithos emplacements) related to textile dyeing (phase B installations are marked in blue, phase A installations are marked in red (modified from Bombardieri 2017a, 30 fig.3.15)](image)

SAI underwent refurbishment and spatial reorganisation in the later phase A, and the space become divided into three sub-units (Bombardieri 2017a, 34–37). Three stone emplacements with *in situ pithoi* (A.354.SA1,3,4) were unearthed in Sub-unit 1 in the north/east corner of the room (Bombardieri 2017a, 34, 36 fig. 3.24). A rectangular hearth (Ft.4) with two fire
chambers made of limestone slabs is located in Sub-unit 3 (east of SAI), not far from the pithoi (Bombardieri 2017a, 36, 36 fig. 3.24). Hearth Ft.4 indicates clearly that a heating structure remained essential to the activities performed in the more recent phase and seemed to have replaced the circular oven of the earlier phase. The new heating structure appears as a more efficient version of the previous one: it has two distinct fire chambers and a flue pipe (assembled from two modified jug necks) (Bombardieri 2017a, 37, 38 fig. 3.30). These improvements were probably made to achieve better control over temperatures and for directing the heat toward the adjacent chamber, over which pots were standing. Originally interpreted as a storage room due to the presence of these pithoi (Bombardieri 2017a, 34), Sub-unit 1 can now be reinterpreted as a working unit. Nonetheless, Ft. 4, even if assigned to Sub-unit 3, is in evident proximity of the pithoi, and their relationship seems to be practical.

Figure 7.73. Erimi. Pithos A.354.SA4 (Webb 2017b, 168 fig. 4.33)

Pithoi are large containers, and the ones in SAI have a total capacity of ca 250l (A.354.SA1: 30l, A.354.SA3: 80l, A.354.SA4: 140l) (Bombardieri et al. 2015, 126) (Figure 7.73). Archaeobotanical analyses have not produced significant results for the pithoi or to phase A, and the identified remains are scarce and likely belong to plants growing in the surroundings of the site (Scirè Calabrisotto et al. 2017, 261–292). However, a spouted jug (A.354.SA9) retrieved from within pithos A.354.SA1 suggests that these large vessels were intended for

44 Scirè Calabrisotto et al. (2012, 477) report the identification of Rubiaceae remains from inside the pithoi in SAI. The remains are too scarce to be correlated with textile dyeing. It must be noted, however, that Rubia tinctorum is one of the earlier plants exploited in the Mediterranean for textile production by extracting its red substance and dyeing textiles (Nosch 2004; see also Cardon 2007, 107, 122).
liquid substances (Bombardieri 2017a, 34). In addition, bowls and jugs were found in the vicinity of the SAI *pithoi*, indicating that actions such as pouring and refilling were frequently performed in relation to these vessels (Bombardieri 2017a, 34). All things considered, these *pithoi* thus seem to have had a more ‘active’ function than simple storage; stabilised in their emplacements, they may have functioned in the same manner as basin Ft.43 (Muti 2017a; Bombardieri and Muti 2018a, 28, 30). The advantage would have been an increased capacity and more efficient emptying by simply moving the *pithoi* outside the room to discard their contents. It is not uncommon in textile dyeing to use large vessels as dye-vats, and the *pitharin* (an elongated *pithos*) is an illuminating example of such use in Cypriot traditional hand dyeing (Ionas 1998: 41, 40 fig. 27; 2001: 529). Nevertheless, as noted for Ft.43, it is impossible to be certain whether these containers were actually used to dye textile materials or for intermediate steps. Two other meaningful vessels were found on the floor near Ft.4, a cooking pot (A.362.SA7) and a large-spouted bowl intentionally modified with a perforation at its base (A.362.SA11) (Bombardieri 2017a, 34). As previously noted, vessels for boiling and liquid processing are essential in dyeing activities, and A.362.SA11 could have been readapted for making it more suitable for this purpose. Textile dyeing would explain the presence of the *pithoi*, the hearth, and the peculiarities of the assemblage in this unit in phase A. In the later phase B, the room does not seem to have changed function but rather was reorganised for more efficient, and perhaps increased, production.

*Figure 7.74. Erimi. 3D image of the workshop complex with Units SAI-III and SAVI (Bombardieri 2017a, 26 fig. 3.10)*

200
Turning to spaces adjacent to SAI, it is worth noting that Unit SAIIa is characterised by grinding installations and tools, and storage vessels in both occupational levels (Bombardieri 2017a, 39–42) (Figure 7.74). Vessels for liquid processing and a cooking pot were also found in the southern part of the room (Bombardieri 2017a, 42), and they may have been stored and used in SAI and open spaces as no heating or liquid processing installations are present in SAIIa. In addition, a bronze knife (A.423.1) was also retrieved from phase A, suggesting that not only grinding but also cutting was part of the activities conducted in the room. Nearby, Unit SAIII also displayed a pottery assemblage with vessels that could have been used in textile dyeing, such as cooking pots and vessels for liquid processing (Bombardieri and Muti 2018a, 30).

![Figure 7.75. Erimi. Open and semi-open spaces WA I-IV with round, oval and rectangular basins and post holes (Bombardieri 2017a, 27 fig. 3.12)](image)

Open spaces in the northern part of the workshop (WAI-IV) are extremely important for our investigation into textile manufacture as they are characterised by a high occurrence of liquid processing installations – mainly basins of different types and drainage channels (Bombardieri et al. 2015, 119–121, Bombardieri 2017a, 27–28, 34) (Figure 7.75). These installations allowed craftspeople to process and use an enormous quantity of liquids: a maximum capacity of 8000l was calculated for the largest basins in WAV (Bombardieri et al. 2015, 128, 134 tab. 2). Washing is an activity frequently practised in relation to textile production and textile
dyeing (Appendix I), and the presence of many water processing installations fits with the textile evidence described so far for Erimi. Similar structures were also used for fulling in antiquity (Appendix I). Fulling might therefore also be hypothesised as an activity conducted at Erimi, even though rarely attested in Mediterranean sites before the Roman period (Gleba and Mannering 2012, 20).45 WAI-IV Units also display a great concentration of post holes that could be interpreted as the remains of perishable ‘informal structures’, possibly party shelters or stacks for hanging textiles (fibre, threads, or fabrics) to dry (Bombardieri 2017a, 28; Amadio and Dolcetti 2019, 33–34, 34 fig. 5, 35 fig. 6). The location of these open spaces, exposed to the prevailing wind blowing from south-west and channelled through the valley, would have greatly facilitated this activity (Bombardieri 2017a, 28).

One other room that can be related to textile activities is Unit SAVI, immediately to the east of SA I. In the earlier phase B, it was probably an open space similar to WAI-V, with a large rectangular cistern for water storage (Bombardieri 2017a, 52). In the more recent phase A, the unit was roofed and showed two superimposed mud-plaster floors. The absence of installations and a reduced number of artefacts have let the excavator to interpret the room as a reception space (Bombardieri 2017a, 52–54, 56). However, the unit is located among working spaces, and its entrance is in direct connection to ‘dirty’ working spaces with basins and running water. It seems thus unlikely that it was used purely as a reception space. As regards its purpose, we should remember that the majority of tools, products and raw materials, as well as their containers (e.g. baskets, wood shelves), are perishable and that absence of evidence may not be evidence of absence. Even if it will not be possible to clarify the use of SAVI further, it can be noted that most of the spaces identified in the ‘workshop complex’ were likely dedicated to textile activities, and the ones around SAI seem particularly devoted to washing, drying, and dyeing.

7.5.3 Tools and contexts

Settlement

Spindle whorls are generally from floors or depositional contexts related to the most recent occupation episodes of the workshop or domestic units, while fewer were collected from disturbed deposits (Muti 2017a, 230–231). The majority was retrieved from roofed units,

45 Little research has been done so far to characterise the indicators for fulling (Gleba and Mannering 2012, 20).
where secure contexts produced 22 whorls. Upper or disturbed contexts yielded four artefacts (Appendix Tables III.40, III.42) (Figure 7.76). Only three whorls (and one from the topsoil) have been collected in open spaces. Similarly, whorls from secure contexts come from domestic units of Trench 2. The loom weights included in this analysis were collected from Unit SAV and an extension immediately to the north, and were dated to phase A (Bombardieri 2018, 9, 11). Additional examples were retrieved from Unit SAXII in the workshop and domestic Unit 1 (Trench 3) during the 2019 fieldwork season (Bombardieri 2019, 13); the artefacts are still being processed and it was not possible to include them in this analysis. However, it is worth mentioning them and noting that spinning and weaving tools have now been attested in both the workshop and residential areas, and loom weights seem concentrated in the north-west units of the workshop.

![Figure 7.76. Erimi. Distribution of spindle whorls and loom weights in the units excavated between 2008 and 2018](image)

Concerning the presence of possible sets, the technical analysis has demonstrated the loom weights from SAV could have operated within the same loom setup. As for whorls, these have been found in groups or as single artefacts in the roofed units of the workshop; examples retrieved from the open spaces were probably dispersed tools. The fact that interior spaces

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46 A remarkable concentration of 12 spindle whorls was also retrieved from a phase a floor of room SAXII.
have brought to light larger quantities of these tools does not necessarily mean that spinning was practiced in those specific rooms: being portable objects, whorls were more likely stored in these spaces to be used either in interior or exterior spaces. This may be the case for the whorl collection from SAIb, in which a large quantity of vessels and other small finds – including a comb-shaped pendant – were found within a relatively small interior space (Bombardieri 2014, 49, 50–51; 2017a, 43–46, 548, 44 fig. 3.37). Interestingly, another comb-shaped pendant was recently found in Unit SAXII, again accompanied by a conspicuous assemblage of textile tools and pottery (Bombardieri 2019, 50). As argued in Chapter 4.3.1, this comb-shaped iconography may have a textile connotation and may allude to a comb for weaving or fibre preparation.

In the Erimi complex, spindle whorls were also retrieved from pits or basins sealed to build phase A floors (Bombardieri 2018, 8–10). For instance, whorl P55 was retrieved from a circular pit (Pt.117) in Unit SAIV, along with a large *Semicassis granulata* (helmet shell) (Bombardieri and Muti 2018a, 31; shell identification by Reese, 20/03/2019), and a group of whorls is from a sealed basing in Unit SAV. Even though these finds can be interpreted as abandoned or discarded upon refurbishment activities (Bombardieri 2017b, 6), P55 and the other tools retrieved from pits were intact castoffs and still functional. As will be further discussed in Chapter 9, the findspots of some textile tools at Erimi seem thus to indicate that the significance of these artefacts probably went beyond that of being simple work tools (Bombardieri 2014, 49, 50–51; Bombardieri and Muti 2018a, 32–35).

No undecorated tools come from the domestic units. In contrast, 30% of the workshop assemblage lack decoration (Figure 7.77). This mirrors the patterns at Marki (§7.1.2) and Alambra (§7.2.2) which had similar or even higher percentages of undecorated whorls characterising the MC settlement assemblages (Frankel and Webb 2006a, 174; Muti 2017a, 230). At Erimi, the majority of undecorated whorls comes from work and communal spaces.

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47 One other possibility is that these artefacts were accumulated just before the intentional, and possibly ritual, closure of the complex (Amadio and Bombardieri 2019).
48 Unit SAV may also have held a special function (Bombardieri 2018, 10), and the presence of textile tools could have been charged with a special value. The unit is currently under study.
49 Another two helmet shells were recovered from the workshop complex, and one of them had calcified seeds of *Boraginaeae* inside (Reese and Yamasaki 2017, 321). Shells and textile activities seem to be connected somehow, but not in a practical way as this shell species is not suitable for pigment extraction nor for fixing dyes (Reese and Yamasaki 2017, 321).
As it will be explained in the next section, a relationship between individuals and whorls can be detected in burial contexts at Erimi: it is thus possible to propose that a distribution between undecorated and decorated whorls in the workshop, domestic units and cemetery may be significant in terms of personal and group identities, and ownership (Muti 2007a, 231). Possibly related to the mobility of spinners from other communities to Erimi are two whorls from Trench 2 (P40, P129), one from SAV (P107), and another two examples from the 2019 campaign which display fabric and decoration distinctive of the north coast and they can therefore be considered imports.

![Figure 7.77. Erimi. Ratio of decorated/undecorated whorls in the workshop complex (n=28), domestic units (n=9) and cemetery (n=43)](chart)

Cemetery
Thirty-nine percent of the tombs excavated at Erimi contained whorls (Figure 7.79). No other types of textile tools were retrieved from the cemetery (Figure 7.78). Whorls range from a minimum of two to a maximum of 12 artefacts per tomb with each context displaying a different number of these artefacts (Table 7.19). The average number of whorls (six) per tomb is significantly higher from the other south coast cemeteries (Muti et al. 2019, 190–191), and mirrors most closely select examples from the north coast: fourteen chamber tombs yielded 39 spindle whorls at Karmi, giving a mean average of 2.8 whorls per tomb (Webb et al. 2009, 227 tab.4.7). Twelve out of the 20 tombs excavated by the Swedish Cyprus

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50 Most of the Erimi tombs were used for long periods, re-opened or found disturbed in antiquity or more recent times, and it is extremely difficult to understand different phases of the burial sequence or tomb maintenance (Bombardieri 2017a, 74). Whorls, however, were retrieved from secure, floor contexts.
Expedition at Lapithos yielded 79 spindle whorls (Crewe 1998, 80–89) – considering that the majority are multiple chambered tombs, their distribution per chamber shows a mean of four whorls (Table 7.19).

Figure 7.78. Erimi. T.248. Cluster of spindle whorls (4.58–61) of the same type and showing similar decoration (Muti 2017a, 232 fig. 6.11)

<table>
<thead>
<tr>
<th>Tomb</th>
<th>Tomb preservation</th>
<th>Nos. of spindle whorls</th>
<th>Minimum number of individuals</th>
<th>Biological sex of individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.228</td>
<td>partially disturbed</td>
<td>2</td>
<td>4</td>
<td>U</td>
</tr>
<tr>
<td>T.230</td>
<td>partially disturbed</td>
<td>3</td>
<td>2</td>
<td>F; U</td>
</tr>
<tr>
<td>T.231</td>
<td>intact</td>
<td>7</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>T.248</td>
<td>intact</td>
<td>6</td>
<td>4</td>
<td>F; M(2); U</td>
</tr>
<tr>
<td>T.428</td>
<td>intact</td>
<td>4</td>
<td>4</td>
<td>F; M; U(2)</td>
</tr>
<tr>
<td>T.429</td>
<td>partially looted</td>
<td>12</td>
<td>2/3</td>
<td>U</td>
</tr>
<tr>
<td>T.464C</td>
<td>partially disturbed</td>
<td>9</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 7.19. Erimi. Tombs with spindle whorls: number of spindle whorls per tomb, minimum number and biological sex of the individuals (F=female; M=male; U=sex undefined) (data from Bombardieri 2017a, 73–128; Albertini and Monaco 2017; also: Douglas and Muti 2019, 21 tab. 1)

Figure 7.79. Erimi. Pie chart representing the percentage of tombs with and without spindle whorls
Spindle whorls from single burial contexts generally show similar sets and arrangements of design patterns, and tombs with large assemblages display clusters of whorls often with recurrent decorative motifs or of the same shape (Douglas and Muti 2019, 20–23, 27) (Figure 7.80). For example, a distinct group of five whorls with a similar arrangement of repeated motifs, and an undecorated whorl were retrieved from T.248 (Figure 7.81). As shown by Figures 7.80 and 7.81, whorls were found in clusters and often found concentrated in the vicinity of adult human remains (e.g. T.248, T.428, T.429) (Table 7.19). Although no human remains were found in T.231, Bombardieri (2014, 50–51; 2017a, 81, 81 fig. 3.103) has hypothesised that the tomb had been occupied by a single deposition. The burial space was divided into two sections by a large slab with one area clearly reserved for the grave goods, and the other, presumably, for the deceased (Figure 7.80). Except for one, all spindle whorls were found spread throughout the area reserved for the body, along with a small bowl and
picrolite ornaments (Bombardieri 2014, 50–51; Douglas and Muti 2019, 22). It appears therefore that spindle whorls had an important value as grave goods in the Erimi tombs, were connected to specific individuals, and that the spindle whorls design expressed a possible relationship or significance. Taken together, the evidence invites us to interpret these artefacts as personal belongings. In cases where spindle whorls were imported from the north coast (T.231, T.429, and T.464C) this would suggest the presence of individuals from that area.

![Figure 7.81. Erimi. Plan of T.248. The findspots of spindle whorls are highlighted in blue (redrawn after Bombardieri 2017a, 96 fig. 3.121)](image)

### 7.6 Kissonerga Skalia: techno-functional and contextual analysis of the indicators

<table>
<thead>
<tr>
<th>Tool, structure Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Spindle whorl</td>
<td>Thread making</td>
</tr>
<tr>
<td>Specific Loom weight</td>
<td>Weaving</td>
</tr>
<tr>
<td>Specific Needle</td>
<td>Sewing, etc.</td>
</tr>
</tbody>
</table>

*Table 7.20 Skalia. Archaeological indicators for textile production*

Ongoing excavations at Skalia, the only EC–MCIII/LCIA settlement investigated in western Cyprus, have produced 85 spindle whorls, four loom weights, five partial or complete metal needles and 12 fragments potentially belonging to bone needles (partially published in Crewe *et al.* 2007, 110 fig.4; 2010, 245 fig. 6; Crewe 2014, 144, 143 fig.4; 2015a, 144, 143 fig. 12)
Another 24 terracotta and two stone whorls were retrieved from tombs excavated at KissonerGA Ammoudhia (Ammoudhia) (Graham 2013, 176–180), a cemetery area associated with the settlement at Skalia (Appendix II). At Skalia, the majority of textile tools come from the final phase complex, and a small sample of 14 whorls can be identified as EC tools. These come either from the early occupational levels identified under the complex or were redeposited within the later complex. As described in Chapter 5.7.2, early levels of occupation have been identified in areas D, G2, and B3, but the stratigraphic sequence of these two crucial areas is currently under study and the analysis of contexts must be considered preliminary.

7.6.1 Techno-functional analysis

Spindle whorls

Conical whorls (Type I) were preferred over other types at Skalia and Ammoudhia, where this type corresponds to ca 80% of the whorl assemblage (Graham 2013, 176) (Figures 7.82–83). Whilst this conforms to the trend seen across the island in the ECI–II, it is unusual for the late MC period as this type decreases in the ECIII, when truncated biconical (Type III) whorls start becoming popular (Crewe 1998, 35) (§8.3.1). The predilection for tall, conical whorls seems thus to be a site characteristic or a regional variant. In accordance with expectation, all the imported late MC whorls are biconical/spherical (Type III) whorls (§7.6.2).

Figure 7.82. Skalia. Local spindle whorls (left to right: KS358, KS184, KS285, KS230, KS199, KS144)

51Skalia is the only EC–MC site currently investigated in western Cyprus, and only further research in this area may help to understand its regional characteristics.
Figure 7.83. Skalia. Pie charts illustrating the frequency of spindle whorl of early type from early and mixed deposits (left) (n= 10) and in the final phase complex (right) (n=75)

Figure 7.84. Skalia. Percentage of spindle whorls showing use-wear and no/undetectable marks (n=85)

Over 60% of the Skalia spindle whorls show use-wear marks in the form of chipping and abrasion around narrow perforations (Figure 7.84). Among these, at least 17 conical whorls display extensive abrasion (ca 2–4mm wide), which, in some cases, tend to smooth over the narrow end of the tool, as already observed for Sotira (§7.4.1). Use-wear marks on the remaining 40% of artefacts are generally difficult to read due to the fragmentary nature of the objects. In contrast, only a small number of the complete and well-preserved artefacts do not display distinct traces. Remarkably, all the whorls from Ammoudhia, including the stone examples, show use-wear, meaning that they were in use prior to being buried as grave goods (Graham 2013, 180).

The Skalia ECI–II whorls belong almost exclusively to very light and light weight classes (Figure 7.85). MC/late MC spindle whorls appear more differentiated in terms of mass values,
but it is important to note that the light class of 18–36g adds up to more than 40% of the assemblage. Medium-weighted whorls are well-represented, while heavier categories occur less frequently, and only two artefacts weigh more than 90g. A more balanced distribution among light (18–36g) to heavy classes (72–90g) is visible in the Ammoudhia tombs (Figure 7.86). As regards the relationship between weights and diameters at Skalia, the scatterplot in Figure 7.87 shows that diameters of early whorls have a more homogenous width than the ones of later whorls. However, when the latter are compared to whorls from contemporary sites (e.g. Erimi [§7.5.1]), the Skalia assemblage reveals less variation in the weight/diameter relation.

**Figure 7.85. Skalia. Weight classes of spindle whorls from the ECI–II (n=10) occupation and the late MC final complex (n=75)**

**Figure 7.86. Ammoudhia. Histogram of the weight classes of spindle whorls from EC/MC tombs (n=24)**
RS values tend to increase for whorls from the late phase, suggesting a reduction in the size of diameters (Figure 7.88). However, MI values are relatively homogenous for early whorls, ranging between 7g/cm² and 44g/cm², while MC tools require more differentiated rotational
input as their values range from 18g/cm² to 288g/cm² (Table 7.21). In general, spinners at Skalia were inclined to use relatively light tools displaying similar proportions. This can mainly be correlated with the production of fine and medium thread. Most whorls from the last occupational phase show perforation diameters ranging between 8mm and 12mm (Figure 7.89). Even though the Skalia whorls are lighter than the Erimi examples (§7.5.1), wooden shafts were probably of similar thicknesses at these two sites.

![Figure 7.89. Skalia. Variation ranges of perforation diameters of spindle whorls from the final phase complex (n=72)](image)

**Loom weights**

Three out of the four conical loom weights retrieved from the final phase complex are almost complete, with the diagnostic parts preserved, and KS171 and KS315 come from the same context 333 in Area B, namely a deposit lying above an occupational surface (Figure 7.90). These two artefacts show an atypical shape but have similar base diameters and similar weights, and they could have been used in the same loom setup. The warp thread tension calculated for KS171 shows that a loom could have optimally worked with tensions higher than 40g. KS15, from a different area, has a base diameter similar to KS171 and KS315 but shows a heavier weight and would have worked best with high warp tensions (Tables 7.22–23). The functional parameters and operation of loom weights at Skalia are in line with patterns identified at the other EC–MC sites that yielded loom weights (§7.1.1, §7.2.1, §7.4.1, §7.5.1).
### Table 7.22. Skalia. Loom weight KS171. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weight in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup

<table>
<thead>
<tr>
<th>Warf thread tension</th>
<th>10g</th>
<th>20g</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
</tr>
</thead>
<tbody>
<tr>
<td>WrT/LW</td>
<td>912/10 = 91.2</td>
<td>912/20 = 45.6</td>
<td>912/30 = 30.4</td>
<td>912/40 = 22.8</td>
<td>912/50 = 18.2</td>
<td>912/60 = 15.2</td>
</tr>
<tr>
<td>WrT/2 LW</td>
<td>91x2 = 182</td>
<td>46x2 = 92</td>
<td>30x2 = 60</td>
<td>23x2 = 46</td>
<td>18x2 = 36</td>
<td>15x2 = 30</td>
</tr>
<tr>
<td>WrT/cm</td>
<td>182/9.1 = 20</td>
<td>92/9.1 = 10</td>
<td>60/9.1 = 7</td>
<td>46/9.1 = 5</td>
<td>36/9.1 = 4</td>
<td>30/9.1 = 3</td>
</tr>
<tr>
<td>Loom setup</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Possible</td>
<td>Optimal</td>
<td>Optimal</td>
<td>Optimal</td>
</tr>
</tbody>
</table>

### Table 7.23. Skalia. Loom weight KS15. Calculations of: 1) warp thread per loom weight; 2) warp thread per loom weight in two different rows (tabby weaving); 3) warp thread per cm; likelihood of successful loom setup

<table>
<thead>
<tr>
<th>Warf thread tension</th>
<th>10g</th>
<th>20g</th>
<th>30g</th>
<th>40g</th>
<th>50g</th>
<th>60g</th>
</tr>
</thead>
<tbody>
<tr>
<td>WrT/LW</td>
<td>1300/10 = 130</td>
<td>1300/20 = 65</td>
<td>1300/30 = 43</td>
<td>1300/40 = 33</td>
<td>1300/50 = 26</td>
<td>1300/60 = 22</td>
</tr>
<tr>
<td>WrT/2 LW</td>
<td>130x2 = 260</td>
<td>65x2 = 130</td>
<td>43x2 = 86</td>
<td>33x2 = 66</td>
<td>26x2 = 52</td>
<td>22x2 = 44</td>
</tr>
<tr>
<td>WrT/cm</td>
<td>260/8.4 = 40</td>
<td>130/8.4 = 15</td>
<td>86/8.4 = 10</td>
<td>66/8.4 = 8</td>
<td>52/8.4 = 6</td>
<td>44/8.4 = 5</td>
</tr>
<tr>
<td>Loom setup</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Unlikely</td>
<td>Possible</td>
<td>Optimal</td>
<td>Optimal</td>
</tr>
</tbody>
</table>
Needles

Two out of five metal needles from the final phase complex are complete or nearly complete, show a medium length and comparable circular cross-sections with diameters of 2mm. KS10 has a round eyelet measuring ca 15mm (Figure 7.91). No measures could be taken for KS33 due to chalk encrustations hiding its eyelet. The relatively fine cross-section of these needles, which, however, were strong tools as they had been made of metal, would have made them useful for generic sewing or more specific works on a variety of fabrics, including relatively fine ones without causing damage to the needle itself. The eyelet perforation of KS10 is comparable in size to the larger ones attested in the Marki assemblage (§7.1.1). Also, KS10 is bent at its tip, and it cannot be excluded that this was deliberate to facilitate a specific sewing movement. As bent modern needles are normally used for furniture, it cannot be excluded that this object was modified to sew some more rigid, heavy fabric – perhaps using a thick thread, which would be also compatible with the measure of the eyelet’s diameter. The remaining three objects are shaft or tip parts of small metal artefacts, possibly needles, with cross-sections slightly thicker than the previous two examples.

Eight fragmentary body and tip parts from small bone tools might have belonged to needles, but this cannot be definitively proven as no eyelet parts are preserved. Unfortunately, as the Chalcolithic residual materials from nearby *Mosphilia* are found in all deposits, and given the fragmentary state of the finds, it cannot be securely established that these were in fact MC artefacts. Two needles, larger and flatter than the rest, can be compared to the Alambra large
examples for which we proposed a function of weaving or working hard fibres/materials (§7.2.1). The remaining objects are likely fragments from small or medium bone needles. Microscopic analysis to detect use-wear traces were conducted but the surface of all the examined tools were extremely damaged and only a few, incoherent traces, namely multi directional striations, could be observed.

![Image](image.png)

Figure 7.91. Skalia. Bent metal needle KS10

7.6.2 Tools and contexts
The small sample of spindle whorls available for ECI–II allows partial, but significant, glimpses of spinning practices before the construction of the final complex. Unfortunately, at this stage of research, it is not possible to assign them securely to primary contexts, further limiting considerations on their contextual significance (e.g. Crewe 2015a, 144).

The situation is more promising for the late complex, where spindle whorls have been collected from most of the exposed areas and were found mostly concentrated in areas B, G, and G2. Area D has also yielded a fair quantity from the two main occupational phases (Figure 7.92). Ca 25% of these artefacts come from upper, highly disturbed, contexts, while more than 75% are from contexts only partially disturbed or currently under assessment. While not ideal, whorls can nevertheless be considered as relatively securely associated with the areas from which they were retrieved. It is noteworthy that the largest number of whorls is from the two open spaces located either side of the monumental Wall 67+407. Even though spindle whorls can be easily misplaced, high concentrations may be indicative of episodes related to their use and abandonment. In this regard, it can be observed that the large open spaces excavated at
Skalia show a series of sequential, relatively clean floors, suggesting a deliberate attempt to keep them clean from discard. This stands in contrast with the ‘dirty’ surfaces of alleyways at Sotira and Politiko (Swiny 2008, 47–48; Falconer and Fall 2014, 174). It is thus more likely that the spindle whorls were used and abandoned instead of being disposed of in these spaces, as was also the case in the Southern Courtyard at Politiko (§7.3.2).

Figure 7.92. Skalia. Occurrence of textile tools in the main areas of the final complex (data from Appendix Table III.31)

Concerning specific areas, it is worth mentioning that two spindle whorls (KS284 and KS287) were retrieved from context 537 in area B, an intact deposit of floor construction materials. It is also interesting to observe that another two whorls from intact contexts in the same area come from a pit in the vicinity of Wall 225 which delimits the ‘beer courtyard’ to the north east, and from inside the courtyard itself, on occupation layer 262. To the north of the beer courtyard a possible working area with intact floor (1156) has been identified between areas B and P. On this floor, two spindle whorls were found next to Walls 506 and 669. Similarly,
some spindle whorls from the open spaces in the same areas were found in proximity to the monumental Wall 67+407 (Crewe et al. 2011, 247 fig.8) (Appendix Table III.43–44).

**Figure 7.93. Skalia. Pie chart showing the ratio between the decorated and undecorated spindle whorls from the final phase complex (n=75)**

**Figure 7.94. Skalia. Imported spindle whorls KS370 (ECI–II) and KS287 (MC) (KS370 from Crewe 2015 143 fig.12c)**

Due to the low numbers and poor preservation, the contextual analysis of the loom weights and needles does not provide secure additional information on the objects, their uses and correlation with other tools. Interestingly, the two loom weights KS171 and KS315 are from the area with a higher concentration of spindle whorls. Also, context 333 is a partially disturbed deposit, but directly above a surface. The fact that the two weights could have functioned in the same loom setup might represent further indication of the presence of a functional group of loom weights, but we cannot establish whether these large spaces were also used for weaving. As for the needles, it may be significant that the two complete examples are from areas B and D, although respectively from an upper occupational surface.
(KS10) and the fill of a pit (KS33). No structures can be related to textile uses. As described in more detail in Appendix II, the main installations of the final complex, including two large ovens, have been interpreted as having been for the production and consumption of food and alcoholic beverages (Crewe and Hill 2012). Thus far, Skalia offers an interesting contextual picture for investigating late MC textile production, and its presence and dynamics in community spaces where significant productive and social-oriented activities have been attested. The social context of textile production will be further explored in Chapters 9 and 10.

Regarding the burial contexts, it can be noted that the occurrence of whorls in the Ammoudhia tombs is high, with 17 out of 29 rescue-excavated tombs yielding these small tools (Graham 2013, 176). Whorls frequency in tombs is generally of one or two artefacts per tomb, with the only exception of T.20, that produced seven examples. Remarkably, these last can be assigned to at least three different weight classes and may correspond to one or two spinning sets (Graham 2013, 179, 335, 177 tab. 4.3). Human remains are scanty and fragmentary at Ammoudhia, and a direct correlation between whorls and individuals cannot be established (Appendix II). However, when human remains are detected, they belong to at least one or two individuals (Graham 2013, 281 fig. 4.5): this and the frequent presence of use-wear indicate that these tools were likely to be personal objects. T.20 probably contained two inhumations, and Graham (2013, 335) suggested that one or both the occupants of the tombs could have been spinners buried with their whorl kits.

Most of the Skalia and Ammoudhia spindle whorls are locally produced, displaying plain fabrics or composition and surface treatments similar to the RP and DP variants identified for the local pottery (Graham 2013, 176). The early assemblage shows the same ratio of decorated and undecorated artefacts, while undecorated spindle whorls are slightly more common than the decorated examples in the later sample (Figure 7.93). Undecorated examples are also common in the Ammoudhia tombs (35% of whorls), and this seems to reflect a different kind of selection when compared to coeval Erimi (§7.5.3). Like Erimi, however, it can be noted that medium heavy and heavy classes show higher peaks in tombs than in the settlement.

Regarding imports, three of the early spindle whorls (KS370, KS552, KS682) from Skalia show fabric and style typical of the north coast and find exact parallels at Vounous A (Crewe 1998, 89, fig. 2.09–2.10; 2015, 144) (Figure 7.94). Another two whorls retrieved from the
final phase can be identified as imported: KS287 is a spherical object with typical south coast fabric and decoration (checkerboard pattern), while KS610 is likely to be from the north coast. Although perhaps sporadic, the imported whorls are significant in retracing intra-regional connection, which in the early phases seem only with the north coast, while in the late MC certainly involves the south coast and, possibly, other areas of the island.
PART III

Chapter 8

Textile Technology and Production. An Overview of the Indicators

The aim of Part III (Chapters 8-10) is to interpret the data analysed in Chapters 6 and 7 using the different interpretative lenses of technology, production, and associated socio-economic aspects. The current chapter (Chapter 8) will provide a re-assessment of textile technologies and insights on production (types of threads and fabrics) through a discussion the indicators identified in Chapter 4 and presented in Part II. In Chapters 9 and 10, the discussion will expand from tools and textiles to an analysis of the entanglement of ‘productive’ things and humans in the Cypriot context, following the concepts described in Chapter 2.4.2 and derived from Hodder’s entanglement (2012). To further expand this analysis beyond production, Chapter 10 will then trace the lines of these entanglements to their societal context and evaluate the role played by textile work in Cypriot prehistoric communities.

8.1 The Pre-Philia

Mosphilia was examined as a case study to demonstrate that defining pre-Philia textile production can be achieved. Concerning the indicators of textile production, bone needles are the only textile tools identified in all of the site’s occupation periods. Perforated stone objects, which likely functioned as spindle whorls, were mainly retrieved from Period 4a/b contexts (LChal). In addition, some of the early clay whorls retrieved from this site could pre-date the Philia (§6.1.2). The diagnostic characteristics and surface microwear of the needles suggest that these tools were used on textile materials and contribute to cast some light on crucial textile activities besides sewing. Although offering indirect evidence only, they inform on the raw materials exploited and the type of threads used.

From an analysis of the microwear traces on needles it appeared that bast fibres were the main textile fibres used in the Chalcolithic. Archaeobotanical remains of flax (Linum usitatissimum) are evidenced in some Mosphilia contexts dating to Periods 2, 3 and 4 (Murray 1998, 217, 216 tab. 11.1). The presence of flax in the archaeological record cannot, of course, be taken as definitive proof of its textile use (Barber 1991, 12). However, when considered in
conjunction with microwear evidence, it strengthens the hypothesis that this plant was employed in textile production. The use of other bast fibres cannot be excluded as their fibre structure is similar to flax (Barber 1991, 15–20), and likely would have left analogous wear traces on bone. **Wool fibres** are generally excluded from consideration for the period because Chalcolithic caprine remains do not seem to belong to woolly species (Croft 2003, 443; 2006, 270–271). As will be further examined, however, light-weighted whorls comparable to the *Mosphilia* artefacts are associated with wool spinning by some textile specialists (Grömer 2005, 110). This contrasting evidence requires us to revisit the discussion of the ‘wool question’ in the LChal (§8.2.1).

Indirect evidence for thread making is provided by the diameters of the needle eyelets. Variation in sizes indicates that threads of different thicknesses, from fine to coarse (0.4/0.5mm to 1.8/2mm diameter), were used with these tools. However, it cannot be specified whether spinning or splicing were used as techniques, and which kinds of spinning tools (e.g. spindles or spindle whorls), if any, were employed. A re-examination of later textile remains showed that splicing was a thread technology used in the EC/MC. This thread making technology appeared earlier than drop spinning in prehistory and is specifically connected with the use of bast fibres (Gleba and Harris 2019). It is thus tantalising to propose that it was also used in the Chalcolithic, although future research will need to clarify this important point.

The re-evaluation of the stone ‘beads’ of Types 4–6 as whorls is crucial and opens up different scenarios in the reconstruction of thread making in the LChal. The first possible scenario is that spindles furnished with whorls existed before the LChal but are essentially invisible in the archaeological record because they were made of perishable materials: KM1447 would be the only evidence preserved of this practice. In this regard, it is noteworthy that the shape of this unique object strongly resembles a lead spindle whorl found attached to the upper end of a wooden spindle in the Ashalim Cave, Israel (Langgut et al. 2016, 981, 983 fig. 6) (Figure 8.1). Their similarity, however, cannot be used to prove whether the two artefacts were used in the same way.

Assuming that the LChal stone whorls were indeed used with a spindle, it would be evidence of a change in the material with which spindle whorls were made. Alternatively, it could represent change both in material and tools/techniques. What can be affirmed with more
confidence is that these tools show a more limited range of weights (4–40g) than BA whorls (4–108g). Therefore, it appears that these new (?) tools were only used to spin a limited assortment of yarn types, namely fine and medium-fine yarn. A second, equally possible scenario is that spinning techniques used before the LChal did not involve the use of spindles furnished with whorls, and KM1447 was not a spinning tool. In this case, the appearance of the stone whorls would correspond to a technological innovation. However, it must be noted that the limited range of weights, the infrequent occurrence of these tools, and their uniform operation may indicate that these tools were used only for the production of fine and medium-fine yarn, while previous techniques continued to be used for spinning different products.

Figure 8.1. Artefact KM1447 retrieved from Unit 1015, in the Ceremonial Area (Mosphilia) (photograph by the author; drawing from Bombardieri and Muti 2018b, 34 fig.2) and the Ashalim spindle (from Langgut et al. 2016, 983 fig.6)

A small sample of terracotta spindle whorls was also retrieved from Mosphilia. All but one came from mixed Period 4 and 5 contexts (§6.1.2), leading archaeologists to think that they were contemporary with mature Philia material at the top levels of the site. Whilst some can be stylistically attributed to the Philia, and probably appeared together with the Philia material culture, the only whorl recovered from a secure context (KM2367) was likely in use in the earlier Period 4a. This is the same period during which we witnessed the peak occurrence of stone whorls. The functional parameters of the terracotta whorls show similar values when compared to the stone sample, and the difference between the two categories of objects is thus
stylistic rather than functional. Notably, terracotta spherical whorls have the same shape as the stone ones, while biconical whorls represent a new shape. Regardless of whether the two categories overlapped or replaced one another, no major changes in their functions can be observed, and this indicates that there was virtually no change in technology and product types. No incontrovertible weaving implements have been recognised in the Chalcolithic. Even though some needles could have been used as weaving needles, they do not provide any clues on the type of loom utilised (e.g. vertical or horizontal loom, presence of band weaving implements) (Barber 1991, 79–125).

Before moving on to discuss the Philia, it is worth reiterating that the textile evidence presented so far fits well within the wider LChal new material culture and technologies that pre-date the Philia (Peltenburg 2013; 2018) (§3.1). As observed in Chapter 3.1.1, it must also be kept in mind that, based on the data currently available, the extent of the Philia and LChal overlap cannot be established confidently.

8.2 The Philia

Philia spindle whorls were light, fast-rotating tools (Crewe 1998, 32–36; Frankel and Webb 2006a, 160–162; Peltenburg and Webb 2013, 270–276). In terms of weight, the most common categories are between light (4–18g) and medium light (18–30g), similar to weight ranges noted for the stone whorls. Even though spindles can be furnished with more than one whorl, and the Philia whorls may not have been exclusively used to produce thin yarn, a significant part of the Philia repertoire was undoubtedly aimed at obtaining fine products.

The use of tools with the same functional parameters may not always be a secure indicator that the same outcome was reached as this can also depend on other factors, such as the human component and, in the case of spinning, the preparation of the raw materials (Kania 2013; Grömer 2016, 62–63). However, similar preferences on part of the spinners and possible common production targets seem the only explanations for such a homogenous assemblage across the island. This may be supported indirectly by a general uniformity in the Philia material culture: for example, pottery was primarily produced in the Ovgos Valley area and distributed widely, reaching all Cypriot regions (Dikomitou-Eliadou 2014). The whorls’ diffusion followed a similar trend to the Philia pottery as the fabric of most whorls indicates that they were produced within a limited area (the Ovgos valley) from which they spread.
Local imitations have, however, been identified at sites far from the production centre (Sotira, Skalia). These tools do not differ in their operation but were made in a different pottery fabric and were generally undecorated.

Regarding **loom weights**, the quantity of these artefacts retrieved is unfortunately too small to characterise technical aspects of weaving in this period. Frankel and Webb’s (2006a, 176) observation that the Philia weights are the lightest examples in the Marki assemblage and their proposed correlation to the production of relatively fine fabrics was discussed in Chapter 6.2.2. In this regard, however, it is important to remind the reader that this type of loom weights appears largely incompatible with weaving fine thread, leading to think that other weaving tools (weights, looms, implements) and, possibly, techniques were in use (as it can be also hypothesised for the EC–MC [§8.3.2]).

The sample of **needles** is also small and consists primarily of long types that could be used as generic sewing needles and, perhaps, in tapestry. Only metal needles were retrieved from the Philia levels at Marki. However, this does not mean that bone sewing implements ceased as they are present in the ECI–II and later phases of the EC and MC periods at Marki and other settlements. Instead, their absence from Philia levels at Marki is likely a result of the limited exposure of this period’s occupation. The eyelet diameters (0.5–1.5mm) registered are compatible with the use of fine to thick threads, and this can be considered as interesting additional evidence concerning the yarn used. Predictably, the Philia craftspeople used more ranges of yarn than compatible with the light whorls, similar to the situation noted for the LChal. Assuming that most of the yarn used in this period was produced on the island, this may mean that they were adapted to a non-optimal use, that spindles were set by adding more than one whorl, or that they used other, archaeologically invisible, thread making techniques to make thick thread.52

**8.2.1 Light whorls and wool**

One of the most important questions emerging from the above data is why there was a need for spindle whorls. This question is related to a second one, namely, why only light weight categories start appearing in the record between the LChal and the Philia. As already

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52 Very thick thread and cordage were obviously needed, and it is unlikely or impossible to spin them with such tools.
discussed, light spindle whorls can be related to the production of fine thread; therefore, it is logical to think that the appearance of these artefacts is connected to their function and the products of their use. Some scholars have proposed a direct connection between the increase in number of light spindle whorls and the exploitation of wool fibres. Supporting this hypothesis, Grömer (2005, 110) concluded through experimental tests that “a very light spindle with a weight of 10–20g cannot be used for threads of more than 1.5mm diameter or flax, whatever technique is employed”. This is even more crucial if we consider that the beginning of the Bronze Ages in Europe and the Near East generally corresponds to the intensification of the wool production (Rast-Eicher 2014; Sabatini et al. 2019, 4909–4911; also: Sabatini and Bergerbrant 2019), even though wool was probably already in use earlier than the BA (Breniquet 2008, 92–93; Militello 2014, 2014, 265, 276) (Appendix I). Nonetheless, the debate is ongoing (Andersson Strand and Nosch 2019, 28), as Neolithic whorls may appear smaller than BA examples, and the association may not always be direct. Functional parameters describing the rotation of these tools (RS and MI) are thought to be more accurate for this evaluation. An increase in whorls’ rotation can be an indicator of wool exploitation (Médard 2018, 96, 97 fig. 9.3), and fast rotation is a distinctive characteristic of early whorls on Cyprus.

Changes in faunal remains are considered the indicator of one of the most substantial transformations occurring between the Chalcolithic and beginning of BA in Cyprus, namely the re-introduction of cattle and introduction of donkey on the island (§3.1). Croft (2003, 443; 2006, 270–271) has found that new caprine breeds were also introduced to the island during the Philia. This conclusion is based on an evident difference in size detectable when comparing the Mosphilia sample to the Sotira and Marki assemblages. Chalcolithic goats generally show non-twisted horncores typical of wild species, leading him to hypothesise that these are mouflon-like species; it is uncertain whether they were herded or hunted (Croft 1998a, 305–308; 2006, 270–271). Similarly, Chalcolithic sheep are believed to be close to wild species, even though the sample includes only a few diagnostic bones (Croft 1998a, 305–308; 2006, 270–271). As regards textile fibres, kemp (the thick fibres in the fleece) is predominant on wool in wild species. This fibre type cannot be spun because it is very short; wild caprine are therefore normally dismissed as a source for textile fibres (Barber 1991, 21,
24 n.8) (Appendix I). Taking this assumption to its logical conclusion, we could therefore deduce that wool was not yet spun in Chalcolithic Cyprus.

The evidence, however, is not as clear-cut as it may appear. The evolutionary development of fleece can be slow and gradual through time, and breeding has been recognised as determinant in producing sheep breeds with intermediate types of fleece (namely, of variable quantities of kemp, hair and wool) as can be detected in the difference between the kemp of wild mouflons and the fine hair of modern breeds (Ryder 2005) (Appendix I). As Chalcolithic caprines showed anatomical characteristics both of wild mouflons and domestic species, it cannot be excluded that they could produce spinnable wool, despite their not being the most suitable breed for this purpose. It is worth noting that genetic studies can greatly contribute to the reconstruction of ancient breeding (Sabatini et al. 2019, 4192–4193). Genetic studies thus open up the possibility to investigate Cypriot remains with the aim of determining the development of LChal fauna and the possible chronology and dynamics in the exploitation of animal fibres on Cyprus.53

8.3 The Early Cypriot–Middle Cypriot III/Late Cypriot IA

The next sections of this chapter will investigate the EC–MC record, touching also upon the transitional period between the end of the MC and the beginning of LC. In doing so, the following sub-sections will draw on the analysis conducted in Chapter 7.

8.3.1 Spindle whorls and spinning

With reference to the **spindle whorls**, continuity and transformation of these tools are detectable during ECI–II. First, early whorls from Marki show a preponderance of the same weight categories as in the Philia, though heavier classes are now added for the first time. Second, biconical whorls remain in use and clearly derive their shape from their Philia precursors; and the new conical type (Type I) is added to the repertoire. Conical whorls – also displaying an innovative, distinctive decoration – appear as early as the ECI on the north coast and characterise the assemblage at the Vounous A cemetery (Crewe 1998, 88–89, A2.9–10)

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53 The analysis of mitochondrial DNA has enormous potential for obtaining a more secure outline of the physical characteristics of animal populations, including the type of hair from goat and sheep specimens (Sabatini et al. 2019, 4193). Due to difficulties in the replication of mitochondrial DNA, this approach currently has a limited application but is expected to be an important research tool for future archaeozoology studies (Sabatini et al. 2019, 4192).
This type is also prevalent in the early assemblages of Marki and Skalia. Despite being primarily a stylistic change, the introduction and sudden diffusion of this type across the island stimulates some reflections.

The shape and decoration of these whorls show a strong connection with a category of contemporary Anatolian spinning tools (e.g. from Troy [Richmond 2006, 227 fig. 2a] and Küllüoba [Sari 2018, 217 fig. 19.3.d,f]). In some cases (e.g. VT90/26, VT95/1, VT116/28 from Vounous), they also display a hollowed top that is diagnostic of this type in Anatolia (Richmond 2006, 227 fig. 2a; Sari 2018, 217 fig. 19.3.d,f). Because this style is so distinctive and shows no connection with Cypriot Philia whorls, direct Anatolian influence is highly likely. Local imitations of this type and one import from the north coast are recorded at Skalia, and this suggests that the new type originated in the north coast and then spread to different areas of the island (also: Crewe 2015a, 114, 144). A few likely imports were identified also at...

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54 This characteristic continues into the ECIII and is typical of the north coast (e.g. VT2/28, VT2/44, VT7/10, VT17/35, VT17/61, LT322B/19 [Crewe 1998, figs. A2.5, A2.8, A2.10–12]).

55 In a recent study, Vakirtzi (2020) has identified similar conical whorls with hollowed tops diffused in the Aegean as Anatolian-derived types. Whorls with these characteristics appear in the Aegean earlier than on Cyprus, but the largest sample is from sites dated to Early Cycladic II–III (ca 2500–2200 BC), thus contemporary with Vounous A (Vakirtzi 2020, 113–118).
Marki (Frankel and Webb 2006a, 175). As introduced in Chapter 3.1.2, the ECI–II is recognised as a period of disruption of international and inter-regional networks, with a remarkable divide between the north and south regions. It is therefore no surprise that the majority of conical whorls are locally produced, and the Skalia import may have reached the western region indirectly. However, the relatively fast diffusion and peculiarity of the type suggests a stronger link between the north and south-west regions than hitherto thought.

Other changes in the shape of whorls are visible between the end of the EC and the beginning of the MC. Truncated biconical/spherical tools (Type III) started becoming increasingly popular in this period (Crewe 1998, 35): this type can be considered a carinated variant of the conical whorl, which, in turn, decreases in popularity.

As regards weight categories, heavy classes are still absent from the Sotira record, but a more evenly spread distribution of weight classes is evident in the ECIII–MCI, for example, at Marki, thus foreshadowing the more evenly distributed patterns observed at MC sites. The development and use of differently weighted tools also allow us to draw a better picture of the
other components of spinning practices and productive choices (Figure 8.3). An example of this is the distribution of whorls across weight categories at Erimi, Alambra and Politiko. At these sites, peaks are in the medium classes, but light, heavy and very heavy whors are not insignificant: in fact, the latter represent between 20% and 30% of the site assemblages. In contrast, Skalia shows lower percentages of these categories, with a clear inclination for use of light and medium light whors. While whors can only be correlated to general categories of yarn thickness (thin, medium, thick) (Andersson Strand et al. 2015, 192), the size of needles’ eyelets shows that the diameters of threads used at these sites were generally between 0.5mm and 1.5mm. Threads fitting into such diameters are of medium-light to very thick thicknesses (Andersson Strand et al. 2015, 192 fig. 6.1.2; Grömer 2016, 87 fig. 4.1) and are compatible with thread thicknesses recorded for the fabric pseudomorphs, namely between 0.5mm and 0.7mm, and, occasionally, thicker (Appendix IV).

The picture drawn so far does not indicate changes in the types of fibres spun (Crewe 1998, 36); on the contrary, wider range of whorl weight classes represents a strategic improvement of the spindle to be able to be used for different qualities of thread. As observed for the Philia assemblage, it is implausible that thick yarn and cordage was not used in the EC, but it is problematic to connect these products to the lighter weight classes. Spliced threads are possibly detectable on EC–MC mineralised fabrics, meaning that most probably both splicing and drop spinning were used as thread technologies, and whors are not essential for the latter (Appendix IV).

Concerning the types of fibres spun, direct evidence comes from the textile remains; all of which have been identified as flax (Landenius Enegren and Vanden Berghe 2016; Landenius Enegren 2018, 30–32). Wool seems to have played an important role in Cypriot textile production, probably starting to be exploited in the LChal or, at the very latest, during the Philia (§8.2.1). It is thus sensible to assume that it continued to be one of the main fibres also used throughout the BA. Secure evidence of wool exploitation can be found at Erimi where, given the presence of dyeing activities, it is likely that this fibre was largely – albeit probably not exclusively – used (see, e.g., Militello 2014, 266 for the correlation dyeing-wool). Unfortunately, faunal remains are silent on the role of wool in Cypriot manufacture and economy: no faunal assemblage from an EC–MC settlement has so far displayed kill-off
patterns specific of wool exploitation (Croft 2003, 440–443; 2006, 245, 263 tab. 9.1; Falconer and Fall 2013b, 127–128).

One other aspect related to spindle whorls that this analysis allows us to tackle is the tendency towards a general increase in size through time as originally hypothesised by Stewart (1962, 233), and subsequently recognised in the Marki record (Frankel and Webb 2006a, 172). However, the overall size and weight increase only if we consider mean values, as done for Marki (Frankel and Webb 2006a, 172, 172 fig. 5.7), rather than the distribution of artefacts across weight classes. This is because heavy classes were introduced in the late EC/early MC, and whorls had become more functionally developed and hence became distributed across a wider range of weight classes. In contrast, this analysis confirms that small, light and medium light whorls are still efficiently used in the MC (Crewe 1998, 35–36), and their reduction in number is likely to indicate a more specialised use. At the end of the MC the tendency overturns again in favour of light/medium light whorls, as observed at Skalia.\(^{56}\) This is likely to reflect productive targets, but it can also be interpreted as a first step in a process of transformation that led to the appearance of new spinning and weaving tools in the LC. The majority of LC whorls are, in fact, light or medium light weighted (Sauvage and Smith 2016, 197, 199 tab. 1, 200). Notably, no remarkable changes in RS values, indicating the relation between heights and diameters can be detected through time. Also, RS values indicate that diameters varied proportionally with the size of the whorls, and were generally slightly larger than heights in all types.\(^{57}\)

Changes in **spindles** can be observed indirectly: the ECI–II whorls show smaller perforations when compared to the later examples and must have been mounted on thinner spindles. ECIII/MC spindles had diameters that could fit into whorls with perforations of 10–12mm and 12–14mm. The ECI spindle whorl in the terracotta model from the Vounous T.92 is comparable with contemporary ECI–II conical whorls, giving an idea on the appearance of an ECI spindle. This spinning modality – the mid-whorl spinning – continues to be in use in the MC, as suggested by the arrangement of the ‘Zintilis’ spindle (§4.2.4) (Muti 2017a, 228–229).

\(^{56}\) Similar tendencies can be observed in the record from contemporary sites, such as Episkopi Phaneromeni, Korovia Nitovikla, and Kalopsidha (Swiny 1986, 112 tab. 6; Crewe 1998, 35; Medelhavsmuseet 2020).

\(^{57}\) As noted in Chapter 4.2.1, diameters are important functional parameters that affect the rotational speed and should always be considered in relation to weight.
Another terracotta model from Vounous (T29/52) exemplifies another way of furnishing a spindle (low-whorl spinning) (§4.2.4). As both representations are from the same site, we can exclude that spinning techniques were region-specific. Instead, it appears that low- and mid-whorl spinning were two alternative ways to equip a spindle across the island. This conclusion is additionally supported by use-wear marks on whorls, namely an area of circular abrasion at narrow terminals that is produced when the whorl is placed in the lower part of the spindle with the narrow terminal downwards (Frankel and Webb 1996, 194; Crewe 1998 60–62) (§4.2.2). Regarding the direction of spinning, secure evidence for S-spun thread can be retrieved from the analysis of textile pseudomorphs and the presence of an S-groove at the top terminal of metal spindles (Webb 2002, 369, 365 fig. 3; 2018, 42 fig. 3.47).

8.3.2 Loom weights and weaving

The sample of **loom weights** (101 artefacts) from the select case studies presents a representative cross-section from the entire island. Unfortunately, I was unable to include in this study the assemblage from Pyrgos (Belgiorno 2009, 55), two fragmentary examples found at Ambelikou (Webb and Frankel 2013a, 174–175), 13 loom weights from MCIII/LCIA Phaneromeni (Swiny 1986, 107–110), and one from Vounous T.37 (Dikaios 1940, 79, pl. LIX.15), so far the only example retrieved from a burial context. Considering the scarce occurrence of these objects, the analysed sample is representative for the island’s trends. Three weight classes (namely, 401–800g, 801–1200g, 1201–1600g) representing medium/heavy to very heavy tools can be identified at all EC/MC sites, and two (401–800g [generally >500g], 801–1200g) are present at all sites considered, suggesting homogeneity in functional ranges across the island. Calculations based on the weight and thickness of these tools have demonstrated that these categories of loom weights would allow optimal loom setups by providing warp tensions of 30–40g and 50–60g (with twn to 30 threads per weight), and tabby fabrics with five/six warp threads per cm² could be woven.

Because of the heavy weight of these tools, Frankel and Webb (2006a, 176) hypothesise that an EC–MC weaving set was composed of a small number of weights, each one attached to a large number of warp threads. Nonetheless, recent research has shown that the number of warp threads does not depend on the mass or type of loom weights and should not exceed 30 threads per single tool (Mårtensson *et al.* 2009). A minimum number of four weights, as estimated by
Barber (1991, 104), on a minimum of two rows needed for weaving a tabby fabric would produce at least a fabric of a maximum width of 60 threads, which, even though reasonably wide, would be no more than a textile band. As noted by more recent studies, loom weights may produce different types of fabrics of different densities depending on how many threads are attached to them, and warp threads needing more than 40g tension correspond to thick types (Mårtensson et al. 2009; Andersson Strand et al. 2015, 193, 193 fig. 6.1.3). Thus, it can be deduced that the Cypriot loom weights can be more likely correlated to the production of heavy fabrics from thick, and robust thread. It is not clear whether they were used with a preference for specific fibre types. Certainly, flax is less elastic than wool and probably more suitable to be woven with heavier weights without being stretched beyond the elasticity point, but thick or coarse wool threads would also be suitable. Amongst the possible array of textiles, it should be considered garments but also non-worn textiles, such as coverings, blankets, carpets (also: Appendix VI), and it is worth noting the warp-weighted loom seems particularly appropriate for tapestry as it can give flexibility to the warp (Smith 2013, 165).

All mineralised pseudomorphs analysed in Appendix IV belonged to tabby fabrics and variability in the warp thread count (from 3x4 to 10x10 threads per cm²) can be noted: optimal or possible setup using the conical weights is not compatible with weaving only some of fabrics (with a warp thread count between five/six and eight threads per cm²). The fact that light loom weights were not part of a typical EC–MC assemblage, it can be hypothesised that other types of looms or weaving techniques – archaeologically invisible – must have been used. The heavy loom weights were thus tools for weaving certain kinds of textile products, and this would easily explain why the same type and range of functional parameters were used and perpetuated. The initial impression given by the EC–MC assemblage, namely that weaving practices were uniform across the island and unchanged through time, may thus be incorrect, or, rather, may be an erroneous conclusion based on their lack of visibility in the record. It must be noted that new types of loom weights start appearing in the late MC sites of the Measoria plan. Åström’s (1972, 157) taxonomy included these pyramidal and discoid types that can be only identified at Kalopsidha and Agios Iakovos (see Chapter 4.2.7).
However, the only type retrieved from Skalia is the ‘traditional’ one, probably indicating that the change originated in another area of the island and did not reach the site.\textsuperscript{58}

8.3.3 Sewing and the finished products

Possible developments in sewing techniques are difficult to detect as no functional changes of \textit{needles} are visible in the EC–MC assemblage and no stitches could be detected from the EC–MC mineralised fabric. In contrast, needle types can give a more vivid and reliable picture than that obtained from the fabric remains and imprints alone, which represent a limited, but significant variety of textiles and garments only (i.e., plain fabrics for object wrapping and funerary shrouds [Appendix IV]), indicating that these tools could be used for different purposes in cloth-making and, possibly, decoration. Their optimal use is compatible with a range of different fabrics and textile artefacts, providing a glimpse into the variety of textiles during the EC–MC. In addition, likely evidence of textile \textit{dyeing} at Erimi proves that coloured textiles were part of the EC–MC productive environment, and, most probably, highly valuable objects (see §9.2.1). Likewise, the fine needles recovered from Sotira may hint at the possibility that textiles were decorated with additional elements (§7.4.1).

\textbf{Figure 8.4.} Plank-shaped figurines from Vounous and Lapithos (from Morris 1985, 137 n.181, 148 n.226), and terracotta model showing washing or pottery making activities, Louvre Museum (AM816), unprovenanced (re-drawn [Muti 2017d, pl. IX fig. 4b])

\textsuperscript{58} The loom weight assemblage at MCIII/LCIA \textit{Phaneromeni} shows an identical situation (Swiny 1986, 107–108, fig. 32).
Iconography can also provide indirect evidence of the finished products, especially clothing. Anthropomorphic figurines may show representations of cloth and banded textiles. These are: a) plank-shaped figurines; b) figurines applied to vessels; and c) figurines part of scenic composition (Karageorghis 1991, 49–102) (Figure 8.4). The plank-shaped figurines are free standing, human-like figurines, smaller than real-size and characteristically flat (Webb 2016b), while the other two categories comprise small anthropomorphic appliques within everyday life representations on vessels or as models (Karageorghis 2006).

The so-called ‘plank-shaped’ figurines can be considered another piece of indirect evidence of the existence of elaborated clothing, and the use of sewing (or embroidery?) and weaving techniques to enrich the visual appearance of the dress. In fact, these anthropomorphic representations, typical of the MC, show elaborated clothing, such as decorated long tunics, and hair and neck bands (Webb 2016b, 7). The dress and ornament display of these anthropomorphic figurines contrasts with the lack of cloth details (with exception of geometric hair or neck bands) of the human figurines applied to vessels or used within scenic compositions (e.g. Karageorghis 2006). An in-depth study of the iconography of the plank-shaped figurines was not within the scope of this thesis, but it would be an interesting topic for future research to investigate differences in appearance and consumption of everyday clothing and ‘haute couture’ (following Nosch 2008). Textile consumption is extremely difficult to detect, but, as will be observed in the next chapters, it is central to our understanding of many aspects related to changes in production and society.
Chapter 9

Productive Entanglements of Cypriot Textiles

This chapter develops our data interpretation from analysing single indicators and activities to contextualising the evidence and reconstructing the entanglement of relations between ‘productive’ humans and things as they emerge from the contexts selected for this study. The productive entanglement was formulated in Chapter 2 and is based on Hodder’s (2012) entanglement approach. Specifically, it facilitates describing the relations between the entities or factors (producers, tools, materials, productive choices, socio-economic implications, work-related identities) involved in the productive process.

As explained in Chapter 2.4.1, Hodder’s approach is general and aimed at understanding how reality is constructed through sets of relationships between humans and things. The productive entanglement is focused on investigating a specific kind of reality, namely textile production. This is not intended as a sub-set but as series of specific interactions and dependencies between things and humans within the general entanglement. The concept of entanglement will also be utilised to progress our investigation into the relationship between textile production and society in Chapter 10. To visualise all these aspects that the entanglement of textile production comprises at once and examined in this chapter and the next one, I have adopted Hodder’s tanglegrams which provide a suitable research tool to depict such a wide-ranging web of dependencies (Chapter 10). Aspects related to specialisation and the identity of textile craftspeople, also discussed in Chapter 2, are included in this analysis.

9.1 The Pre-Philia and Philia

9.1.1 Settlements

LChal production at Mosphilia was likely set in the typical domestic units (roundhouses) as the settlement was overall lacking in communal work areas, shared spaces, and facilities. The use of bast fibres as the main textile materials, however, suggests that at least some steps of this production were probably taking place outside the buildings or the village as the preparation of these fibres requires space for water soaking and drying that are unlikely to fit inside a roundhouse (Andersson Strand 2012, 26–27, 29 tab.3). The domestic units, however,
show typical assemblages of utilitarian vessels, ground stone tools, and installations in which the core activities undertaken with textile tools fit well and can be interpreted as a part of the household assemblage.

An exception to this picture are the textile tools retrieved from the Pithos House (Building 3, Period 4a), analysed in Chapter 6.1.4 (Peltenburg et al. 1998a, 37–44, 252–254). Seven needles and a stone whorl represent textile production in this extraordinary context, interpreted as the material expression of control over resources and behaviours aimed at gaining social prestige (§6.1.4; Appendix II). The presence of the spindle whorl is particularly significant as the style of these tools appears in Period 4 and has a restricted distribution for the number of pieces recovered in the settlement. These artefacts show a similar shape and function when compared to the Philia artefacts and are particularly suitable for spinning fine thread (§8.1). A large number of new types of ornaments, such as faience beads and annular shell pendants, were also retrieved from the Pithos House (Peltenburg et al. 1998a, 37–44; Bolger 2013, 10). For Bolger (2013, 10–11, 14–15), these show a great social value and represent “the deliberate choice by some communities on the island to transform their previous identities by adopting new types of personal ornamentation that served to highlight their greater degree of engagement with the outside world”. This thesis has consistently argued that textiles and, more specifically, clothing served this very same purpose and acted, in combination with ornaments, to re-define bodily aesthetics and personal identities.

As already remarked (§8.1), the archaeological record provides us with clues, but it is difficult to establish, in the same way that this can be done for pottery and metallurgy, whether, how, and to what extent textile technology changed from the previous period, and if and to what extent the adoption of new tools, and, possibly, technologies, and fibres (i.e., wool) impacted on the characteristics and style of the final product. The presence of textile production in this context remains significant and may be interpreted as additional evidence of the social and, possibly, economic role that this craft and textiles could have played in the LChal/Philia transition. No organisation of craft manufacture beyond the domestic level (following criteria described in §2.2 [e.g. Costin 1991]) can be unambiguously detected in the LChal. However, a differentiation between utilitarian and prestige textiles has been hypothesised which, most likely, played different roles in the LChal entanglement of textile production and consumption.
As we proceed to the Philia, settlements are virtually unknown for this period – with the sole exception of a few, complete or partial units excavated at Marki and Skalia. Further complicating matters is that a significant quantity of Philia tools has been recovered from later contexts (§6.2.1). At Marki, for example, only five tools were retrieved from contexts of use and abandonment of the phase B domestic units, and only one whorl is from an exterior area between compounds (Appendix Table III.27). Little can be said about the dynamics of textile work for this period, but it is tempting to think that textile activities were not confined to the interior of the house as the Philia units were surrounded by open spaces used for different activities and, possibly, cooperative work (Frankel and Webb 2006b, 290–291). Given the portability of textile tools, it is not difficult to imagine that such spaces could have been also suitable for textile production. However, the current evidence is only circumstantial.

9.1.2 Integrating the burial evidence

The burial evidence presents an inverse situation when compared to settlements. New funerary and grave good complexes occurred at Mosphilia in the LChal (Keswani 2013, 180–186), but the textile tools retrieved from tombs are few and mainly come from fills, and it is not possible to argue for the existence of textile-related symbolism (§6.1.4).59 In contrast, selected Philia tombs provide evidence to explore the social value of textile tools, and, possibly, textiles. This section will thus discuss the data concerning T.1, T.2 and T.4 at Laksia, the Nicosia T.4, and the Sotira T.15 (following Douglas’ re-interpretation [2019, 181]) as examples that can facilitate such investigation (§6.2.4).

The location of spindle whorls within these burial spaces shows a relationship with the human remains which mirrors that between bodies and ornaments. This selective placement of whorls opens up the possibility that early whorls could also have been used as beads or pin toggles, given that both categories of objects can fit a shaft (Frankel and Webb 2006a, 161). Use-wear traces can be detected on the tools and demonstrate that these artefacts were used before being buried. This makes it likely to propose that they were personal tools buried with their owner, like later examples (§9.2.3) (Douglas and Muti 2019, 26–27).

Amongst other textile implements, spinning tools are perhaps the objects creating the closest physical relation with the craftsperson’s body as spinning is characterised by a unique human-

59 The sample is small, and it is not possible to be certain if this reflects patterns at other sites.
thing co-dependence: the body movement of the spinner’s arm connects through the yarn with the spindle and the rotation of the tool (Barber 1991, 41–42). Sørensen (2010) has stressed that the presentation of the deceased’s body through configurations of worn objects is used to perpetuate a range of different messages that can be drawn from the relation of the body and objects and the embodied experiences that derive from them. Among different categories of relations between bodies and worn objects (attached, additive, and associated objects) (Sørensen 2010, 56–59), additive objects are considered extensions of body parts and the “may therefore have been involved in discourses about and perceptions of the body, its boundaries and abilities” (Sørensen 2010, 57); swords or axes are examples of such objects.

Likewise, spindles could have been perceived as an extension to the body or as a component that is indissoluble from the artisan’s body when spinning (§2.3.4). Placing whorls – perhaps

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60 Different body parts and movements can be associated with the spinning action, depending on the technique used. However, the interrelation arm-tool is always fundamental in the spinning action (Appendix I).
even with their shafts – near the deceased may not only act as a comment upon a specific tool-
person association but may also mimic an inert spinning act, expressed through the inseparable
bond between body and tool. Also, spindles are movable objects frequently carried by spinners
to be used in different places; and they can even be worn (Figure 9.1). These kinds of
everyday actions could have contributed to spindles and whorls being recognised as having a
strong relation with the owner/spinner, helping to construct and depict his/her social identity
based on craft practicing (§2.3).

The treatment of whorls in these tombs mirrors that of metal objects. Mina (2014, 236, 236
fig. 4) has observed that both metal ornaments and weapons were placed over or along bodies;
a practice that started in the Philia and continued throughout the EC/MC (Webb and Frankel
2015; Mina 2016; Douglas 2019, 132–138). Worn metal artefacts were means to represent
the social identity of the deceased through the adorned/dressed body and the depiction of
aesthetic values and a “mnemonic reference to the deceased’s actions in life” (Mina 2014,
237–239). The presence of spindle whorls in the same space as metal objects suggests that
they could have been used similarly in the construction of the deceased’s identity. Like metal
artefacts, whorls seem to evoke a bodily performance of the individual and suggest a
construction of the deceased’s identity through the construction of bodily appearance.
Furthermore, the light Philia spindle whorls may not only allude to the consumption but also
to the manufacture of fine, valuable textiles. For Dobres (2000, 127), technology and social
practice cannot be kept separated: in the Philia tombs, however, it is not (or not only) a
technological, but mainly a productive action (and, more broadly, a productive activity) that is
represented for a social audience. This interpretation agrees with the mechanisms of identity
construction explained in Chapter 2.3 and fits well with Mina’s understanding of metallurgy as
a series of activities creating a sensory experience that impacted on the creation of social roles

How new are these identities? Mina (2014, 238–239) stresses the novelty of the Philia in
relation to variety of ornaments and their relations to different body parts, especially when
compared to the Chalcolithic emphasis on pendants. As noted above (§9.1.1), however, the
MChal and LChal show enormous differences in the type and consumption of ornaments

61 It is also noteworthy that tools other than spinning ones are rarely buried as grave goods in the Philia and
EC/MC (Douglas 2019, 117–122). Also, ornaments are found as offerings (Douglas 2019, 134)
(Bolger 2013, 10–11). The adoption of new types of ornaments in the LChal certainly impacted on the bodily experience of adorning bodies – namely, wearing different types of ornaments (e.g. size, colour, style) – and their reception by a social audience. The Philia record, thus, may represent a consolidated attitude towards the use of ornaments and the burial arena for these purposes. More systematic use of metallurgy and textile technologies or a more wide-spread production and diffusion of specific types of metals and textiles could have contributed to the normalisation of these behaviours, but the relation of dependence between worn objects with new characteristics or style and identity re-definition, and perhaps technological ability, seem to have begun in the LChal.

9.2 The Early Cypriot and Middle Cypriot III/Late Cypriot IA

9.2.1 Settlements

As introduced in Chapter 5.2, the organisation of the settlement spaces is fundamental in situating textile production, and the appearance of community spaces in the EC–MC seems to have had an impact on the dynamics of textile work.

All categories of indicators for thread making, weaving, and sewing have been retrieved from domestic units in all the case studies examined. Preservation issues particularly affected the visibility of loom weights. The occurrence of needles is also low, especially when compared to Mosphilia, where broken and residual materials gave a good idea of the quantity of these tools used and discarded.62 Even though these tools were part of the domestic assemblage, it unfortunately prevents any other type of distributive and spatial analysis, and questions about the number of possible sets owned and used by each household can unfortunately not be answered. Other textile activities, especially the ones essential to the operative sequence, were practised but are completely invisible in the record. As noted for the previous periods (§9.1.1), open spaces outside the buildings or the village are the most suitable for these kinds of activities.

Despite these limitations, valuable information for our understanding of textile work in EC–MC domestic spaces is provided by spindle whorls. The mean number of spindle whorls within a typical household assemblage ranges from 1.2 to 2.5 objects (Table 9.1), and tools

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62 Given the lower quantities retrieved in the EC/MC sites, that perishable materials could be used in addition to metal and bone for making needles.
from single units generally belong to different weight classes. This suggests the probable
presence of spinning kits, each composed of few whorls suitable for making a variety of
threads. Supporting evidence for this hypothesis is provided by Webb (2018a, 273), who noted
that single-inhumation chamber tombs excavated by Markides at Lapithos produced the same
number of whorls as domestic units. She proposed that spinning sets used by individual
spinners may have been composed of two to four whorls and that this relationship continues
into the funerary sphere (Webb 2018a, 273). Clusters of two or three whorls identified at
Sotira also confirm this trend (§7.4.2).

<table>
<thead>
<tr>
<th>Site</th>
<th>Mean whorl number per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marki</td>
<td>2.5</td>
</tr>
<tr>
<td>Sotira</td>
<td>2</td>
</tr>
<tr>
<td>Politiko</td>
<td>2</td>
</tr>
<tr>
<td>Erimi</td>
<td>1.9</td>
</tr>
<tr>
<td>Alambra</td>
<td>1.2</td>
</tr>
<tr>
<td>Skalia</td>
<td>n/a</td>
</tr>
</tbody>
</table>

*Table 9.1. Table illustrating the mean number of whorls per domestic unit in EC–MC III/LC IA
settlements (n/a= not applicable as no or incomplete domestic units are exposed)*

As regards to the relation between tools and the productive space, it was already observed that
whorls and needles are portable tools that can be carried and used in different places, and
looms can be dismantled and re-assembled (§4.5; §9.1.1). Thus, the findspot of textile tools
does not necessarily indicate that textile activities were carried out in the spaces where the
tools were retrieved. It must be noted, however, that settlements such as Marki, Alambra and
Sotira are characterised by agglomerations of domestic buildings with no, or very few,
possible spaces for extra domestic activity (see note 63). As no other spaces can be detected
for working activities, it can be postulated that the household space was the main productive
space where spinning, weaving, and sewing (and, possibly, other textile activities that we
cannot detect from the archaeological record) were carried out, even though not necessarily in
the exact rooms in which the tools were found. In contrast, when community spaces appear
during the MC at Erimi, Politiko, and Skalia, tools stored in houses could either have been
used in domestic or public spaces (see below). It must also be pointed out that locating textile
manufacture exclusively ‘in the household’ places a misleading emphasis on the topographic
location of the craft rather than its socio-economic implications (Frankel and Webb 2006a,
For example, while textile activities were conducted in open courtyards at Marki, they were actually walled off, thus creating ‘private’ spaces associated with the household unit (Frankel and Webb 2006a, 160, 317).

Moving our consideration from the actual to the socio-economic space of production, within this context it is important to remember that crafting ‘inside’ the EC/MC household does not so much imply a contrast between inner and outer space but rather a separation into ‘private’ and ‘public’ space. It has been observed that the private nature of the EC/MC household, which is especially visible at Marki, can be connected to the development of individual families that could rely on their domestic work for meeting domestic needs, whilst in the previous periods (the Chalcolithic and Philia) cooperative work and kin networks can also have had economic relevance (Bolger 2003, 37–38; Webb 2009, 264). Some scholars, such as Webb (2009, 264), have argued that spatial differences might mirror gender differences, with women work concentrated in the household. Webb (2009, 264–265), however, has also explained that there is no further evidence in the domestic architecture and distribution of indicators related to work activities that hints at gender segregation. Regarding textile activities, and especially the portability of textile tools, it can be hypothesised that textile work may also have been undertaken, for example, during social visits. Despite the privacy of the EC/MC house, it is unreasonable to think that families did not socially engage at all with each other and their neighbours, and different social dimensions of textile production could have existed.

As noted in Chapter 3.2, Smith (2002, 298–299) recommended that domestic textile production in the EC–MC should be more carefully analysed as the productive space may not correspond to productive specialisation. In this regard, it must also be kept in mind that our knowledge of the archaeological record does not inform us about fundamental factors, such as, for example, time spent crafting and number of people involved in textile activities: differences in these indicators would suggest the possible presence of artisans or households producing more than what was necessary to meet their needs (following Costin 1991, 8–9).

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63 Spaces with possible extra-household functions, from which textile tools were retrieved, were recognised at Sotira and Alambra (§7.2.2 and §7.4.2). Their tool frequency is generally lower than that of domestic units, and most tools found there are lost or discarded objects. It is therefore not unlikely that some textile activities were performed outside the house, but they do not appear to have been central spaces for textile production.
Overall, it can be concluded that textile production and the household (and the settlement organisation) are practically, socially, and economically co-dependent. As I will argue below, this co-dependence seems to change dramatically once the organisation of settlements changes.

The majority of textile evidence recovered from Erimi, Politiko and Skalia is from extra-domestic contexts that show high visibility of work activities and extra-household frequentation (Crewe 2017, 147–148) (Appendix II). Other possible production loci (following Costin 1991, 29; 2005, 1056–1063), alternative to the house, become thus visible in the organisation of the MC settlements. Despite the emphasis on work, and the main productive activities detected are very different in type and purposes (e.g. metallurgy, food and alcoholic beverages), and the level and organisation of these spaces is different. Whilst some can be identified as workshops (e.g. Ambelikou [Webb and Frankel 2013]), other sites, such as Politiko, offer evidence that these places were social spaces not exclusively used for working activities (Falconer and Fall 2013a). A difference in the type of evidence retrieved is noticeable: in all places concentrations of tools were found, but at Erimi fixed installations can be also associated with textile production.

Even though the nature of textile evidence (unavailability of products, portability of tools, etc.) and the fact that no other sources than archaeological materials are available limit us from applying criteria generally used to assess specialisation, it is worth using this lens to investigate textile production in these complexes, bearing in mind the productive entanglements of textiles that have been defined for the household. As observed in Chapter 2.2.2, the organisation of workspace, a greater density of tools and installations (indicating labour investment), the quantity or quality of the final products, and their degree of standardisation are elements often considered when assessing the level of surplus production or specialisation (following Costin 1991; 2005; Orton 2013; Earle 2018). It is worth reminding ourselves that Costin’s model combines space, concentration, scale, intensity of production, and the socio-political context of production to determine the level of specialisation (Costin 1991, 13–17). As regard the last point, EC-MC society is considered non-hierarchical, and levels of specialisation that are linked to control from an institutionalised entity have therefore been excluded (§§2.2.4, 3.1). Nevertheless, it is worth contextualising the textile evidence
from these areas in each of the sites to understand whether we can identify different organisational types and assess the role of textile production within the MC complexes.

Erimi is probably the site that is best understood in terms of textile production. The relative quantity of textile tools from secure contexts is high in the Area A complex, especially where spindle whorls are concerned. Averaging out the finds, four whorls per unit were retrieved. However, the number of tools found at the complex outnumbers the average of a household. In addition, it is also extremely important to consider the high concentration and functional organisation of fixed installations, and other implements (e.g. pottery, ground stone tools) that can be related to textile washing, drying, and dyeing.

Functional analysis of the tools of the complex shows that spinning activities were not targeted at making a specific type of thread, suggesting that there was no attempt at product specialisation. The identification of likely dyeing activities could indicate that emphasis was instead on making coloured thread or fabrics. The association of textile tools with dyeing and water processing facilities is significant and supports the hypothesis that at least a large part of the Erimi complex (Area A) was dedicated to workspaces for textile production (§7.5.2). Dyeing, washing, drying, etc. were mainly conducted in both inner and open spaces where installations, vessels and tools were found in functional association, indicating that these workspaces were optimally organised for this productive purpose (for comparanda: Barber 1991, 239–243). An increase in production – as evidenced by an increase in liquid processing capacities of the fixed installation – seems to have occurred between the earliest and the most recent phase of use in unit SAI and the open spaces in the eastern wing of the complex. It can thus be proposed that workspaces and structures in this complex were not only functionally organised, but also possibly modified and expanded over time.

The layout and design of the workspace at Erimi seems to reflect primarily practical aspects of production, but it may also shed some light on possible task differentiation and the social role of textile craftspeople: a deep dependence of workspaces on organisational dynamics can be envisaged. As explained in Chapter 7.5.2, water processing and drying facilities are located in open spaces, but evidence for possible dye-making installations was retrieved only from the nearby roofed unit SAI. If we hypothesise that water-related structures were located in open spaces primarily for a practical reason, then there is no apparent functional purpose in using an
inner, relatively narrow space (SAI) with one access point for the preparation of coloured materials and dyeing – two activities that were ‘dirty’ and required large quantities of water (§7.5.2) (Bombardieri 2017a, 34, 351, 357). Regardless of whether access to the inner room was exclusively limited to the dyers, placing crucial steps of the dyeing process inside suggests the intention to protect and, perhaps, even hide these activities. Furthermore, fewer practitioners would have been able to fit inside SAI, whilst many more workers could occupy the open spaces to undertake activities that required less specialised skill and a larger workforce. It is also crucial to note that dyeing is not essential in textile production as a fabric can be left as its natural colour. When dyeing is performed, its main purpose is to enhance the visual aspect of fabrics, providing an exclusively aesthetic characteristic that transforms the product into something more valuable and appealing (Harris 2017, 688–690). It may thus be inferred from the organisation of manufacture and type of products obtained that the Erimi craftspeople produced textiles for exchange.

The Erimi complex was recognised as a textile workshop by the excavator, mainly based on the organised nature of its workspaces (Bombardieri 2013; 2014; 2017a, 356). As already observed (§3.2), this definition has no explicit equivalent in Costin’s scheme (1991, 3–11). It is worth noting that the concept of workshop is often related to both a type of workspace and to a level of specialisation oriented towards exchange, with specific ‘productive’ characteristics such as, for example, labour coordination, task division and the presence of artisans of various skills (Costin 2020). In a narrow sense, the definition of workshop also indicates an organised workspace provided with specific facilities (Costin 2020, 180). As regards the workshop’s spatial organisation, it is important to draw attention to the high number of textile-related facilities, including fixed installations. This denotes investment in infrastructure and formal configuration of the physical space for textile production (Costin 2020, 180, 186, 191). In a broader sense, therefore, considering production as targeted towards exchange, evidence of labour coordination, task division and different expertise, and high productive capacities, it is possible to propose that ‘workshop’ can also describe the level of specialisation at Erimi.

64 It must be noted that it is not possible to obtain specific information on intensity, namely the time or seasonality of work, and workforce.
Skalia represents another example of a spatial unit where textile manufacture is well-represented. The majority of textile tools from this site were recovered from a sequence of floors in large open spaces or walled courtyards (the ‘beer courtyard’). As discussed in Chapter 7.6.2, it is likely that spinning, weaving and sewing were practised in these spaces as the tools can be associated with episodes of use and discard. At first glance, the large quantities of spindle whorls from a single complex, and their relatively homogenous operational parameters can be associated with homogenous production and be taken as clues of a level of specialisation that went beyond that of a domestic household. However, whorls tended to become more homogenous in size and weight from the end of the MC onwards, making it less likely that the observed development corresponds to a deliberate productive choice. Exploring in more detail the productive context and the types of activity conducted, the level of specialisation at Skalia appears difficult to determine. This is particularly evident if we consider two points. First, fixed installations, containers and tools point towards the production and consumption of drink and communal meals as the main activities conducted in the complex (Crewe and Hill 2012, Crewe 2015b). Second, textile activities, such as spinning and sewing, can be easily conducted as side-tasks while other activities are performed (Barber 1991, 29–30; Grömer 2016, 275). The picture that emerges from Skalia thus seems to combine these two sets of activities within community spaces. Here, textile activities, which can be very time-consuming everyday tasks, were undertaken alongside other activities and thus became physically and socially embedded within the life of this community.

There are a number of similarities and differences that can be noted when Skalia is compared to Politiko, where a cluster of whorls and needles was retrieved from one of the two large courtyards excavated at this site, the Southern Courtyard and the adjacent alleyway (§7.3.2). The distribution of textile tools in this courtyard spread across different occupational levels, indicating continuity in the use of the area for textile production. The number of whorls per level (two to 11 artefacts per level) is not particularly high, and the assemblage comprised tools that can be associated with the production of different types of thread. The relatively low quantity of textile tools combined with their lack of product specialisation makes it likely that textile production at this site was non-specialised. Similar to Skalia, other activities were

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65 Also, a significant quantity of artefacts from Skalia are from disturbed contexts and it is not possible to established that they were used at the same of different times.
performed in the courtyard, and a concentration of deer bones seem to indicate collective activities related to meat preparation (Falconer and Fall 2013a; 2014). Different to Skalia is that textile and other activities are concentrated in only one of the two courtyards identified as community spaces, and the Southern Courtyard appear as more informal with no specific installations or organisation of spaces. On the one hand, the evidence from the Southern Courtyard could be interpreted as an attempt to concentrate some working activities within one dedicated space that facilitated collaboration. As observed by the excavators, the community character of the large courtyards at Politiko leads one to think of the work activities performed in these contexts as “group economic endeavours” based on cooperation between community members (Falconer and Fall 2013a, 113–114). On the other hand, as stated above, the available evidence does not indicate that there may have been specialisation here. Instead, the context suggests that spinning and sewing were practised by individuals as side activities and/or as a form of sociality, and this may not necessarily imply specialisation.

The next section aims to deepen our current discussion by exploring possible social and ideological aspects related to textile manufacture.

9.2.2 Social and ideological aspects of textile production

Archaeological debate has long drawn upon the reciprocal relationship between production and social dynamics, and this has mainly been done by using work specialisation to deduce socio-economic complexity (§2.2). Less space has been allotted to considering the sociology of production, namely the social dynamics developed through working or in working environments, regardless of a specific level of specialisation. Before returning to the Cypriot contexts, it is worth briefly acknowledging that textile crafting can display a typical ‘sociality’. It has been recognised that textile manufacture can foster group working, collaboration, and the formation of craft groups with high socialising power (Gleba 2016, 850). Modern craft groups who make textiles as a leisure activity provide vivid insights into group socialisation and the development of cohesion (King 2001, 28–29). Here, textile work favours the formation of a community of practice whose shared primary objective is not to create for production’s sake but rather to share a social experience. This does not mean that a workshop for intense production and ‘social’ crafting do not share both features: as it will be further discussed, specialised work will create some social cohesion (see the concept of
‘communities of practice’ applied to the case of Erimi below), and it cannot be excluded that working together led to small productive targets and forms of exchange.

Community areas at Skalia and Politiko have provided rich evidence to investigate group sociality and community dynamics throughout the MC. As previously noted, food and beverage preparation are particularly visible activities at Skalia (Crewe and Hill 2012). Even if there is no secure indication that the alcoholic beverages and roasted meat prepared by community members were also consumed in the areas investigated, the large, empty spaces seem places well-suited for community meetings and the cooking and brewing activities themselves seem indicative of places aimed at their immediate consumption. Also, Crewe and Hill (2012, 234) highlight that the building environment of the Skalia complex is to be placed within “a shift towards new venues for communal gatherings” but may not simply be an occasion for strengthening the cohesion of the community. The two authors have proposed that the specialised architecture may hint at the possibility that some members of the community exercised control over food, beverages and production, using them as a form of reward for agrarian work (‘work feasts’) (Crewe and Hill 2012, 234). The abundance of faunal remains at Politiko can likewise be correlated with preparation and, probably, consumption of meat (Falconer et al. 2014, 12). No reference to the presence of possible work feasts is made by the excavators. Instead, the community efforts are often highlighted as taking place in the courtyards (Falconer and Fall 2013a; 2014). Despite these possible differences, textile production at these sites was evidently carried out within contexts of social occasions, collaboration – and, perhaps, also conviviality – between members of the community and beyond family bonds.

Supporting evidence of other aspects of shared social practices at Skalia and Politiko are visible in the use of gaming boards and plank-shaped figurines in Skalia’s ‘beer courtyard' and in the Politiko courtyards (Crewe and Hill 2012, 215, fig. 4; Falconer and Fall 2013a, 109; Falconer et al. 2014, 12–13). The latter are particularly significant within the context of the South Courtyard and have been related to expressions of social group identity by the excavators (Falconer et al. 2014, 12–13). They clearly bear ideology-related implications, and their relationship with workspaces is not only attested at these sites but also in the pottery workshop at Ambelikou (Webb and Frankel 2013a, 171–172). These objects clearly had a
significance in relation to productive spaces, but, as argued by Webb and Frankel (2013, 217), their actual meaning in relation to work activities remains obscure. The significance of these artefacts is also open to different interpretations depending on whether they are retrieved from burial or domestic contexts (Frankel and Webb 2006a, 155–157, 317; Knox 2012, 146–155; Webb 2016b), but it can be concluded that the plank-shaped figurines played an important role in households, work contexts and funerary ideology.

No evidence of feasting or social gatherings has been detected at Erimi, but insights into social and symbolic implications of textile production can be deduced from an analysis of the tool dataset by considering findspots, associations, and the presence of special artefacts (Bombardieri 2017a, 358; Bombardieri and Muti 2018a). In particular, the unusual findspots of some whorls have contributed to shedding light on the possible coexistence of practical/productive purposes and a work-related ideology. As described in Chapter 7.5.3, it is not unusual to find groups of intact spindle whorls in the fills of pits or basins sealed off to build the more recent phase floor. It is not clear whether these pits had previously been working installations that then were transformed into foundation deposits, but we can observe that perfectly functional tools were not kept in use but had to remain in these spaces. Although belonging to the later LC, an interesting parallel can be found in the intentional object depositions (e.g. gaming stones, a quern, and a jug) into wall foundations attested in Building 2 at Aredhiou Vouppes (Steel 2016, 530–531). Steel (2016, 530–531) observes that these objects were deliberately removed from circulation, and this ritual practice was thus probably a different way in which these objects were made part of the “lived-in environment”. At Erimi, the reason for this behaviour seems strongly associated with the identity of a place in which textile production is not just performed, but literally ‘immersed’.

Other relevant evidence to explore the concept of identity related to textile work at Erimi is the presence of special objects, such as the comb-shaped pendants (Bombardieri 2017a, 358). If the interpretation of the comb pendants as representations of combs for wool processing or weaving is accepted (Knox 2012, 142) (§4.3.1), the symbolic value of this type of ornament does not only fit in the socio-economic context of Erimi, but it also contributes to visually communicating a work-related ideology, tangible and expressed through material culture (Bombardieri 2014, 49, 50–51; Bombardieri and Muti 2018a, 32–35) (Figure 9.2). We do not
know the role (productive or social) of the people that wore these ornaments, but we can hypothesise that these artefacts contributed to the construction and communication of their identity, which was closely correlated with the activities carried out in the workshop and the identity of the place itself. The process of turning textile tools into symbols seems to go hand in hand with the process of constructing work-related identities described in Chapter 2.3 and reiterated above for the Philia (§9.2), in which the crafting activity is the means through which this kind of identity is constructed and the tool or its replica become the symbol that connects the person to the crafting action.

Figure 9.2. Erimi. Comb-shaped pendant (A.428.1) on the floor of Unit SAILb, phase A (Bombardieri 2017a, 47 fig. 3.44)

At all the sites considered, the construction of personal and group identities reflects an interaction with productive activities. Producing textiles in community spaces at Skalia and Politiko made textile practitioners much more visible than conducting the same activities within the walled confines of a domestic unit. As observed in Chapter 2.3, social acknowledgement is essential to the construction of identity, and these kinds of exterior contexts would have facilitated these sociological mechanisms. Erimi seems to have an even stronger link to production. The emphasis on textile manufacture as a primary productive activity seems directly correlated to the formation of a work-related identity for this community. In this case, the concept of the ‘communities of practice’ (as introduced in §2.3.2) can be applied as the interpretative filter (Lave and Wenger 1991; Wegner 1998; Wenger et al. 2015; also: Bombardieri 2017a, 353–354; Bombardieri and Muti 2018a, 33–35; Bombardieri 2019b). This concept helps to describe a work community that has a set of shared aims and targets, in which production cohesion can contribute to a shared symbolic horizon. Through this lens, textile production, identity formation, social cohesion, and perpetuation of
knowledge, practical skills and value through generations are in constant feedback loops at Erimi.

Taking a more regional viewpoint, the circulation of textile tools also seems linked to the identity of textile craftspeople. This specifically pertains to spindle whorls as they can present specific regional variability, unlike the other tools. Frankel and Webb (2006a, 175) have considered these tools as personal items that express links and movements between kin groups through their figurative repertoire (§3.2). The presence or diffusion of whorl styles is thus connected to the movement of spinners – who the two authors identified as women who entered a new community through marriage (Frankel and Webb 2006a, 175). Their idea, however, is based on similarities between stylistic features, and it could be argued that only direct imports, interpreted as personal belongings, indicate actual movement of spinners between sites. In contrast, sharing a figurative repertoire is more likely connected to visual interdependency and common aesthetic preferences. While this implies interconnection, it does not necessarily imply movement of people nor does it allow us to ascribe a gender identity to these individuals. As will be further explained in the next section, the question of gender identity of textile producers is not straightforward in Cypriot prehistory, and an identification of exogenous spinners as brides remains only one among several possibilities. However, spindle whorls are mundane objects easy to reproduce and imitate, and it is improbable that intermediaries would acquire and redistribute them. Therefore, they can be considered reliable indicators of practitioners’ movement between sites. If we thus take into consideration only the imported materials, the data highlight a certain degree of mobility of spinners from their original village to other communities, especially during the MC: at Skalia, for example, imported whorls are from the south coast, while all the imports at Alambra, Erimi and Politiko are from the north coast (Chapter 7).

9.2.3 Integrating the burial evidence
Cemeteries linked to settlements will be prioritised in this discussion, although this kind of evidence is not available for all the sites considered. Among these, spindle whorls were retrieved from tombs at Sotira, Erimi, and Ammoudhia, while needles were buried as grave goods at Alambra.66 Most spindle whorls from these sites revealed a high incidence of use-

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66 Data concerning these finds were analysed in Chapter 7.
wear marks, suggesting that these tools were used before being buried as grave goods, and the needles were likely to have been personal tools too.67 The deposition of terracotta models and metal spindles suggests the possibility that complete tools and not only significant parts of these (e.g. single or sets of spindle whorls) were buried as grave goods. Possible remains of carbonised wool in Lapithos T.302C (Åström 1964, 111–112) and the mineralised yarn around the Zintilis spindle68 may indicate that raw materials or part-finished products were associated with the tools. This can also be proposed for T5.21 from Linou which housed a needle with mineralised thread through its eyelet (Flourentzos 1989, 67), revealing that textile tools in burials could reflect the object’s original function.69 In addition, it must be remembered that burial contexts were also places of textile consumption. As explained in Appendix IV, textile remains hint at a use of textiles for body and object wrappings or as mortuary shrouds. Textiles and textile tools were thus protagonists in constructing and conveying messages within the burial arena.

<table>
<thead>
<tr>
<th>Chronology</th>
<th>Site, Tomb</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECI–II</td>
<td>Psemaetismenos, T.91, T.100; T.103; T.122</td>
<td>Only four tombs yielding one whorl each: in the areas reserved for the deceased and separated from the other grave goods</td>
</tr>
<tr>
<td>ECIII</td>
<td>Vounous, T.29</td>
<td>Secondary deposition of two skulls in a niche: one is associated with a spindle whorl (T.29.46) and the spindle model T.29.52</td>
</tr>
<tr>
<td>ECII–III/MCII</td>
<td>Pyrgos, T2a</td>
<td>Whorls are located near the upper body of one of the two individuals</td>
</tr>
<tr>
<td>MCI</td>
<td>Lapithos, T.322B</td>
<td>15 whorls grouped in the centre of the chamber floor, in the same findspot as bones belonging to one individual</td>
</tr>
<tr>
<td>MCIII/LCIA</td>
<td>Galinoporni, T.1</td>
<td>Three spindle whorls can be assigned to the primary inhumation and were originally positioned on top of the upper part of the deceased’s body</td>
</tr>
</tbody>
</table>

*Table 9.2. Tombs from different periods and cemeteries showing an association between spindle whorls and the deceased (Gjerstad et al. 1934, 143; Dikaios 1940, 62–63, 62 fig.23; Crewe 2009, 90 fig. 2; Georgiou et al. 2011, 150–152; Belgiorno 2019, 24 – 25, 24 fig. 24)*

Looking at tools, the evidence shows that the treatment of whorls and needles in the burial space seems similar. In addition, the whorl distribution pattern also transcended geographic boundaries. As observed for the Philia record (§9.1.2), their location in the burial space and association with human remains are crucial elements for exploring the significance of spindle

67 This confirms a trend already detected (Crewe 1998, 59; Douglas and Muti 2019).
68 The artefact is unprovenanced but most probably from a tomb (Lubsen Admiraal 2004, 252).
69 Personal analysis of the artifact was conducted on 14/01/2017.
whorls in funerary contexts. In the Erimi tombs the number of whorls normally exceeds the minimum number of individuals, and direct association to single individuals is detectable in T.228, T.248, T.429, and, most probably, T.231 (§7.5.3). A possible close relation between whorls and the deceased can also be hypothesised for the Ammoudhia T.20 (§7.6.2). Cypriot BA burials had multiple inhumations with extensive secondary treatment, but noteworthy examples of primary depositions or direct associations also exist (Keswani 2004, 39–42) and are presented in Table 9.2.

As regards an island-wide analysis, the quantity of textile artefacts by site is clearly variable, possibly indicating different criteria for expressing the relationship between these tools and their owners at different sites. Only a few whorls were retrieved from EC tombs in Cemetery A at Sotira, while a good number of EC–MC burials at Ammoudhia had whorls with an occurrence of one or two artefacts per tomb (§7.4.2; §7.6.2). In contrast, MC pit or chamber tombs excavated at Erimi yielded a high number of these tools (§7.5.3). In general, the frequency of whorls in tombs in the Kouris valley increases through time, with more and more tombs being equipped with whorls and a larger number of whorls having been discovered per tomb in the MC (Muti et al. 2019, 190–191). In contrast, the pattern appears more variable in the EC/MC cemeteries of the north coast (e.g. Vounous, Lapithos and Karmi [Crewe 1998, 78–93; Webb et al. 2009, 227, 227 tab. 4.7]). Lapithos and Karmi show that the whorl occurrence may vary from site to site within the same period and regional horizon (Webb 2018a, 231). However, the record at Lapithos seems to suggest that large MC burials tended to have higher numbers of whorls (Webb 2018a, 231).

Douglas (2019, 118) calculated that the frequency of whorls’ occurrence is between 5% and 60% per cemetery in the EC–LCI. As evidenced by experimental archaeology, spinning is very time-consuming and was continuously and widely practised by many people in antiquity, and considerable length of yarn is needed to weave a garment (Andersson Strand 2012, 34; Olofsson et al. 2015, 84, 97, 97 fig. 4.1.34). It thus seems that not all ordinary users were buried with their tools, as also noted by Crewe (1998, 37), but only those who were recognised experienced or outstanding practitioners (Gleba 2009, 72, 75–76). If so, the social identity of a spinner was referenced through possession and display of these objects. As for the Philia,

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70 It was calculated that 2000m of yarn are not sufficient to weave a garment of adult size (Andersson Strand 2012, 34).
although a possible alternative use as beads cannot be ruled out (e.g. Georgiou et al. 2011, 301), the placement of used whorls in proximity to bodies appears to reference meaningful symbols eternally capturing the spinning act. Similar body-tool associations have been detected in Early Iron Age burials in Italy and in pre-Colombian tombs at Huacas de Moche (Peru); in both cases they have been interpreted as signalling the presence of specialists (Gleba 2009, 72, 75–76; Rengifo Chunga and Castillo Butters 2015, 130–131). If the intention was to reference this activity, then this would certainly contribute strongly to the definition of the identity of some members of BA society, perhaps as experienced spinners and textile artisans, through their use of functioning tools in life and as grave goods in death.

A similar treatment can be observed for the needles retrieved from T.102 and T.104 at Alambra. As introduced in Chapter 7.2.2, both yielded pairs of needles that can be associated with male individuals, and in T.102 one of these artefacts was found commingled with the human remains (also: Keswani 2004, 72–73). It is interesting to note that none of these tombs contained spindle whorls, in contrast to Vounous and Lapithos where these small objects were frequently found in tombs that also contained whorls (Keswani 2004, 197–213 tabs. 4.7–4.11).

The traditional interpretation of textile tools in burials considers them to have been gendered artefacts; with the traditional expectation being that their association is with females (Webb 1992, 90; 2016b, 381–383). The data presented for the case studies (Chapter 7), however, highlight the difficulties of gendering textile tools, and future research will hopefully be able to shed more light on this aspect, which at the present time is still speculative. A recent study by Douglas (2019, 128, 130–131 figs. 5.18–19) established 38 occurrences of spindle whorls and sexed human remains from male and female individuals. Unfortunately, most are in mixed burials within multiple chamber tombs (Douglas 2019, 128), which is also the case at Erimi (Table 7.16), so that it is impossible to assign the tools to a specific individual or draw conclusions about the sex of textile makers. T.322B at Lapithos represents the only case in which the gender of the deceased is known, showing a direct association between whorls and a female individual (Fischer 1986, 29; Douglas and Muti 2019, 24) (Figure 9.3). Even though Douglas’ (2019, 128) analysis has added to the existing dataset (Crewe 1998, 38 tab. 6.1), the nature and size of the sample still does not allow us to establish patterns of gender identity for the whorls’ owners. However, it seems possible to affirm that these objects were not used to
signal womanhood – neither individual nor general. The tombs that contain whorls appear, in fact, to have been relatively rare at some sites (see above). If spinning was indeed a female activity in both life and death, these tools should occur more frequently burials with female depositions than is evidenced in the burial record.

Needles, too, could have been used to signal the identity of artisans. In the scholarly literature needles have traditionally been associated with whorls as “appropriate female goods” (Keswani 2004, 76) and considered “exclusively or predominantly” buried with women (Webb 2016b, 378). However, the evidence presented here shows a much more nuanced picture that questions these traditional assumptions. Bearing in mind that sexing of human remains in general is relatively infrequent on Cyprus and that results may not always be conclusive, we only have a few examples where a female individual is associated with needles (e.g. Vounous and Lapithos). In the only two cases that attest the deposition of these objects at Alambra, needles are associated with males. It therefore seems that needles may not have been clearly gendered artefacts, and this opens up the possibility that textile craftspeople were a more heterogeneous, ‘fluid’ group than previously imagined.

This chapter has explored the entanglements of textile production. Relations and forms of dependencies between producers and the formation of a work-related identity, tools, resources,
spaces, technology, strategies, socio-economic contexts were identified and examined to draw a global picture of the dynamics of textile craft in different periods, areas and contexts. In the next chapter, the lines of productive entanglement will be followed beyond the productive contexts of the site analysed to look at how textiles were enmeshed in the major developments that characterise Cypriot society.
Chapter 10
Textile Production and Society

As introduced in Chapter 3, there are many gaps in our understanding of prehistoric Cypriot society, and its transformative dynamics are often a matter of debate. The data gathered so far pertain to a specific type of manufacture but show socio-economic implications that go beyond a technical reconstruction of production. In this final chapter, textiles are used as a new interpretative lens that can contribute to our understanding of the periods comprised between the LChal and the MCIII/LCIA. More specifically, I will address questions that link productive and technological aspects of textiles to the interpretation of socio-historical phenomena, starting from the Philia transition.

10.1 The role of textile technology and production in the Late Chalcolithic/Philia transition

10.1.1 Which changes?
Evaluating if and which changes occurred in textile technology in the LChal/Philia transition is particularly complex. As observed in Chapter 6, this is mainly due to the lack of visibility of the archaeological indicators, and, consequently, the impossibility of comparing how textile activities were conducted in the two periods. Notwithstanding, an established position in the archaeological debate correlates the Philia textile tools with the appearance of low-whorl spinning and the use of the vertical loom for weaving (e.g. Frankel 2000, 172–173; Webb 2002, 366–370). Frankel (2000, 172–173) and Webb (2002, 366–367) have packaged spindle whorls and loom weights as a ‘toolset’ reflecting the transmission of a ‘technology package’ that included drop spinning and the use of the warp weighted loom, namely textile technologies for spinning and weaving described by Barber as characterising the ‘north-west zone’, a region corresponding to the northern Mediterranean and part of Central Europe (1991, 249–253, 250 fig. 11.1). In this technology macro-area, Anatolia was the nearest region and the one most closely related to Cypriot textile practices in the mid-3rd millennium BC and the most likely source for all the textile and non-textile related innovations that occurred during the Philia (Frankel et al. 1996) (Chapter 6). Criticism of this diffusionist paradigm has been voiced by Knapp (2013a, 273), who questions that ethnicity can be attributed to tools and
techniques that are geographically widespread. Knapp (2013a, 273) discusses on the modalities of interaction (direct and uni-directional versus multiple, hybrid, and bi-directional) and describes the LChal/Philia transition through the lens of hybridisation. Despite favouring a different understanding of the complexity and different levels of relations that may have occurred, this model does not offer an explanation as to why and how tools and, possibly, techniques previously not detectable are then ‘suddenly’ visible in the record. In more general terms, hybridisation is helpful for picturing the results of a process of amalgamation but shows limitations in describing the dynamics and the inputs behind the phenomenon (Georgiou 2011, 303).

The reconstruction proposed in this study started from a different premise, that is to scrutinise the record to obtain a more complete picture of both LChal and Philia textile tools and techniques, in order to facilitate a diachronic comparison and evaluate possible changes. The data collected for this research led to the conclusion that spindle whorls were already present in the Pre-Philia and likely operated in a similar manner to the Philia examples, probably within the same Anatolian/‘north western’ tradition. In contrast, loom weights are currently only attested from the Philia level at Marki. For these reasons and in the light of the technical discussion conducted in Chapter 8, the Philia ‘new’ spinning and weaving tools are not considered a tool/technology ‘package’ in this study.

10.1.2 How?
Postulating a direct link between the appearance of new textile tools and the adoption of new technologies has been a key element in the LChal/Philia transition debate. This is especially central to Frankel and Webb’s model, in which changes are described as a large-scale, relatively fast switch to a different set of crafting motor skills. The explanation for such changes was found in a possible movement of households to the island, which transmitted their domestic technologies and lifestyle to the native Chalcolithic population as a process of acculturation/inculturation (Frankel 2000, 2005; Webb and Frankel 2007) (§3.1). In Chapter 8.2.1, it was established that bast fibre crafts were practiced in the Chalcolithic, and different scenarios about thread making technologies were proposed, varying from a change in the tools’ appearance to the introduction of new spinning technologies and a new fibre type (wool). Two observations can be made regarding the scenario of a possible external
acquisition. First, the Pre-Philia shows a relatively limited occurrence of whorls which would not have been sufficient to meet the needs of the settlements and, most probably, only a small number of spinners used them.\textsuperscript{71} This suggests that Chalcolithic techniques were not entirely replaced and ‘traditional’ techniques or tools continued to be used, ensuring that enough products were made to meet basic needs.\textsuperscript{72} Secondly the Pre-Philia and Philia whorls can be related to the making of specific types of threads (especially, fine thread) and seem to find their raison d’être these kinds of products that could be obtained by using these tools. These two elements point to the possibility that whorls as a tool were a technological addition rather than substitution.

One other question is whether whorls can be correlated with the exploitation of wool (Bachhuber 2014, 148–149), thus signifying a change in the fibre economy. Such a change would have necessitated the adoption of different fibre processing techniques (as wool fibres are prepared differently than flax), and possibly also spinning techniques, but it cannot be established that one set of skills replaced the other. Schneider and Fisk (1983, 131–132) observe that it is much harder to modify already learnt body gestures than to learn a completely new skill. The possible acquisition of an alternative way of spinning and its parallel use could be compared to the acquisition of a completely new body gesture, rather than adapting the old one to a new use. However, interaction with experienced practitioners is essential for the successful transmission of a new technology/technique (Minar and Crown 2001 with references).

Moving from tools to work dynamics and interaction, it is worthwhile briefly expanding our discussion to the productive environments in which the textile craftspeople operated who acted as technology transmitters. Recent works on the organisation and labour dynamics of Anatolian textile production have highlighted the presence of specialised manufacture and cooperative work at crucial EBA sites in western Anatolia (Bachhuber 2016; Britsch and Horejs 2020). Even though domestic production was obviously central (Richmond 2006), the household was not the only context of production, and locus of transmission of practices and know-how. It is also noteworthy that Anatolian-style spindle whorls have not only been

\textsuperscript{71}As the objects as made of stone, and preservation issues are unlikely to have occurred.

\textsuperscript{72} The identification of splicing in later EC–MC textile fragments may be another piece of evidence suggesting that Pre-Philia textile thread making technology was not completely replaced (§8.1.1).
retrieved from Cyprus, but come from a vast area demarcated by the Aegean in the south and Bulgaria in the north and dated around the mid-3rd millennium BC (Sotirakopoulou 2008, 544–545; Rahmstorf 2015b, 153–155, 154 fig. 4). In this regard, Rahmstorf (2015b, 166) observes that, even if the origins of the prototypes are clearly visible, these were not merely reproduced but adapted to the local needs: they are thus more likely representative of the presence of small, mobile groups of specialists from Anatolia rather than household migration. The same considerations apply to the Cypriot assemblage; they become even more potent when the loom weights are considered.

Where weaving is concerned, scholars have often highlighted that the use of the warp-weighted loom requires completely different skills for setting up and weaving than other looms, such as the horizontal and back-strap looms (Maynard et al. 1999; Cutler 2016, 174–175; 2019, 5–8). If the appearance of loom weights in Cyprus marks the beginning of the use of this loom type, the new weaving skills must have been acquired from experienced weavers. Given that conical loom weights occur in the Anatolian record, it is likely that the expertise came from this area (Frankel et al. 1996, 43–44). Interestingly, only this specific category of weights from among a wider range occurring at Anatolian sites was adopted on Cyprus (§6.2.2). If the transmission occurred through mobile households, one may wonder why these households did not replicated all of the tool types they had used prior to their move.

Within the scenario of household transfer (Frankel 2000; 2005; Webb and Frankel 2007; Webb 2013a), the assumption is that weavers would have replicated at least the main types of loom weights that they normally used for their household necessities, but there is no trace of these in the Cypriot record. Again, this picture seems to reflect the acquisition of new tools and/or techniques with a specific productive target and adapted to the needs of the Cypriot communities rather than a wholesale adoption. As observed for the whorls, this is more likely to have happened by direct contact with experienced practitioners or specialists: the identification of social encounters as the principal means for interaction within Anatolia and between Anatolia and other parts of the Mediterranean (Şahoğlu 2005; Bachhuber 2016) may have created the conditions for prolonged interaction and the creation of a display and learning environment in which crafts were practised (§10.1.3). Also, the possible delayed appearance of loom weights in the ‘mature’ Philia and changes through time in the style of spindle whorls
but all deriving from Anatolian prototypes, as described in Chapter 8, suggests that different moments of interaction could have occurred. As already observed, contact with practitioners is crucial for the transmission of practice as well as the pre-conditions and conditions of interaction between two traditions determines how and to what extent a transmission is successful (Crown 2004). These conditions depend on the characteristics of the productive entanglement, which will be explored in the next section.

Figure 10.1. Productive entanglements in the LChal
10.1.3 From where and why?

Comparing the settings in which textile production was carried out on Cyprus and in contemporary EBAII–III Anatolia (ca 2700–2200 BC) is essential to establish the type of roles and the nature of their interactions. Also crucial to the characterisation of the contacts is the degree of engagement – or entanglement – that people from the two ‘sides’ were willing or able to develop. As noted in Chapter 3.1.1, an openness for self-redefinition and dynamism are the most constitutive traits of LChal society. These traits have been interpreted as the result of aggrandising behaviour, which had functioned as the catalyst for LChal communities to seek a new means of expression beyond their cultural horizon (e.g. Bolger 2013; Peltenburg 2018).

The social significance of exotic, new or precious objects have the ‘capability’ to construct the social representation of individuals, and building, maintaining, or re-defining their relations (e.g. Helms 1994) (§2.2.4). The LChal socially active environment, and the communities’ inclination to engage, goes hand in hand with the socio-economic context of contemporary Anatolia and the Eastern Mediterranean: the 3rd millennium Aegean and western Anatolia were proactive in the construction of networks, the opening up of mechanisms of exchange and interaction that facilitated mobility, and sharing practices (Peltenburg 2007). Within this context, the presence of textile production and ‘new’ tools or practices was identified as part of a transforming productive environment at Mosphilia and at the ‘mature’ Philia sites.

An exchange economy based on valuable products and status-enhancing practices, such as metal artefacts and feasting, seems to have been the preferred means of interaction by Anatolian people with the Eastern Mediterranean (Chapter 3). The acme of this phenomenon, termed the Anatolian Trade Network (ATN) (Şahoğlu 2005), is traditionally dated to ca 2500–1950 BC but probably started even earlier as Anatolising material culture has been attested in the Aegean and Cyprus since the first half of the 3rd millennium BC (Broodbank 2000, 276–319, Peltenburg 2007; Crewe 2015a). Social interaction was facilitated by the construction of arenas of conviviality and display of valuable items at a small scale, within the community, and at a larger scale in external networks. The production of coloured textiles and fabrics enriched with precious ornaments has been evidenced at different sites in EBA Anatolia (e.g. Troy, Demircihöyük) (Bachhuber 2016, 357). Undoubtedly, this kind of artefacts had a dramatic visual impact (Bachhuber 2016, 357) and would have created a “socio-sensorial engagement” (Hamilakis 2013, 76), leading to attempts at emulation from the ‘spectators’ in
the social context described above. The presence of textile and ornament production in the Pithos House at *Mosphilia* appears to have been a reflection, if not a reproduction, of this kind of environment, and the Anatolian ‘way’ was probably adopted for both the production and the products. Trying to explain the adoption of these new practices, it makes most sense to view them through the lens of prestige goods theories and aggrandising strategies (e.g. Peltenburg 2018), without, however, directly implying the formation of élite hierarchies as hypothesised by early studies (§3.2). In fact, new approaches to craft manufacture understand this phenomenon not as unitary but as socially heterogenous, implying different and less rigid scenarios of social transformation (Schortman and Urban 2016). The significance of metal, ornaments and textile tools in the Philia burials can be seen to reiterate and promote similar values, and thus sees the beginning of the BA as a direct consequence of the ideology that emerged in the preceding period.

When discussing precious textile tools, Bachhuber (2016, 358–359) stresses the importance of wool and observes that “EBA woollen textile industries were a vital aspect of a dynamic and transformative period in prehistoric Anatolia”. According to this reconstruction, the EBA sees a rapid development of a textile economy based on wool and valuable fabric goods for exchange (Bachhuber 2016, 358–359). It is noteworthy that the two are often combined. For example, wool-based fabrics can be more effectively dyed than those made of flax, greatly increasing the object’s value and its visual appeal (Rahmstorf 2015b, 155; Harris 2017, 688–690). The significance of these objects is thus likely comparable to that of metal objects, and their display can be recognised as a crucial means to make social statements within more complex social transformation (Bachhuber 2016, 357–359). It is within this context that the Anatolian-styled spindle whorls start diffusing beyond Anatolia (Sotirakopoulou 2008, 544–545; Rahmstorf 2015b, 153–155, 154 fig. 4). In the Aegean, their introduction coincides with the first exploitation of a new type of wool, the long-stapled or ‘woolly’ wool (Rahmstorf 2015b, 155). This indicates that the network was not exclusively based on the circulation of finished products, but that knowledge of the ‘Anatolian’ way of making these objects, including relevant tools, livestock, raw materials and learnt technologies/techniques, was equally important to reproduce.
Figure 10.2: Web of interactions between Cyprus, Anatolia, and the Eastern Mediterranean during 3rd millennium BC.
As introduced in Chapter 3.2, scholars have long relied upon Sherratt’s (1981) Secondary Products Revolution model to explain changes in animal exploitation between the Chalcolithic and the Philia (Knapp 1990; 1993; 2008, 78–81; Manning 1993; Frankel 2000, 176–177; Falconer et al. 2013b). New approaches to the Secondary Products Revolution have re-conceptualised this model, noting that the exploitation of animal products should not only be correlated to a change in intensity of the production but also to a series of new socio-economic relations (Greenfield 2011). In light of the above argument, and considering the context of Anatolian textile production, it can be suggested that an initial or a more visible interest in wool (also: Bachhuber 2014, 148–149) may not necessarily have been the exclusive result of new sheep breeds or fibers in Cyprus but a consequence of the important role that craftspeople played in society.

10.1.4 By whom?
Evidence that can help us re-trace the craftspeople’s identities is sporadic but nevertheless indicated in the Anatolian context. The traditional interpretation of textile production as a domestic, female occupation was also applied to Anatolia (Richmond 2006, 218–219). However, recent studies dealing with the Chalcolithic and EBA production have pointed out that its correlation with gender is particularly weak (Schoop 2014, 437; Bachhuber 2016, 349, 356–357; Sari 2018, 220). This is especially evident in the deposition of textile tools in burial contexts: for example, spindle whorls were equally associated with adult female and male individuals in the Demircihöyük cemetery (Massa 2008, 19; 2014, 84 tab. 3). Similarly, no clear association with one gender can be detected for the golden and silver spindles from Alaca Höyük and Horoztepe (Sari 2018, 220). In contrast, these unusual spindles are clearly a transposition of tools into precious objects (Barber 1991, 60) and their significance is to be considered in relation to the important role or status assigned to the owners. Anatolian production described above leads one to think that textiles were crucial for the BA economy and included the manufacture of textiles as prestige goods; this, therefore, encourages the interpretation that the producers’ status was acknowledged by society. On this subject, Britsch and Horejs (2020) have recently pointed out that specialised textile workers with a distinctive social role can be identified in western Anatolian and the Aegean since the beginning of the BA (ca 3000–2600 BC).
Concerning Cyprus, a similar emphasis on the social value of production and consumption of textiles can be detected in the LChal and the Philia. The presence of textile tools in the Pithos House can be related to a possible role that textiles played in the representation of the self. Indirectly, it may also inform us about the identity of the textile artisans who produced these valuable objects. Here, we need to look at the tombs which provide the best evidence for investigating the role of the Philia spinners. Even though information about the gender identity of the artisans is lacking, the association between whorls and bodies and other special objects, such as ornaments and metals, suggests that spinning (or textile activities broadly speaking) played an important role in the construction the identity of these individuals as recognised practitioners and makers of valuable objects. This certainly does not exclude the possibility that domestic or everyday manufacture could have attained a certain degree of socio-economic relevance but indicates that the identity of spinners, and, maybe of textile craftspeople more generally, was more complex than that of the hypothesised female domestic producers who catered only for their household’s needs. As observed in Chapter 2.3.6, it must be also noted that the recognition of the level of skill achieved by an artisan is crucial in the definition of a work-based identity and may not be related to the level of specialisation in which they work (Kujipers 2018a, 44; 2018b, 552).

10.2 Embracing complexity: the Early–Middle Cypriot textile work and social transformations

Moving onto the EC and MC periods, this section will use the textile perspective to tackle debates concerning social transformations during the EC–MC and offer some preliminary thoughts also on the MCIII/LCIA transition. The section will first start providing an overview textile production and technological developments before moving on to tackle broader questions relating the developments and dynamics of this manufacture in Cypriot society.

10.2.1 A long-standing technology?

As illustrated in Chapter 8.3, elements of both continuity and change can be detected in EC and MC production. The innovations that can be observed up until the end of the MC were more technical than technological, namely adaptations of the spinning tool repertoire to make it more efficient and target a more differentiated production. The development of whorls’ weight classes is evident at sites from different areas (i.e., Mesaoria, south and west coast),
signifying that the same changes occurred across the entire island. Even though spindle whorls show elements (e.g. the decoration) that reflects the regionalism observed for pottery during this period (Crewe 1998, 43–45), the types, functional development and use of the tools seem to transcend regional boundaries. Interestingly, however, analysis of whorl assemblages and their contexts also indicates that individual sites made contrasting choices and developed different productive targets.

The picture for weaving instruments and practices differs significantly from that outlined for yarn production as loom weights show little or no change since their first appearance. When compared to spindle whorls, these tools appear extremely ‘conservative’ in their appearance and continue to display the same functional parameters. Yet, they could also have been adapted to more optimal weaving, especially in relation to the production of fine fabrics. The ‘strategy’ behind their development would have been the same as adopted for the spindle whorls, namely a broader diversification of weight classes. Reasons behind the loom weights’ resistance to change remain obscure, and the only satisfactory explanation seems to be the possibility of alternative looms or techniques, invisible in the archaeological record. However, until evidence of such alternatives emerges, it appears that these two main categories of EC–MC textile tools, loom weights and spindle whorls, moved at different paces with regard to textile technologies and production steps. We can therefore conclude that textile technology was not ‘monolithic’ in this period, and that transformations occurred for productive/economic reasons.

The expansion of whorls’ classes (§8.3.1) and the differentiation of productive spaces (§9.2.1) appear to be contemporary phenomena starting between the end of the EC and the beginning of the MC. This co-occurrence is significant and developed alongside substantial changes in the re-organisation of settlement space, especially in relation to the appearance of community spaces, as introduced in Chapters 3 and 5. It seems reasonable to think that the inclusion of textile activities in community spaces, or areas which allowed larger numbers of people to gather, could have acted as a catalyst for the development of spinning tools and modalities, and, perhaps, cooperative work. The transformation of any kind of making-related practice happens through performance, and this kind of entanglement created favourable conditions for the exchange of expertise, approaches, and solutions. As Webb (2016a, 55) stressed, “the way
in which objects are produced, used and disposed of embodies social knowledge of what is appropriate, relevant and meaningful, technical knowledge about how things are or should be made and physical or performed body knowledge”. This may imply that all the MC sites were involved in networks that facilitated the movement of people and a relatively fast spread of innovations. In contrast, some types of tools (e.g. loom weights) and correlated practice do not undergo any transformations until the very end of the MC, despite their presence in the same workspaces.

To sum up, textile production finds its place, and in some cases a central place, in those community areas. As will be discussed in more detail in the next section, these new spaces become the main socio-economic spaces in the village, substituting for or integrating the role that was previously exercised by the household. The process, however, is not ‘linear’; these spaces assume different characteristics, and, in turn, textile production assumes different roles within these spaces and is present in different modalities, reflecting that there was no single accepted organisational and social model.

10.2.2 Where and how did manufacture take place?

The household is the basic social and economic unit in the EC, and, within the current state of research, extra-domestic areas are non-existent or have with limited functions at sites such as Marki, Sotira and Alambra (§9.2.1). Textile production is thus concentrated in private spaces that have little apparent contact with craftspeople external to the family. At Sotira and Alambra, the presence of textile tools in spaces frequented by people from different households might signify that textile activities could be carried out also in these spaces, especially when portable tools are involved. In the MC (§§9.2.1–9.2.2), the settlement layout started to incorporate new spaces that were foci of collective action in which textile production appears to play an important role. These community spaces show similarities but also differences in their possible functions and the way they were articulated: some can be defined as workshops as they appear as structured working spaces with fixed installation and functional organisation of workspaces (Erimi), others seem to have been more informal, regardless of the presence of working/productive activities (Politiko). Skalia has a hybrid arrangement: on the one hand, specialised structures for food preparation can be detected; on the other, the final complex also exhibited large, relatively empty spaces with evidence for
different work activities, but without the presence of fixed installations. This new organisation seems to reflect a transforming sociality that extends itself and inter-personal networks from the household to the community. Textile activities are present in these spaces and play a role in the construction of this new socio-economic reality.

Figure 10.3. Productive entanglements in the Philia and EC–MC (domestic production)
Spatial diversification of non-domestic contexts suggests that new socio-productive dynamics arose. Hypotheses for the possible identification of different levels of specialisation were discussed by combining an evaluation of the productive context (type and organisation of the spaces), the presence and density of installations for textile production, and incidence and operation of textile tools. Specialised production conducted at a workshop level was recognised at Erimi, where textiles were present in considerable amounts and were found within an organised space with fixed installations for the manufacture of dyed textiles. The emphasis on dyed textiles suggests that the community at Erimi produced a surplus for exchange and hence that there existed a degree of workshop specialisation. In contrast, it was extremely difficult to assess whether and to what extent textile activities were specialised at Politiko and Skalia. While the productive loci were in community spaces, the organisation of workplaces and incidence of markers of production do not provide incontrovertible indicators of specialisation (following criteria described in §2.2). Complicating the picture further, textile activities facilitate working in groups and gathering in communal spaces for social reasons without the need of having to postulate economic implications, as was highlighted in Chapter 9.2.1. Looking at the timeframe under discussion it is clear that productive specialisation undergoes significant changes between the EC and the beginning of the LC. The resulting picture shows that production scenarios can be more fluid than described by indicators used for assessing work specialisation. In addition, it has become apparent that manufacture is deeply connected to sociality and can act as an agent of social change, regardless of whether or not economic motivations are at play.

10.2.3 Who were the craftspeople?

In the introduction of this work, it was observed that the emphasis given to female domestic work in textile studies has often prevented a more comprehensive investigation of the identities of textile workers (§1.1.2). Concerning Cyprus, the burial record can provide important insights into gender identity of the people associated with textile tools, even though the sample is relatively limited. In this regard, it is particularly relevant that needles were found in direct association with male individuals in the Alambra tombs. This suggests that men possessed, and probably used, these kinds of artefacts and could therefore be involved in textile activities, even when conducted at domestic level as the settlement does not display community areas. Spindle whorls is another category of textile tools that has often been used...
to explore gender identity, but an exclusive association between women and spinning tools cannot be proven with certainty. As stressed above (§10.1.4), researchers have often remarked that textile production was probably the most gendered textile activity in the past, but ethnographic and archaeological exceptions can be found (Sari 2018, 220). It may thus be misleading to take this association for granted when the archaeological background is not clear. Although it cannot be excluded that task differentiation based on gender was more evident in certain textile activities, the record leads us to think that textile production was not in the domain of a single gender. It was also noted that the appearance of extra-domestic levels of specialisation may have loosened the rigid division of gendered activities hypothesised for the EC–MC household (Webb 2016c, 381–383), giving more space to craftspeople’s ability and productivity and involving a growing number of people in the production, as was probably the case at Erimi (Muti 2017a, 231–232).

Instead of gender, the deposition of non-local tools in burials seems to indicate that textile tools were generally considered personal belongings and were thus more strongly correlated with the deceased’s personhood, as proposed by Douglas (2019, 184–187, 283–285; also: Douglas and Muti 2019), and their status of artisans rather than to their gender. The bodily bond between artisans and their tools is the means used to construct and communicate the social identity of craftspeople from the Philia until the beginning of the LC period. Nonetheless, the deep social transformations and re-organisation of settlement spaces that occurred at least from the beginning of the MC impacted greatly on textile production, its modalities and visibility. It is thus worth asking if the role of textile artisans remained steady as might appear from the burial record or whether it underwent profound changes.

When the only productive level we have evidence of is the domestic setting, we can hypothesise that the identity of textile artisans, who distinguished themselves through a particular competence in these domestic tasks, could be recognised by other members of the family in such contexts and this characteristic is displayed in their burials. With the appearance of community spaces, the textile craftspeople became more visible, and their role likely obtained a more demarcated social definition and importance. Politiko and Skalia are an expression of this phenomenon, and the presence of a structured workshop for textiles makes Erimi the paradigmatic MC case study where importance of textile production for the
economy of this site appears to have resulted in a concrete investment in the construction of the role of textile workers. Even though Erimi reflects a strong sense of community built upon participation in textile manufacture, it also yielded evidence that points towards differentiation between textile craftspeople. A distinction could perhaps be drawn between those individuals working in outside spaces and those with access to interior productive spaces which appear reserved for more skilled activities. In addition, the presence of comb-shaped pendants in the workshop, a rather distinctive ornament type, might imply that they were worn by selected workers, marking out their identity in some way (Bombardieri 2014). The individual identity of textile craftspeople thus constructs their collective one but, in parallel, tends to emerge and differ from it, playing a game of contradictions which may cause social tension through time and may provide a possible explanation for forthcoming social transformation. Following this trajectory, the changes – and, in some respect – the social tension visible in the MCIII/LCIA (discussed in §3.1) do not come as a surprise. Furthermore, a variety of imported goods start appearing in this period, suggesting a development in trade and connectivity beyond the island boundaries (Crewe 2012). Within this context, export of textiles was likely conducted alongside the export of Cypriot copper and agricultural goods.

10.2.4 What is the link between textile production and socio-economic transformations?
The strong socio-economic implications of textile production appear deeply rooted in the EC and MC social contexts. They reflected and, possibly, contributed the broad transformations that the island communities underwent during these periods. Given the regional differences in site organisation, the EC may present an even more complex picture than that outlined in this study, especially on the north coast (Webb 2018a). In the areas considered, however, the household is the centre of social and economic life. In contrast, a series of “steps towards different ways of living, including specialisation and supra-household activities” can be identified throughout the MC (Crewe 2017, 149). Again, it seems that the north coast had a different pace also in this period and has been identified as a bridgehead for crucial socio-economic transformations and an early upswing in international trade (Webb 2018a, 13/31–15/31).
Figure 10.4: Productive entanglements in the MC period (domestic and community spaces)
Our analysis of textile production seems to confirm this view. Textile production thus co-constructed and co-participated in this long incubation of transformations within Cypriot communities. When production is detected in spaces with a non-domestic function, the tendency is to correlate this evidence with the appearance economic changes, such as the emergence of specialisation. The picture proposed in this study suggests that equal, if not more, emphasis should be placed on investigating all those aspects pertaining the sociality of manufacture. The ‘new’ interest in sharing life spaces and the tendency toward work interaction and cooperation produces the social environment that act as a foundation for new lifestyles and collective targets. The sudden changes dated by Knapp to the end of the period (2013a, 348; 2013b) and termed a ‘revolution’ appear, in light of the current evidence, fundamentally rooted in the MC, as already argued by Crewe (2017), Webb (2018a), and Manning (2019). In this latter scenario, manufacture and craftsmanship are two key aspects to consider that fostered the transition from a subsistence to an ‘industrial’ economy; the reorganisation of work tasks and spaces are among the most visible transformations identified (Knapp 2013a, 348; Fisher 2014). MC sites with community areas, such as Skalia, Politiko and Erimi, have allowed us to recognise these changes within a longer-term trajectory.

For Bombardieri (2013; 2017a, 362–363), the development of new labour strategies should be considered the *primo movens*, namely the spark of all those transformations that would lead to the foundation of the LC urban centres. Production and work organisation certainly had a major role in affecting social change. However, establishing a direct, immediate link between labour division, an increase in economic advantages and social complexity/inequality, which is typical of traditional approaches to specialisation (§2.2), is ill-advised and should be discussed in a more nuanced way (Kuijpers 2018b, 565–566). In this respect, it is worth noting that economic intensification in small societies may not be exclusively related to political or economic reasons; instead, social and ritual action can also act as a stimulus for economic increase (Spielmann 2002). On Cyprus, all analysed MC contexts with textile production indicate that social action may have been the first impetus that led to work ‘aggregation’ and the construction of new spaces in which large areas were dedicated to productive activities. This development eventually led to changes also in the economy and profit-based relationships, as production was targeted at both trade and immediate, communal
consumption, such as food processing and production of alcoholic beverages (Spielmann 2002, 197; Crewe and Hill 2012, 234).

Production is thus equally entwined in society and economy, and when a large number of community members are involved in targeted production, transformations are more likely to occur. As frequently remarked in this study, such changes can range from the technical diversification of tools or site production capacity, the re-organisation of spaces and the construction of new dynamics and ideologies – all of which facilitated the weaving of elements of change into the social fabric. Whether the organisation of work was more rigidly or loosely coordinated, social tension will arise when task division allows individuals to have ‘specific’ or ‘better’ roles. This swing between communities’ and individuals’ goals may or may not bring social structure and acknowledged differentiation but are themselves the experience of forms of diversity and loss in social cohesion, and this is key in the light of the social structures visible in the mature phases of the LC.

Despite all these considerations, it may be misleading to consider the MC as the beginning of a linear process that leads directly to the LC and the rise of urban centres (Bombardieri 2017a, 362–363; in Bombardieri and Graziadio 2019, 68–83 the MC period is re-defined as ‘proto-urban’). Instead, urbanisation – if it can be defined as a single process at all – or, in more neutral terms, the transition to the LC, seems to bring together different realities leading to the adoption of a series of different pathways and even dead ends, but all apparently aiming at overcoming the limited sociality of the household to build and reinforce community relations. Within this long period of development, further questions to investigate are the nature of the links between the MC and the transitional MCIII/LCIA realities and later LC urban developments and what triggered this long ‘journey’ in the beginning. In contrast to these traditional evolutionary process-driven approaches, the viewpoint of productive archaeology generally and textile manufacture specifically can offer a community-level perspective on these dynamics. The transformation of the original social nucleus (the family or kin), which tends to reduce in size, and a growing apprehension over resource control detected at Marki and, possibly, final Sotira (Frankel and Webb 2006a, 313–314, 317) are contemporary with a newly discovered interest in community engagement which is visible in newly established sites, such as Erimi. As the household as socio-economic unit becomes weaker, it is replaced
by new community-based places and structures. This is a fundamental crossing point in Cypriot prehistory, which may have been the main prompt for irreversible changes.

**10.3 Current interpretation and future research**

This thesis has provided a first comprehensive definition of Cypriot textile production and has highlighted that the study of this craft can be used as a privileged lens to tackle a multiplicity of social, economic, and ideological aspects of the island’s prehistoric communities. The adoption of a contextual and relational approach has allowed us to follow the lines of the productive entanglement to evaluate the co-dependence of craft and society. Figures 10.1–10.4 are tanglegrams that summarise the productive entanglements between humans and things evidenced and discussed so far.\(^{73}\) In the tanglegrams, textile indicators and activities identified for each period are presented and connected to the relevant productive space, the possible level, aspects of the identity of craftspeople, and socio-economic facets (e.g. circulation of craftspeople, consumption, exchange of goods). In this concluding section, I wish to compare and contrast them and reflect upon the main developments of textile entanglements through time.\(^{74}\)

The LChal productive entanglement displays more uncertain connections (dotted lines) between elements when compared to the other tanglegrams (Figure 10.1). On one hand, textile activities are connected to the productive space of the roundhouses; on the other, the possible appearance of new tools or techniques, and valuable textiles can be linked to a re-definition of social identities of producers and consumers. Figure 10.3 illustrates the entanglements in the Philia and EC–MC settlements with no or limited community spaces. Different steps, techniques, work activities of textile production depend on the textile indicators identified in the archaeological record and can be more securely linked with the use of flax and wool. Craftspeople depend on these things and domestic spaces, and identification of the household as an economic unit depends on the organisation of the village. Mobility of textile workers and a work-based identity also rely on tools, and social acknowledgment, also reflected in burial

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\(^{73}\) The tanglegrams were constructed by identifying the humans and things entangled in Cypriot textile production and linking them through their relations of dependence. These relations are represented by an arrow starting from one thing or human that depends on thing or human towards which the arrow points. The tanglegrams have the purpose to visualise that the productive entanglement comprises all these aspects discussed in Chapters 8, 9, and 10 at once.

\(^{74}\) Concerning chronology, Figures 10.3 and 10.4 partially overlap and the distinction between the two representation is also based on the type of contexts considered.
display. Where the LChal, the Philia – and, possibly, the early EC – are concerned the textile entanglement expands beyond the Cypriot environment. Figure 10.2 draws on a possible web of interaction between things and humans that stretches into the eastern Mediterranean. It is a complex web in which Cyprus is ‘entrapped’ as the ‘maker’ of (textile) people, tools, resources, skills, and goods. At the same time, Cyprus is co-dependent on movement, trade, occasions for social encounters, personal representation, and display of valuables.

One other complex web of entanglements is visible in the MC, Figure 10.4 shows a multiplication of relations compared to previous time periods. Productive things and humans do not exclusively depend on the household but mostly on communal and working spaces. These spaces can be connected to greater social involvement, increase in the visibility of technological developments, and a different definition of work-based identities and work organisation. A link with the appearance of specialised workspaces and activities that can be more securely related to the production for exchange is also detectable. Overall, these lines visualise a multiplication of practical, ideological, social, economic reliance and dependences between the elements that populate the productive process and extend their connection far beyond the limits of the productive domain. Through the interaction of humans and things, production and society in prehistoric Cyprus thus became more intimately connected, captured in a denser web of relations and, at the same time, creating a new social and historical horizon.

Much more research is needed to explore the textile ‘realities’ visualised by the tanglegrams, and this study is far from being conclusive. We hope, however, that it can serve as an initial prompt for Cypriot archaeologists to incorporate textiles and textile-related features more systematically into the grand narrative of the island’s prehistory. There are many directions into which this work could be developed, such as, for example, a systematic characterisation of the MCIII/LCIA tools and production, or an examination of tool manufacture in relation to function. The most urgent need that emerged from the discussion is for an investigation of type, availability, procurement, and management of resources used in textile production. As highlighted by Steel (2018), the human-landscape interaction is a key component of entanglements, and it is perhaps even more urgent to consider where crafting is concerned. A multidisciplinary approach is necessary to pursue this kind of research as essential data can only be obtained from archaeofaunal and archaeobotanical analyses, archaeometry-based
approaches (e.g. animal DNA), and an investigation of soils, water resources, etc. The goal will be to characterise textile activities within and upon the ‘natural’ environment, highlighting availability and choices for exploitation of those fundamental resources that correspond to the initial steps of the textile manufacturing process. An understanding of these relationships between manufacture and resources, landscape and animal exploitation, and craftspeople’s strategies permits a better contextualisation within a geographic and socio-economic territory.
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