Nº
62

ARCHAEOLOGICAL TEXTILES REVIEW

2020 issue

Archaeological Textiles Review

ATR is published by the Friends of ATN, hosted by the Centre for Textile Research in Copenhagen.

Layout: Karina Grömer
Cover: Pernille Højfeld Nielsen
Iron shears from Cascina Grande (Image: Polo Museale della Lombardia)

Print: Grafisk
University of Copenhagen

Subscription information: To purchase a printed copy of the latest *Archaeological Textiles Review*, please visit: www.webshophum-en.ku.dk/shop/archaeological-textiles-333c1.html. Information about institutional subscriptions is also available here. This will also provide membership of the Friends of ATN.
Visit www.atnfriends.com to learn more about the organisation.

ISSN 2245-7135

Contents

Editorial 2

Articles

An exceptional way to join two textiles: A textile fragment from Hisn al-Bab, Egypt 3
Anne Kwaspen

Bandages for Bastet: a study of three Egyptian cat mummies 6
Luise Ørsted Brandt, Anne Haslund Hansen, Hussein Shokry & Chiara Villa

The analysis and conservation of a 5th century CE child's tunic from Egypt 21
Christina Margariti, Ina Vanden Berghe, Gabriela Sava & Tina Chanialaki

Cultural interconnections: textile craft and burial practices in Early Medieval Sudan 32
Elsa Yvanez, Mary Lou Murillo, Vincent Francigny & Alex de Voogt

Medieval Nubia: a contribution to the study of textiles from Meinarti 45
Magdalena M. Wozniak & Barbara Czaja

Exploring the construction of a Bronze Age braided band from Dartmoor, UK 56
Celia Elliott-Minty

Dating loom weights from Százhalombatta-Földvár, Hungary 65
Sophie Bergerbrant & Magdolna Vicze

Early Iron Age Textile Tools from the Požega Valley, Croatia 83
Hrvoje Potrebica & Julia Katarina Fileš Kramberger

Late La Tène and Early Roman textile tools from Dorno, Italy 101
Serena Scansetti

Animal hair evidence in an 11th century female grave in Luistari, Finland 109
Tuija Kirkinen, Krista Vajanto & Stina Björklund

Articles

High Medieval textiles of Asian and Middle Eastern provenance at Prague castle, Czech Republic 126
Milena Bravermanová, Helena Březinová & Jana Bureš Víchová

Pious vanity: Two pairs of 18th century abbesses' knitted gloves 144
Sylvie Odstrčilová

The Gällared shroud: a clandestine early 19th century foetal burial 152
Elizabeth E. Peacock, Stina Tegnhed, Emma Maltin & Gordon Turner-Walker

Projects

Linen twills from the Hallstatt salt mine re-dated 164
Karina Grömer, Margarita Gleba, Mathieu Boudin & Hans Reschreiter

Holy hands: studies of knitted liturgical gloves 170
Angharad Thomas & Lesley O'Connell Edwards

Heritage Gansey Knitting Network Project 175
Lisa Little

Margrethe Hald: the life and work of a textile pioneer 181
Ulrikka Mokdad, Morten Grymer-Hansen & Eva Andersson Strand

EuroWeb: a new European network and COST Action 2020-2024 183
Marie Louise Nosch, Agata Ulanowska & Elsa Yvanez

Conferences

Texel Stocking Project conference 187
Christine Carnie

The colour BLUE in ancient Egypt and Sudan 190
Susanne Klose

EAA: Annual meeting of the European Association of Archaeologists 194
Luise Ørsted Brandt, Elsa Yvanez, Matilde Borla, Varvara Busova, Samantha Brown, Bela Dimova, Francesco Meo, Alessandro Quercia, Francesca Coletti, Vanessa Forte, Christina Margariti and Stella Spantidaki

Resources: New Books and News 199

Sophie Bergerbrant & Magdolna Vicze

Dating loom weights from Százhalombatta-Földvár, Hungary

Abstract
Loom weights are difficult to date as they are fairly consistent in weight and shape over long periods. This article discusses the dating of 194 light loom weights with no contextual data from Százhalombatta, Hungary. The aim of this paper is to present previously unpublished material and identify the period to which the textile tools belong. It shows that the light loom weights in this study most likely belong to the Hallstatt period based on the find site's characteristics and comparison with loom weights from dated contexts.

Keywords textile production, Bronze Age, Hallstatt period, weaving, hillfort, tell, Százhalombatta-Sánc-hegy

Introduction

A number of loom weights have been found at the archaeological site Százhalombatta-Földvár in Hungary. Some of the textile tools at the site came to light from excavations of reliably dated contextual layers (Poroszlai 2000; Bergerbrant forthcoming; Vicze & Stig Sørensen in print) but a large number were collected by members of the public who regularly visited the site (Poroszlai 2000, 15). This article discusses the loom weights which were given to the Matrica Museum, Százhalombatta by private collectors, who found the loom weights while working on their own property.

The area has the remains of a large fortified Iron Age settlement and an Early and Middle Bronze Age tell (Poroszlai 2000; Vicze 2005, 66). The settlements are strategically placed on the Danube overlooking a bend in the river (fig. 1). The settlements of both periods are situated largely next to each other on the same natural promontory above the Danube. In order to distinguish between them the Bronze Age tell is referred to as Százhalombatta-Földvár and the Iron Age hillfort as Százhalombatta-Sánc-hegy.

Today, the Bronze Age tell site covers an area about 200 m long and 100 m wide (Poroszlai 1992, 153; 2000, 14)

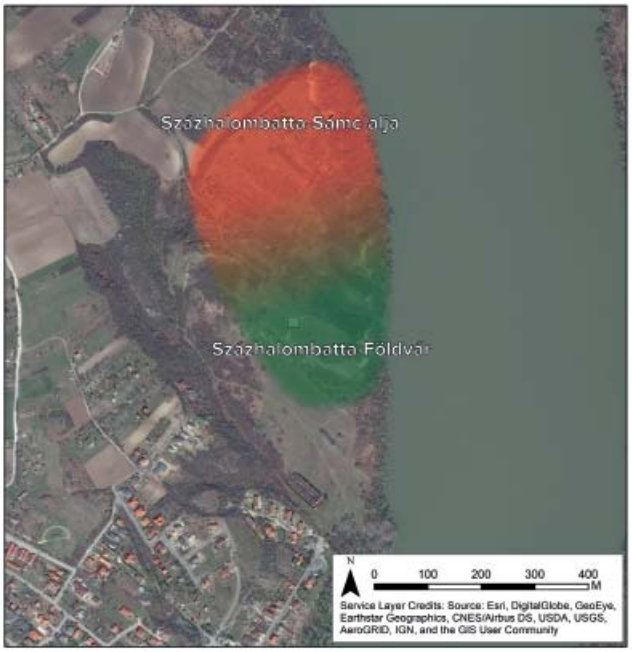

Fig. 1: The locations of Százhalombatta-Földvár and Százhalombatta-Sánc-hegy and other Hungarian sites with discoid loom weights (Image: Sophie Bergerbrant)

ID	weight/g	complete	remains	estimated weight g	height/cm	width/cm	marks
87.2.1	67	yes	all	**67**	6.1	3	
87.2.2	56	yes	all	**56**	5.6	3	
87.2.3	57	yes	all	**57**	6.1	2.9	
87.2.4	47	almost	almost	50	5.5	2.8	
87.2.5	56	yes	all	**56**	5.5	2.8	
87.2.6	57	yes	all	**57**	6	3.3	
87.2.7	54	yes	all	**54**	6.4	3	
87.2.8	53	yes	all	**53**	5.5	3.4	
87.2.9	48	yes	all	**48**	5.4	2.9	
87.2.10	51	yes	all	**51**	6	3.1	
87.64.1	132	yes	all	**132**	7.2	4.2	cross
87.64.2	104	yes	all	**104**	6.6	4.3	
87.64.3	93	yes	all	**93**	6.9	4	
87.64.4	122	yes	all	**122**	6.9	4.6	cross
87.64.5	82	yes	all	**82**	6.7	3.5	
91.1.1	65	yes	all	**65**	5.6	3.1	
91.1.2	103	yes	all	**103**	6.4	3.4	
91.1.3	134	yes	all	**134**	6.4	4	cross
91.1.4	106	yes	all	**106**	6.3	4	
91.1.5	76	almost	almost	**80**	5.8	3.3	
91.1.6	89	yes	all	**89**	6.4	3.1	
91.1.7	69	yes	all	**69**	5.6	3.2	
91.1.8	56	yes	all	**56**	5.8	2.8	
91.1.9	104	not			6.2	3.5	X
91.1.10	90	yes	all	**90**	6.7	2.7	
91.1.11	107	yes	all	**107**	5.9	3.4	cross
91.1.12	127	yes	all	**127**	7	3.4	
91.1.13	49	yes	all	**49**	5.4	2.4	
91.1.14	77	almost	almost	85	6.4	3.3	
91.1.15	125	almost	almost	130	7.6	3.6	
91.1.16	126	yes	all	**126**	7.2	3.6	
91.1.17	79	yes	all	**76**	6.2	3.1	
91.1.18	75	yes	all	**75**	5.7	4.4	cross
91.1.19	58	no	half		6.3	3.4	
91.1.20	63	yes	all	**63**	5.5	3	
91.1.21	55	yes	all	**55**	5.5	2.8	
91.1.22	70	yes	all	**70**	5.8	3.2	
91.1.23	56	almost		65	6.4	2.7	
91.1.24	97	yes	all	**97**	6.9	3.4	
91.1.25	109	no			7	3.8	I
91.1.26	103	yes	all	**103**	5.8	2.8	

Table 1a: Pyramidal loom weights. Estimates are indicated in normal text and complete weights in bold. The lengths and the widths are measured at their broadest parts

91.1.27	55	no			6.4	2.8	
91.1.28	72	yes	all	**72**	6.2	3.1	
91.1.29	125	no			8 cm	4	
91.1.30	50	no			5.5	3.1	
91.1.31	106	almost		110	5.9	4	
91.1.32	62	no			7	2.8	
91.1.33	60	no			6	2,8	
91.1.34	74	almost	almost	80	5.8	2.8	
91.1.35	85	almost	almost	90	5.8	3.1	
91.1.36	103	almost		120	7.1	4	cross
91.1.37	51	no			5.4	2.8	
91.1.38	53	no			6.9	3	
91.1.39	98	no		120	6.7	3.7	
91.1.40	112	almost		115	7.2	4.1	
91.1.41	104	almost	almost	110	6.5	3.4	
91.1.42	59	no	top missing		4.1	3	
91.1.43	100	almost		110	6.6	3.8	
91.1.44	61	almost			6	3	
91.1.45	80	no	almost	90	6.8	3.6	cross
91.1.46	103	no			6.4	4	
91.1.47	103	almost		110	7.1	3.6	
91.1.48	92	no			6.7	3.1	
91.1.49	60	no	only upper		5.6	3.1	
91.1.50	60	no		75	5.6	2.8	cross
91.1.51	44	no			6	3.3	
91.1.52	40	no			5	3.5	I
91.1.53	53	no	little		5.4	3.2	
91.1.54	44	no			5.1	2,8	
91.1.55	113	no			6.9	4	cross
91.1.57	39	no	half		4.5	3	
91.1.58	65	almost		70	5.2	3.6	
91.1.59	63	yes	all	**63**	5.9	2.9	
91.1.60	67	yes	all	**67**	5.9	2.8	
91.1.61	135	yes	all	**135**	7	4	cross
92.1.1	112	yes	all	**112**	6.6	4.6	
92.1.2	65	almost	almost	67	5.1	2.8	
92.1.3	53	no			5.1	3.2	cross
92.1.4	72	no			6.4	3.6	
92.1.5	72	almost	almost	75	6.1	3.5	
92.1.6	132	no			7.1	4.2	
92.1.7	135	yes	all	**135**	6,3	4,4	cross
92.1.8	134	yes	all	**134**	6.8	4.4	X
92.1.9	76	yes	all	**76**	6	3.2	

Table 1b: Pyramidal loom weights. Estimates are indicated in normal text and complete weights in bold. The lengths and the widths are measured at their broadest parts

92.1.10	108	no			6,3	4,1	X
92.1.11	86	almost	almost	90	5.2	4.1	
92.1.12	109	no			6.2	3.8	cross
92.1.13	108	almost	almost	111	7.3	3.8	
92.1.14	104	no			6.3	3.5	X
92.1.15	108	almost	almost	110	6.3	3.8	X
92.1.16	94	no			6.1	4.2	
92.1.17	83	no			6.3	4.6	
92.1.18	41	no			5.2	2.6	cross
92.1.19	54	no			6.1	3.1	
92.1.20	121	yes	all	**121**	6.7	4.2	cross
92.1.21	98	no		110	6	3.6	
92.1.22	101	no			6.3	4	
92.1.23	125	yes	all	**125**	7.6	4.4	X
92.1.24	90	no			6.2	4.1	cup
92.1.25	124	yes	all	**124**	6.8	4	X
92.1.26	130	yes	all	**130**	7	4.5	cross
92.1.27	100	yes	all	**100**	6.3	4	
92.1.28	125	yes	all	**125**	6.6	3.9	cross
92.1.29	122	no	all	**122**	6.2	4	cup
92.1.30	130	yes	all	**130**	6.8	4.2	cross
92.1.31	131	yes	all	**131**	7.2	3.6	cross
92.1.32	92	yes	all	**92**	6.4	3,3	
92.1.33	120	no			7	3.7	
92.1.34	118	almost	almost	125	6.8	3.3	X
92.1.35	75	almost	almost	78	7	3.2	
92.1.36	107	yes	all	**107**	6,1	3,6	cross
92.1.37	93	yes	all	**93**	5.8	4	cross
92.1.38	71	yes	all	**71**	6	3	
92.1.39	130	yes	all	**130**	7	4,5	cross
92.1.40	81	yes	all	**81**	6.6	3.1	
92.1.41	78	no	all	**78**	6	3.1	
92.1.42	79	yes	all	**79**	5.5	3.5	
92.1.43	64	yes	all	**64**	5.2	3.2	
92.1.44	67	yes	all	**67**	5	3.6	
92.1.45	123	yes	all	**123**	7	3.8	X
92.1.46	79	yes	all	**79**	6	3	
92.1.47	75	yes	all	**72**	5.6	3.4	
92.1.48	64	almost		67	5.4	3.3	
92.1.49	107	almost		115	6.8	3.4	
92.1.50	76	almost		79	6.2	3.6	
92.1.51	69	almost		71	5.9	3.6	
92.1.52	48	no			5.6	2.3	

Table 1c: Pyramidal loom weights. Estimates are indicated in normal text and complete weights in bold. The lengths and the widths are measured at their broadest parts

ID	type	weight/g	complete	remains	estimated weight g	hight/cm	width/cm	thickness
87.1.1	C	80	no			6.3	5.3	1.3
87.1.2	C	60	no			6.6	5	1.7
87.1.3	C	51	no					
87.1.4	C	81	no			5.6	5,8	1.8
87.1.5	C		no					
87.1.7	C	76	no			5	6.2	1.7
87.1.6	D	100	almost	almost	110	5.9	6.2	1.6
87.1.8	D	93	yes	all	**93**	5.2	5.5	1.8
87.1.9	C	109	yes	all	**109**	7.2	6.3	1.4
87.1.10	C	62	no	less 1/2		6.9	4.3	1.8
87.1.11	C	55	no			6.9	4.1	1.5
87.1.12	D	97	almost	almost	100	6.3	6.3	2.2
87.1.13	C	86	no			5.9	6.6	1.3
87.1.14	C	106	almost	almost	110	6.8	6.5	1.6
87.1.15	C	95	yes	all	**95**	6.8	6.3	1.8
87.1.16	D	60	no			4.7	4.3	2.2
87.1.17	C	85	no			5.7	7.6	1
87.1.18	C	102	yes	all	**102**	7.3	6.8	1.3
87.1.19	C	123	yes	all	**123**	7.2	7.4	1.5
87.1.20	C	85	no			6.2	5.6	1.8
87.1.21	D	68	no			5.3	5.7	1.7
87.1.22	C	60	no	1/2		6.9	7.2	1.1
87.1.23	C	37	no					
87.1.24	C	96	no			7.6	7.4	1
87.1.25	C	30	no					
87.1.26	C	112	yes	all	**123**	7.8	7.2	1.1
87.1.27	B	83	no			4.9	6.1	1.9
87.1.28	C	81	no			5.6	7	0.9
87.1.29	C	64	no			5.3	5.7	1.6
87.1.30	C	97	yes	all	**97**	6.8	6.3	1.3
87.1.31	C	73	no			5	6.6	1.9
87.1.32	D	95	yes	all	**95**	5.7	5.6	1.5
87.1.33	C	14	no					
87.1.34	A	74	yes	all	**74**	5	6.2	1
87.1.35	A	69	no			4.8	5.8	1.5
87.1.36	A	82	yes	all	**82**	5.2	6.2	1.5
87.1.37	transitional	64	no			4	5.7	1.7
87.1.38	A	87	yes	all	**87**	5.2	6.8	1.4
87.1.39	A	74	no			5.8	6.2	1.6
87.1.40	B	50	no	c. 1/2	100	6.4	2	1.2
87.1.41	A	74	no	2/3		6.2	6.8	0.9

Table 2a: Discoid loom weights. Estimates are indicated in normal text and complete weights in bold. The lengths and the widths are measured at their broadest parts.

87.1.42	C	58	no			4,8	6.7	1.2
87.1.43	A	87	yes	all	**87**	5.3	6.9	1
87.1.44	A	78	yes	all	**78**	6.4	6	1.2
87.1.45	A	94	no			5.6	6.2	1.3
87.1.46	A	71	almost	almost	72	6.3	5.8	1.3
87.1.47	A	68	no			6.6	5.7	1.2
87.1.48	A	64	no			6.1	5	1.7
87.1.49	A	68	no			6	5.2	2.2
87.1.50	A	92	yes	all	**92**	6.2	5.2	1.9
87.1.51	A	94	yes	all	**94**	7.2	6	0.9
87.1.52	A	82	no			5.6	6.1	1.6
87.1.54	B	61	no			4.7	6.3	1.2
87.1.56	B	94	yes	all	**94**	5.2	6.2	1.6
87.1.55	transitional	81	yes	all	**81**	4.7	5.6	1.7
87.1.57	round	51	yes	all	**51**	5.4	3.6	2.1
87.1.58	A	98	yes	all	**98**	5.3	6.7	2.4
87.1.59	A	89	yes	all	**89**	5.8	6.3	1.4
87.1.60	A	83	yes	all	**83**	6.8	6.9	1.2
87.1.61	A	90	yes	all	**90**	6.7	5.7	0,9
87.1.62	A	94	yes	all	**94**	6.1	5.3	1.3
87.1.63	A	91	almost	almost	100	5.8	6.7	1.6
87.1.64	A	21	no					
87.42.1	C	117	almost	almost	**118**	7.8	8	1.8
87.42.2	D	103	yes	all	**103**	5.5	6	1.7
87.42.3	C	113	yes	all	**113**	8.2	7.2	2
87.42.4	C	121	yes	all	**121**	8	7.1	2.2

Table 2b: Discoid loom weights. Estimates are indicated in normal text and complete weights in bold. The lengths and the widths are measured at their broadest parts.

and has 3 m to 5 m deep, well-preserved occupation levels, which date to the period from between 2300 and 1500/1400 BCE (Vicze 2013). The Middle Bronze Age tell settlement belongs to the Vatya culture (Poroszlai 2000, 13; Vicze 2013).

The Hallstatt period hillfort is triangular in shape with sides of unequal length (500 m, 600 m and 700 m) (MRT 7 1986, 231-233). The hillfort covers an area of about 10 hectares and is protected by an earth wall or rampart and a ditch, which today is 11.5 m high in places. It is regarded as having been an important centre throughout the Iron Age. The settlement was also occupied during the La Téne period. So far, the only example of Celtic stone sculpture in Hungary, a carved stone head, was found within the enclosed settlement (Poroszlai & Vicze 2004, 93; Jerem & Mester 2010, 54-56). The hillfort has the largest known Hallstatt period tumulus cemetery in Hungary (Poroszlai 1999, 376), which covers about 50 hectares and consists of close to 400 burials (Czajlik et al. 2016) of which 122, the larger ones, were visible and began to be documented as early as 1847 (Czajlik 2008, 97; Luczenbacher 1847, 286).

The geological layer under the Bronze Age settlement contains clay that was historically seen as suitable for brick making and was used in a factory situated next to and 130 m below the site. The demand for the clay has meant that some of the archaeological remains were destroyed during its extraction (Poroszlai 2000, 14; Vicze 2005, 66-68). Excavation has shown that the top of the Bronze Age tell includes a mixed level containing finds from Hallstatt C-D and La Téne D as well as some form the Middle Bronze Age. From level II and below, the material is dated to the Middle and Early Bronze Age (Poroszlai 2000, 16).

It has been pointed out that loom weights are fairly

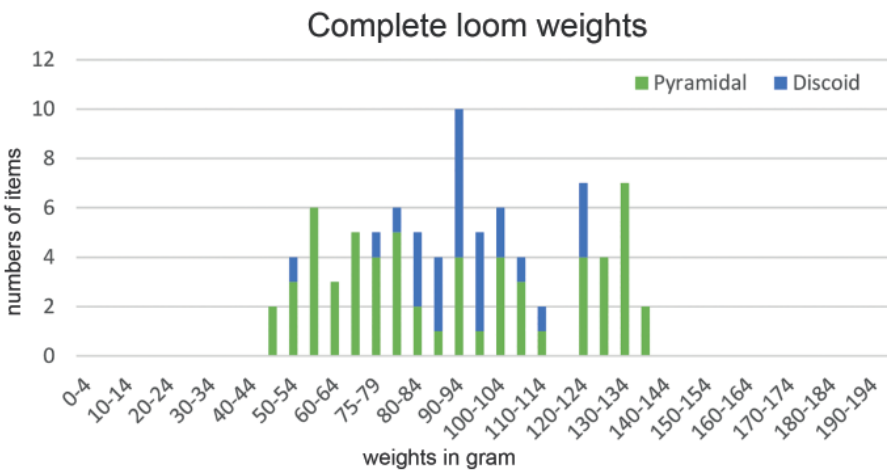

Fig. 2: The weights of the complete loom weights: green indicates pyramidal loom weights and blue indicates discoid loom weights (Image: Sophie Bergerbrant)

Fig. 3: A pyramidal loom weight (Image: Sophie Bergerbrant)

similar in weight and shape over long periods and are therefore difficult to date (Gleba 2008, 128). The tools discussed here have been registered in the Matrica Museum as belonging to the Middle Bronze Age and have been previously published as such (Poroszlai 1992; Poroszlai & Vicze 2004; Marton 2001, 300). This was based on their provenance and a brief preliminary study. The general area where the tools were found contains both Bronze Age and Iron Age remains. With no contextual data, the dating of these tools is unclear and they need to be analysed and compared with other textile tools. This article aims to present the previously unpublished work on them and an analysis of the period to which they might belong.

Method

All of the weights included in the study are held by the Matrica Museum and were examined in person. The weights were weighed to the nearest gram. In the case of fragmented loom weights, the full weight was estimated wherever possible. For those that were even less complete, only the current weight was recorded (table 1 and table 2). The loom weights' widths, heights and depths were recorded according to Mårtensson et al. (2009, fig. 7).

Material

In total, 194 loom weights were examined for this study. In each case, the loom weight has a single suspension hole. They were found outwith a closed archaeological context at the site Százhalombatta-Földvár by private collectors and given to the Matrica Museum, Százhalombatta between 1987 and 1992.

Of these, a total of 127 (see fig. 2, fig. 3 and table 1) could be defined as small pyramidal loom weights. More than half are complete or almost complete, and their original weight could be calculated. The complete or almost complete weights range between 48 g and 135 g with a mean of 90.66 g (based on 61 complete loom weights). Most of the pyramidal loom weights (Mårtensson et al. 2009, fig. 2) are of Gleba's (2008, 131) type F2a, and the bases are more or less rectangular.

A total of 35 weights have decoration on the top. The cross symbol is the most common mark; it was found on 22 weights. Nine loom weights have an X mark, two have a small round depression and two have an I mark on their tops. A total of 24 of the marked examples are complete or almost complete and they weigh between 75 g and 135 g. No differences between the marks can be discerned concerning the weight or height of the loom weights with marks. However, as a group they are among the heavier examples in the complete collection. The pyramidal loom weights measure between 4.1 cm and 8 cm in height and from 2.7 cm to 4.6 cm in width (at the broadest part). The median width is 3.6 cm and the median height is 6.3 cm.

There are 67 discoid loom weights (Mårtensson et al. 2009, fig. 2; see fig. 4-8 and table 2 for all with an estimated weight) which measure between 51 g and 123 g, with a mean 94.15 g (based on 26 complete loom weights). A discoid loom weight is one which is flat or which has a slightly convex surface, and has the suspension hole near the edge (Gleba 2008, 132; Mårtensson et al. 2009). While these major characteristics enable the pieces to be grouped among the discoid loom weight category, there are three types

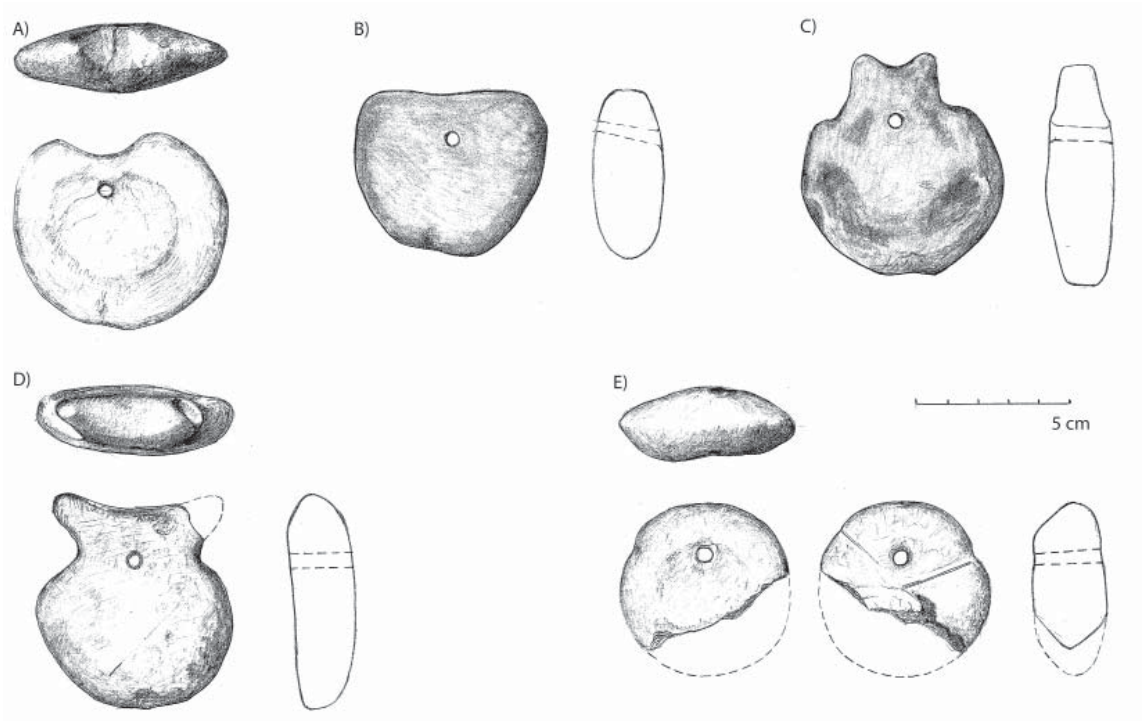

Fig. 4: The five discoid types of loom weights from Százhalombatta-Földvár, Hungary (Image: Sophie Bergerbrant)

Fig. 5: A round discoid weight (number 1); type A discoid loom weights (numbers 2 to 25) (Image: Sophie Bergerbrant)

Fig. 6: Type B discoid loom weights (Image: Sophie Bergerbrant)

Fig. 7: Type C discoid loom weights (Image: Sophie Bergerbrant)

Fig. 8: Type D discoid loom weights (Image: Sophie Bergerbrant)

that seem to be unique to this assemblage. They are all handmade and have a wide variety of individual characteristics.

The discoid loom weights can be broadly divided into five distinct types. All of them have a rounded lower part but vary in the upper part (fig. 4). The first type (A) has a depression on the top above the suspension hole (fig. 5.2-25) which can be like a small dimple that gradually widens and transforms from an almost half-circle (fig. 5.8-11, 15) to a long flat surface with two little ear-like protrusions (fig. 5.16-18, 20). It is interesting that in some cases the depression is asymmetrical, causing the ear-like protrusions to become lopsided (see fig. 5.4, 8-9, 14-15, 18, 22). Fig. 5.25 shows that this asymmetry could very well be intentional as the piece was deliberately made this way. Type B can be described as a half circle (fig. 6) with a round lower half and a straight or almost straight top part. No other example of this form has been found in Hungary so far. It is interesting to note that there are two examples that can be considered transitional pieces between groups A and B (fig. 5.19, 23). The third form has the same rounded lower part but instead of going down in the middle, the upper part goes up (C), forming, over a shoulder-like feature, a double knob, which is over the suspension hole (fig. 7). Interestingly, there are five pieces within this group, which do not have rounded lower halves but instead finish in a straight line (fig. 7.13-17). No parallels for this type have been located. A probable derivation from type C is the next type (D), where on top, above the shoulder, wide horn-like horizontal protrusions can be seen (fig. 8). The shape of these loom weights at this time is unique to the site. There is only one example of the classical (E), completely round discoid shape (fig. 4.E and 5.1). A total of 23 loom weights are of type A, while there are four of type B, 30 of type C, and seven of type D. It was not possible to categorise the single round discoid and two transitional forms. A total of 26 were complete, making it possible to determine the exact weight; these range between 51 g and 123 g. Though clear divisions between the types are difficult to discern, type A examples tend to be lighter (with an average weight of 87.3 g based on 12 pieces) while the heavier pieces (with an average weight of 110.4 g based on eight pieces) are of type C. The height of the complete examples varies from 5 cm to 7.4 cm. The width at the widest point (measured on all that had a complete middle section) ranges between 4.1 cm and 7 cm. The thickness of the discoid loom weights is between 0.9 cm and 2.2 cm with a mean of 1.15 cm and a median value of 1.5 cm (based on 61 measurements).

Dating the loom weights

The existence of warp-weighted looms is illustrated by the presence of loom weights (Gleba and Mannering 2012, 14-16). It can also be seen in the eastern Hallstatt area in the well-known depiction on a conical necked vessel in Tumulus 27 from Sopron-Burgstall (Várhely in Hungary), which shows one woman spinning and another weaving on a warp-weighted loom (Grömer 2012, 58).

The contexts, shapes, marks and weights of the loom weights were analysed to pinpoint a possible date for them. Several studies have been conducted on textile tools in the Bronze Age in the east Mediterranean (Andersson Strand & Nosch 2015; Burke 2010), and some on central and northern European examples (Belanová Štolcová & Grömer 2010; Kneisel & Schaefer-Di Maida 2019) and Italian (Gleba 2008; Sabatini 2019) of loom weights. These studies in addition to several others were the basis for the discussion which follows.

Site context

The excavations of the Middle Bronze Age tell settlement produced a small number of textile tools. They are found in a reliably dated context. The loom weights are all pyramidal in shape and weigh from 340 g to more than 1 kg (Bergerbrant, forthcoming). Excavations in the hillfort Százhalombatta-Sánchegy produced spindle whorls, a bobbin (?) and bone needles all dating to the latter half of the early Hallstatt period, Ha C2-D2, circa 800/750 BCE to 450 BCE (Marton 1999, 140). At least one of the spindle whorls is biconical (Marton 1999, table 2:1).

The archaeobotanical data from Százhalombatta-Földvár shows only a nominal presence of flax seeds (*Linum usitatissimum*) in the Middle Bronze Age and none in the Late Bronze Age (Stika & Heiss 2013). The seeds may have been removed before the plant was brought back to the settlement (Maier & Schlichtherle 2011, 568) and the very low quantity could indicate that flax was not processed on the site or was an unimportant crop during the period. This may suggest that flax was not a major component in fabric making. However, it must be borne in mind that an absence of evidence is not evidence of absence. In contrast, sheep are the dominant animals in the zooarchaeological record from about 2000 BCE onwards. The rise in the number of sheep occurred at the transition to the Middle Bronze Age (2000 BCE to 1600 BCE). At the same time, the slaughter age of the sheep shifted in a way that indicates a change from acquisition of meat (indicated by an early slaughter age) to wool (indicated by a predominance of older sheep). In the period 2000

BCE to 1600 BCE, more than 60% of the sheep were kept as adults; moreover, one third of these were male. The only reason for keeping older male sheep would be for their wool (Vretemark 2010, 164-166).
There are therefore indications of pre-existing textile production in both periods and this information does not help to narrow down the date of the loom weights.

Shape

Kneisel & Schaefer-Di Maida (2019) have presented a review of the published loom weights in the period 2200 BCE to 500 BCE in the area from the Rhine to Warta (west to east) and from Denmark to the alpine region (north to south). The study contains 6,734 loom weights of which 5,904 are identified as different types (Kneisel & Schaefer-Di Maida 2019, fig. 4.1). The pyramidal-shaped examples occurred from the Neolithic era onwards, and are the most common type with 4,167 examples (62%) on record (Kneisel & Schaefer-Di Maida 2019, 87, fig. 4.1). According to Belanová Štolcová & Grömer (2010, 16), pyramidal, spherical and discoid loom weights are the most common forms in the Late Bronze Age (1300 BCE to 800 or 750 BCE) and the Hallstatt period, whereas spherical and cylindrical are the most common in the Late Neolithic and Early Bronze Age (2300 BCE to 1600 BCE). In the Hungarian material, there are pyramidal loom weights from the excavated Middle Bronze Age layers from Százhalombatta-Földvár (Bergerbrant, forthcoming). Pyramidal loom weights have been found from the Neolithic era onwards in Hungary (Horváth & Marton 1998; Marton 2001; Ďurkovič 2015). It is clear that in central Europe during the Iron Age pyramidal-shaped loom weights were the dominant type, although other forms existed as well (Banck-Burgess 2018, 5; Kneisel & Schaefer-Di Maida 2019, 86). The loom weights also reduced in size and, for example, became narrower in the Iron Age than they were in the Urnfield period (Banck-Burgess 2018, 5).
At the Middle Bronze Age (1600-1350 BC) settlement site Montale in Italy, five different types have been identified: truncated pyramidal, bell-shaped, ring-shaped, bun-shaped and cylindrical (Sabatini 2019, 46). Of the 95 loom weights, only three are pyramidal (Sabatini 2019, 46-59). In Italy, pyramidal loom weights became the most common type during the first millennium BCE (Gleba 2008, 131).
Pyramidal loom weights are found at some sites in the eastern Mediterranean from the end of the Neolithic era (Burke 2010, 24) and exist at sites during the Bronze Age (Andersson Strand & Nosch 2015). They can be found at Quartier Mu, Malia, Crete (Poursat et al. 2015, 229-270), Archontiko (Papadopoulou et al. 2015, 294-295), Sigagroi (Elster et al. 2015, 304-305), Troia (Guzowsla et al. 2015, 321), Apliki (Smith et al. 2015a, 331) and Kition (Smith et al. 2015b, 340).
According to Belanová Štolcová & Grömer (2010, 16, fig. 3.9) flat oval weights with a hole on top also existed in the Late Bronze Age and the Hallstatt period. They were produced in the central European tradition and now identified as disc-shaped (Belanová Štolcová & Grömer 2010, 16, fig. 3.9). It would be surprising if the authors had put discoid loom weights similar to the types under discussion here into any of the other categories. However, as there is no written description of the type, it is difficult to be certain.
Discoid loom weights are common in the Mediterranean Bronze Age (Andersson Strand & Nosch 2015), whereas in central Europe, as argued above, they appear to first become common in the Hallstatt period. The current survey of discoid loom weights in central Europe shows that they are more common during the Hallstatt period than in the Bronze

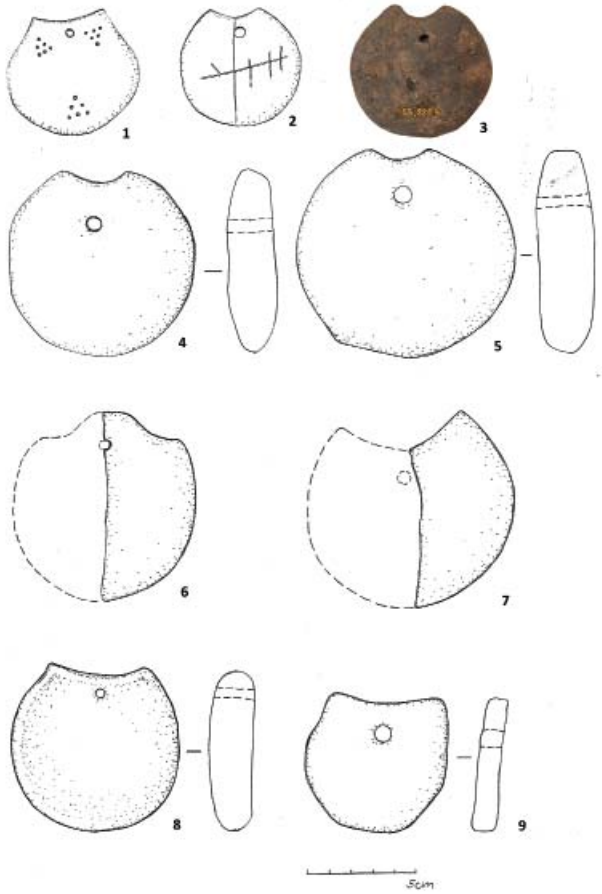

Fig. 9: Early Iron Age loom weights from Hungary: 1 & 2) Somló (Patek 1968: Pl. LIV.10-11); 3) Süttő (note image is not to scale, the diameter is 9 cm); 4 & 5) Tata (Vadász 2003); 6 & 7) Koroncó (Mithay 1970); 8) Halimba (Lengyel 1959); 9) Kajárpéc (Németh 1996)

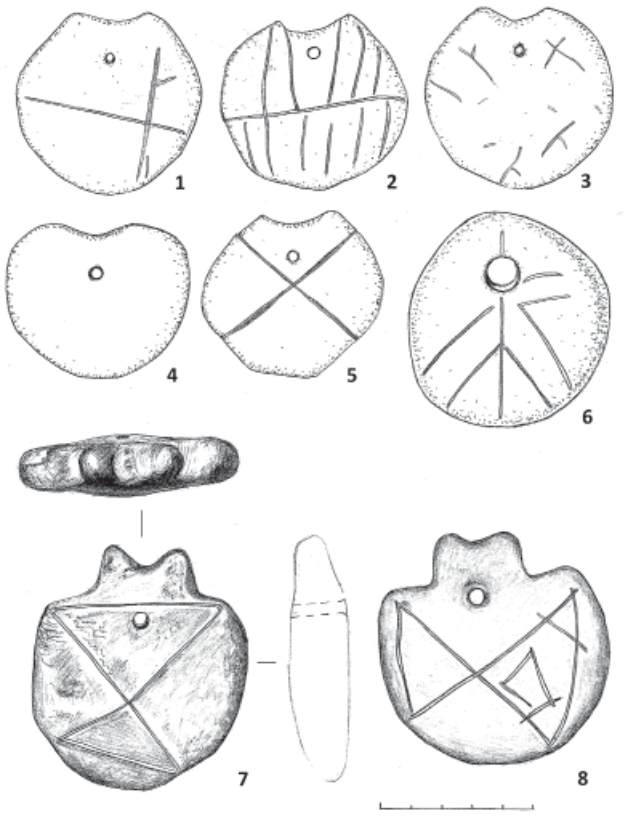

Fig. 10: Examples of incised decorations on different types of discoid loom weights: 1 to 5) Svodín, Slovakia; 6) Gór-Kápolnahalom; 7 to 9) Százhalombatta-Földvár (Image: 1-5) after Němejcová-Pavúková, 1986; 6) after Marton 2001, 7-8 Sophie Bergerbrant)

Age (Belanová Štolcová & Grömer 2010, 16; Kneisel & Schaefer-Di Maida 2019, fig. 4.2). The best and most numerous comparisons for type A from within the wider eastern Hallstatt cultural area are the flat and heart-shaped loom weights found at Molpír (Belanová Štolcová & Grömer 2010, 16; for Hungarian examples see table 3 and fig. 9) or the completely rounded ones from Devín (Studeníková 1993) type E, which would indicate a Hallstatt period date for these finds (fig. 10). Ďurkovič (2015, 89) argues that the pyramidal and discoid loom weights are characteristic for the Early Iron Age in the north-western parts of the Carpathian Basin. Therefore, the combination of pyramidal and discoid loom weights in this study would indicate an Early Iron Age date.

Marks

Marks in the form of crosses and dots are common on loom weights in eastern Hallstatt Culture (Belanová Štolcová & Grömer 2010, 16; Grömer 2012, 54). Simple marks on the top of the surface are also common in Italy (Gleba 2008, 134-135). The different types of marks found on the loom weights from Nové Košariská, Slovakia (Belanová Štolcová 2012, 313), from Győr-Ménfőcsanak, Hungary (Ďurkovič 2015, 100-103) and Százhalombatta-Földvár cannot be connected to any specific weight group. Their meaning is therefore difficult to understand. It has been suggested that marks on top of pyramidal weights could be production marks or aids in weaving a pattern (Belanová Štolcova 2012, 313). The marked pyramidal loom weights from Százhalombatta-Földvár do not provide any further information which could help in understanding their meaning.

In Italy, there are also loom weights with more advanced forms of decoration (Gleba 208, 135-136). In the case of the loom weights from Százhalombatta-Földvár which have been studied, it could be argued that the shapes of some of the discoid loom weights are decorative. However, the difference in their shape could have a similar function to their decoration, which, in keeping with that on the pyramidal loom weights, could have provided some aid to weaving. It must be noted here that the incised decoration on these loom weights is more complex in design than the ones on the pyramidal weights (fig. 10). The crosses, Xs, Is and small, round depressions on the top of some of the pyramidal loom weights seem to indicate they belong to an eastern Hallstatt culture group and date.

Weight

The loom weights in this study differ from the loom weights found during excavations of the Bronze Age tell levels (Bergerbrant, forthcoming). Even though the loom weights found in the excavated layers are all pyramidal, none are as light as these (Bergerbrant, forthcoming). Light weights from the Bronze Age exist in many other areas - in, for example, Minoan Knossos. The spherical loom weights weigh from 86 g to 710 g and, of these, ten (11%) weigh between 86 g and 130 g (Burke 2010, 51-53), which puts them in the light category. A number of eastern Mediterranean sites have produced light loom weights (Andersson Strand & Nosch 2015) - for example, the area Quartier Mu, Malia, in Crete has more than 600 loom weights. The site has different loom weight clusters, in one of which the loom weights weigh between 75 g and 150 g. The weights are of many different shapes (Poursat et al. 2015). Most of the loom weights that are complete or sufficiently preserved to estimate complete weight in the Centre for Textile Research database (from the eastern Mediterranean, which is the basis for Andersson Strand & Nosch's 2015 publication) are loom weights less than 400 g, with an emphasis on

No of loom weights	Site name	Diameter (cm)	Reference
23	Százhalombatta	5.2-8	This article
1	Budapest-Harsánylejtő	~ 6	Zsidi 2017, 62-63
1	Nagybörzsöny-Rustok-hegy	8.5	Matuz & Nováki 2002, fig. 115, 4
10	Tata	8.5-10	V. Vadász 2003, T. 5
5	Süttő	8.6-11.2	Unpublished museum collection
1	Kajárpéc	6.7	T. Németh 1996, fig. 4:22
1	Koroncó-Újtelep	~ 8.5-9.5	Mithay 1970, 10, fig. 2, 13
3	Halimba	7.8	Lengyel 1959, T. XLVII, 5-6 & 8
5	Somló	~ 5.5-6	Patek 1968, T. LXX

Table 3: Early Iron Age sites in Hungary with discoid loom weights of Type A

weights in the range 100 g to 400 g. Of the 2,280 data points, about 160 weigh less than 50 g, and the ranges 50 g to 100 g and 100 g to 150 g include about 480 loom weights each. These numbers are estimates because they are presented in a table without exact numbers (Firth 2015, 164-165).

Of the loom weights found on the Po Plain in Italy belonging to the Middle Bronze Age studied by Sabatini (2019), all but three weighed between 287 g and 1230 g. The three exceptions weigh between 134 g and 150 g. In the Late Bronze Age (1350 BCE to 1150 BCE), the weights in the area seem to get heavier (Sabatini 2019). The weights published in Bazzanella (2012, 211) for Neolithic and Bronze Age Italy are consistent with the main weights in the Po Plain. Lighter loom weights, with the exception of the three noted by Sabatini (2019), weighing from 20 g seem to appear in the Final Bronze Age in Italy (Gleba 2008, 135).

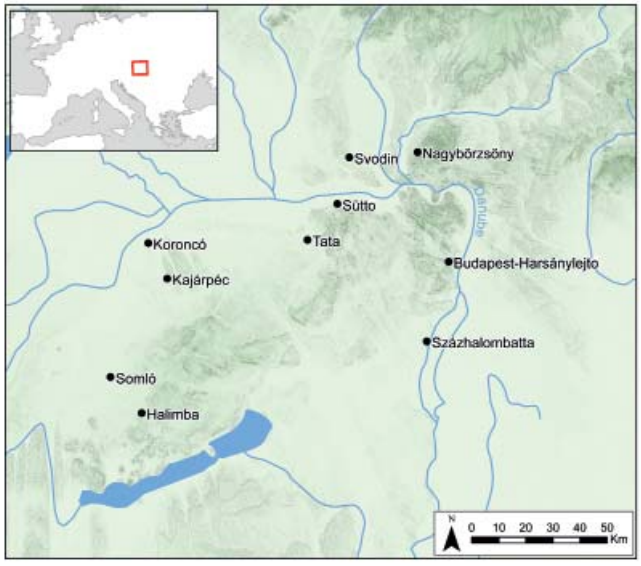

Fig. 11: Map showing the Hungarian sites with discoid loom weights (Image: Sophie Bergerbrant)

According to Belanová Štolcová & Grömer (2010, 17), there is no significant change in weight between the Neolithic, Bronze Age and Urnfield, Hallstatt period loom weights as there are some variations within the periods. At the Hallstatt period site Nové Košariská, Slovakia, 170 pyramidal loom weights were found in a house. Based on their placement in the house, they have been interpreted as the remains of two looms: one with 91 heavy loom weights of about 1,300 g each and another one consisting of 79 loom weights weighing about 600 g each (Belanová Štolcová 2012, 312). Many of the publications cited regarding loom weights in central Europe are primarily concerned with shape and do not mention the weight. It is therefore difficult to achieve a complete picture of the relevant evidence. The majority of the Early Iron Age (HaC) loom weights at Győr-Ménfőcsanak are pyramidal and generally weigh between 960 g and 1,690 g, with the majority between 1,300 g and 1,690 g (Ďurkovič 2015). The examples from the Middle to Late Iron Age (HaC2-D2) site in Gór-Kápolnadomb, Hungary, weigh from 1,200 g to 1,750 g (Marton 2001) and are therefore regarded as heavy. Examples of light loom weights can be found in the eastern Hallstatt area, for example, the 50 small flat discoid loom weights that weigh between 45.6 g and 157.9 g at Smolenice-Molpír (Belanová Štolcová 2012, 311). Another example is the single light pyramidal loom weight found at the Hungarian settlement Győr-Ménfőcsanak that weighs 112 g (Ďurkovič 2015, 91, 103).

Although light loom weights are present in the eastern Mediterranean from the Bronze Age (Burke 2010; Andersson Strand & Nosch 2015), the lighter loom weights, at less than 130 g, seem not to make their appearance in central Europe until the Late Bronze Age or Early Hallstatt period based on this

literature review. Taken together, these point to a Hallstatt period date for the light loom weights from Százhalombatta-Földvár.

Date

Pyramidal loom weights seem to be the most common both in number and distribution in central and northern Europe, whereas the discoid type is limited to the eastern Alps and Czech Republic according to Kneisel & Schaefer-Di Maida (2019, 88 & 90). The small discoid loom weights seem to have a clear connection to the eastern Hallstatt culture, though at Százhalombatta-Földvár, there is one example of this type (type E). However, there are similar loom weights to types A and B presented here (fig. 4A and fig. 4B) from other hilltop settlements such as Smolencie-Molpír (Belanová Štolcova 2012, 311-312) and from burials such as Svodín (Němejcová-Pavúková 1986, 196, fig. 19: 1-6) and Tata (Vadász 2003, Plate V.), which seem to suggest a Hallstatt period date.

In addition to the previously discussed typo-chronological parallels of the loom weights from Százhalombatta, a detailed visual analysis of the clay fabric was undertaken. This concluded that the type, quality, quantity and composition of temper used for these loom weights is in line with the local Iron Age ceramic tradition.

Textile production in eastern Hallstatt area

The Hallstatt period has an unusually large number of preserved textiles. This is partly due to the finds from the Hallstatt salt mines (Grömer 2012, 42-43). Textile remains from graves also exist in other areas in Austria (Grömer 2012, 43-44; Grömer et al. 2013), Germany (Banck-Burgess 2012), Hungary (Bender Jørgensen 2005, 141-142), Czech Republic, Slovakia (Belanová Štolcová 2012, 310), and Slovenia (Bender Jørgensen 2005).

The textiles themselves are very varied and attest to the use of many weaving types, such as tabby, twill and diamond twill (Grömer 2012, 42-43). The main weave became 2/2 twill, and the fibres used were wool, linen and hemp as well as other fibres (Bender Jørgensen 2005, 138). The Hallstatt period has spin pattern twills that almost vanished with the La Téne period (Bender Jørgensen 2005, 138; Grömer 2012). In the La Téne period the textiles seem to become more uniform and possibly coarser (Bender Jørgensen 2005, 138, Belanová Štolcová 2012; Grömer 2012). Banck-Burgess (2018, 6) concludes that some of the textiles such as pieces from Hochdorf show that they were produced by specialists who contributed to the regional power structure and economy.

Spindles and occasionally loom weights can be found in graves from the period (Vadász 2003; Grömer 2012, 54; Belanová Štolcová 2012, 312; Banck-Burgess 2018, 4; Metzner-Nebelsick 2018, 16) and show the importance of the craft. The illustrations of individuals that spin or weave, such as on the conical necked vessel from Sopron-Burgstall (Grömer 2012, 58) and the Tintinnabulum, Bologna (Gleba 2008, 30) indicate that it was a female craft. Metzner-Nebelsick (2018, 16) connects the presence of spindle whorls and loom weights in some female Kalenderberg graves, a sub-group of eastern Hallstatt culture in Austria and Hungary, with their involvement in textile production and the social role as lady of the house. The importance of the craft is probably indicated in the conical-necked vessel from Sopron–Burgstall (Grömer 2012, 58). It is possible that the presence of textile tools in rich female graves is connected to control over textile production. Banck-Burgess (2018, 6) argues that Iron Age textile production centres are difficult to document based on settlement evidence. Although Belanová Štolcova & Grömer (2010, 9-20) view it differently and interpret the site Smolenice Mopír (with more than 2,100 spindle whorls and a large number of loom weights) as a textile production centre. Webley (2018, 15) argues that crafts, including textile production, are often carried out at a household level. He suggests that the common finds of spindle whorls and loom weights prove this.

The looms used in the eastern Hallstatt area could be fairly large, up to 4 m, based on the loom weights which are interpreted to be their remains (Belanová Štolcova 2012, 312-313; Belanová Štolcová & Grömer 2010, 16; Grömer 2012, 54). These looms seem to have had weights mainly in the range 350 g to 1,600 g (see above). The lighter weight group in this study (51 g to 135 g) seems to be less common, and seldom found in as large numbers as in Százhalombatta. The large looms are found both at hillforts and other types of settlements (Belanová Štolcova 2012, 313), indicating that weaving large textiles was not confined to the hillforts.

Traces of a small settlement outside the walls at the Százhalombatta-Sánc-hegy have been found (Poroszlai 1999, 16). However, the loom weights here were most probably found in an area within the hillfort's wall but farther away from the dense household area in the centre. Private or illicit excavations were known to be primarily carried out within the fortification walls. The name given as the find spot by the donor of these loom weights (Földvár) indicates the southern part of the Bronze and Iron Age site complex. The donor is the landowner of this particular part of the

site and the objects were found while he was working on his land. Current knowledge suggests it seems that the northern part (Sánc-hegy) consists of dense Iron Age settlement features without any Middle Bronze Age remains. This part is considered to have been the centre of the Iron Age hillfort. The southern part is where the Middle Bronze Age tell is, and it also contains scattered Hallstatt period and Celtic remains, which are clearly not as abundant as in the northern part.

The site Smolencie-Molpír, which seems to have fairly similar loom weights to those of Százhalombatta, is situated between two cultural spheres (north-east alpine Hallstatt and the Lusatian culture) and suggests that the site participated in long-distance trade (Belanová Štolcová 2012, 312). The Hallstatt period Százhalombatta-Sánc-hegy is not as well excavated (Marton 1999) but its strategic situation by the Danube and the finds from the nearby large Hallstatt cemetery (Czajlik 2008, 97; Poroszlai 1999, 376) suggest that the site could have been an important part of a long-distance network, probably similar to Smolencie-Molpír. An important difference so far is that Smolencie-Molpír has revealed around 2,100 spindle whorls (Belanová Štolcová 2012, 311). Only a few spindle whorls have been collected from the Százhalombatta site complex or given to the museum. From the casual finds, only about ten spindle whorls have been donated to the museum. While all the light discoid loom weights were given to the museum in 1987, the pyramidal loom weights were passed to the museum sporadically between 1987 and 1992 in three batches. Without further details about the find spots, it is difficult to say with confidence whether or not they all came from a limited area, such as a workshop or artisan's location.

Conclusion

Comparison with loom weights from dated contexts and a review of the site suggests that the light loom weights in this study most likely belong to the Hallstatt period. It seems that weaving on large looms was an activity known during this period. As the Iron Age hillfort (Százhalombatta-Sánc-hegy) only had limited excavations, it is not possible to say whether there would have been a large loom with heavier weights at the site at this time. The large number of light loom weights (more than 180) might indicate that textile production was an important factor in Százhalombatta-Sánc-hegy as well. However, without more extensive excavations of the hillfort, this is difficult to establish with certainty.

Acknowledgements

We wish to express our gratitude to Matrica Museum employees, Gabriella T. Németh for her generous help in collecting the archaeological data and Gabriella L. Pammer for masterfully executing the drawings. We are also grateful to the Hungarian National Museum and Balassa Bálint Museum, Esztergom, Hungary for allowing the publication of their material in this article mainly table 3, including images and figure 9 and 10. We also wish to express our gratitude to Etelka Studeníková for providing us with references for some of the Hungarian examples. Sophie Bergerbrant would like to thank the Swedish Foundation for Humanities and Social Sciences under Project Grant P15-0591:1 *Bronze Age Wool Economy: Production, trade, environment, herding and society* for supporting this project and the Royal Society of Arts and Sciences in Gothenburg for a travel scholarship.

Bibliography

Andersson Strand, E. & Nosch M.-L. eds. (2015) *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books.

Andersson Strand, E. & Nosch, M.-L. (2015) Introduction to the CTR database. In: E. Andersson Strand and M.-L. Nosch (eds), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books, 145-151.

Banck-Burgess, J. (2012) Case Study: the Textiles from the Princely Burial at Eberdingen-Hochddorf, Germany. In: M. Gleba and U. Mannering (eds), *Textiles and Textile Production in Europe: From Prehistory to AD 400*. Oxford: Oxbow Books, 139-150.

Banck-Burgess, J. (2018) Textiles and Perishable Materials. In: C. Haselgrove, K. Rebay-Salisbury and P. S. Wells (eds), *The Oxford Handbook of the European Iron Age*. Oxford University Press, Oxford. 10.1093/oxfordhb/9780199696826.013.6.

Bazzanella, M. (2012) Italy: Neolithic and Bronze Age. In M. Gleba and U. Mannering (eds), *Textiles and Textile Production in Europe: From Prehistory to AD 400*. Oxbow: Oxford, 203-213.

Belanová Štolcova, T. (2012) Slovak and Czech Republics. In: M. Gleba and U. Mannering (eds), *Textiles and Textile Production in Europe: From Prehistory to AD 400*. Oxbow Books: Oxford, 306-351.

Belanová Štolcova, T. & Grömer, K. (2010) Loom-weights, Spindles and Textiles – Textile Production in Central Europe from the Bronze and Iron Age. In: E. Andersson Strand, M. Gleba, U. Mannering, C. Munkholt, and

M. Ringgaard (eds), *North European Symposium for Archaeological Textiles X.* Ancient Textile Series 5. Oxford: Oxbow Books, 9-20.

Bender Jørgensen, L. (2005) Hallstatt and La Téne Textiles from the Archives of Central Europe. In: P. Blicher, K. Grömer, R. Hofmann-de Keijzer, A. Kern, and H. Reschreiter (eds), *Hallstatt Textiles: Technical Analysis, Scientific Investigation and Experiement on Iron Age Textiles*. Bar International Series 1351. Oxford: ArchaeoPress, 133-150.

Bergerbrant, S. (forthcoming) Loom weights and spindle whorls in phase 1. In: M. Vicze and M.L.S. Sørensen (eds), Living in a Tell: Memory and Abandonment. Százhalombatta-Földvár Phase I (Late Koszider). SAX IV.

Burke, B. (2010) *From Minos to Midas: Ancient Cloth production in the Aegean and in Anatolia*. Ancient Textile Series 7. Oxford: Oxbow Books.

Czajlik, Z. (2008) Aerial archaeology in the research of burial tumuli. Communicationes *Archaeologicae Hungariae* 28, 95-107.

Czajlik, Z., Holl, B., T. Németh, G., Puszta, S. & Vicze, M. (2016) New results in the topographic research on the Early Iron Age tumulus cemetery at Százhalombatta, *Archäologisches Korrespondenzblatt* 46(1), 57-73.

Ďurkovič, É. (2007) Újabb adatok a Kisalföld kora vaskori településszerkezetéhez (Recent contributions to the Early Iron Age settlement network of the Kisalföld). *Arrabona* 45(1), 11-60.

Ďurkovič, É. (2015) Weaving-related finds from the Early Iron Age settlement at Győr-Ménfőcsanak (Hungary). In: I. Szathmári (ed), *An der Grenze der Bronze- und Eisenzeit: Festschrift für Tibor Kemenczei zum 75. Geburtstag*. Budapest: Magyar Nemzeti Múzeum, 81-107.

Elster, E. S., Andersson Strand, E., Nosch, M.-L. & Cutler, J. (2015) Textile tools from Sitagroi. In: E. Andersson Strand and M.-L. Nosch (eds), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books, 299-308.

Fichtl, S. (2018) Urbanization and *Oppida*. In: C. Haselgrove, K. Rebay-Salisbury and P. S. Wells (eds), *The Oxford Handbook of the European Iron Age*. Oxford: Oxford University Press, DOI: 10.1093/oxfordhb/9780199696826.013.13.

Firth, R. (2015) Mathematical analysis of the spindle whorl and loom weight data in the CTR database. In: E. Andersson Strand and M.-L. Nosch (eds), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books, 153-190.

Firth, R. & Nosch, M.-L. (2012). Spinning and Weaving Wool in Ur III Administrative Texts. *Journal of Cuneiform Studies 64*, 65-82. doi:10.5615/jcunestud.64.0065.

Gleba, M. (2008) *Textile Production in Pre-Roman Italy*. Ancient Textile Series 4. Oxford: Oxbow Books.

Gleba, M. & Mannering, U. (2012) Introduction: Textile Preservation, Analysis and Technology. In: M. Gleba and U. Mannering (eds), *Textiles and Textile Production in Europe: From Prehistory to AD 400*. Oxford: Oxbow Books, 1-24.

Grömer K. (2012) Austria: Bronze and Iron Age. In: M. Gleba and U. Mannering (eds), *Textiles and textile production in Europe from prehistory to AD 400.* Ancient Textile Series, vol 11. Oxford: Oxbow Books Ltd, 27–88.

Grömer, K., Kern, A., Reschreiter, H. & Rösel-Mautendorfer, H. (eds.) (2013) *Textiles from Hallstatt: Weaving Culture in Bronze Age and Iron Age Salt Mines/ Textilen aus Hallstatt: Gewebte Kultur aus dem bronze- und eisenzeitlichen Salzbergwerk.* Archaolingua vol 29. Budapest: Archaeoloingua Alapítvány.

Groot, M. (2018) Animals and animal husbandary. In: C. Haselgrove, K. Rebay-Salisbury and P. S. Wells (eds), *The Oxford Handbook of the European Iron Age*. Oxford: Oxford University Press, 10.1093/oxfordhb/9780199696826.013.43.

Guzowsla, M., Becks, R., Andersson Strand, E., Cutler, J. & Nosch, M.-L. (2015) Textile tools from Troia, western Anatolia. In: E. Andersson Strand and M.-L. Nosch (eds), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books, 309-328.

Horváth, T. & Marton, E. (1998) Prehistoric Spinning and weaving objects from the Carpathian basin (Hungary). In: Költő, L. and Bartosiewicz, L. (eds), *Archaeometrical Research in Hungary* II, 249-263.

Jerem, E. & Merster, Z. eds. (2010) *Prehistoric monuments and collections in Hungary*. Budapest: Archaelingua.

Kneisel, J. & Schafer-Di Maida, S. (2019) Loom weights in Bronze Age Central Europe. In: S. Sabatini and S. Bergerbrant (eds), *The Textile Revolution in Bronze Age Europe: Production, Specialisation, Consumption*. Cambridge: Cambridge University Press, 80-116.

Lengyel, I. (1959) A halimbai (Veszprém megye) koravaskori temető (The Early Iron Age cemetery from Halimba (Veszprém county)). *Archaeológiai Értesítő* 86(2), 159-174.

Luczenbacher, J. (1847) A pogány magyar sírok körül tett felfedezés (Discover about pagan Magyar burials). *Magyar Tudományos Akadémiai Értesítő* 7, 282-289.

MRT 7 (1986) *Magyarország Régészeti Topográfiája 7. Pest megye régészeti topográfiája. A budai és szentendrei járás.* Budapest: Akadémiai Kiadó, 231-233.

Maier, U. & Schlichtherle, H. (2011) Flax cultivation and textile production in Neolithic wetland settlements

on Lake Constance and in Upper Swabia (south-west Germany). *Vegetation History and Archaeobotany* 20(6), 567-578

Mårtensson, L., Nosch, M.-L. & Andersson Strand, E. (2009) Shape of things: Understanding a loom weight. *Oxford Journal of Archaeology* 28(4), 373-398.

Marton, E. (1999) Oikos in the Late Bronze – Early Iron Age Fortress at Érd-Százhalombatta: New results from the season 1996. In: E. Jerem and I. Porozslai (eds), *Archaeology of the Bronze and Iron Age: Experimental Archaeology, Environmental Archaeology, Archaeological Parks. Proceedings of the International Archaeological Conferences Százhalombatta, 3-7 October 1996*. Budapest: Archaeolingua, 133-142.

Marton, E. (2001) Weaving-related finds from Western Hungary from the First Millennium BC. In: A. Lippert (ed), *Die Drau-, Mur- und Raab-Region im 1.vorchristlichen Jahrtausend. Akten des Internationalen und Interdisziplinären Symposium vom 26. Bis 29. April 2000 in Bad Radkersburg*. Universitätsforschungen zur prähistorischen Archäologie 78. Bonn: Dr. Rudolf Habelt GmbH, 279-308.

Matuz, D. E. & Nováki, G. (2002) *Spätbronzenzeitliche, früheisenzeitliche Erdwälle in Nordungarn.* Inventaria Praehistorica Hungariae 10. Budapest: Magyar Nemzeti Múzeum.

Metzner-Nebelsick, C. (2018) Central Europe. In: C. Haselgrove, K. Rebay-Salisbury and P. S. Wells (eds), *The Oxford Handbook of the European Iron Age*. Oxford: Oxford University Press,DOI: 10.1093/oxfordhb/9780199696826.013.33.

Mithay, S. (1970) A koroncói koravaskori kunyhó. (Die Hütte von Koroncó aus der jüngeren Eisenzeit). *Arrabona* 12, 5-16.

Němejcová-Pavúková, V. (1986) Vorbericht über die Ergebnisse der systematischen Grabung in Svodín in den Jahren 1971-1983. *Slovenská Archeológia* 34, 133-176.

Papadopoulou, E., Andersson Strand, E., Nosch, M.-L. & Cutler, J. (2015) Textile tools from Archontiko, northern Greece. In: E. Andersson Strand and M.-L. Nosch (eds), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books, 293-297.

Patek, E. (1968) *Die Urnenfelderkultur in Transdanubien.* Archaeologica Hungarica 44. Budapest: Akadémiai Kiadó.

Plachá, V. (1975) Výsledky výskumu na hrade Devín v roku 1975 (Grabungsergebnisse auf der Burg Devín im Jahre 1975). *Archeologické Výskumy A Nálezy na Slovensku* 1975, 186-188.

Plachá, V. & Hulínek, D. (1998) Priebežné výsledky výskumu Národnej kultúrnej pamiatky Devín (Laufende Grabungsergebnisse vom Nationalen Kulturdenkmal Devín). *Archeologické Výskumy A Nálezy na Slovensku* 1998, 143-145.

Poroszlai, I. (1992) Százhalombatta-Födvár. In: W. Meier-Arendt, (ed), *Bronzezeit in Ungarn: Forschungen in Tell-Siedlungen an Donau und Theiss*. Frankfurt am Main: Pytheas GmbH., 153-155.

Poroszlai, I. (1999) Archaeological Park in Százhalombatta. In: E. Jerem and I. Porozslai (eds), *Archaeology of the Bronze and Iron Age: Experimental Archaeology, Environmental Archaeology, Archaeological Parks. Proceedings of the International Archaeological Conferences Százhalombatta, 3-7 October 1996*. Budapest: Archaeolingua, 377-385.

Poroszlai, I. (2000) Excavation campaigns at the Bronze Age tell site at Százhalombatta-Födvár I. 1989-1991; II. 1991-1993. In: I. Poroszlai and M. Vicze, (eds), *SAX: Százhalombatta Archaeological Expedition. Annual Report 1 – Field season 1998*. Százhalombatta:"Matrica" Museum, 13-73.

Poroszlai, I. & Vicze, M. (2004) Százhalombatta története a bronzkortól napjainkig. A százhalombattai "Matrica" Múzeum állandó kiállításának katalógusa (History of Százhalombatta from the Bronze Age till today. The exhibition catalogue of the Százhalombatta "Matrica" Museum), Százhalombatta: "Matrica" Museum.

Poursat, J.-C., Rougemont, F., Cutler, J., Andersson-Strand, E. & Nosch, M.-L. (2015) Textile tools from Quartier Mu, Malia, Crete, Greece. In: E. Andersson Strand and M.-L. Nosch (eds), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books, 229-242.

Rast-Eicher, A. & Bender-Jørgensen, L. (2013) Sheep wool in Bronze Age and Iron Age. *Journal of Archaeological Science* 40, 1224-1241.

Sabatini. S. (2019) Weaving in Bronze Age Italy: The Case of the Terramare Settlement at Montale. In: S. Sabatini and S. Bergerbrant (eds), *The Textile Revolution in Bronze Age Europe: Production, Specialisation, Consumption*. Cambridge: Cambridge University Press, 39-79.

Smith, J.S., Cutler, J., Andersson Strand, E. & Nosch, M.-L. (2015a) Textile tools from Apliki, Cyprus. In: E. Andersson Strand and M.-L. Nosch (eds), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books, 329-335.

Smith, J.S., Cutler, J., Andersson Strand, E. & Nosch, M.-L. (2015b) Textile tools from Kition, Cyprus. In: E. Andersson Strand and M.-L. Nosch (eds), *Tools, Textiles and Contexts: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Ancient Textile Series 21. Oxford: Oxbow Books, 337-345,

Stika, H.-P. & Heiss, A. G. (2013) Seeds from the Fire Charred Plant Remains from Kristian Kristiansen´s excavations in Sweden, Denmark, Hungary and Sicily. In: S. Bergerbrant and S. Sabatini (eds), *Counterpoint: Essays in Archaeology and Cultural Heritage in Honour to Professor Kristian Kristiansen*. Oxford: ArchaeoPress, 77-86.

Stöllner, T. (2005) More than old rags: Textiles from the Iron Salt-mine at the Dürrnberg. In: P. Blicher, K. Grömer, R. Hofmann-de Keijzer, A. Kern and H. Reschreiter, (eds), *Hallstatt Textiles: Technical Analysis, Scientific Investigation and Experiment on Iron Age Textiles*. Bar International Series 1351. Oxford: ArchaeoPress, 161-174.

Studeníková, E. (1993) Staršia doba železná (halštatská). In T. Štefanovičová (ed), *Najstaršie dejiny Bratislavy.* Bratislava: Vyd. Elán, 116-142.

T. Németh, G. (1996) Angaben zur hallstattzeitlichen Topographie des südlichen Teils der Kleinen Tiefebene. In: E. Jerem and A. Lippert (eds), *Die Osthallstattkultur. Akten des Internationalen Symposiums, Sopron, 10–14 Mai 1994.* Budapest: Archaeolingua, 365–378.

Von Vadász, É. (2003) Kora vaskori halomsír Tata határában (Früheisenzeitliches Hügelgrab in der Gemarkung von Tata). In: J. Kisné Cseh (ed), *Annales Tataienses III. Régészeti adatok Tata történetéhez 1.* Tata: Mecénás Közalapítvány, 89-126.

Vicze, M. (2005) Excavation methods and some preliminary results of the SAX Project. In: I. Poroszlai and M. Vicze, (eds), *Százhalombatta Archaeological Expedition. Report 2.* Százhalombatta: Matrica Múzeum, 65-80.

Vicze, M. (2013) Expecting the unexpected: Százhalombatta-Földvár surprises once again. In: S. Bergerbrant and S. Sabatini (eds), *Counterpoint: essays in archaeology and cultural heritage in honour to professor Kristian Kristiansen*. Oxford: Archaeopress, 71–76.

Vicze, M. & Stig Sørensen, M.-L. (in print) *Living in a Tell: Memory and Abandonment. Százhalombatta-Földvár Phase I (Late Koszider)*. SAX IV.

Vretemark, M. (with contribution by H.-P. Stika, B. Berzsényi and P.S. Henriksen) (2010) Subsitence Strategies. In :T. Earle and K. Kristiansen (eds), Organizing Bronze Age societies; the Mediterranean, Central Europe, and Scandinavia compared Cambridge: Cambridge University Press, 155-184.

Webley, L. (2018) Household and communities. In: C. Haselgrove, K. Rebay-Salisbury and P. S. Wells (eds), *The Oxford Handbook of the European Iron Age*. Oxford University Press, Oxford, DOI: 10.1093/oxfordhb/9780199696826.013.40

Zsidi, P. (ed) (2017) Kincsek a város alatt. Újdonságok a múltból. Budapest régészeti örökségének feltárása 1867 / 2005-2015. *Időszaki kiállítás a BTM Vármúzeumban 2017.04.12.-2017.09.17.* Kiállítási vezető és katalógus. (Treasures under the city. Novelties from the past. Uncovering the archaeological heritage of Budapest 1867 / 2005-2015. Exhibition catalogue of the exhibition at the BHM Castle 12.04.2017-17.09.2017.) Budapest.

Authors:
sophie.bergerbrant@gu.se
vicze.magdolna@gmail.com