

Spinning Yarns: The Archaeological Evidence for Hand Spinning and its Social Implications,
c AD 1200-1500
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THIS PAPER examines the archaeological evidence for hand spinning in medieval Britain from c 1200 to c 1500. Ceramic, stone and baked clay spindle whorls have dominated the excavated finds, but a new corpus of lead alloy spindle whorls, recorded through the Portable Antiquities Scheme and Scottish Treasure Trove, is presented here. Analysis of the metal whorls' distribution, manufacture, dating and decoration is provided, illuminating the wide social and economic contexts in which they were used. From memento mori of pious spinners to sexually potent objects representative of lubricious gossips, the ubiquitous spindle whorl was a universal tool that had a powerful agency. The artefacts are small finds embodying daily life but also tie into the wider national economy of the High and Late Middle Ages.

INTRODUCTION

Hand spinning using a drop spindle in the Middle Ages required a prepared mass of fibres and a spindle fitted with a spindle whorl. To twist the fibres into yarn a pre-spun piece of thread or some of the raw fibres were attached to a notch or small hook on the top of the spindle shaft, and held in one hand by the spinner, suspending the spindle in the air. With the other hand the spindle was set in motion. The rotating spindle would twist the fibres together while the spinner drafted a few fibres at a time, and at a regular pace, from the larger mass, to create a continuous and uniform thread. This mass of fibres could be gathered and held on a distaff from which they were drafted. The twisted yarn would then be wrapped around the spindle shaft, and the process continued. The weight of the whorl provided the spindle with momentum, kept it vertical and kept the fibres taught. Threads could also be plied together using this drop spindle method. The finished yarns were then woven, sewn or knitted into textiles.

Spinning was fundamental to the success of the textile industry. While weaving and processes such as dyeing and fulling are discussed more frequently in archaeology, spinning is often relegated to a mention in finds reports, or merely noted as evidence of the presence of women. The ubiquity and unpretentious nature of spindle whorls has meant that they are overlooked in studies of the High and Late Middle Ages, in contrast to their treatment in those of the Early Middle Ages.² The aim of this article is to remedy this imbalance by analysing the evidence for hand spinning in Britain between c 1200 and c 1500, with a focus on the newly discovered lead alloy whorls. The evidence is discussed within a wider context of the act of spinning and its social significance. This in turn contributes to our understanding of small finds that relate to daily life and the economy, and medieval attitudes to spinning.

The Portable Antiquities Scheme (PAS) and the Canmore records of Scottish Treasure Trove finds provide an important national dataset of spindle whorls that has not yet been examined.³ This paper contends that these objects can make a valid contribution to our understanding of this economic and social activity in the medieval past. The data is confined to lead alloy examples resulting from the reporting of finds by metal-detectorists. By the end of October 2014, there were 2744 lead alloy spindle whorls recorded on the PAS database that were possibly medieval in date (Figs 1 and 2). These data, and the chance finds recorded on Canmore, have been analysed to examine: first, the frequency of such finds compared with excavated examples, and how we might start investigating spinning on a

larger scale and through the material evidence; secondly, their geographical distribution and whether there are clusters of finds and why; and finally, their manufacture, dating, and decoration. As promoted by Roberta Gilchrist,⁴ the approach used here combines empirical data with social/theoretical perspectives to examine the agency of the later medieval spindle whorls, the meanings they embody, and the act of spinning. This is particularly relevant in the investigation into the contemporary depictions of spinning, and the motifs that decorate the whorls themselves.

YARN AND THE TEXTILE INDUSTRY

High quality raw wool was the main export product of Britain in the 12th and 13th centuries, with large quantities being distributed to the Netherlands, Belgium and Italy. At the peak of the wool trade in the early 14th century there was an annual export of some 45,000 sacks of raw wool from England; this came from over 10 million sheep.⁵ The raw material was traded (and processed) throughout the country via dealings between local and foreign merchants. For example, from 1275 Newcastle was a staple for the export of wool from the north of England with agents working on behalf of Florentine and Lucchese merchants.⁶ The quality and cost of the wool varied, and the export taxes collected at the port of Calais reveal that the finest quality and most expensive came from the Welsh Marches (Herefordshire and Shropshire), the second best from the Cotswolds, and the next best from districts of Lincolnshire. Wool from the far north-east (Northumberland, Cumberland and Durham) and the south-west (Cornwall) was the coarsest.⁷

In 1275 royal custom duties were levied on the export of wool to support financial strain caused by the costly Hundred Years War. The export taxes increased over time, and with higher import costs for the finest wool from England, foreign textile producers were choosing the cheaper and second-best Spanish wools that had been improving in quality during the 15th century.⁸ By the early 16th century the wool trade had faltered, and fleeces from only c 5.25 million sheep were being shipped overseas.⁹ The English cloth industry thus benefited from tax-free access to homegrown, quality wool supplies, suitable for making heavyweight luxury woollens. This led to an increased production of cloth in England for native consumption and export.

By the mid-1360s, English cloth had 'ousted foreign goods from the home market'.¹⁰ Soft woollen cloths and lighter worsteds were manufactured, and the rural economies in much of SW England, the Weald of Kent, parts of East Anglia, the Pennine dales of Lancashire, and the West Riding of Yorkshire were transformed as a result of the wool and textile industries.¹¹ Linen textiles were produced from home grown flax, but flax was also imported from Ireland, the Baltic and Russia, and linen cloth from France and Switzerland. As linen was not exported from England in the same quantities, the documentary evidence is poor in comparison with wool cloth.¹²

The wool and linen industry not only transformed local economies through animal management and land use, but also the craft occupations involved in textile production. Non-agricultural labouring, such as craft-working, was a way to supplement income. By 1300 it may have contributed to roughly a tenth of rural incomes, and by 1500 it is thought to have doubled.¹³ Poll tax returns of 1381 reveal the variety of occupations of rural and urban residents. For example, in the hundred of Tunstead (Norfolk) there were drapers, dyers, fullers, pedlars, millers, tailors and weavers, and these activities may have been combined with small-scale farming.¹⁴ In the 1355–56 records relating to labour laws for the area surrounding Ross-on-Wye (Herefordshire), occupational groups included agricultural

labourers, textile workers, tailors, and other craftsmen.¹⁵ Some people had multiple occupations, such as 'weaver and spinner' or 'weaver, spinner and servant'.¹⁶ Again, the poll tax records of 1381 indicate the variety of fibre processing and textile working roles of inhabitants in the immediate suburbs of Oxford (Oxfordshire).¹⁷ It is noteworthy that 39 householders' occupations were listed as spinner; it was a recognised occupation and not just a domestic task. The data also show that weaving prospered in Oxford in the later 14th century; 34 householders and 28 servants were listed as weavers. This can be compared with an apparent decline of urban weaving around 1300 suggested by Bolton, when the 'Oxford gild was cut in 1275 because the numbers of weavers had fallen from 60 to 15...by 1323 it was alleged they were all dead and without successors'.¹⁸ The poll tax records and the archaeological evidence from York (North Yorkshire) and Winchester (Hampshire) also show that textile production in urban areas continued into at least the late 14th century.¹⁹ This supports Bridbury's suggestion that the guilds were losing members and authority during the period, not that production was in decline.²⁰

Economically, spinning yarn was fundamental to the success of the textile industry. Historical documents offer information on the scales of export and production of textiles, but they also reveal something of the costs and time spent on the various textile processes. Munro has shown that for a typical Flemish draper, the production of a 15th-century broadcloth of 42 x 4 ells (30 x 2.8 m) required 88 lb (40 kg) of wool.²¹ He calculated that 12 or more days' work for 26–30 people were needed for the preparation of the wool, which included wool-beating, carding, combing, and spinning the yarns. Following this at least another 12 working days were required to complete the weaving, then three to six days for fulling, and another week for dyeing, shearing, and finishing. Spinning wool was a time-consuming and costly process in textile production. Although the following example is based on costs from an Italian workshop using Spanish wool, the processes are comparable. For six woollens made from Spanish Majorcan wool in 1396–98, the cost of the raw wool (with taxes) was the most expensive part of the process, but spinning was the most time-consuming activity, and after wool preparation, the most costly (Tab 1). This corresponds with Muldrew's calculation that to make one broadcloth of a similar mass of wool (c 86 lbs or 39 kg) in 1588 in Yorkshire, 60 people would be involved, 30 of whom carded and spun the wool.²² Clearly, the great importance of spinners and their skill to the textile economy cannot be overstated. But how can we understand spinning through the archaeological material remains, and what social meaning did it have, if any?

SPINDLE WHORLS IN BRITAIN

Spindle whorls are found on excavations of almost all manner of medieval urban and rural settlements. They usually occur associated with waste in and around buildings; excavations in the cities of Northampton (Northamptonshire), Norwich (Norfolk), Oxford, Winchester, York and Perth (Perthshire), for example, provide typical urban contexts (Fig 3; see also Tab 2, and for references). Spindle whorls are found at deserted medieval settlements but numbers are rather low compared with urban sites. The diversity in materials used is nevertheless the same. Early archaeological finds in the 19th century were earthenware and bone 'beads' from Woodperry (Oxfordshire), now recognised as spindle whorls.²³ At the 16th-century seasonal dwelling in Hafod y Nant Criafolen (Denbighshire), ten stone spindle whorls were found, along with a possible weaving tablet.²⁴ This site was occupied for only part of the year, when sheep were taken to higher ground for the summer months. Whole communities could have accompanied the flocks, and fibre processing and

tablet-band weaving may have been common activities; the products of which could have been sold to supplement the income from farming. At the deserted medieval settlement of Great Linford (Buckinghamshire) a number of elements necessary for textile working have been excavated: 11 spindle whorls made of stone, clay, lead alloy and a reused ceramic sherd; shears and scissors; and thimbles.²⁵ A row of four pairs of postholes (some stone-packed) on a surface running parallel with a ditch were excavated outside of Building 22, Croft H, where some of the tools were found²⁶ – this may have been the site of a tenter frame for drying cloth. Conversely, and surprisingly, during the large-scale investigation of Shapwick village (Somerset) and the surrounding parish, only two stone whorls were found, but they are thought to be Roman in date.²⁷ Glastonbury Abbey established Shapwick as a dependent settlement for the grazing of sheep; the name of the village derives from ‘Sheep Wick’ and in Domesday Book the Abbot who held the manor had 100 sheep.²⁸ Economically, there were changes in Shapwick during the 12th and 13th centuries when arable farming dominated, but a flock of almost 300 sheep was recorded in 1330, and a sheepfold was constructed in 1334–35.²⁹ The spinning of the wool was undoubtedly taking place in the village, but the material evidence is perhaps lacking because Shapwick is an extant village and investigations were carried out away from the main areas of activity and at a distance from occupied buildings. In contrast, in the deserted settlement of Great Linford, where archaeologists were able to carry out large-scale excavation, the spindle whorl finds were often closely associated with the abandoned buildings.

The examples mentioned above show the commonplace discovery of whorls at most settlement sites. Sites of a religious nature also provide examples of the small find. Whorls deliberately placed with the deceased have been found in medieval burials in Britain. This high- and late-medieval phenomenon is a rarer occurrence than in the early medieval period. In Gilchrist’s paper on later medieval grave goods with protective functions, ten whorls are listed as being associated with burials of adults and a child.³⁰ Egan noted that spindle whorls were repeatedly found at religious house sites in Britain, not only as grave goods.³¹ Pre-Reformation textile work would not have been unusual at monastic houses, as evidenced by the woolhouse at Fountains Abbey (North Yorkshire).³² The monastic communities were wealthy landowners and for the Cistercians sheep farming was a key part of their economy.³³ Fibre processing remains are found in the detritus of religious houses. For example, the excavation of the Dominican Priory in Oxford produced two stone whorls: one that was a residual find from a 17th century gulley; and a second from a layer of an open yard made up of dumped material.³⁴ A possible wool comb tooth was identified at St Mary Stratford (Essex), dated c 1135–1220. One of the few late-medieval spindles to have been found on an excavation in England with its whorl still in situ was an oak spindle and lead whorl excavated from a stone lined drain at Austin Friars, Leicester (Leicestershire).³⁵ At Whithorn (Dumfries and Galloway), 93 whorls were recovered.³⁶ The excavation suffered from disturbed phases, but 63 of the whorls were associated with activity in the monastic town dating from c 1000–1600. The excavators encountered a ‘stratigraphic nightmare’ because of medieval grave digging and recent cultivation, but some of the whorls may have had secondary uses as grave goods.³⁷

Evidence for spinning at high-status sites is less than at other occupation sites. At Castle Rising Castle (Norfolk), finds included a baked clay whorl, two lead whorls of 13th- to 16th-century date, and one small pair of 14th-century shears.³⁸ At Norwich Castle the only whorl was a post-Conquest ceramic example.³⁹ Despite the lengthy occupation of Sandal Castle (West Yorkshire) between 1100 and 1485, no spindle whorls or textile producing

evidence was recovered,⁴⁰ nor were any found at Barnard Castle (County Durham).⁴¹ At Fast Castle (Berwickshire) whose construction began in the early 15th century, five stone spindle whorls and one earthenware example were found, along with fragments of wool textile, goat hair, and the staples of fine, raw wool.⁴² The evidence suggests spinning on site during the 15th century using wool from local sheep. Comparably, the small castle of Lengberg Castle, East Tyrol (Austria), has produced textile tools including spindles and a tapestry bobbin suggestive of small-scale tapestry production at the site in the 15th century.⁴³

Castles were defensive sites that could act as a lord's residence, centres for estate administration, and billet small garrisons. Judging from the scant archaeological evidence that has been recovered, the production of spun fibres or textiles appears not to have been large-scale at these places. Perhaps however, small-scale, local production was more common in castle households but very little evidence has survived. When the lord and retinue moved on, the packing of small tools, such as spindles, and episodes of clearances, may have caused the low numbers of textile equipment to be found. Moreover, the fact that many castle excavations focus on the keep, which would have been kept clear of the domestic rubbish, may mean that whorls which accumulated in such deposits may not be recovered. The Lengberg Castle finds notably came from the void below floorboards and formed part of a large cache of waste reused to insulate or level a floor.⁴⁴

LEAD ALLOY SPINDLE WHORLS

As we have seen, whorls of ceramic, stone, baked clay, reused ceramic fragments and lead alloy are found in archaeological contexts. Significantly, wooden whorls are generally missing from the record as they are dependent on particular environmental conditions for their preservation, thus distorting the overall picture of types of spindle whorls represented. Wooden whorls would almost certainly have been in use in medieval Britain despite the lack of finds; comparative evidence for wooden examples is provided by the remarkable finds from Bergen (Norway) and Montpellier (France).⁴⁵ Within the range of surviving materials, however, lead alloy whorls are relatively rare. This is illustrated in Table 2, but it is also a pattern seen in the Whithorn excavations, where of the 93 whorls found, 74 are made of stone, 6 of bone, and only 13 of lead.⁴⁶ Similarly, at Bergen, from the recovery of a vast collection of 410 high-/late-medieval whorls, a mere seven were made of lead alloy.⁴⁷ Although the total numbers of whorls found at rural settlements are less than at urban sites, the former tend to provide more evidence of lead alloy whorls. For example, in the small-scale excavation of the deserted medieval village of High Worsall (North Yorkshire), the few finds from late 12th to late 14th centuries included a decorated lead whorl found with other small personal items.⁴⁸ Five lead whorls were also found at House A of West Hartburn, a small settlement in County Durham, one of which was decorated with cast lettering.⁴⁹ Lead whorls are also commonly found as unstratified, topsoil finds at deserted rural settlements and in their agricultural hinterland. Thrislington (County Durham), Wharram Percy (North Yorkshire), Caldecotte (Buckinghamshire), and Cottam (East Yorkshire) have all produced such finds.⁵⁰ At Woodhouse (Northumberland), a decorated lead whorl from the topsoil was misidentified as Roman, and subsequently entered the archaeological literature.⁵¹ This has led to the misidentification of a number of high- and late-medieval whorls.⁵²

Why was lead chosen to make spindle whorls from, why is there is discrepancy between urban and rural finds, and can any more be discovered with regard to their date of manufacture and use?

SOURCES AND PROPERTIES OF LEAD WHORLS

During the later medieval period the main sources of lead were Yorkshire, Durham, the Peak District of Derbyshire, Flintshire, the Mendips and south Devon, and all experienced changing fortunes. The metal was a valuable product with many uses, and was transported around the country for consumption in great quantities.⁵³ The density and low melting point of lead make it a useful and easily manipulated material to fashion the whorls from. They would also be less susceptible to breaking or chipping compared with stone or ceramic whorls. Lead is c 15 times more dense than wood, and therefore is a feasible substitute to make a small whorl of c 30 mm diameter and of the required weight. The weight of a whorl is often used to identify which fibre it spun: a heavy whorl (such as one might expect to be made from lead alloy) for thicker yarns and for plying, and a lighter one for fine fibres.⁵⁴ Thus the choice of material may be related to the fibre. Unfortunately, this coarse relationship is simplistic and unfounded. Penelope Walton Rogers has warned of over-emphasising the importance of whorl weights, and that it is one aspect of many which affected spinning.⁵⁵ The mass of the spindle, and the weight of the spun yarn wound onto the spindle during spinning is often not taken into account. Verheken suggests that the moment of inertia (MI) determined by mass rather than mass itself should be used to compare whorls (and assemblages).⁵⁶ Kania, however, has shown that it is the spinner that has a significant effect on the structure of spun yarns, rather than the equipment or fibre.⁵⁷ Whorl mass had no clear affect on yarn thickness, nor on the mass of yarn produced in her experiments. A low MI can produce the same thickness of yarn as a higher MI, but at a faster speed — meaning the spinner needs to draft the fibres more quickly, or twirl the spindle more often — but not use a different whorl. This means that the material the whorl is made from also bore little impact on the yarn output.

Perhaps, then, the ease of production can explain the use of lead alloy. Their manufacture — by casting — permitted mass production, but also relief decoration (Fig 1). This could be carried out without the need for large or complicated apparatus once the metal was acquired: a small fire (melting point of pure lead is a low 327.5°C), a crucible and a mould were sufficient. During the later medieval period the casting of small objects in their hundreds, such as base metal jewellery or decorative fittings, was commonly practiced.

CHANCE FINDS

Data recorded on the PAS and Canmore databases confirm that lead alloy whorls are more widespread in Britain than previously recognised through excavation. Dating can still be problematic. Of the 2744 lead alloy spindle whorls recorded on the PAS, many have been assigned wide date ranges by finds' recorders, such as 'Roman to post-medieval'. From the Canmore database of the RCAHMS and Perth's collection of Treasure Trove finds, at least 30 lead whorls are recorded in Scotland.⁵⁸ Some are given a date based on other high-/late-medieval or post-medieval objects found in the vicinity. Unfortunately the RCAHMS records do not include photographs or other details about the objects.

A discussion of the lead alloy whorls' distribution patterns is provided below, followed by an analysis of their dating and aspects of their manufacture.

The weights of the PAS whorls range from 2.53 g to 99 g, with a mean of 35.6 g. These values are normally distributed with a standard deviation of 21.5 g. This suggests a standardisation in the manufacture of lead spindle whorls that would be expected with mass production of cast objects, but production at multiple locations would have introduced a

certain variability to the data. The variation in the weights of the PAS finds matches the range of weights found at high-/late-medieval sites, regardless of material.

The evidence of chance finds is heavily biased in favour of metallic finds recovered from the ploughsoil in areas of unconstrained land. Gaps in any PAS object distribution map may be a result of constrained land.⁵⁹ It must be remembered that the dearth of metal whorls from certain areas does not indicate an absence of spinning, as the method of recovery means that the stone, ceramic or bone whorls are not being collected by chance and wooden examples have not been preserved. The lead alloy pieces are still a small subset of the total number of whorls that would have been in use. A relatively wide distribution of lead alloy spindle whorls is evident in Figure 2. Most finds are in Yorkshire (570) and Lincolnshire (446). This corresponds with key wool producing regions, and proximities to centres of lead mining.

The PAS data do show, however, that lead alloy whorls are rare in the Cotswolds (only 33 from Gloucestershire and Oxfordshire), Cornwall (21), Devon (2), and Kent (20). Considering the quantity of wool being produced in these areas and the high quality of that from the Cotswolds, the lacunae are unexpected. There are lower numbers of all PAS finds, regardless of object type or date, from the Cotswolds and the south-west, partly caused by constrained areas.⁶⁰ This low 'background' of PAS data may explain the scarcity of lead spindle whorls found there. Either that, or whorls were more commonly made of other materials. In contrast, in Kent there is a high background of chance finds, and over 400 medieval lead objects of various types on the PAS. Thus a lack of detecting cannot explain the paucity of lead whorls in this county. The inference must be that they were not as readily available for consumption, or were not desirable, and that local stone or ceramic whorls were the predominant type.

The remarkable occurrence of 21% of the PAS finds of lead whorls in the north-east requires further consideration. The high frequency of lead whorls in Yorkshire is anomalous with the finds from the city of York, where no high-/late-medieval lead examples have been recovered as yet through excavation. Their absence in York and low number on other urban sites, may be explained by their recycling. Gathered together as scrap they could have been used for small repairs or in lead glazes for pottery, for example. Recycling by plumbers must have been common and sometimes problematic as casual dealing in secondhand lead was forbidden in 1365.⁶¹

The great number of sheep kept in the Vales of Pickering and York by monastic orders (and the laity) may explain the north-eastern concentration; whorls were presumably used to spin the wool at source. In Yorkshire, sheep farming was central to the economy and dominated monastic activity. The Cistercian houses of the north-east were believed to have had 50,000–60,000 sheep in the 13th century, while the Augustinians and Gilbertines also owned large flocks.⁶² Riveaulx Abbey (North Yorkshire) alone was estimated to have a flock of over 14,000 in the early 14th century.⁶³ Great quantities of the wool were destined for export, but much would still have been for home consumption and production of textiles, especially during the 15th century when exports of wool were declining, and cloth exports increasing.⁶⁴

Spinning at sheepcotes, or *becarie*, and the consequent loss of spindle whorls at such sites, can in part explain the widespread distribution of whorls away from settlements. *Becarie* were buildings and enclosures where flocks were sheltered during the winter months. They also provided storage for fodder, skins and wool, and areas for the management of the sheep, especially during lambing or clipping seasons.⁶⁵ The *becarie* were

usually separate from nucleated settlements, and as at the Welsh summer *hafods*, dairying, cheese making, wool processing and spinning may well have taken place there. Indeed, in a late 14th-century account for the manor of Avening (Gloucestershire), a payment was made for clay pots to contain grease,⁶⁶ perhaps used to coat (size) wool during combing, after the fleece had been washed. Evidence for spinning carried out at *becarie* is shown in Figure 4; here shepherds and a shepherdess with their flock are depicted in and around a wooden shepcote at the appearance of the archangel. The shepherdess had been spinning, as she is holding her distaff. The archaeological recognition of *becarie* is poor; perhaps this could be remedied by survey and documentary analysis, in conjunction with propitious PAS find spots of spindle whorls (and wool comb teeth).

The extensive distribution pattern in Figure 2 is also explained by lost whorls accumulating with domestic or shepcote waste being deposited with manure on arable land. It is likely too that they were lost as people moved around the country. Such a person is depicted in Bruegel the Younger's 1564 *The Procession to Calvary*, where a pedlar has a string of whorls (made of stoneware) strapped to his backpack of goods.⁶⁷ The apparently haphazard, but regular occurrence of the spindle whorls can also be related to their loss at transient fairs and markets. A similar proposition has been made for the sources of other small finds found by chance, such as dress accessories.⁶⁸ Hall also suggests that over three hundred small personal objects of high-medieval to modern date, including weights, coins, buckles and spindle whorls, could be indicative of a market location in the area adjacent to the Cathedral in Dunkeld (Perthshire).⁶⁹

DATING

Dating the unstratified spindle whorls is challenging. From the large numbers of whorls of all materials and dates excavated at Coppergate, York, Walton Rogers suggested a change in design over time: the post-11th-century whorls became rounder in shape with no flat faces, and were either globular, spherical, or rounded biconical — known as Type/Form C.⁷⁰ Unfortunately, this does not fit with any of the high-/late-medieval Winchester finds, or for example, the decorated lead alloy whorl from the 12th-/13th-century house at St Peter's Street, Northampton, which is a hemisphere. Walton Rogers' proposed typology, therefore, is not applicable as a universal method of identification and dating. Nevertheless, by comparing unstratified, decorated lead whorls with the few from secure archaeological contexts presented in Table 3, we can confirm the likely date range of these types of whorls as the 13th century to 15th century.

Whorls from the River Wear deposits in the city of Durham and the collection from the deserted settlement of Meols (Cheshire), reinforce this chronology. A group of artefacts collected during underwater exploration in the River Wear in Durham contained a surprising number of lead whorls, and supplement the dearth of whorls from excavations in the city. The finds are a part of a vast collection of 3872 objects from a small area of the river-bed near Elvet Bridge; the material is thought to be rubbish, or items lost by people or shops on or near the bridge that was built at the end of the 12th century.⁷¹ The majority of objects recovered (2000) are 15th- to 16th-century in date. At least 23 of the 38 whorls found retain traces of cast decoration, and most are biconical in shape. From the associated finds and context we may surmise that these Durham lead whorls may range in date from shortly after the bridge was built to the 16th century. They form a collection of lead whorls that were being sold, used, and lost in the city, and that escaped recycling.

From the deserted settlement of Meols, two spindles, 44 whorls (34 made of lead and a cast waster fragment) and other textile tools have been recovered.⁷² The finds do not

have secure contexts because many were found in the 19th century as the site was uncovered by shifting sand. Nonetheless the bulk of the high-/late-medieval metalwork finds date to before the end of the 15th century,⁷³ providing a *terminus ante quem* for the whorls. This site appears to be anomalous because of the high number and proportion of lead whorls. But the 34 whorls, a cast waster fragment, and the proximity of the site to natural sources of lead in Flintshire may suggest that it was a production centre. Five of the Meols' whorls, plus the waster fragment, have cast ornamentation,⁷⁴ the styles of which are closely comparable with other decorated forms, and include combinations of pellets, annulets, lines forming star patterns, and curved lines. The metalwork at the site, and therefore the whorls, most likely dates from the 13th century to before the end of the 15th century.

When the decorated lead whorls stopped being a popular form in Britain is harder to determine from the extant evidence. Some of the PAS finds appear to be more post-medieval in style, with sinuous rather than linear embellishments, such as an example from the Harrogate area (North Yorkshire).⁷⁵ On post-medieval sites, Rhenish stoneware or forms made from stone are more common,⁷⁶ I can find no datable comparisons of lead examples at such sites. Nevertheless, the imported stoneware whorls show the continued demand for spindle whorls, and that despite the introduction of the spinning wheel and development of machinery, the drop spindle technique was still being used well into the 19th century. It may remain exceedingly difficult to date the undecorated whorls from unknown contexts, but it seems likely that many of the plain biconical lead forms will have been contemporaneous with the similarly shaped decorated examples.

The proposed 13th-century to late-15th/16th-century date range corresponds with the growth and peak periods of the textile trade. The PAS and Treasure Trove whorls therefore provide a geographically widespread form of material evidence for the economy of this period, compared to the smaller set of evidence recovered from excavation alone. With respect to the wool trade, archaeology reveals the consistent and extensive processing of the raw material for British production of cloth, in contrast to the documentary evidence, which is mostly indicative of the large-scale export of raw wool.

MANUFACTURE

From the chance finds we now know that there was an interest and demand for decorative versions of spindle whorls in the High and Late Middle Ages.⁷⁷ 61% of the PAS total (1680) are decorated, as are 15 from Scotland (Fig 5). The metal-detected finds plus the few decorated excavated examples show a multitude of cast motifs in relief. From the distribution map it indicates that the spinners, and certainly those in the Midlands, north of England, and east of Scotland, had a wide range of lead whorls with different designs to choose from.

Common motifs are star shapes, or cells around the central perforation that are often interspersed with pellets. Moulds would have been used to cast the whorls, and one was found by chance in the 1930s in Dunkeld beside the River Tay, near ferry crossing points (Fig 6).⁷⁸ It is either half of a two-piece mould, or more likely was a single-piece mould from which two halves were cast and then fused together. Eleven spindle whorls have been metal detected at the possible market location to the north of Dunkeld Cathedral; four are cast with lines and pellets, although none derive from the mould found nearby.⁷⁹ A second stone mould fragment has been identified in Lyons (France) and would have produced whorls ornamented with eight projecting lozenges around the circumference, interspersed with hatched decoration.⁸⁰ Fourteen PAS whorls have a similar design (Fig 7a) and have only been

found in the southern counties and the Midlands. It seems possible that they, or at least their design, originated in France and were imported – as post-medieval Rhenish stoneware whorls were. Certainly from the unofficial recording of French metal-detecting finds online, this style of lead whorl with projecting lozenges is common.⁸¹

Further evidence of manufacture in England are halves of miscast whorls, and two whorls with the same cast design found in adjacent fields near Leeds (West Yorkshire).⁸² Miscast whorls show that biconical forms were made in two halves then joined.⁸³ A miscast half from Fulford, seen in Figure 7b, is one of seven spindle whorls and over 300 other high-medieval to post-medieval chance finds found in the area on the outskirts of the modern city of York. This could well be an as-yet-unidentified fair or market site, where lead whorls were also being produced for sale.

A MAIDEN'S YARN?

Pictorial evidence from the later medieval and post-medieval periods reinforces the idea of women spinning yarn in the past. Many of the images and contemporary literary works depict idealised versions of women that echo a Christian ideology and mimic the Virgin Mary – a chaste, holy and diligent woman. Spinning and textile work were activities habitually associated with the Virgin Mary. In the Pseudo-Matthew Gospel, Mary is to spin the purple thread for the veil of the Temple, and the endeavour is an attribute found in Annunciation scenes. Mary is spinning not only the thread of life, but also that of Christ's life.⁸⁴ The thread spun is arguably a representation of Christ's life, which is born from Mary, and will, one day, be cut short. On the belly of the Virgin in the *Gothic Spinning Virgin*, the Christ Child is depicted surrounded by an aureole of light, an explicit connection between the spinning of thread and his life to come.⁸⁵ Mary even makes the seamless shroud when Christ is a child, and is seen knitting it in the round in a detail of the Buxtehaude Altar (c 1400–10). In the altar panel painting, known as *Maria gravida* (c 1410), Mary is surrounded by angels who hold her distaff and wind spun yarn onto a hand winder. A box of skeins of yarn is also shown at her feet next to a winding reel holding blue yarn.⁸⁶ Mary is shown again drawing the thread across her body, directly over her womb. The thread is directing one to not only dwell on the Virgin Mary and her actions, but also the unborn Child and his future life, suffering and death. The viewer of the altar would recognise Mary was pregnant in the scene, and remarkably, infrared images of the painting revealed a sketch of the tiny Christ in the foetal position in her womb.⁸⁷ He is again surrounded by the aureole, with a cross on his shoulder referring to the Passion.

Can this ideology and theological connection be found on the whorls themselves? The PAS data reveal 79 lead whorls that are decorated with words, letters or pseudo-letters. Due to heavy wear on many of the whorls, any lettering that might have been cast is often too worn to be legible. Out of the 79 whorls, only 33 have readable, Roman letters. Of these a mere 7 are recognisable as Latin or Middle English words. Early medieval examples with incised runes and Ogham scripts are found in Britain and Scandinavia.⁸⁸ For example, an early 11th-century lead whorl incised with runes found in Lincolnshire is thought to be a non-Christian invocation for personal support.⁸⁹ Similar invocations, although of a Christian nature, are found on the high-/late-medieval whorls. Devotion to the Christocentric and Marian cults was manifested on some of the lead spindle whorls. From Stanton on the Wold (Nottinghamshire), a whorl was found cast with letters that read IESVS on one side and possibly MARIA on the other. A skull motif was cautiously identified as well.⁹⁰ The other inscriptions on the metal detected whorls that are interpreted as invocations to Mary read:

MARIA, MVIAIA, and +D?EVE ARIAN (perhaps intended as +AVE MARIA or +DEA MARIA).⁹¹ The use of the holy names on objects, especially dress accessories, is common in the late medieval period following the rise of the devotional cults of the Holy Name and the Virgin Mary.⁹² The earliest date for the IESVS MARIA whorl is probably mid-14th century, when the cult of the Holy Name gained widespread popularity. A similar religious invocation has been recorded on a cast whorl from West Hartburn, with the reversed letters 'Rho' from *Chi Rho*.⁹³

Annular brooches and rings were often inscribed with forms of the Holy Name or *Ave Maria* invocations, and the whorls were comparable annular objects that could be adorned in the same way. As with jewellery examples, the muddled or pseudo-lettering on the PAS whorls may be attempts at invocations, or they have a religious, protective or magical significance not yet identified, such as OWNNA(.)OIV AYVYOX.⁹⁴ The whorl from West Hartburn, Stanton on the Wold and those with forms of MARIA would have clearly invoked Christ and Mary's protection and good fortune in the same way that the jewellery did. Most of the metal items connected with the cult of the Holy Name were to be carried or worn on the person.⁹⁵ However, these whorls, and a similar late 13th-century lead weight with the legend +IHCNA[ZA]RENVSREX IVDEOR[VM], were to be used as tools.⁹⁶

These lead whorls served not only as invocations but also a reminder of the Virgin Mary's life and pursuits. In turn, the spinners were emulating Mary and her positive characteristics. The whorls were symbolic, and with their legends, didactic. The thread they formed was imbued with the gestational power attributed to the act of spinning,⁹⁷ but also a reminder of the fragility of life and how it could be cut short. If the skull identification is correct, the Stanton whorl also acted as a *memento mori*, encouraging the spinner to live a pious life, and to prepare their soul for death.

Their role as *memento mori* may have been part of the reason for spindles and/or their whorls being used as grave goods. Gilchrist has suggested that the whorls in graves may have been deposited as keepsakes or protective amulets symbolic of the home.⁹⁸ The all-encompassing allegory of the thread of life being cut short, however, can partly explain why spindles and/or whorls were placed in the late-medieval graves of not only women, but men and children too. A decorated lead whorl found in a grave at Coldingham Priory (Berwickshire) can be added to those recorded previously by Gilchrist. It was found alongside the body of a young adult female who suffered with her mobility, and was buried sometime during the 13th to early 16th centuries.⁹⁹ This very whorl could have been the tool with which she made her living, rather than being merely symbolic of the home. The biconical whorl is decorated with the common cast lines forming a six-pointed star, and pellets. This object may have had symbolic properties associated with death, but also invocative properties in a similar fashion to those inscribed with the Holy Names. Indeed, the star motif was a symbol of the Virgin Mary and Christ, and Spencer has argued for the hexagram (six-pointed star) as having potent mystical or devotional powers.¹⁰⁰

Other lead spindle whorl finds have a theological association. For example, there are instances of lead papal bullae reused as whorls. Bullae were seals attached to papal documents sent from Rome, some of which may have been papal indulgences. They were decorated with the faces of Saints Peter and Paul, and the names of the issuing pope. These consecrated objects are recorded through the PAS¹⁰¹ and in excavations. Some are found pierced with smaller perforations to allow suspension or to be nailed to something, for example, lintels over doorways. Notably around 30 bullae have been found in English burials of the 14th or 15th centuries and Gilchrist has proposed that they were perhaps buried in graves as apotropaic talismans.¹⁰² Of the chance finds, two bullae with large central

perforations from England, and one found in Scotland appear to have been reused as whorls. The first is a bulla of Pope Innocent VI, 1352–62 (Fig 8); the second, from Brompton on Swale (North Yorkshire), is a bulla of the antipope John XXIII, 1410–15.¹⁰³ The third from Dunkeld is of Pope Innocent IV, 1243–54.¹⁰⁴ If found after becoming detached from their documents, these bullae would have been useful pieces of lead perfectly formed for reuse as a whorl. Their consecrated nature and decoration suggests, however, that their selection was more symbolic and pious, rather than simply practical.

The PAS records another unusual form of whorl that stands out from the corpus because of its shape. This example from Dodford (Worcestershire) can be seen in Figure 9. While the six-pointed star motif echoes the stars on other decorated examples, the groove around its circumference is distinct. It suggests that it was used as a drive whorl on a late medieval spinning wheel. It is comparable to a wooden example of 17th-century or earlier date from Coppergate.¹⁰⁵ Unfortunately, there is no direct dating evidence for the Dodford whorl, but the nearest PAS finds are late-medieval and post-medieval in date. Additionally, the land on which it was found is associated with Grafton Manor, which was present in Domesday and the Lay Subsidiary Rolls (1334–36).¹⁰⁶ This is an extremely significant find, as we currently have very little physical evidence of spinning wheels.

Finally, two thought-provoking biconical whorls have been recorded and are decorated with a Middle English maker's formula. A whorl with the inscription of +YCMAGAGAWBE was found in the parish of Elford (Staffordshire), and remarkably, a second with a similar inscription came from Lancashire (Fig 10).¹⁰⁷ Okasha commented on the latter for the PAS report and interpreted the inscription to be a Middle English maker formula, as found on early medieval objects. The suggested reading was, '[R]yc made (this) dawbe', with Richard abbreviated to Ryc, and dawbe meaning spindle whorl. A 12th or 13th century manufacture date was also proposed based on the language and style of lettering.¹⁰⁸ This supports the dating of the biconical whorls as discussed above.

An amended reading of both legends is proposed here, which is: 'I made [this] awbe'. Burnett et al correctly identified that the word 'dawbe' does not translate as spindle whorl.¹⁰⁹ 'Dawbe', and 'awbe' on the Elford whorl, are in fact derived from the Latin *alba*, meaning white. The Middle English word is 'alb' and there are various spellings; however, its use on a spindle whorl is highly significant. Alb was not only the colour white, but also a white linen religious vestment worn by clergy in celebration of the Eucharist. These could be plain linen, or of more ornate design with embellishments of silk or embroidery; the Priory of St Martin, Dover, for example, possessed, 'v olde aulbes one of red velvet wrought with roses and leaves embrodered' at the Dissolution.¹¹⁰ Gifts to churches could take the form of vestments, including linen albs, as we see in 1502 when Agnes Lark left linen to a church in Bury St Edmunds (Suffolk) to be made into clothes for the high altar for lent, and an awbe for every altar in the church.¹¹¹ We may surmise that these whorls decorated with a maker's formula and the word 'awbe' were used for spinning flax fibres with the hope the threads were used in liturgical textiles (although they could have been used for spinning wool too). Linen before being bleached was a brown colour; the transformation of the flax, from fibres and thread to linen textile, and from brown to white, is being referred to on the whorls. As is the ownership of the act: 'I made this awb'; 'I' being the whorl that had its own creative agency. The message could also have been a reminder to the spinner of the transformation process, and the final function that the linen textile could have. The material itself, bleached white linen, would mirror the holiness and purity of the Virgin Mary, and the creation of thread and thus 'life', through spinning.

In stark contrast to this holiness and purity, female spinners were often contemporaneously depicted as lubricious and gossiping temptresses.¹¹² The ambiguous notions that people held of women spinning suggests an important, saintly task, and a social wariness and suspicion of the power and control that the women held. Insinuated in contemporary depictions was the attitude that the public appearance of a chaste and good woman who spun as the Virgin Mary did could hide a private, sinful temptress. For example, a copy of a woodcut from an early 16th-century manuscript of German folksongs depicts a young woman spinning using a spindle and distaff.¹¹³ All appears virtuous, however, the woman's skirts are lifted exposing her naked thighs entwined by a snake. It has been read as a *memento mori* because it was added to a page where the verse advises a young woman to think about her death, but it seems it also acts as a warning against carnal temptation and sin — the snake echoing Eve's original sin. In another German woodcut of c 1520s, Beham depicts a sewing room where debauchery and chaos reign (Fig 11). Female spinners using spindles and distaffs are suffering, or encouraging, sexual advances and drunken behavior of men. The image indicates a generalised view of the unchaste and disorderly events taking place at gatherings of spinners outside of their homes.¹¹⁴ While there is a specific cultural context to this image of inappropriate behaviour, the ideas of spinning, sexuality and control are seen in other material evidence in Europe. A lead alloy badge of the second half of the 14th century found in Belgium depicts a vulva spinning while wearing a crown of phalluses (Fig 12). This embodies the analogy of the woman being a sexual temptress, despite her chaste activity of spinning. She is also a controller and emasculator of men, as indicated by her phallic crown.¹¹⁵ While no whorls found in Britain depict an explicit motif of sexual promiscuity or inappropriate behaviour, the tools themselves are sexually suggestive. As with purses and daggers, the spindle and its whorl are sexual symbols — a moral contradiction for the chaste maiden industriously spinning with a sexually suggestive tool.

Other sexual badges depict the vernacular motif of spinning as a warning against vices, chaos and immorality. The wickedness of gossiping is chronicled on late medieval badges that show figures holding a distaff, spindle and bellows.¹¹⁶ This interpretation of the badge contradicts Jones' suggestion that the figure represents a, 'goddess of the hearth'.¹¹⁷ Similar representations of gossiping — a woman spinning, and a man using bellows to blow air into the ear of another — are depicted in Bruegel the Younger's *Netherlandish Proverbs* (1559). On St Fiacre pilgrim badges, the gossip Houpdée, the shrew, is shown with her distaff and spindle too.¹¹⁸ Chaos is implied on a badge that depicts a phallus, wearing breeches, and carrying a distaff and spindle while a vulva stands nearby.¹¹⁹ Despite 'wearing the breeches', this male member has allowed his world to be turned upside down, and he is the one spinning. Furthermore, a badge from the Netherlands of 14th-/15th-century date shows an obviously male ass spinning.¹²⁰ This motif of occupational inversion is linked with identifiable gender roles, and is referred to in *The Canterbury Tales*, where we find the Host's wife angry at her husband when he does not defend her honour quickly enough, and exclaims, 'By corpus bones, I wol have thy kniff, And thou shalt have my distaff and go spyne!' One may also refer to the *Wright's Chaste Wife*, where the duplicitous, feeble men are trapped by the chaste wife, and forced to spin and weave. This 'world upside down' motif is seen in other contemporary depictions of weak men being beaten by their wives, often with a spindle and distaff, such as 14th-century misericords,¹²¹ and in the Luttrell Psalter (c 1325–40).¹²² At Westminster Abbey there is also a misericord that shows a man holding a ball of yarn and a hand winder, who is to have his bare arse beaten with a birch by his wife.

The use of the spinning motif acknowledged how important this occupation was in the social and economic spheres, and the images convey a concern about the power of women, and weakness of men. Despite the overwhelming, and often misogynistic, imagery of women and their spinning tools, there is evidence for men spinning. It was not an *exclusively* female activity, or identity. The fact that contemporary badges, illustrations and literature depict men spinning intimates that it did occur. Additional evidence is found in contemporary records. In a Somerset roll for 1358–60, of 466 workers brought before the Justice of Labourers, there were five categories of occupation that included the role of spinner, for example, ‘common labourer and spinner’ or, ‘brewer and spinner’. Out of the 179 people who were classed in these ‘spinner’ categories, 107 were men, and 72 were women.¹²³ Laws in Bristol similarly point to men spinning, but also women weaving; weavers in the city were not to receive yarn from any other person than their husbands or wives in 1355.¹²⁴

The sharing of labour between women and men may have resulted from a depleted workforce in the years after the Black Death, but in 1608 men were listed as yarnmakers and woolwinders, and the gender divide continued to be blurred.¹²⁵ Both sexes were spinners, with spinning constituting part, or all, of their labour. We cannot assume that when spinning is referred to women always carried it out. And likewise, the high-/late-medieval spindle whorls found in archaeology cannot automatically be assigned to feminine contexts. Archaeological finds of spindle whorls are often referred to as items that evidence women’s work, female activity or simply evince ‘the presence of women’.¹²⁶ Rather, the work of spinners was fundamental to the economy, within the household and nationally, and would have been carried out by males and females. As females make up half the population, it is reductionist to use a spindle whorl to identify the ‘presence’ of a woman at an archaeological location.

DISCUSSION

Recognising trends in the intensity of spinning at sites over time is difficult. On the High Street excavations in Perth, it was not possible to identify whether spinning at the rigs, ‘was associated with the professional cloth industry in the burgh, or was purely for domestic purposes’.¹²⁷ Meanwhile, MacGregor, in his discussion of the bone textile tools from the same excavation, does suggest that the involvement in textile production was in fact, ‘more than necessary to fulfill domestic needs’, implying that the craft working was producing surplus for trading.¹²⁸ The raw wool in urban centres would have been procured from middlemen but could also have come from small flocks that were kept in urban settlements, for which there are faunal remains and other archaeological evidence.¹²⁹

Identifying the scale of fibre processing and spinning is problematic for all sites; we need to consider the long time periods over which these sites were occupied, the intensity of occupation, and the extent of the excavations. As Keene argues, the fluid nature of occupation from a high turnover rate of urban housing dwellers, and excavation of individual tenements of urban centres, means that these items may not necessarily represent the trends of activities in the parish or suburb as a whole.¹³⁰ Subsequently, chronological changes and scale of production can only be recognised with sufficient quantities of finds from a large area that have been identified and dated. This then requires a consolidation of data and varied sources of evidence,¹³¹ and unfortunately we still do not have sufficient data to do this in each and every settlement. The recycling of lead alloy whorls also hinders the interpretation of urban datasets. Similar problems with excavations at rural settlements

hamper full investigation into spinning, with clearance phases complicating the contexts of finds, the occupation of sites cut short by desertion, the spreading of waste mixed with manure on fields, and limited access to deposits at currently occupied villages. Small scale investigations, such as at High Worsall, make any meaningful interpretations about textile production in the settlements difficult to gauge. Spindle whorls are also often frustratingly listed as 'unstratified' in reports, may be indicating a problem with their recording during excavation, or if thought to be residual, they may be excluded from discussions.¹³²

Nevertheless, the evidence as a whole does show fibre preparation, spinning, weaving, and finishing taking place on both urban and rural sites. Multiple activities were evidently happening in the same areas, and perhaps in the same buildings. Carding or combing and spinning could have been carried out by the same person, and weaving of the yarn at the same site. Yarn could have been produced for home use and incomes could have been supplemented by piecemeal payments for spun yarn.

The social implications of the spindle whorls are both economic and religious. The chance finds significantly add to our understanding of an aspect of daily life fundamental to the economy. Fibre processing in Britain is usually obscured in historical documents, unlike the evidence for exports. While we know spinning had to have taken place for the wool and linen to be processed, the importance of the act and the material evidence for it are often lost in the archaeological literature. A more complete picture of the evidence is being created by the chance finds. Where once lead alloy spindle whorls were not accurately represented in the archaeological record, we now have a source of data thanks to the PAS and Canmore databases. This provides evidence for the production of whorls, and the wide variety of decorative designs that were available. It is now the wooden whorls, and spindles, that are extremely rare, and our evidence as a whole is still partial.

With over 2700 whorls from the PAS, we can now determine that those made of lead were more common than previously recognised through archaeological excavations. The absence of these types of whorls on urban excavations, such as York, might be attributed to the recycling of the lead objects. However, our spindle whorl evidence is now biased towards the metal whorls, as chance finds of stone, bone or ceramic are not found or collected to the same degree. The River Wear finds illustrate important collections of artefacts in our watercourses that are, as yet, little known.

Lead whorls were used in large numbers in key wool producing areas of the north-east and Lancashire, but they are noticeably scarce in the Cotswolds and far south-east. In Kent this scarcity is possibly the result of a tradition of using stone whorls. The metal detected finds and mould from Dunkeld show that the lead whorls may well have been manufactured at fairs and markets, where they were then sold. The chance find data can help in future studies to identify these sites, and sheepcotes too. In the south, some of the lead whorls may have originated in France and were imported, as Rhenish stoneware examples were in the post-medieval period. A range of decorative whorls was common, especially motifs of stars, lines and pellets. However, those ornamented with letters are much rarer. The date of the decorated lead whorls can be confirmed as the 13th–15th/early-16th century period, and they were being mass produced during this time. The spinning wheel did not replace the drop spindle and its whorl, and they continued to be fundamental to the success of the textile industry. The PAS is also adding to our meagre, physical evidence of spinning wheels.

Spindle whorls are an artefact type which speak to late medieval belief and devotional practice, and they can be discussed within a social commentary on past medieval

attitudes. A combination of archaeological evidence and artistic depictions of spinning reveals the dichotomy of women in the medieval mind, simultaneously pious but with a latent capacity for sin. Small whorls and spindles are often overlooked in pictorial evidence with attention generally given to grander iconographic narratives. Yet, spindle whorls were objects of daily life that were used extensively by people, and they had much wider importance than a prop in a liturgical scene. When they are discussed in the wider context of the textile processes and industry, we can appreciate the importance and value of the humble spindle whorl, both symbolically and economically.

By examining the evidence as a whole, we can question the accepted notion that only women spun yarn in the medieval period as a domestic chore. It appears that a distinction between spinning as an industrial process and domestic task is often sought in the archaeological literature,¹³³ but I would speculate that spinning cannot be classified as one or the other. During the period under consideration there is no evidence of the 'industrialisation' of spinning: the process does not necessarily move out of the household when the economic role of textiles is booming.¹³⁴ The portable nature of the spindle meant spinning could be carried out quite easily in any location. Wool would have been delivered by agents for spinning, or bought from wool broggers, if not from the spinners' own flocks. Piecemeal payments for yarn lengths were then paid or the yarn was sold at market, the payments forming main or supplementary incomes.¹³⁵ Whether within a house, *hafod*, *becarie*, or monastic precinct, spinning carried out by women and men was a skilled occupation and part of the larger textiles industry.

The ubiquitous spindle whorl was a tool which produced thread that became woven into the economic lifeblood of the textile trade, the final products being used in Britain and exported to the rest of Europe. But the whorls also had a sacred identity that created the thread of life and embodied the story of Christ. By studying the material remains of spinning empirically *and* with an interdisciplinary slant using archeological, historical and art historical evidence, it is hoped that this paper has contributed to a 'more meaningful medieval archaeology' as advocated by Gilchrist, which spans the rift between 'social/theoretical' and 'economic/scientific' approaches.¹³⁶

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ABBREVIATIONS

- MoL Museum of London
 MoLAS Museum of London Archaeology Service
 PAS Portable Antiquities Scheme
 RCAHMS Royal Commission on the Ancient and Historical Monuments of Scotland

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LIST OF FIGURE CAPTIONS

FIG 1

Examples of high-/late-medieval biconical lead alloy spindle whorls. a) Found in the parish of Great and Little Broughton (North Yorkshire). The whorl is cast with the radiating lines and pellet decoration on both sides. Diameter 25.48 mm, thickness 9.84 mm, perforation diameter 11.8 mm, weight 24.13 g. *Photograph E Cox 2014. © York Museums Trust, License: Attribution-ShareAlike License.*

b) Found in Burnhope parish (County Durham), with star and pellet, and radiating line decoration. Diameter 27.03 mm, thickness 8.96 mm, perforation diameter 10 mm, weight 27.2 g. *Photograph L Proctor 2013. © Durham County Council, License: Attribution-ShareAlike License.*

FIG 2

Distribution of all possible high-/late-medieval lead alloy spindle whorls recorded on the PAS and Canmore. *Map drawn by A Tompkins.*

FIG 3

Key locations referred to in the article.

1. Durham (County Durham), 2. Perth (Perthshire), 3. Northampton (Northamptonshire), 4. West Hartburn (County Durham), 5. Coldingham Priory (Berwickshire), 6. Meols (Cheshire), 7. Leicester (Leicestershire), 8. Thrislington (County Durham), 9. Wharram Percy (North Yorkshire), 10. High Worsall (North Yorkshire), 11. Oxford (Oxfordshire), 12. York (North Yorkshire), 13. Norwich (Norfolk), 14. London, and 15. Winchester (Hampshire). *Map drawn by ER Standley.*

FIG 4

Terce: Annunciation to the Shepherds from *The Hours of Henry VIII*, illuminated by Jean Poyer, c 1500. © *Photographic credit: The Pierpont Morgan Library, New York. Hours of Henry VIII, MS H.8 fol 56v.*

FIG 5

Distribution of the decorated lead alloy spindle whorls recorded on PAS and Canmore. *Map drawn by A Tompkins.*

FIG 6

Spindle whorl mould made of sandstone with typical line and pellet motif, found in Dunkeld (Perthshire). Dimensions: length x width x height 73.1 x 54.4 x 25.8 mm; dimensions of a cast whorl: diameter 30 mm, perforation diameter 9.7 mm. © *Perth Museum and Art Gallery, Perth & Kinross Council. Licensor www.scran.ac.uk*

FIG 7

a) Lead alloy whorl decorated with six equidistant lozenges, interspersed with ridges found in South Cambridgeshire. Diameter 23.6 mm, thickness 15.6 mm, perforation diameter 8.6

mm, weight 31.5g. *Photograph J Watters 2011. © St. Albans District Council, License: Attribution-ShareAlike License.*

b) Half of a lead alloy spindle whorl, miscast, found in the Fulford area of York. The PAS record suggests the mould broke during casting. However, if it were made in a one-piece mould, such as in Figure 6, it is more likely that too much lead was poured in or that it was knocked, spilling the metal. Diameter 26.8 mm, thickness 10.9 mm, perforation diameter 10.8 mm, weight 25.98 g. *Photograph K Leahy 2012. © The Portable Antiquities Scheme, License: Attribution-ShareAlike License.*

FIG 8

A lead papal bulla of Pope Innocent VI, reused as a spindle whorl. Found in Worfield area (Shropshire). Length 34.4 mm, width 36.8 mm, thickness 5 mm, perforation diameter 11 mm, weight 33.15 g. *Photograph P Reavill 2008a. © Birmingham City Council, License: Attribution-ShareAlike License.*

FIG 9

Lead alloy whorl found in the parish of Dodford with Grafton (Worcestershire). It is decorated with the familiar star and radiating line motif, and the groove around the circumference suggests its use as a drive whorl on a spinning wheel. Diameter 22.15 mm, thickness 13.28 mm, perforation diameter 9.19 mm, weight 33.7 g. *Photograph A Bolton 2013. © Birmingham Museum and Art Gallery, License: Attribution-ShareAlike License.*

FIG 10

Elaborately cast, biconical lead alloy spindle whorl from the Great Mitton area of Lancashire. The lettering reads HYC MAD DAWBE, on the other side is a six-pointed star, with hatched points interspersed with annulets. Diameter 29.5 mm, thickness 8 mm, perforation diameter 10 mm, weight 22.81 g. *Photograph D Boughton 2012. © The Portable Antiquities Scheme, License: Attribution-ShareAlike License.*

FIG 11

The Spinning Room by Barthel Beham (1502–1540), c 1520s. WA1863.3188 © Ashmolean Museum, University of Oxford.

FIG 12

A cast lead-tin alloy badge depicting a vulva sitting on a stool, holding a distaff and spindle, and wearing a phallic crown. On the reverse a pin survives for attachment. The badge was found in Schoonaarde (Belgium) and is thought to date to the second half of the 14th century. 29 x 25 mm. *Photograph 'Vulva met falluskroon, op krukje en met spinrokken' (Vulva with phallus crown, on stool with distaff). AV.1956.035.0351 Museum Vleeshuis / Klank van de Stad Gebruiksvoorwerp, Bart Huysmans + Michel Wuyts.*

TABLE CAPTIONS

TAB 1

The costs and number of days work required to produce six woollens of Majorcan wool in an Italian workshop, 1396–1398. After Munro 2012, 114–15.

TAB 2

Spindle whorl and other textile manufacturing evidence from a selection of urban excavations in Britain.

TAB 3

Decorated lead alloy spindle whorls from datable contexts in Britain.

NOTES

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- ¹ School of Archaeology, University of Oxford, 36 Beaumont Street, Oxford, OX1 2PG, <eleanor.standley@arch.ox.ac.uk>
- ² Nicholson 2015; Meaney 1981; Walton Rogers 1997; 2007; Henry 1999.
- ³ PAS database available at <<https://finds.org.uk/database>>; Canmore database available at <<https://canmore.org.uk>>
- ⁴ Gilchrist 2009, 399–401.
- ⁵ Rigby 2006, 24; Childs 2006, 270.
- ⁶ Graves and Heslop 2013, 99, 119.
- ⁷ Munro 2012, 50, 51, n 10.
- ⁸ Ibid, 106.
- ⁹ Campbell 2006, 187.
- ¹⁰ Walton 1991, 251.
- ¹¹ Campbell 2006, 222.
- ¹² Walton 1991, 342.
- ¹³ Campbell 2006, 221.
- ¹⁴ Ibid.
- ¹⁵ Dyer 2000, 172–3.
- ¹⁶ Ibid; Penn 1987, 6.
- ¹⁷ Chance et al 1979, tab 11.
- ¹⁸ Bolton 1980, 157.
- ¹⁹ Walton Rogers 2002; Keene 1990.
- ²⁰ Bridbury 1982, 31–2; Walton 1991, 351.
- ²¹ Munro 2008, 115–6.
- ²² Muldrew 2012.
- ²³ Wilson 1846.
- ²⁴ Allen 1979.
- ²⁵ Tyrell and Zeepvat 1992.
- ²⁶ Mynard and Zeepvat 1992, 76–8, fig 27.
- ²⁷ Gerrard with Aston 2007, 782, 785, S4 and S12.
- ²⁸ Thorn 2008, 5, 19.
- ²⁹ Dunning 2004.
- ³⁰ Gilchrist 2008, tab 2.
- ³¹ Egan 1997, tab 14.
- ³² Coppack 1986.
- ³³ Donkin 1963; Moorhouse 1989.
- ³⁴ Henig 1976, 218, nos 46 and 47.
- ³⁵ Keily with Egan 2004, 151; Clay 1981, 140, no 71, fig 51.

-
- ³⁶ Nicholson 1997a, tab 10.18.
- ³⁷ An unfinished whorl was found in a Period V (c1250x1300–1600) grave. Hill 1997, 61; Nicholson 1997b.
- ³⁸ Williams 1997, fig 64 nos 42 and 43, fig 67 no 17, fig 76 no 2.
- ³⁹ Margeson and Williams 1985, fig 37 no 1.
- ⁴⁰ Mayes and Butler 1983.
- ⁴¹ Austin 2007.
- ⁴² Ryder and Gabra-Sanders 1992.
- ⁴³ Nutz and Ottino 2013.
- ⁴⁴ Ibid, 55.
- ⁴⁵ Øye 1988, 45–8; Cardon 1999, 225, fig 83.
- ⁴⁶ Nicholson 1997a, tab 10.18. Of the total 63 dating from c 1000–1600, 9 were lead and 5 were bone, the remainder were made of stone.
- ⁴⁷ Øye 1988, tab II.2.
- ⁴⁸ Daniels 2009, 88–90, fig 19.7.
- ⁴⁹ Still and Pallister 1964, 197.
- ⁵⁰ Goodall 1989, 137 no 1; 1979, no 3; King 1994, 127; Richards 2011, no 160.
- ⁵¹ British Museum 1964.
- ⁵² This continued error is especially prevalent in the PAS records.
- ⁵³ Homer 1991, 64.
- ⁵⁴ For example Henry 1999, 72.
- ⁵⁵ Walton Rogers 1997, 1743–5.
- ⁵⁶ Verhecken 2010.
- ⁵⁷ Kania 2015. See also Nicholson 2015. In Nicholson’s experiments based on 8th century ceramic whorls from Ribe (Denmark) and wool thread, it was suggested that the amount of twist remained the same for a given diameter of whorl, regardless of weight. But that the whorl design did affect the quality of thread produced. However, all Nicholson’s experiments were carried out by one spinner (the author), using one type of wool, meaning that other spinners may have produced different yarns based on their level of skill and competence, regardless of spindle design.
- ⁵⁸ Canmore online database available at <<http://canmore.rcahms.gov.uk>>; Mark Hall pers comm 2015.
- ⁵⁹ See Robbins 2014 for discussion of these areas and their effect on PAS data.
- ⁶⁰ Ibid, fig 6.
- ⁶¹ Homer 1991, 65.
- ⁶² Aston 2000, 141–2.
- ⁶³ Jamroziak 2003.
- ⁶⁴ See Walton 1991, tab 181.
- ⁶⁵ Dyer 1995.
- ⁶⁶ Ibid, 154.
- ⁶⁷ Kunsthistorisches Museum, Vienna, Inv. No. GG_1025.
- ⁶⁸ Standley 2013.
- ⁶⁹ Hall 2001, 76; 2003, 48–9.
- ⁷⁰ Walton Rogers 1997, 1736–43.
- ⁷¹ Gary Bankhead pers comm 2014; McCormack 2011

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- ⁷² Morris 2007, nos 3288–9; Egan 2007, nos 2175–2201, 2293; Ottaway with Griffiths 2007, nos 2749, 2754–72.
- ⁷³ Griffiths and Philpott 2007, 436; Egan 2007, 76; Laughton 2007, 414.
- ⁷⁴ Egan 2007, 76, 173–4.
- ⁷⁵ Coulthard 2012.
- ⁷⁶ Hurst and Moorhouse 1981.
- ⁷⁷ Cf Egan 1998, 256.
- ⁷⁸ Hall 2003, 48; Perth Museum and Art Gallery accession no 119.
- ⁷⁹ Mark Hall pers comm 2015.
- ⁸⁰ Musée Gallo-Romain de Fourvière MOU-9005.
- ⁸¹ Metal-detecting in France with the aim of looking for archaeological material is forbidden, therefore detectorists' finds are not generally recorded, and there is no systematic recording allowing full analysis or interpretation of the finds.
- ⁸² Downes 2011a; 2011b.
- ⁸³ For example Cox 2013; Blevins 2011; Reavill 2008b.
- ⁸⁴ Gibson 1990; Jones and Stallybrass 2000, 116–7.
- ⁸⁵ Staatliche Museum, Gemäldgalerie, Berlin.
- ⁸⁶ Magyar Nemzeti Galéria Inv no 52.656.
- ⁸⁷ Boda et al 2014, 30–1.
- ⁸⁸ Forsyth 1995; Long 1975, 22; Scandinavian Runic-text Database <<http://www.nordiska.uu.se/forsk/samnord.htm>>.
- ⁸⁹ Daubney 2010.
- ⁹⁰ Burrill 2010.
- ⁹¹ Gilmore 2014; Daubney 2008; 2012.
- ⁹² Blake et al 2003, 176; Standley 2013.
- ⁹³ Standley 2013, 84.
- ⁹⁴ Found in the Chester area (Cheshire), Oakden 2009.
- ⁹⁵ Blake et al 2003, 182.
- ⁹⁶ Rohde 2007.
- ⁹⁷ Jones and Stallybrass 2000, 117.
- ⁹⁸ Gilchrist 2008, 133.
- ⁹⁹ Stronach 2005.
- ¹⁰⁰ Spencer 1983, 81–3. Mary is known as 'Star of the Sea' from the translation of her name *Stella Maris*. Stars also feature in later medieval depictions of the Annunciation, Christ's Nativity, Adoration of the Magi, and the enthroned Virgin and Child, for example, a 15th-century pilgrim badge from the shrine of Our Lady, Walsingham, and a mid- to late 14th-century badge from Cologne, both in the MoL (inv nos 83.608 and 94.102). See also Spencer 1990, 39–40, and Spencer 1998 174–5 for discussion of star pilgrim badges or amulets related to Christ.
- ¹⁰¹ 348 as of 31st October 2014.
- ¹⁰² Gilchrist, 2008, 130–1.
- ¹⁰³ Downes 2009.
- ¹⁰⁴ Hall 2002, 92; 2003, fig 4.
- ¹⁰⁵ Walton Rogers 1997, 1745.
- ¹⁰⁶ Mindykowski et al 2010, 65.
- ¹⁰⁷ Gilmore 2012; Boughton 2012.

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- ¹⁰⁸ Boughton 2012.
- ¹⁰⁹ Laura Burnett, Mary Sireut and Naomi Payne pers comm cited in Boughton 2012; see Sayers 2008 for terminology.
- ¹¹⁰ Haines 1930, 117.
- ¹¹¹ Tymms 1854, 56, fn.
- ¹¹² Spinning has also been associated with evil witches, spells and magic, see Jones and Stallybrass 2000, 128.
- ¹¹³ Staatsbibliothek, Berlin, MS germ qu 718, fol 65v.
- ¹¹⁴ See Stewart 2003 for a discussion of this image, and the religious and cultural context in Nuremberg at the time of its creation.
- ¹¹⁵ Cf Jones 2002 interpretation of vulva badges as good luck charms.
- ¹¹⁶ Kunera database nos 00540 and 16947 <<http://www.kunera.nl>>.
- ¹¹⁷ Jones 1993, 103.
- ¹¹⁸ St Fiacre of Breuil, an Irish saint who settled in Breuil (France); his relics were enshrined by Bishop Faro in Meaux Cathedral. 31 badges on the Kunera database depict Houpdée. <<http://www.kunera.nl>>
- ¹¹⁹ Kunera database no 17071 <<http://www.kunera.nl>>. The vulva figure is now damaged and it is not clear whether she originally held something too.
- ¹²⁰ Kunera database no 00670 <<http://www.kunera.nl>>.
- ¹²¹ For example in St Boltoph's, Boston (Lincolnshire), Westminster Abbey (London), Barcelona and Toledo cathedrals (Spain).
- ¹²² Add MS 42 130 fol 60r.
- ¹²³ Penn 1987, tab 1.
- ¹²⁴ Perry 1945, 68.
- ¹²⁵ Ibid, 119.
- ¹²⁶ Steane 1985, 38.
- ¹²⁷ Bennett et al 2012, 9.
- ¹²⁸ MacGregor 2011, 104.
- ¹²⁹ Robinson 1980, 204–5; Albarella 2007.
- ¹³⁰ Keene 1990, 213.
- ¹³¹ Ibid 1990, 214.
- ¹³² For example Walton Rogers 1997, tab 146; Oakley and Hall 1979, tabs 28–9; Cool 2011, 309.
- ¹³³ As noted in the reports for Perth and Winchester. Bennett et al 2012, 9; MacGregor 2011, 104; Keene 1990, 213.
- ¹³⁴ Muldrew 2012 has also shown the importance of spinners in the period 1550–1770 and that spinning was a profitable occupation carried out in the household during this time.
- ¹³⁵ Styles 2013, note 31; Muldrew 2012. Many of the processes of textile production would have taken place in different locations, as seen in the case against John Stoby of Cirencester who failed to pay ulnage (the duty charged on cloth exposed for sale) on thirty-six 'Bristol reds' in 1459. The 'Bristol reds' were woven and dyed in Cirencester and then delivered by packhorses to six fullers in Stroud, eight miles away. At the fullers the cloth was watered, washed, fulled, teased and sheared, then returned to Stoby in Cirencester for transport to markets, see Childs 2006, 270–1.
- ¹³⁶ Gilchrist 2009, 399–400.