The Sturtons of South Petherton: bronze vessel founders of the 17th and early 18th century in Somerset: Excavations at Lightgate Road, South Petherton in 2004

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THE STURTONS OF SOUTH PETHERTON; BRONZE VESSEL FOUNDERS OF THE 17TH AND EARLY 18TH CENTURY IN SOMERSET: EXCAVATIONS AT LIGHTGATE ROAD, SOUTH PETHERTON IN 2004

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with contributions by Eleanor Blakelock, R. A. Croft, Nick Griffiths, J. M. Mills
and S. C. Minnitt and illustrations of the bronze vessels and mould material by Nick Griffiths

INTRODUCTION

Cast leaded-bronze vessels and their makers

Cast bronze cooking vessels were an everyday item of equipment in most households in the later medieval and early modern periods (Brears 2008, 217-23) and many survive in private and museum collections to this day. Among these vessels there is a basic division between *cauldrons* which tend to be of broadly globular form, with an everted rim and two projecting angular handles (Figs 1 and 2), which generally stood in or hung above a fire, and *skillets*, which were open-formed vessels with relatively straight sides and flat bottoms, and with a long strip handle (Figs 3 and 4), which could be lifted and moved in and out of the fire according to need (in a not-dissimilar way to the modern saucepan). Both types of vessel possessed three tripod legs, often with ribbed ornament; sometimes (towards the end of the period) with plainer tapering legs. Cauldrons could be called simply 'pots'; large versions, which were rarely, if ever, moved, were sometimes called 'standards' (Brears 2008, 153), but this is a term generally applied to any sort of fixture, immoveable item, or landlord's or heirloom fittings, rather than relating specifically to such large vessels (Blaylock 2015, 304, n. 16). The skillet seems to have developed in the course of the 16th century; prior to that its function was fulfilled by small cauldron-form vessels with strip handles that are called variously skillets and posnets in the literature on this subject (Eveleigh 1994, 7; Brears 2008, 219-21). These appear not to have lasted in production much later than the early 17th century (Butler and Green 2003, 16). Cauldrons and skillets, however, continued in use wherever down-hearth cooking prevailed, only giving way to other types of vessels in the face of changes in methods of food preparation and of the growing availability of cast-iron vessels in the 18th and 19th centuries (Eveleigh 1986, 15-17). Even then skillets continued to be produced by a number of Somerset foundries until well into the mid-19th century, with the centres of production at Bridgwater, Taunton and Bristol.

The surviving vessels of this type give a great deal of information about their makers. Names cast into the handles of skillets, sometimes with a date, identify individual founders, and initials and foundry marks on a variety of vessels has made it possible to recognise families of founders operating over considerable periods. Where these families have been recognised in parish and other documentary records a location for individual foundries can also be established. Thus, in South West England, South Somerset has been identified as a major centre of production of lead-bronze cooking vessels in the 17th and early 18th century, principally cauldrons and skillets, with the Fathers at Montacute and the Sturtons at South Petherton (Butler and Butler 1994; Butler and Green 2003). Casting of vessels was the main trade of braziers and potters (whose product was still often metal not ceramic at this period, especially in towns: Salzman 1923, 143-45, 171; le Patourel 1968, 101-3). John Fathers at Montacute was described as a 'brazier and potfounder' in 1659 (Dunning 1974, 218). In Exeter, however, and probably more generally elsewhere, it seems to have been the 'bread-and-butter' trade of successive generations of bell founders (Blaylock 2000), although the Sturton family seem only to have been sporadic and unaccomplished bell founders (below).

A considerable amount of archaeological information on copper-alloy casting in all its forms has accumulated as a result of the partial excavation of three sites of foundries in Exeter spanning the 13th-16th centuries, the 16th-17th centuries (c. 1525-1624), and the 17th-18th centuries (1625-1721),

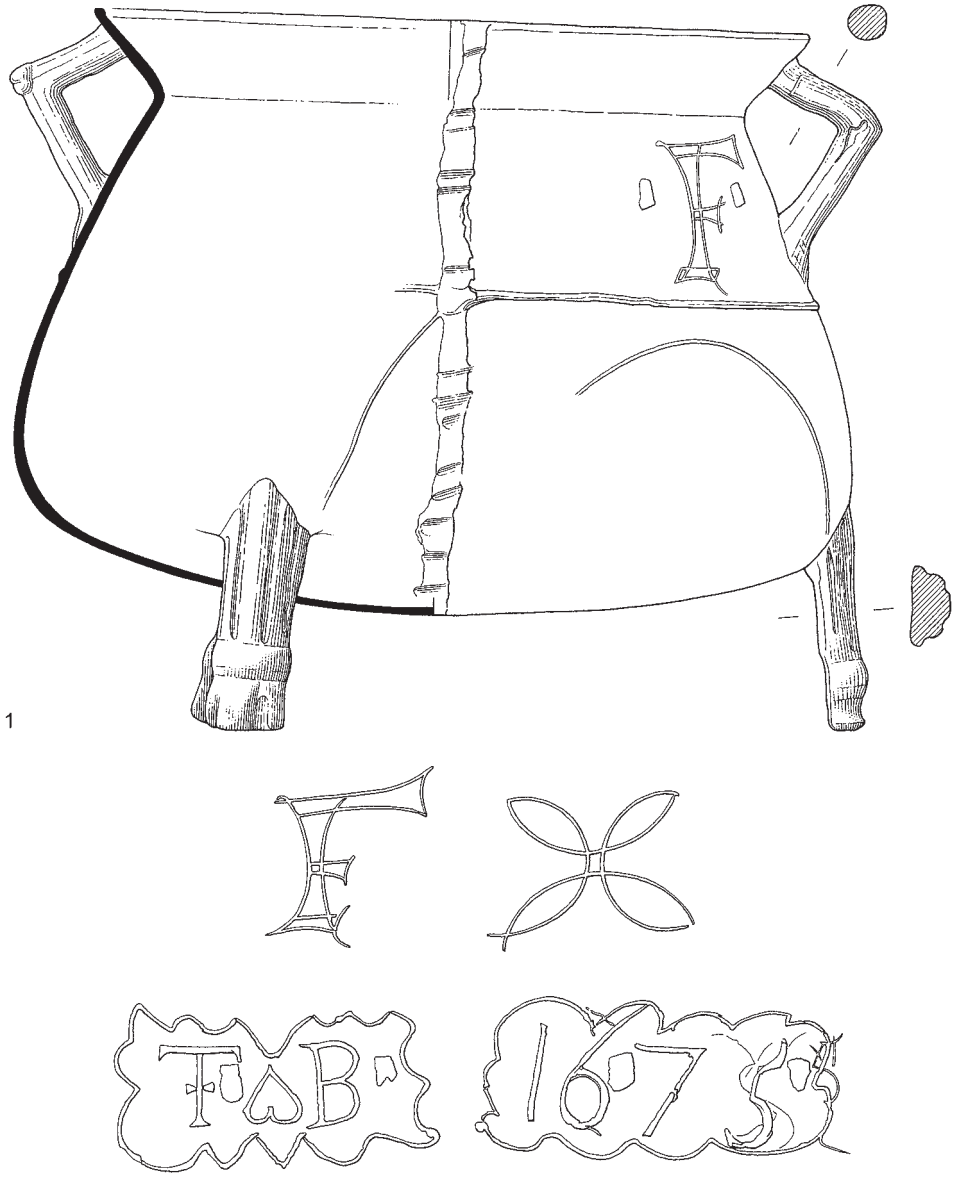

Fig. 1 A large cauldron by Francis Sturton I (1640-98), with scratch marks of the quatrefoil foundry mark and his initial. The initials T and B and the date 1675 probably mark a wedding. Scale 1:4. Museum of Somerset/Butler collection 2004/106.

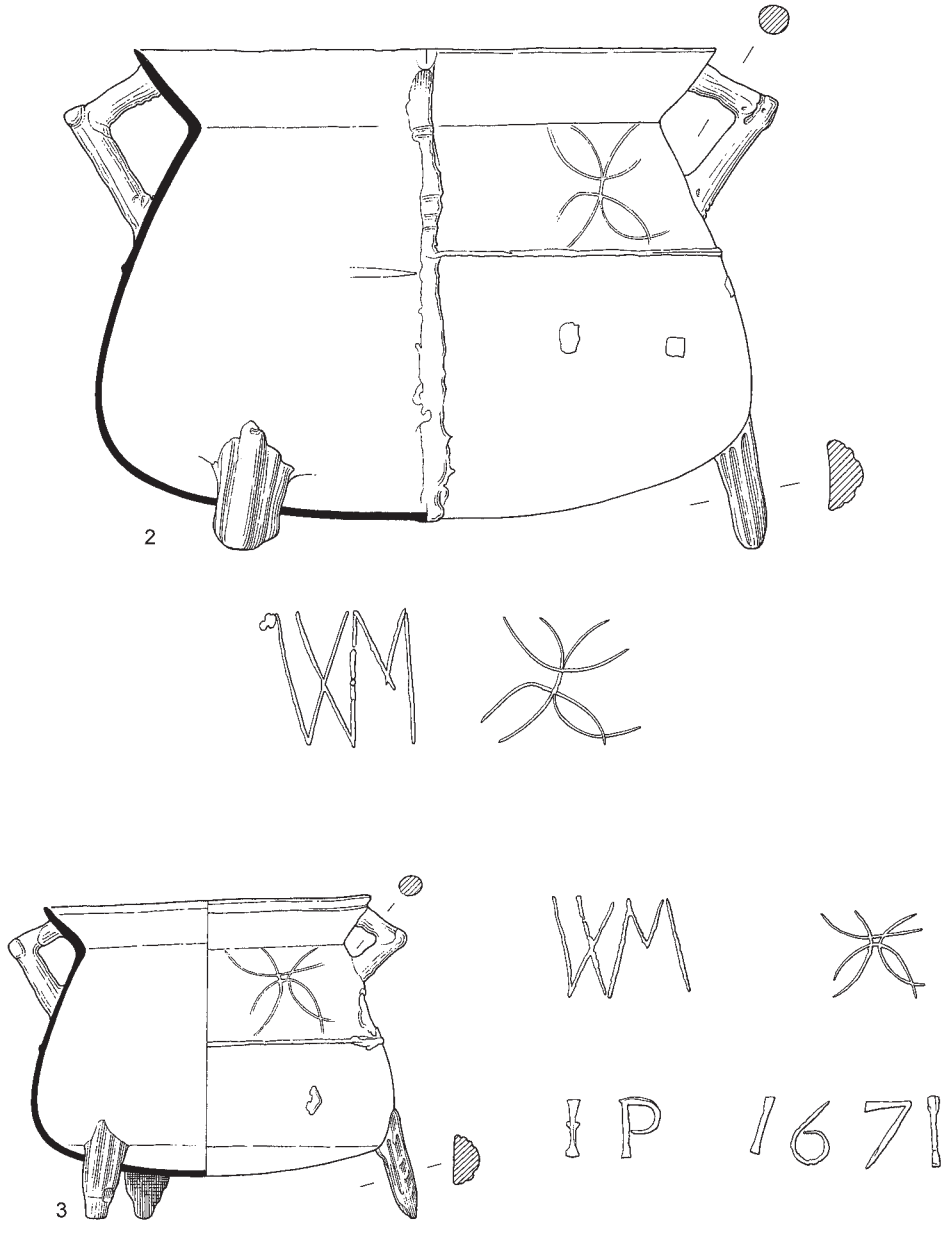

Fig. 2 Medium and small cauldrons, both by William Sturton II (born 1636), with scratch marks of the quatrefoil foundry mark and his initial, a conjoined WM. The smaller vessel is dated 1671, with the initials IP. Scale 1:4. No. 2: Museum of Somerset/Butler collection 2004/114; no. 3: acquired from Mr W. Trood, 1867, 13.1)

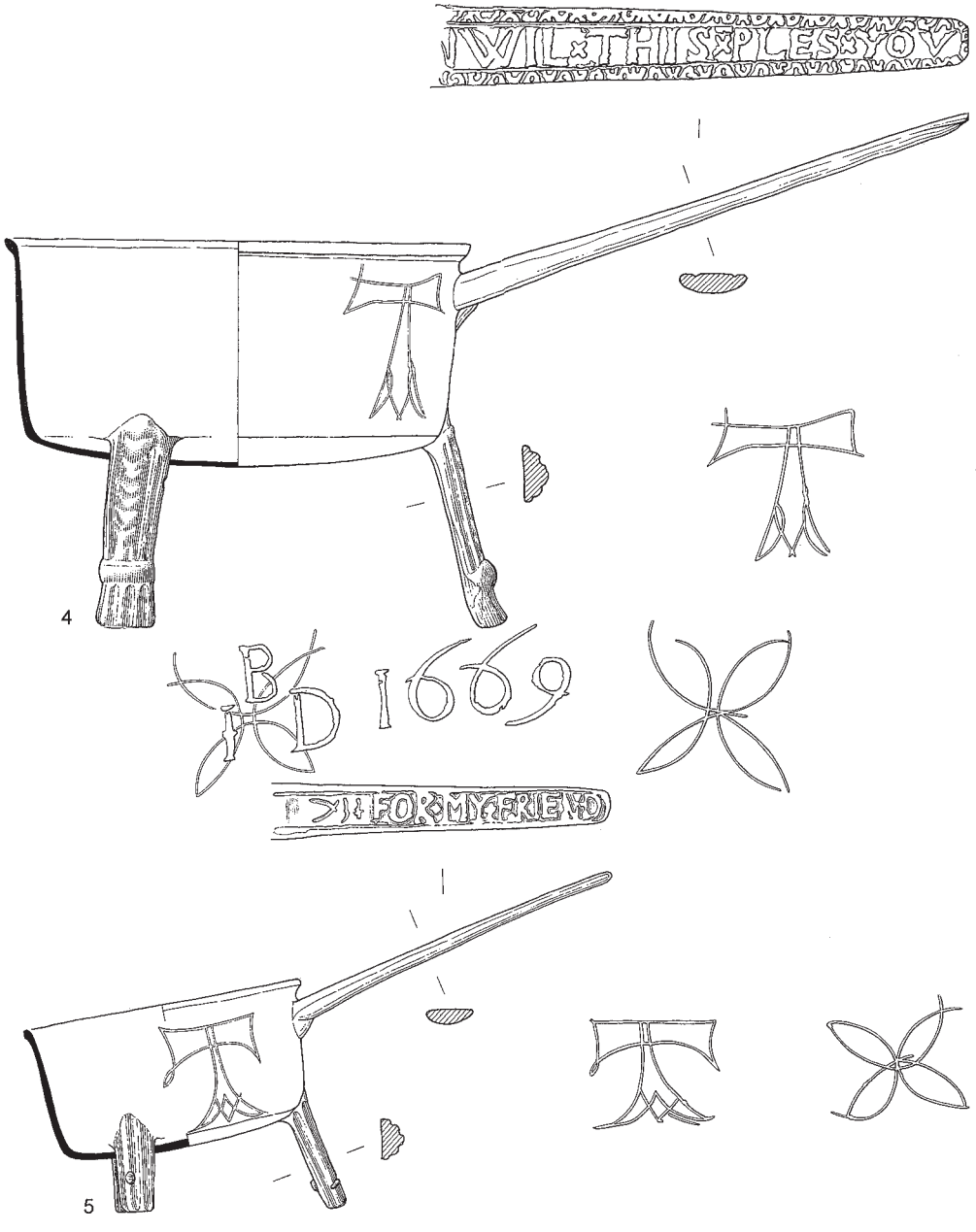

Fig. 3 Large and small skillets by Thomas Sturton II (1629-83), both with the scratch mark of the quatrefoil foundry mark and his initial. The large one is dated 1669, with the initials IBD, probably marking a wedding. Both have mottoes on the handles, produced by using a stamp on the handle-mould; 'WIL THIS PLES YOU' and 'FOR MY FRIEND', respectively. These are two of the four mottoes known to have been used by the foundry. Scale 1:4. No. 4: Museum of Somerset 2006/43 (this vessel was acquired from a resident of South Petherton and it is possible that it had been in the village since it was cast. Unfortunately, there is a gap in the parish records from 1668 to 1676, so a marriage between two people with these initials cannot be established to confirm the theory that these initials and dates on a number of vessels record such events); no. 5: Museum of Somerset/Butler collection 2004/99.

respectively (Blaylock 1996, 72 ff.). These were all operated by bellfounders, and though bells formed the most prestigious output, a major part of the mould recovered was from cast vessels which are likely to have formed the bulk of the products at any given date. More is probably known of this important medieval and post-medieval industry in Exeter and its vicinity than anywhere else in the country, certainly from an archaeological point of view (Blaylock 1996; 2000). Most recently a cauldron foundry probably of the 16th-17th century has been excavated in Crediton, Devon, in 2007 (Allan *et al.* 2010, 144-5, 184-5, and figs 23-27). Comparable sites or groups of material have been excavated at York, Winchester, and Worcester, with smaller groups from Romsey, Salisbury, Chichester, Bristol, Taunton, Hereford, Chester and elsewhere (see Blaylock 2000, 84 and Dungworth and Nicholas 2004, 32 for further discussion and listing of English sites). In North West Europe there are important studies of material from excavated foundries in Odense in Denmark and Uppsala in Sweden (Vellev 1998; Anund *et al.* 1992) and an equally important general study of medieval cauldrons in the Netherlands by Hans Drescher (1968).

Rarely, however, can the archaeological evidence for the casting of these vessels in the form of mould debris be tied directly to either the surviving vessels or the documents. One such instance is the 16th and early 17th-century foundry at Cowick Street in Exeter; this was the foundry of the Birdall family, identified in

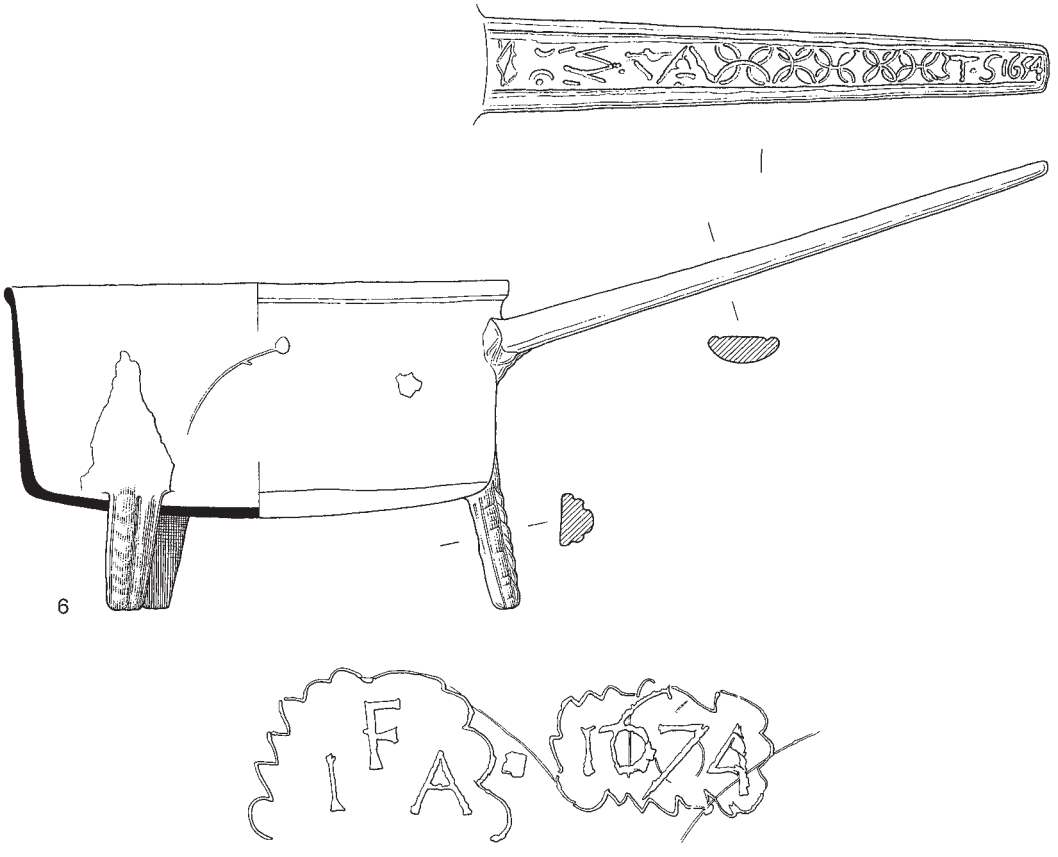

Fig. 4 A large skillet by Thomas Sturton II (1629-83) with his characteristic initial T (not illustrated, but see Fig. 3). The commemorative inscription on the body of the vessel, 'IFA 1674', gives a date for the casting, which is significantly later than the date on the handle, 'T.S.1654'. This seems to show that the carved stamps for the handle moulds remained in use for a considerable period of time. This stamp may indeed have first been used by Thomas Sturton I (died 1661), remaining in the foundry to be used by his son. The handle stamp incorporates the foundry's quatrefoil symbol as a major element of the pattern. Scale 1:4. Museum of Somerset/Butler collection, 2004/92.

both parish records and by initials on bells, and from skillet handle moulds recovered from the excavations, inscribed with the name [Joh]n Birdall (Blaylock 2000, 5-8 and plate 16). The foundry site in South Petherton is another example of this correlation between the three types of evidence and provides important comparative information for this industry in the county in the 17th and possibly early 18th centuries, joining a small group of sites that have produced vessel-casting material nationally and in a broader European context (above).

The Sturton family of founders

In the early 1990s, a study of skillets in museums across England and Wales (Eveleigh 1994) recorded the names of John Fathers and Thomas Sturton cast into the handles of this type of vessel dating to the 17th century. Although the connection between the Fathers family and Montacute in South Somerset (Fig. 5) has been known for some time (Dunning 1974, 218; Eveleigh 1994, 13), with a foundry operating in the late 17th and early 18th centuries, the location of a Sturton foundry was as yet unknown. Thomas Sturton had been listed as an 'unidentified founder' by Eveleigh (1994, 14-15, table 1) and establishing a link between the Sturtons and South Petherton is the result of research by Roderick and Valentine Butler (Butler and Butler 1994; Butler and Green 2003). Study of the surviving vessels in both museum and private collections showed that the Sturton foundry had clearly been a major producer of a wide variety of vessels from 1630 to 1712. Similarities between these vessels and those of the Fathers foundry led to a careful search for the Sturtons in the parish records of the villages around Montacute, a search which found them four miles to the west in the village of South Petherton in the period spanned by the vessels. The evidence of the vessels and the documents has been fully presented by Roderick Butler and Christopher Green in their book *English Bronze Cooking Vessels and their Founders, 1350-1830* (2003). Though the documentary evidence for the Sturtons nowhere specifically describes any members of the large family as 'braziers and pot founders' (the appellation given to John Fathers in 1659), the correspondence between the chronology and names of the recorded family and the founders marks, names, initials and dates on the surviving vessels, made the identification of the Sturtons as major founders in South Petherton conclusive, even before the archaeological discovery of the foundry site itself.

The Sturtons are also known to have cast bells, with one dated 1678 by Thomas Sturton in Cudworth church, about five miles south-west of South Petherton and another in Thorne Coffin church, east of Montacute (Butler and Green 2003, 98; Green and Butler 2005, 20; Massey 2011, 296, 665). A third bell, marked WS 1611, is in St Michael's church, Seavington (Dunning 1978, 210) about two miles south-west of South Petherton, though there is no evidence beyond the initials that this was a Sturton bell and the date is earlier than any other known Sturton casting. This bell is attributed to Robert Wiseman of Montacute in George Massey's survey of Somerset bells (Massey 2011, 599). In contrast to their production of vessels, which was extensive and apparently durable (as the surviving vessels show), the Sturtons were not great or prolific bellfounders, at least when compared to the main West Country bellfounding dynasties of the period such as the Penningtons (of Exeter and east Cornwall) or the Purdues (of south Somerset).

The evidence of the vessels

A large number of Sturton vessels survive and an important group is now housed in the Museum of Somerset in Taunton. Five of these, being typical of the range of cauldrons and skillets produced by the foundry have been illustrated in Figs 1-4. The vessels provide a wide range of evidence of their founders. Vessel bodies have initials, symbols and dates cast into them, produced by incising the inside of the cope mould prior to casting. The symbols appear to have been foundry marks specific to a family, often associated with the initial of the individual founder (Green 2015, 315-6 and fig. 12.5). On some vessels, groups of initials and a date appear to represent and record the owners of a vessel and/or the date of a marriage. Such vessels must have been commissioned. The founder's full name, sometimes with a date, is found cast into skillet handles, using a stamp to impress the handle mould, though mottoes or patterns along the handle are more common.

The handles of three surviving skillets bear the name of Thomas Sturton, in one case with a date of 1652 (Eveleigh 1994, fig.7; Butler and Green 2003, 103; Green and Butler 2005, 19). Each vessel also had a distinctive quatrefoil symbol or 'four-arc mark' on their bodies, evidently the foundry mark, as well as the initial T for Thomas. The identification of this quatrefoil as the foundry mark of the Sturtons allowed a significant number of other surviving vessels, mainly cauldrons and skillets but also mortars, measures and preserving pans, to be recognised as products of the Sturton foundry (Butler and Green 2003, cat. nos 82-119). The foundry mark on these was generally accompanied by a single ornate letter; two forms of T, two forms of F, a W, a conjoined WM and two forms of J (I) have been recorded. T stands for Thomas and the documentary evidence identifies the others as Francis, William and John, with in each case a father and son sharing the same name, explaining the observed differences in the letters. The dates on Sturton vessels range from 1630 to 1712 indicating more than a single generation of founders, a conclusion supported by the variation in the letter forms, and confirmed by the documents.

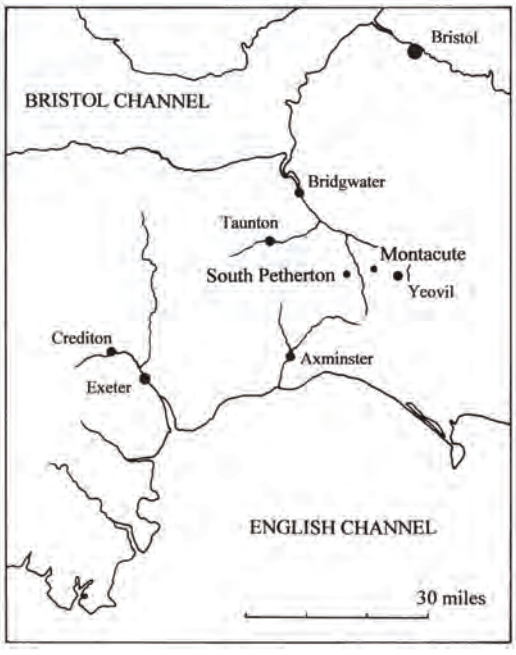

Fig. 5 Location of places mentioned in the text

The evidence of the documents

'Research in the parish records …… uncovered a family of Sturtons living in South Petherton only four miles from Montacute. Several generations could be traced and they were, like the Fathers in Montacute, people of substance in the local community, owning property and serving as Churchwardens and Overseers of the Poor.' (Green and Butler 2005, 19).

The research suggested that the four given names evident from the initials on the vessels, Thomas, Francis, William and John, belonged to eight men, being four pairs of father and son (listed below as Thomas I, Thomas II etc. after Butler and Green 2003) spanning three, and possibly four generations. The family may have come from Glastonbury in the early years of the 17th century but the first known founders in South Petherton were Thomas I and William I, who appear to have been brothers. Thomas I, who died in 1661, was the father of Thomas II, born 1629 and died 1683. By a later marriage, Thomas I also fathered Francis I, born in 1640 died 1698, who was the father of Francis II, born in 1672. Less is known of William I, though his son, William II was born in 1636. These three generations, the brothers Thomas I and William I, the half brothers Thomas II and Francis I with their cousin William II, and the third generation Francis II, spanned the 17th century into the 18th. A single cauldron marked with a 'P', possibly standing for Phillipa, the wife of Thomas Sturton I (m. 1642), was acquired by the Museum of Somerset in March 2020 (accession no. TTNCM: 119/2021; Bearnes 2020, 114 [lot 459]).

Two John Sturtons also appear in the parish records, though their relationship with the rest of the family is unknown. John I evidently lived in a house previously owned by Thomas II (Butler and Green 2003, 99) and may have been his son, and therefore part of the third generation with Francis II. He was working in the early 18th century (skillet dated 1712), and John II, married in 1708, was probably his son and the fourth generation of the family. John Sturton was paid for bell brasses in 1719 and again in 1728, but this is the latest evidence of the Sturtons as founders. Sturtons were resident in the village until at least 1749 and the marriage of (a third or fourth?) John Sturton was recorded in 1765.

Through the evidence of the vessels and the documents, the Sturton family of pot founders was clearly resident in South Petherton during the 17th and early 18th centuries. The records show them at a number of locations widely spaced in the village, at White Street, Roundwell, North Street, St James Street and South Street (Fig. 6), but none can be identified as the location of the foundry. After 1765 the name vanishes from the parish records, but occurs again as 'Sterton's Orchard', being plot 88 on the tithe map of 1840 (Somerset Record Office, D/D/rt 291-South Petherton). On the north-east edge of the village, this was indeed the land upon which the archaeological remains of a foundry were recognised in 2004.

The discovery of the foundry site

The publication in 2003 of *English Bronze Cooking Vessels and their Founders 1350-1830* by Roderick Butler and Christopher Green identified South Somerset as an important producer of cast, bronze vessels, particularly in the 17th and early 18th centuries. On the basis of surviving vessels and documentation, the authors identified the Fathers Foundry at Montacute and the Sturton Foundry at South Petherton as being amongst the most prolific producers of these vessels, in particular cauldrons and skillets. Following a major exhibition of these vessels by Roderick and Valentine Butler in Honiton in September 2003, Somerset County Museums Service was offered the opportunity to buy their collection. The Museums Service was keen to proceed with the purchase as a very significant part of the collection had been cast in South Petherton and Montacute with smaller numbers from Bridgwater and Taunton. The sum needed to acquire the collection was significant and could only proceed with grant aid. An application was submitted to the Heritage Lottery

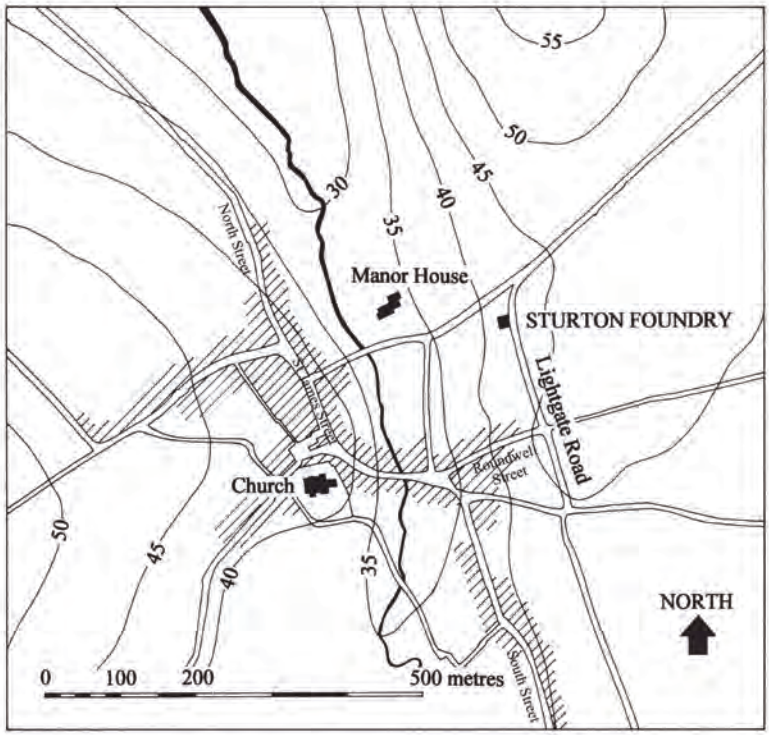

Fig. 6 South Petherton village and the location of the foundry

Fund (HLF), the MLA/V&A Purchase Grant Fund and others. Public engagement is very important to all grant givers. As the sites of the South Petherton and Montacute foundries were unknown it was felt that a good way of engaging with the local populations and increasing awareness of this past industry was to issue a press release asking if anyone could help in identifying the foundry locations. Accordingly, Somerset County Council issued a press release on behalf of the Museums Service on 20 November 2003 which appealed to the residents of these two villages for any information or clues they may have about the sites of these foundries. Roderick Butler was quoted thus: 'We now know that cauldrons and skillets were being cast at South Petherton and Montacute for almost 100 years but we don't know exactly where the foundries were located. Production on this scale must have left large quantities of clay mould fragments and probably some scrap metal on the sites concerned.'

Expectations of a response were not high. However, the *Western Daily Press* published a piece on 1 December 2003 headlined 'Lost and Foundry'. Other local newspapers also covered the appeal: the *Chard and Ilminster News* on 3 December 2003; the *Western Gazette* on 11 December and the *Yeovil Times* on 17 December. The news was read by South Petherton residents Alison and Alex Willis. The name Sturton was particularly resonant to them, as they were living in a house with the name of Sterton, built in the 1930s on a plot known as Sterton's Orchard (on the tithe map of 1840, above) on the west side of Lightgate Road. A connection between this name and the 17th-century Petherton founders seemed probable.

In the following year, while working on relandscaping their front garden, Alex and Alison unearthed fragments of bronze and reddened, burnt clay. Remembering the appeal for information that might help locate the sites of the foundries they contacted the South Petherton Local History Group and through them Somerset County Council County Museums Service. Inspection of the site by Steve Minnitt, Bob Croft and Alan Graham confirmed the importance of the finds and plans were made to carry out a small-scale archaeological excavation. Following on from this initial fieldwork a press release issued in June 2004 had the headline 'The treasure trove in family's front garden'. The discovery received significant media coverage including the *Western Daily Press* on 30 June 2004, the *Chard and Ilminster News* on 30 June 2004, BBC West TV on 1 July 2004 and *The Daily Telegraph*'s Property Section on 30 April 2005.

The preliminary archaeological examination of the site in June 2004 revealed a significant depth of stratified archaeological deposits relating to the activities of a foundry, including large quantities of mould debris, probably in the backfill of quarry pits, as well as finely laminated deposits, potentially accumulated debris on the foundry floors or surfaces. The potential of the site was established, and funding was secured from English Heritage to carry out a small-scale rescue excavation in advance of garden landscaping works. Following on from discussions with the Willis family, plans were made to carry out the investigations and this took place in two weeks in October 2004, supervised by Alan Graham and James Brigers (Fig. 7).

The topographic and geological location of the foundry site

The present village lies on the east and west banks of the North Mill Brook (Fig. 6), with the medieval church and likely area of primary settlement on the west bank though the site of the Manor House is on the east bank. Within the village, the brook, a tributary of the River Parrett, flows north at a height of about 30m above sea level with the land on either side rising fairly quickly to about 50m. The site of the foundry lies at a height of about 43m above sea level, on the east side of the brook, just below the crest of the slope. Though close to the Martock road it is peripheral to all but the latest periods of the village's development. Located near the top of a west-facing slope, the prevailing westerly winds may have both fanned its furnaces and removed toxic fumes away from the village.

South Petherton lies on the Yeovil Sands above the Junction Bed limestones, which outcrop commonly in the Petherton area. Below the limestones are the Pennard Sands, which are comparable to the Yeovil Sands. Both sand beds are variously silty or clayey, and either or both may have been quarried for mould-making material. The same geological sequence is found at Montacute (information from Hugh Prudden, Somerset Geology Group) which is the home of the Fathers Foundry and it is the presence of this clay suitable for mould-making that probably determined the location of these foundries.

Excavations at the foundry site revealed a depth of 1.40m of the underlying geological deposits. These

Fig. 7 Excavations in the garden of Sterton House, South Petherton. Looking west from Lightgate Road. The limited space for excavation is evident.

comprised a compact, yellow-brown clay (20) above a paler, greenish-yellow silty clay (21). At one point on the site, a large piece of limestone bedrock protruded into these layers, presumably an element of the Junction beds. Recent observations of building works on a site downslope to the west had revealed an area of quarrying cutting into limestone, probably where it outcropped in the side of the valley. The site of the foundry appears, therefore, to lie on the Yeovil sands.

THE EXCAVATED SEQUENCE

The excavations were limited in extent, being confined to a trench 5m east-west x 6.30m north-south (an area of 31.5 m^2) on the south edge of the front garden of Sterton House (Figs 7, 8). Some levelling of the site had taken place relatively recently truncating the deposits close to the house and on the north side of the area excavated which was covered with new paving stones. In addition service trenches for the house had bisected the excavation area, and along the east side all the foundry deposits were cut away by what appeared to be a later roadside or field ditch.

Despite these limitations, the excavations recorded a clear stratigraphic sequence which can be divided into two distinct phases; a primary phase when the area formed part of the working foundry, and a subsequent phase when it was used for the quarrying of loam to make the moulds. In the primary phase a cobbled surface (Fig. 8, layer 57) probably lay within a covered area of the foundry which also contained a rubble base for a furnace (Fig. 9). This would imply casting in this

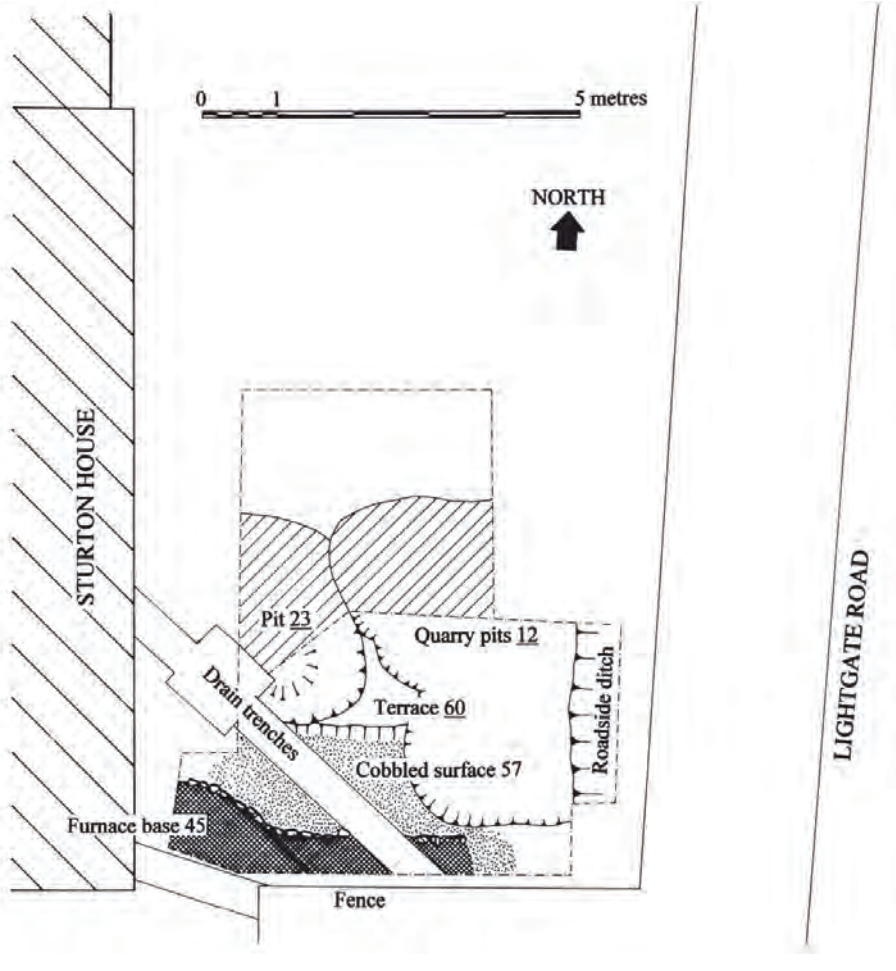

Fig. 8 The location of the excavation trench with all excavated features shown

Fig. 9 The rubble base of the furnace, layers 47 and 48, and the primary layers of the sequence within the terrace. In the foreground is the curving edge of the (now backfilled) quarry pits and to the right the edge of the possible casting pit 23. Scale 0.30m, looking south-west.

area and a single large pit (Pit 23), distinct from the later quarry pits may have been used for this purpose. A sequence of laminated deposits had accumulated around the furnace base evidently reflecting the varied use of this area. In the later phase a number of conjoined quarry pits (12) encroached upon the north-eastern side of this area of the foundry evidently after it became disused. It was into these pits that a mass of vessel-mould fragments was eventually dumped.

Throughout the sequence reddened or blackened, partially fired loam was found, either as small flecks, larger fragments or whole layers and similar deposits have been observed on other excavated bronze foundry sites. Though the most probable source of this material is from the breaking-up of the vessel-moulds after casting, it can only certainly be recognised as such when an area of the surface of the mould itself is present. Burnt loam could also have derived from the furnace structure or channels used to allow molten metal to flow from furnace to mould. In the text which follows, therefore, the term burnt loam has been used for layers or fragments of material which, though visually similar to the obvious dumps of vessel-mould material, did not contain recognisable mould fragments.

Phase 1

Terrace and metalled surface

Across the excavation area the surface of the natural clay lay at about 43.1m above sea level, though some levelling or truncation during the construction of the existing house seems possible. Along the south side of the site, however, the clay had been cut by a horizontal terrace (60), about 0.25m deep with a sloping edge (Figs 8 and 9). Into this had been laid a layer of finely broken limestone rubble (57), up to 0.10m thick with a hard, even surface, sloping down to the east. The limestone make-up was of local origin but the surface included chert fragments and burnt stone fragments. Though otherwise clean, the layer produced a single, corroded fragment of copper alloy. In patches between the base of the terrace and the limestone infill were thin layers of dark clayey loam (58 and 59), possibly trample in the newly cut terrace. Coal fragments were observed in these layers, which also produced five fragments of copper-alloy slag, a fragment of copper alloy, a very small fragment of burnt loam and a single small sherd of glazed earthenware of probable 16th-century date.

To the north, the surface had a hard edge against the

slope of the terrace; to the east, it also ended abruptly (Fig. 10), but this was less clearly an original edge as this area was heavily disturbed by tree roots. It was overlain by a compact and in places laminated dark, fine loam (Figs 10 and 12, 49), up to 0.08m thick. This was general within the terrace but was thicker and more clearly laminated in the east. The laminated nature suggests it was a periodic accumulation trampled into the floor of the terrace. It contained flecks of coal and fragments of burnt loam, as well as a single fragment of copper alloy, a fragment of slate and two sherds of 16th-17th-century earthenware.

To the east layer 49 merged with the comparable layer 51, which contained a higher proportion of burnt loam fragments and two fragments of copper alloy. Below 51 was a compact black and red deposit of pulverised vessel mould (52) which infilled and formed a resurfacing above an earlier hole. This appeared to be a small pit or posthole (54) with a fill of yellow-brown clay, grey loam and limestone rubble (53). If it was a posthole, the rubble may have been the disturbed remnants of a stone packing. A similar feature (16) was found truncated beneath the base of the later quarry to the north and both may have been elements of a structure or shelter (Fig. 10).

Furnace base

The primary phase of activity within the terrace, described above, appears to have been followed by the construction of a base or foundation, possibly for a furnace, which survived in the south-west corner of the excavation (Fig. 10). This comprised a stone rubble base (47) within a kerb of larger stones (48), slightly set into the earlier layers (east of the drain cut these layers were 41 and 44). The base was then overlain by a compact black and red layer of burnt loam and fragments of burnt loam (?vessel-mould) (45), spreading (46) in places beyond the line of the kerb. At the eastern end of the feature comparable layers were excavated (40, 42 and

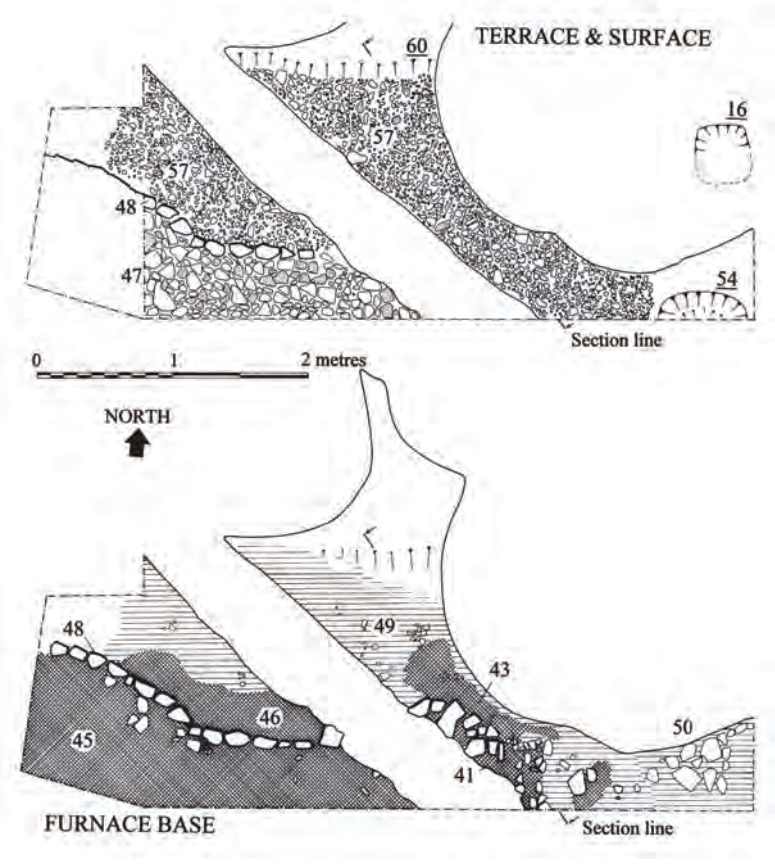

Fig. 10 Terrace 60 and furnace base as excavated

43) adjacent to the edges of the structure, but often very laminated. Within the kerb it had a smooth level surface, which may have been a levelling for an above ground structure or simply the level to which the structure was ultimately demolished. In plan (Figs 10-11), the feature appears to have had an oval or circular west end with a thinner, rectangular east end. Clearly some form of base, its purpose is otherwise uncertain, but significantly the next sequence of layers within the terrace all lie specifically to the north and east of it, as if respecting some form of above ground structure.

The likely type of furnace in use on the site would have been a reverberatory furnace, comprising a firebox and a hearth in which the metal was melted (Blaylock 1996, 72-82, figs 3 and 5 for the Cowick Street, Exeter furnace, figs 10 and 12 for the furnace at Paul Street, Exeter). The base at Sterton House could have served this purpose, the rectangular end being the fire box, the round end the hearth for the metal charge. There was no evidence of a subterranean stoking pit, the whole structure being above ground, and the most probable material for its construction would have been brick or fired clay of some sort. Artefacts from the layers comprise four copper-alloy fragments, but also a possible copper-alloy buckle fragment (Fig. 28, 4) which may be Romano-British. Two fragments of slag were also found.

Fig. 11 The furnace base as revealed after the expansion of the trench west to the wall of Sterton House. The circular nature of its western part is clear. Scale 0.30m, looking west.

Accumulation of surfaces and debris adjacent to the furnace

To the north and east of the base described above, and specifically within the lines of the terrace a sequence of fine, interleaved and laminated layers was excavated. Their maximum overall depth was about 0.12m and they generally had compacted surfaces from use (Fig. 12). To the east (39) comprised grey-black fine ashy loam laminated and interdigitated with burnt loam and pale clay and flecked with burnt loam and coal. The layer contained copper-alloy fragments as well as a large-headed nail or stud (Fig. 28, 2) and a fragment of lead strip. Seven sherds of pottery were also found being small sherds of glazed earthenware of 17th-century date. At the east end of the excavation this layer overlay what appeared to be an upcast layer of natural clay and stone (50), though whence this derived is not known.

Within the terrace north of the base a similarly laminated sequence was excavated, comprising layers of red and black burnt loam laminated with sandy silt (36, 37) interleaved with pale yellow clay (38) and greenish grey silty loams with visible copper staining (32). At the northern edge of the terrace these more general spreads were overlain by a mound or dump of vessel-mould fragments (31) all rather squashed and compacted (Fig. 12). Generally, the layers contained very little artefact material with a single copper-alloy fragment, a piece of solidified molten lead and a stained animal bone. Interestingly, however, 27 fragments of chert were found scattered within layer 32. These ranged in size from squarish lumps up to 35mm across, to small fragments 2mm thick and 9mm long. The material seems to show evidence of having been deliberately chipped or flaked but for what purpose in the context of a foundry is unclear.

Demolition and change

Covering the sequence described above and the level base of the possible furnace was a general layer of dark loam (Fig. 12, 30 and 35). This appeared to represent the disuse of the base and presumably the demolition

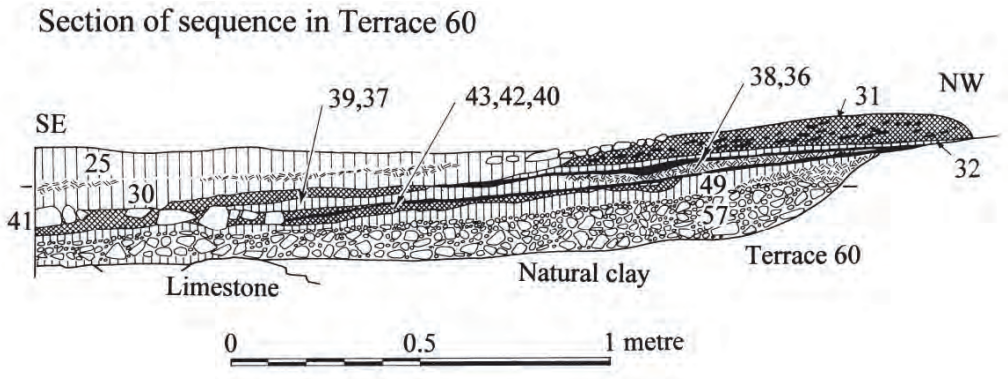

Fig. 12 Section across Terrace 60

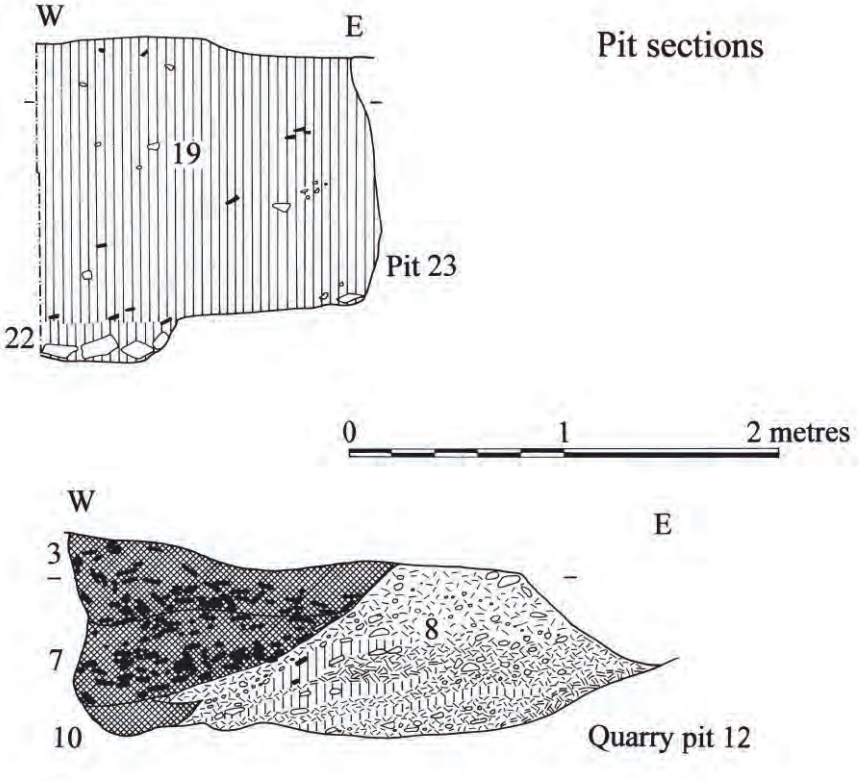

Fig. 13 Section of Pit 23 and the Quarry Pit 12

and removal of any superstructure but these layers too showed signs of lamination and had a hard compacted surface, representing a floor or surface across the area of the terrace. The layer contained coal and slag fragments and several copper-alloy fragments.

A later sequence of layers only remained in the slightly lower eastern part of the site but comprised remnants of probably once more-extensive layers. These layers included patches of limestone rubble surfaces (29 and 34), as well as patches of finely laminated accumulations (27) and vessel-mould debris (26). In one area there was a scatter of yellow clay fragments, possible upcast from digging. Clearly the area continued in use as a part of the foundry once the furnace had been removed, but whether as an internal or external space is not clear. As well as animal bone the layer contained fragments of copper alloy. The stamped base (ID) of a clay pipe was found, being the work of an unidentified pipe maker working in the Yeovil area c. 1650-1700 (information from Marek Lewcun) as well as eleven small earthenware sherds of 16th-17th-century date.

Remnants only of a general loam layer covering this sequence remained at the eastern end of the excavation (25 and 33). Its relationship with the quarry pits described below was not evident and it may indeed be the base of a general sealing layer of loam and topsoil above the now-disused site of the foundry.

Pit 23

Stratigraphically unrelated to the sequence of deposits described above, but located immediately north of the Terrace 60, was a deep oval pit, through which a section was excavated (Figs 8 and 13). This differed in shape and infill from the quarry pits to the east (below) and contained a distinctive assemblage of artefacts.

Cut down through the natural clays, it had vertical or undercut sides and was about 1.30m deep though with a deeper central area (Figs 13-14). A number of limestone fragments (22) lay in the base of the deeper part of the feature beneath, between which were preserved fragments of gorse and pine needles (not evidently carbonised but rather mineralised). Otherwise its infill was a completely homogenous, black silty loam (19) containing much gritty ash, probably from coal. This uniform deposit was 1.30m deep, and there was no evidence to suggest that it was other than a single period of backfilling. It contained 44 copper-alloy fragments, being more than half the total assemblage from the excavations. Most of these were fragments and offcuts of sheet metal, the majority of which were corroded or burnt (below, Copper-alloy sheet fragments and casting waste, categories 1 and 2 and Table 3) with only two fragments of casting waste (category 3). Two iron objects were also recovered. Fragments of coal and slag were also found as well as a group of vessel-mould fragments, which included a very high proportion of sprue-cup fragments rather than mould body, in sharp contrast to the vessel-mould from the quarry pits.

Two sherds of pottery came from the infill of the pit. One was a fragment of Delft tin glaze, probably Dutch, of the later 17th century, the other part of the base of a glazed earthenware jug, probably 17th-century Donyatt pottery, from which the internal glaze had been melted.

Stratigraphically the pit could be contemporary with the sequence of deposits in the terrace and its use as a casting pit is possible, being a short distance from the hearth-end of the furnace (Fig. 8). Its distinctive infill may have been sifted, reserved material for packing around moulds and the feature could have been used many times to support numerous moulds of different sizes during casting. The presence of metal scrap would attest the charging of the furnace hearth, and the sprue-cup fragments the actual casting, being broken off shortly after casting before the removal of the moulds to be broken open elsewhere. The deeper part of the pit with its limestone fragments recalls the bell casting pits excavated at Exeter (Blaylock 2000, figs 8 and 9) and could indicate the casting of at least one bell during the use of the furnace, the existing casting pit being deepened to this end.

Phase 2

Quarry pits

Almost the whole of the eastern part of the excavation area was taken up by a group of intercutting pits, 12, with a single sequence of infilling (Fig. 8). These were rounded, with steep or even undercut sides and a flat base no deeper than about 0.80m below the extant top of the natural clay (Figs 13, 15). The area of pitting was 4.5m north-south and at least 3m east-west, evidently continuing beyond the line of the later roadside ditch.

The primary fills lay along the eastern side of the pits and comprised interleaved bands of clay with limestone debris and greyish silty loam with a limited scatter of red and black vessel mould fragments (8). The top of the sequence sloped down to the west, leaving a linear hollow along that side of the feature and the layers may be interpreted as material discarded during quarrying. The remaining hollow was filled progressively from the south with bands of clay debris and dumps of mould material all tipping down northwards. The primary deposit (10) was a compact black layer of pulverised vessel-mould material overlain by a red and black deposit of large fragments of vessel mould (7) and (24), crushed up together. This was up to 0.40m thick and overlain by a deposit of more broken up mould material (3). These

Fig. 14 Section of the possible casting pit 23, showing the stone in the stepped base and the deep homogeneous infill. Scale 0.30m, looking north-west.

Fig. 15 Section through the quarry pits that occupied the eastern area of the excavation. The primary fill of clay and stone lies beneath the dump of mould debris and foundry soil that lies against the western edge of the pits. Scales 6 feet and 0.30m, looking north

layers were composed entirely of vessel-mould and many large fragments with burnt surfaces were recovered. To the north they were overlain by a band of grey loam with mould fragments and clay (6), itself covered by a layer of clay and limestone debris containing a scatter of animal bones (5). A hollow above this was again filled with a dump of vessel-mould debris (4) including many large fragments.

Besides the vessel-mould fragments, other artefacts were scattered throughout the sequence of infill. Slag and copper-alloy fragments came from the primary fills (8), as well as from the dumps of vessel-mould. A number of what may have been furnace-lining fragments were also recovered from these layers, being tile-like but very burnt. The upper layers contained a similar range of material. Several iron objects were found, as well as pottery sherds: a total of three small sherds of 17th-century earthenware from layers 8 and 6.

THE MOULD MATERIAL

Background

Surviving inventories of household goods show that cauldrons and skillets were present, often in some numbers, in all but the poorest households. There is limited evidence for production of small quantities of other vessels using similar mould-making techniques and alloys, such as mortars and candlesticks. In Exeter the penannular bracelets called manillas were also produced, presumably for export, by at least one of the foundries in the 16th/early 17th centuries (Blaylock 1996, 78). The Sturton's output regularly included mortars, as is shown by numerous such vessels in the Butler collection (Butler and Green 2003, 101-10, cat. nos 83, 90, 93-96, 105). A variety of one-off products, no doubt, was also made by such craftsmen: bushels and other measures are known to have been made by bell founders, as are the four large merchants' 'nails' outside the Exchange in Corn Street, Bristol (see also one by the Exeter founder [John?] Pennington in Axbridge, Somerset). Once again, the Sturton's output indicates that they made a similar variety of other vessels, and includes a preserving pan and a half-peck measure (Butler and Green 2003, 105, 109, cat. nos 91 and 104 respectively).

A distinctive aspect of many excavated foundry sites is their siting in locations where supplies of clay for mould making, such as suitable subsoil or riverine clay deposits, were readily available and the Lightgate Road site appears to be no exception to this. Towards the end of the period of the foundries' operation casting using clay (or 'loam') moulds was beginning to be replaced by sand casting. In South Somerset, the Fathers' foundry at Montacute adopted this new technique readily, and at an early date, whereas the Sturtons at South Petherton appear to have stuck with the older mould-making techniques, using clay moulds until the end (Butler and Green 2003, 27-8, 49, 58).

Copper alloys varied very widely; the optimum composition of bell metal was c. 75-78% copper and 22-25% tin (Singer *et al.* 1957, 38; Tylecote 1976, 72-3 and table 43; Scott 1968, 199), but vessels were generally cast in an alloy with a high lead content (often referred to as leaded bronze or lead-bronze in the literature: Bayley *et al.* 2001, 15; Christies 1996). A recent study of the alloy composition used for domestic vessels has suggested that the distinctive antimony-rich leaded copper alloy encountered in many domestic vessels was a by-product of the extraction of silver from *fahlerz* ores (Dungworth and Nicholas 2004, 29 [literally 'fawn ore', or 'pale ore']), and that this was known as *caldarium* (literally 'cauldron metal') in the Middle Ages (*ibid.*, 30-1). Analysis of the casting waste from South Petherton shows the typical leaded antimony-bronze of the vessels themselves, but that of the scrap metal fragments shows other alloys including brass and leaded gunmetal (below; Blakelock 2005, 2-3). The variability of alloys, where they have been analysed elsewhere, might suggest that, whatever the source of the primary raw materials, there was often a good deal of recycling of second-hand copper alloys. Re-use is likely to be a factor in the apparent complexity and variability of the alloys used in the analyses carried out to date (e.g. Blaylock 2000, 72-8, 86-7). The practice is also suggested by the sparsity of metal finds on the excavated foundry sites in Exeter (a scarcity paralleled in some other sites, such as Taunton, Chester, Crediton, etc.): metal cooking vessels were valuable commodities, and were likely to be traded in on a new-for-old basis when damaged or worn out. It is clear, nonetheless, that the bronze-founders of the period had a well-developed and sophisticated empirical knowledge of different alloys, and that there was little chance of mixing alloys through ignorance, or where it would jeopardise new castings. Specialist dealers in scrap metal also existed in the 16th century, as is shown by the record of recasting a bell at Crediton, probably in the late 1570s, in the course of which a 'great brass crock', which had been donated to the cause, was taken to such a dealer (termed a 'metal man') at Exeter to be exchanged for bell metal (discussed in Blaylock forthcoming).

All the identifiable mould fragments appear to relate to the casting of metal vessels, specifically of cauldrons and skillets. In the later medieval and early post-medieval periods the only way of distinguishing between these vessels was on the basis of size, i.e. a skillet was a small version of a cauldron, with a strip handle (above). From the later 16th century the distinctive form of the skillet, as a 'saucepan on legs', gradually took over from the handled cauldron (often called a posnet, but sometimes also [confusingly] a skillet) which was the predominant form in the later 17th and 18th centuries. The term posnet therefore provides a handy means of distinguishing the

earlier from the later type of skillet, although one without proven historical validity (Eveleigh 1994, 16).

The anatomy of a cauldron mould

The typical form of a cauldron mould is summarised in a conjectural reconstruction drawing of a complete mould based on the Exeter material (Fig. 16). There were essentially two components to the mould: an inner mould, or **core**, which was formed in one piece, probably on a wooden or mould-clay pattern, but possibly by hand; and an outer mould, or **cope**, formed normally in two pieces (again around a pattern) with a longitudinal join or seam running through the centre line of the vessel. In casting, the two halves of the mould were kept apart by small fragments or offcuts of copper alloy known as chaplets. These served to keep the two halves of the mould properly registered and, in theory, would become fused with the new metal during casting. In practice, however, the metal did not fuse completely, and the positions of chaplets invariably remain visible in the finished vessels (and often represent weak points at which holes would develop). To the cope mould the moulds for legs and handles were added during the mould making process. Both were made separately (again presumably around patterns) and inserted into holes cut to fit in the cope mould. Cauldrons typically had three legs, often with vertical ribs and a 'hoof-shaped' foot articulated by a cordon or collar, and two angular handles from which the vessel could be hung. Skillets would have a strip handle (like a modern saucepan) on one side of the vessel, generally with an angled handle or brace, resembling that of the cauldron, supporting the junction of the handle and the body of the vessel (Ward Perkins 1954, pl. 55, fig. 68); this was sometimes replaced by a flange of solid metal.

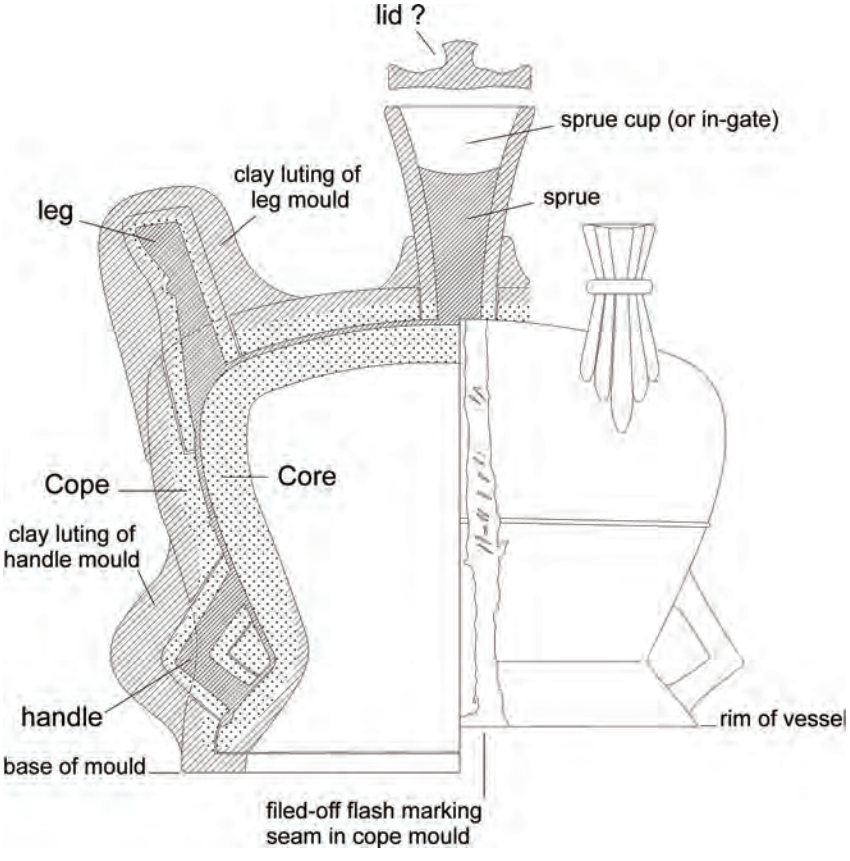

Fig. 16 Conjectural reconstruction of a typical cauldron mould in section, positioned as it would be for casting (i.e. upside-down in relation to the vessel). Based on a later 17th-century cauldron in the RAM Museum, Exeter, and the mould fragments from Cowick Street, Exeter (Blaylock 2000, fig. 15). A section through the mould is shown on the left-hand side, and a surface view of the vessel to the right. Not to scale, although approximately 1:4

TABLE 1 QUANTIFICATION OF MOULD FRAGMENTS BY STRATIGRAPHIC SEQUENCE

Reference	*Context*	*No. of fragments*	*Weight (kg)*
Recent levelling	1	50	1.104
	18	31	0.214
	No numbers	207	3.723
Upper fill of quarry	4	24	0.632
	6	17	0.767
Mould dump in quarry	3	256	17.982
	7	1014	33.501
	24	329	12.832
	3/7/24	15	0.470
Fill of Pit 23	19	177	2.055
Laminated layers in terrace	25, 28, 38/39, 43, 45, 49, 58	25	0.196
	Total no./weight	**2145**	**73.476**

Mould fragments can generally be identified as follows: the casting surface of the mould is invariably the smoother (having been finished with fine clay, wiped with a cloth or brush). In cope mould the surfaces are invariably concave; in core they are convex (compare Fig. 16), although some parts of the profile of vessels (as opposed to the circumference) can appear straight. The colour also helps to identify and distinguish the two types. In general cope mould is orange or red on the outside, and grey on the inside: the mould being oxidised where it was in contact with the air during casting and reduced where the flow of air was limited. Core mould is generally more heavily reduced, and therefore uniformly grey in colour, because the inside of the mould had little contact with air during casting. Typical mould clay was composed of natural riverine clay mixed with plentiful fine chopped vegetable matter, probably straw or chaff (since frequent chaff casts are visible to inspection by the naked eye). The mould when dry was light and porous enough to permit the escape of air and gases through the fabric during the casting process.

General description

The collection comprises a total of 2,145 fragments of clay mould with a total dry weight of 73.476kg. A detailed breakdown by context is given in Table 1, from which it will be seen that the greatest bulk of the material came from layers 3, 7 and 24, being dumps of broken mould into the quarry pits of Phase 2, weighing 64.78kg, or 88% of the collection (a further 1.40kg/2% came from the top fill of these pits, layers 4 and 6). A much smaller group came from the fill of the Phase 1 pit 23 (layer 19: about 2.05kg/3%), and an even smaller group, with few diagnostic fragments, from the laminated sequence of deposits within the terrace of Phase 1 (0.196kg/less than 1%). The rest of the material (about 7%) was collected during the levelling of the site prior to, but resulting in, its recognition, and probably came from the upper fills of the quarry pits, such as layer 4. The collection included a considerable amount (72 fragments/9.145kg; mainly from contexts 3 and 24) of indeterminate wholly oxidised clay fragments, typically 40-50mm in thickness. The bulk of this material possesses no 'wiped' mould surface and is flat or irregular in form. This is a familiar feature of foundry assemblages and has previously been identified as probably representing the clay linings of flues or furnaces (Blaylock 2000, 45-46 and 58; 2001, 3). Little further can be said of this material and it was, therefore, set aside after initial sorting. The bulk of the material, however, comprised fragments of vessel mould. When divided by fragment count and weight, cope-mould fragments out-numbers core by a factor of approximately 3.75:1 (Table 2). This, too, is consistent with other assemblages (Blaylock 2000, 43), and is probably to be attributed to the much greater damage sustained by core mould as the finished castings were extracted from their moulds. Cope mould could easily be broken off a cast vessel with a hammer or pick, but core had to be dug out of the finished casting, and became much more thoroughly broken up as a result. There is a considerable amount of 'exotic' material (not included in the counts of Table 2, although handle and leg moulds would technically belong with the cope mould in terms of quantification).

The mould-clay fabric consists of a coarse sandy clay, with moderate to frequent mica particles and an element of fine chaff, visible in surfaces and in broken edges in the form of chaff casts. There are also occasional large grit particles (up to 5mm), but (by and large) these are rare and the clay would appear to have been reasonably well screened before use. This composition gave the necessary porosity for casting while retaining a sufficiently plastic character for the definition of detail. The sandy element in the

TABLE 2 BREAKDOWN OF MAIN BULK OF THE MOULD COLLECTION SHOWING PROPORTIONS OF CORE TO COPE MOULD BY WEIGHT (EXCLUDING 'EXOTIC' FRAGMENTS, SUCH AS LEG AND HANDLE MOULD, WHICH WILL MARGINALLY INCREASE THE PERCENTAGE OF COPE TO CORE FRAGMENTS)

Reference	Context	Core		Cope		Core : Cope
		No. of Frags	Wt (kg)	No. of Frags	Wt (kg)	
Recent levelling	1	2	0.044	17	0.585	1:13.3
	18	0	0	2	0.057	0
Upper fill of quarry	4	7	0.168	6	0.180	1:1.07
	6	1	0.043	14	0.705	1:16.4
Mould dump in quarry	3	73	3.221	112	7	1:2.17
	7	13	0.585	127	10.25	1:17.5
	24	81	2.4	197	7.925	1:3.3
Fill of Pit 23	19	37	0.75	20	0.215	3.48:1
Totals		214	7.221	495	26.917	1:3.73

clay sometimes leads to lack of clarity of detail in the moulds. Casting surfaces are invariably smoothed, with a brushed or wiped appearance, perhaps produced by a quick smoothing of the mould surfaces while wet rather than deliberate slipping (as has sometimes been suggested). There is certainly a difference between the smoothed casting surfaces and the rougher external surfaces of typical mould fragments, and this is a recurrent feature of most cauldron mould (Blaylock 2000, 40; Butler and Green 2003, 25). Most cope mould displayed the typical half-oxidised and half-reduced colouration produced during the casting (described above), although occasional pieces of cope are wholly oxidised, so that the full thickness of the mould was coloured in the pale orange-orange-red range, and the interior surface was dark red in colour, as opposed to the light grey that is usual. Core mould displayed more thorough reduced colouring, although rim fragments sometimes show some oxidisation where they had been in contact with the air during casting. Typical fabric of the large coarse baked clay fragments identified as flue lining is identical in composition to the mould clay (visually), though possessing a different surface finish (i.e. without the wiped- or brushed-surface of the mould clay), and this material is invariably wholly oxidised rather than oxidised-reduced in colour.

Typical mould material is very soft and friable, having been dried by baking prior to casting and then baked again through contact with the hot metal during casting, but never 'fired' as such. Some of the smaller fragments, such as leg and handle moulds and sprue-cups, appeared more durable, perhaps because, being thinner, they were more effectively baked by the drying process and by contact with the metal during casting. They may also have utilised clay of a finer quality, than that normally employed.

The various rim fragments, as well as the surviving vessels, show that the vessels produced in the South Petherton foundry possessed the characteristic everted rim of all cauldrons. One of the areas in which vessel moulds are distinctive from foundry to foundry is in the precise method used to register the core and the cope at the rim(/base) of the mould. This enabled the moulds to be fitted together accurately as well as providing the means to cast the bead that is a characteristic feature of the inner surface of the rim of a cauldron. At least two types are represented in the South Petherton site: a wave-moulded registration groove (Fig. 24, nos 45-52; 54) and a flared rim fitting into a deep flat groove (Fig. 24, nos 55, 57); these seem to represent the rim moulds of cauldron and skillet respectively: the ?cauldron mould having a wavy profile on the cope (e.g. no. 46) and a bead for the registration on the core (e.g. no. 54), which also serves to form the articulation on the rim of the interior of the vessel; the ?skillet having a simpler profile with a deep flat section (represented only in core mould, and in small fragments; no equivalent cope fragments have been identified). The various profiles of skillet rim profile represented in the surviving vessels, vertical and flared, plain and beaded (see Butler and Green 2003, 98-119), cannot be distinguished in the mould material. All the illustrated fragments are from the dumps of broken mould in the quarry pits of Phase 2.

The Sturton's output of cauldrons conforms to the familiar profile of 16th- and 17th-century cauldrons, which typically have the widest point rather low down the profile, a form often described as 'bag-shaped'. Earlier, late medieval, cauldrons are more globular in shape, indeed a rounded or globular profile has often been taken as typical of medieval vessels, and this does seem to be borne out by surviving vessels dated to the medieval period and in others shown in contemporary manuscript illustrations (Ward Perkins 1954, fig. 68, pls 55-6; Butler and Green 2003, 8, 171). Ornament is confined to a single

moulding wire around the body, with the scratch marks and any initials and/or date placed above this. Ornament below the moulding wire is unusual, although occasional vessels show diagonal or curving ribs rising from the top of the leg to the moulding wire (such as the illustrated vessel, no. 1; Fig. 1).

Many extant vessels in the Butler collection and elsewhere have quite long surviving legs, typically with a flat rear and clustered five-ribbed section (see, for example, Fig. 1, no. 1 and Fig. 3, no. 4 and Butler and Green 2003, 102, nos 84-5). The failed leg mould from context 3 (Fig. 25, no. 60) is useful for showing what an unworn Sturton leg was like and represents a nearly complete leg mould in its original (as-cast) form (see also the well-preserved legs of two of the vessels illustrated here: nos 1 and 4, Figs 1 and 3). This leg mould (along with many other more fragmentary sections of leg moulds) is important also for demonstrating that the South Petherton vessels were cast with leg moulds closed at the foot (a detail also shown by a second selected leg-mould fragment: Fig. 25, no. 61). This means that the moulds were filled from a central sprue-cup (as is suggested in the reconstruction drawing, Fig. 16, which is based on similar observations for the Exeter material). Other foundries have proved to have used a different means of filling the moulds, namely with open leg moulds which could act as vents for the escape of gas during casting, or even for use as supplementary sprue-cups (see Blaylock 2001, 5). One further selected leg-mould fragment shows the flat rear face of the leg at the point where it joined the convex base of the vessel (Fig. 25, no. 63). Relatively few fragments of moulds for the distinctive angled cauldron handles were observed, although we know from the surviving vessels that the Sturton's cauldrons were always fitted with this type of handle (Figs 1-2; Fig. 25, no. 67). The process of extraction of both legs and handles was very destructive of the mould and it is unsurprising that fragments of these parts of the vessels tend to be small or under-represented. All the illustrated fragments of leg, handle and related material came from the dump of broken moulds in the infill of the quarry pits of Phase 2.

A distinctive aspect of this collection of mould is the large quantity of sprue-cup, or in-gate, and vent fragments. Similar fragments have been found at other sites but never in the quantities found here. The fragments are concentrated in the fill of Pit 23, layer 19, amounting to 109 fragments in all (68% of the full collection by weight; 72% by number): 102 individual fragments from the main fill, context 19 (weighing 912g), and seven further fragments (weighing 104g) from the disturbed levelling above it, layer 18; both contexts include numerous joining fragments. The distinctive, uniform fill of this feature was also notable for containing a concentration of sheet metal fragments (below). The most likely explanation of the high incidence of sprue-cup fragments is that pit 23 was used at the time of last filling at least (so whatever function it had is not necessarily its original intended function) for some specific task of mould breakage/extraction of casting, and that the sprue-cups, being one of the most protruberant parts of the mould, were also the first to be broken off. The high incidence of fragments of such pieces in this feature, then, might suggest that this lay adjacent to a casting pit, or in a part of the workshop to which moulds were moved immediately after casting, for extraction of the casts from the moulds. The heavily striated surfaces in this area suggest something similar: i.e. intensive workshop-type use (below).

Another distinctive 'exotic' is a collection of artefacts with a convex lower surface and a concave upper surface with a central boss or nipple, all found in the dump of mould material in the quarry pits of Phase 2 (five fragments from layer 3, Figs 25-26, nos 71-73; three fragments from context 4; and two fragments from context 7, Fig. 26, nos 74-75). These are made from mould clay, and were provisionally identified as 'lids', perhaps fitting over sprue-cups to stop the molten metal from cooling too quickly (such an interpretation was assigned to similar, though not identical, features seen in the Exeter foundries: Blaylock 2000, 46, fig. 28, no. 142). Since the 'nipple' side is reduced and the rounded 'bottom' is oxidised it may be that the perception of their orientation is incorrect and the concave/nipple side fitted over the sprue-cup and the convex side faced outwards. Alternatively these fragments may relate to some other part of the casting process or other form of casting activity altogether, as yet unidentified. It is perhaps significant that they did not occur alongside the concentration of sprue-cup fragments in Pit 23.

Most of the cauldrons in the Butler collection typically fall within the range of 200-420mm in rim diameter and the sub sample of the collection manufactured by the Sturtons conforms to this range. The excavated mould, inasmuch as it can be accurately measured, also conforms to this size range. This forms a typical sample of rim diameters when compared to other excavated assemblages, which have been found to fall in the range of approximately 160-400mm (Blaylock 2000, 42; Vellev 1998, 211). Only very occasional vessels fall outside this range, e.g. the very large missionary pot no. 183 in the Butler collection, which has a rim diameter of 571mm; or the mini-cauldron of 1711 from the Fathers' foundry: Butler collection no. 17, with a rim diameter of 124mm (Butler and Green 2003, 170, 53). Although the rim diameter is a useful rough guide to the maximum diameter as well, there are many vessels that obviously

exceed their rim diameter in maximum diameter (note that in the typical post-medieval sagged profiles even the diameter at the moulding wire is not the maximum and the turn of the profile at the base is often significantly greater than the rim diameter).

Most skillets fall within the range 120-250mm. The skillet of 1712 (Butler and Green 2003, 116, cat. no. 115) is an especially large example, with a rim diameter of 280mm. This must have been very heavy to lift in use, and this probably explains its conversion to a hanging vessel with a bail handle (by having its strip handle and legs removed). Catalogue no. 82 (dated 1630) is also a very large and heavy vessel (rim diameter 312mm), but retains its handle and legs. The largest of all recorded, this weighs 12.5kg when half full of water according to Butler and Green (2003, 101). Coincidentally these two large vessels are the latest and earliest Sturton vessels respectively so far recorded. The few measurable fragments of rim mould for skillets all fall in the smaller part of this range.

Summary of inscribed skillet handle moulds

The collection contains 20 fragments of inscribed skillet handle mould, the total varying slightly depending on how individual items are counted (Figs 17-20, 22). All fragments come from the dump of mould material in the quarry pits of Phase 2 (layers 3, 7 and 24), except for nos 17, 22 and 26, which came from the leveling/disturbance over the site. The four legends known from surviving vessels are all represented in some form (compare Butler and Green 2003, 100-19 passim, but especially 119); there is one example of a fragment of a handle mould with Thomas Sturton's name (attributed to Thomas II on comparison with one similar handle inscription in the Butler collection: Butler and Green 2003, 109); another very fragmentary example possibly from a similar handle; and two examples of a previously unknown legend (below).

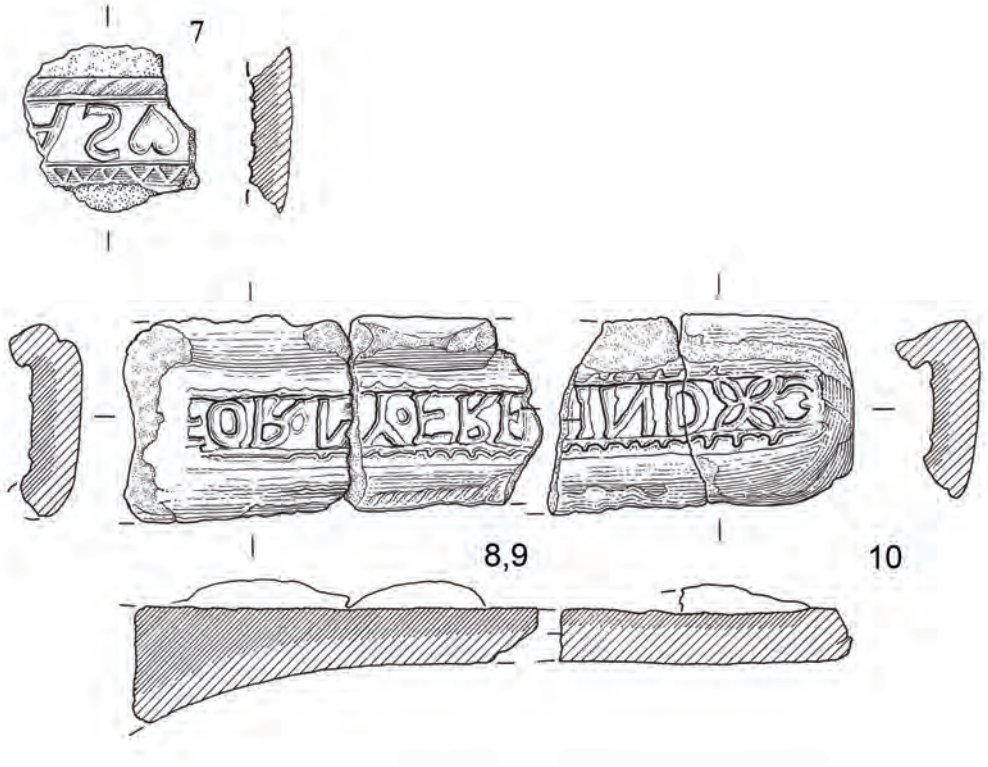

Fig. 17 Inscribed skillet handle-mould fragments; no. 7 part of 'THOMAS STURTON' and nos 8-10, collectively making up the motto 'FOR MY FREIND' [sic] and chosen for their potential to show details of mould construction. Scale 1:2

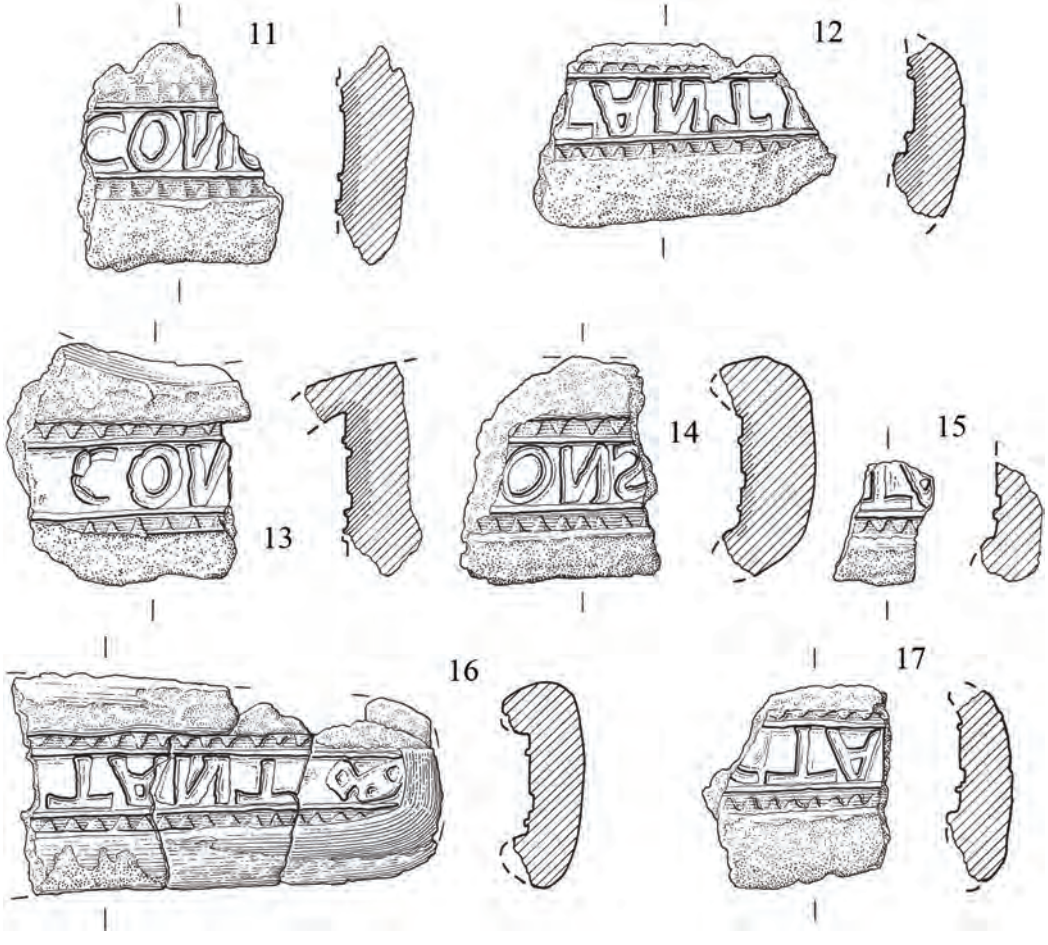

Fig. 18 Inscribed skillet handle-mould fragments nos 11-17 from the motto 'BEE CONSTANT'. Scale 1:2

Of the four known Sturton handle legends or mottos the following are represented:

'FOR MY FRIEND'

Catalogue nos 8 ('FOR M'); 9 ('Y FRE'); 10 ('IND') (Fig. 17). Note that 'Friend' is mis-spelled 'Freind' in the two examples where that part of the inscription survives (see discussion below). No examples of a surviving vessel with this variant spelling are known.

'BEE CONSTANT'

Catalogue nos 11 ('CON'); 12 ('TANT' plus quatrefoil stop); 13 ('CON'); 14 ('ONS'); 15 ('TA'); 16 ('STANT' plus two quatrefoil stops); 17 ('TA') (Fig. 18).

'THIS IS GOOD WARE TS'

Catalogue nos 18 and 19 (joining to form 'WARE [stop]TS' plus a quatrefoil stop); 20 ('OD'); 21 ('OD'); 22 ('TH': ascribed to this motto on the basis of size; compare cat. no. 23, where the [would-be] adjacent letters are significantly larger) (Fig. 19).

'WIL THIS PLES YOU'

Catalogue no. 23 ('WIL') (Fig. 20).

Of the other handle inscriptions, the most important is catalogue no. 7 ('AS ♥ [a stop in the shape of a heart]'). This is almost certainly interpreted as '[THOM] AS♥[STURTON]' which appears on some extant vessels, most notably cat. no. 103 in the Butler collection (Butler and Green 2003, 109). The legend is attributed to Thomas Sturton II (?1629-82) on the basis of the accompanying scratch mark. N.B. that there are other signed skillet handles attributed to Thomas Sturton I in Leicester Museum with 'THOMAS STURTON 1651' cast on the handle (Eveleigh

1994, fig. 7; Butler and Green 2003, 101); to Thomas II with 'TS 1654' (Butler and Green 2003, 105, cat. no. 92); and to Francis Sturton II, with 'THOMAS STURTON' cast on the handle but Francis's scratch mark on the body of the vessel (Butler and Green 2003, 113, cat. no. 111).

Catalogue no. 26 bears a single whole letter 'S' plus a fragment of a preceding letter, which could be an 'A' (Fig. 20), so this fragment could represent another example of the 'THOMAS STURTON' handle inscription, or otherwise some unidentified legend.

Catalogue no. 24 certainly represents an otherwise unknown legend, reading 'ES[stop]F' or 'ES[stop]E', and with a scalloped, rather than cabled or billeted, edge (Fig. 20). Without further information (or the discovery of a

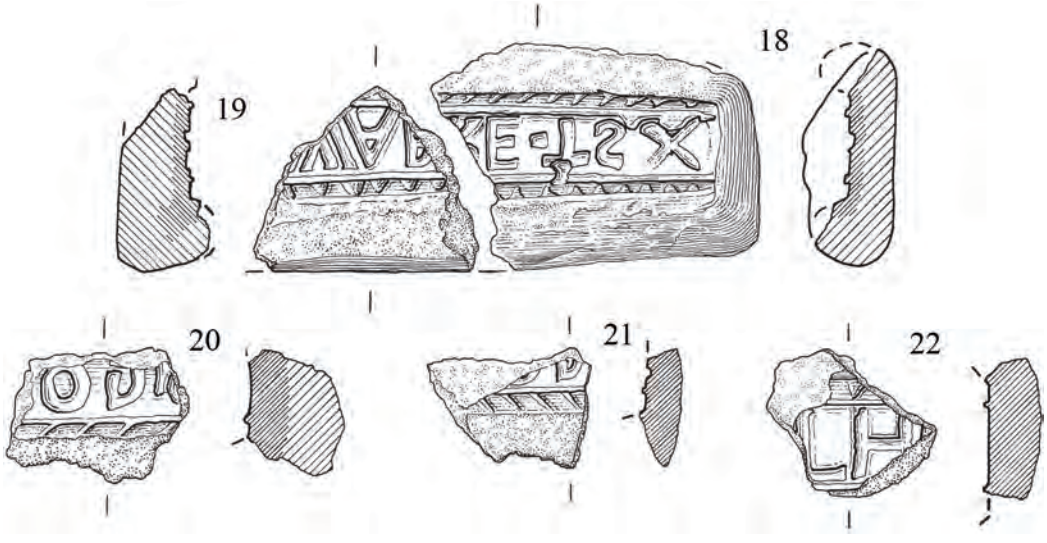

Fig. 19 Inscribed skillet handle-mould fragments nos 18-22, from the motto 'THIS IS GOOD WARE. TS'. Scale 1:2

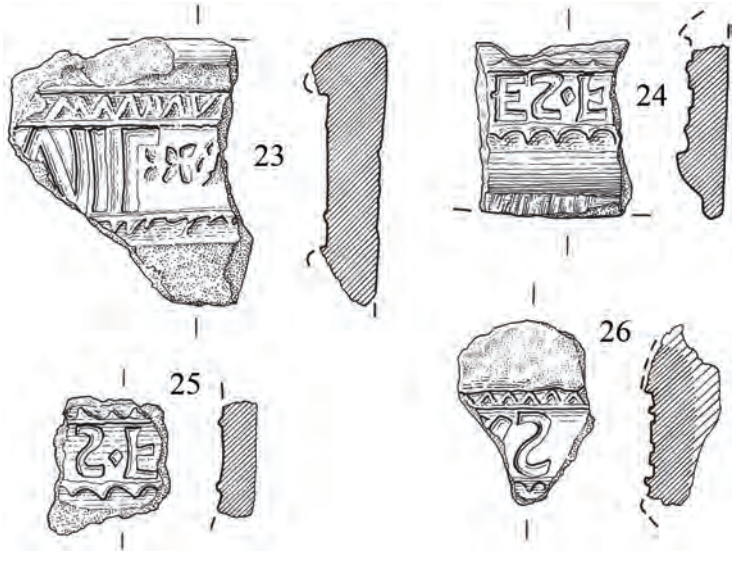

Fig. 20 Inscribed skillet handle-mould fragments; no. 23 from the motto 'WIL THIS PLES YOU'; nos 24 and 25 from an unknown motto reading 'ES.F'; no.26, possible part of 'THOMAS STURTON'. Scale 1:2

vessel with an inscription conforming to this configuration) progress on identifying this legend is unlikely to be possible. A second fragment (cat. no. 25) is probably a less well-preserved fragment of the same inscription (Fig. 20).

There is said to be at least one more motto on an undecipherable skillet handle and 'by lettering on a fragment of handle mould recovered from the foundry site at South Petherton' (Butler and Green 2006, [11: unpaginated]). This may be the fragment reading '….IDE' mentioned by Green and Butler (2005, 21-22 and Table 1), but I have not observed such a fragment in my own examination of the mould material (and this reading is now acknowledged as an error, which should not have been published, Roderick Butler, personal communication, February 2013).

No mould evidence has been observed for the type of scrolled foliage design appearing on one vessel in the Butler collection, attributed to Thomas Sturton I on the basis of its scratch marks (Butler and Green 2003, 103, cat. no. 87). Another example in a private collection is mentioned in the same source (*ibid.*) 'with scrolling handle decoration terminating with the founder's initials, TS', but is not illustrated, so it is unclear if the scrolled decoration is the same in both cases. This could be taken as providing (admittedly slight) evidence of Thomas I working elsewhere, or perhaps at least as providing evidence of the Lightgate Road installation operating mainly under the later founders.

Uninscribed skillet handles are represented by two mould fragments for plain or ribbed handles, catalogue nos 27 and 28 (compare Butler and Green 2003, 104, cat. nos 88-9). It should be noted that these fragments were originally mistaken for ribbed leg moulds, and that other similar fragments could have been similarly misidentified, especially if small. This class of skillet handle may, therefore, be under-represented in the collection as studied.

Summary of body fragments with scratch marks

The collection contains 14 fragments of cope mould with traces of incised scratch marks (Fig. 21), comprising eight fragments with identifiable initials, interpreted as marks unique to individual founders, and six fragments of the quatrefoil marks identified as the generic 'foundry mark' of the Sturtons (Butler and Green 2003, 98). Thirteen of these fragments come from the backfill of the Phase 2 quarry pits; a single fragment came from layer 19 (no. 37), infill of the Phase 1 pit 23 (perhaps significantly part of a T or I, rather than WM). No mark is complete; catalogue no. 31, consisting of the elided letters W and M, representing the founder's mark attributed to William Sturton II (*ibid.*, 98; 115), is perhaps the nearest; with catalogue nos 32-36 also representing fragments of the same mark. Catalogue no. 37 is hard to interpret, but might represent a letter 'I' or 'T', therefore the mark of John or Thomas Sturton; catalogue no. 38 probably represents a letter 'T' or 'F', therefore standing for Thomas or Francis Sturton, but neither of these is complete enough for certain identification to be possible.

Of the quatrefoil marks, the most complete is catalogue no. 39 which retains most of the mark (also illustrated in Butler and Green 2005, fig. 13). The remainder are smaller fragments consisting of single loops of the four-arc quatrefoil mark (cat. nos 40-44).

Although little significance can be read into the

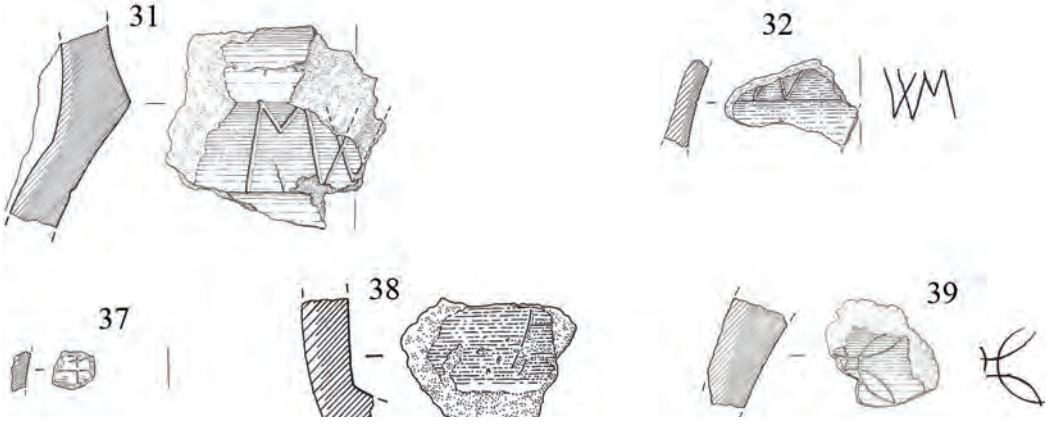

Fig. 21 Cope mould fragments with scratch marks; nos 31-32, from cauldrons with the WM of William Sturton II; no. 37 with T or I; no. 38 from the base angle of a skillet with part of the scratch mark of a T or possibly F; no. 39, from a cauldron mould with the quatrefoil mark of the foundry itself. Scale 1:4

presence or absence of given marks in such a small sample, one conclusion can be drawn from the range of marks represented: that William Sturton II is the main identifiable individual represented. Two further individuals from the remaining founders Thomas (I or II?), John and Francis are tentatively or possibly represented by single and/or uncertain fragments. William I, of course, could be represented by any of the fragmentary 'W' scratch marks where the elided 'M' is not present (catalogue nos 32-34). Although the evidence as to specific individuals other than William II is far from clear, it is certain that others are represented by scratch marks in the collection, and thus that the Lightgate Road site can be associated with more than a single founder.

Among the known vessels the motto 'FOR MY FRIEND' occurs only in association with Thomas Sturton II's mark, whereas the other three mottoes, including 'THIS IS GOOD WARE' which includes Thomas's initials, are associated with multiple founders (Butler and Green 2003, 119). On available evidence, then, Thomas Sturton II must be represented in the excavated collection as well as William (since all four of the known mottoes are represented in the mould material: above) and this tends to be supported by the presence in the collection of possible scratch marks of Thomas I or II (catalogue nos 37-38). In turn, this implies that while William Sturton II may have predominated in the mould recovered from the Lightgate Road site, other founders are represented and so the site must have accommodated more than just the workshop of William Sturton II. There is a plausible case to be made that the mottoes were standard repertoire of the whole family of founders, regardless of the 'TS' suffix on the 'THIS IS GOOD WARE' motto handle, although we are lacking a full complement of vessels with which to demonstrate this. What the vessels do show is that this motto was used by William I and Francis I (Butler and Green 2003, 119), so this interpretation is, in fact, quite likely. No motto handles are associated with William II's scratch mark among surviving vessels (*ibid.*). The occurrence of the full set of mottoes and William II's scratch marks together in the excavated mould material must strongly suggest that he, too, produced the full range of mottoes, although because of the fragmentary nature of the material such an association cannot be proven.

Method of study

The full collection of mould was sorted initially to quantify the material by number and weight of fragments, and to break it down by class of material (core vs cope, rim vs body, features, other diagnostic fragments, miscellaneous) and to make provisional selection for further study and illustration by drawing and photography. A summary breakdown is given in Table 1 (above). Following the study of the whole collection of material, 69 items (nos 7-75 in the catalogue, below), with a total weight of 4.46kg (or about 6% of the whole) were selected for more detailed recording and illustration and are presented in the catalogue that follows.

The key difference between studying this assemblage and that of other archaeological cauldron-mould assemblages is that we have multiple examples of the output of the South Petherton foundry, unambiguously identified as Sturton vessels, in the collection of the Museum of Somerset, with numerous others surviving in other collections, public and private. It was decided, therefore, to draw a representative selection of whole vessels from the museum collection, as samples of the sorts of vessels cast on the site (Figs 1-4), followed by a selection of mould fragments that showed key details of mould construction or ornament of vessels (Figs 21-26).

The mould fragments are very soft and friable, and prone to breakage and general physical damage. The finer pieces, such as handles, leg moulds, and sprue-cups, that were individually made in mould clay, tend to be better baked and a little more durable as a result. The mould was too delicate for it to be cleaned by washing, so it was slowly air dried, and then dry brushed to remove the worst of the soil. The friable and dusty nature of the material means that it cannot successful be marked (and so must always be handled with care to avoid mixing material from separate contexts). Much of the undiagnostic material was discarded after primary processing, enabling the smaller sub-group of the collection of diagnostic fragments to be considered for consolidation (a more manageable task than consolidation of the whole collection of more than 2,000 pieces). Catalogued fragments were bagged separately, with details, including provisional catalogue numbers, written on the bags.

Catalogue

The catalogue describes the whole vessels first (nos 1-6; Figs 1-4, above), followed by inscribed moulds for skillet handles and related material (nos 7-30); then cope mould fragments with scratch marks (nos 31-44); measured rim fragments and related material (nos 45-59); leg, foot, cauldron handle, and related mould fragments (nos 60-68), and ending with sprue-cups and 'lids' (nos 69-75). Of the material in the catalogue, all but two fragments were recovered from the dump of mould material in the quarry pits of Phase 2; only nos 37 and 69 came from Phase 1, being from the infilling of Pit 23.

Abbreviations: D diameter; H height; L length; RD rim diameter; Th thickness; W width; max maximum; min minimum; all measurements are given in millimetres. Diameters of body fragments are only approximate, as moulding wires are never even or concentric enough (and often the curvature of the

fragments is too small) to give accurate measurements.

For the illustrated vessels the Museum of Somerset accession numbers are given in the catalogue entries. Vessels in the Butler collection are identified by the general accession number TTNCM 187/2004, with a sub-number being the catalogue number of the individual vessel as published in the handbook to the collection (Butler and Green 2003). The excavation finds from the site at Lightgate Road, South Petherton have the accession number TTNCM 159/2004.

Selected vessels from the Sturton foundry in the Museum of Somerset

Fig. 1

1. Large cauldron dated 1675 with the initials 'T B' separated by an inverted heart shape, both initials and date surrounded by borders of undulating lines (note the traces of alternative form and position of the digit '5'); scratch marks of Francis Sturton I (initial letter 'F' and quatrefoil mark). RD 380mm; Max D 440mm; H 370-80mm. TTNCM 187/2004/106.

Fig. 2

2. Medium cauldron with the scratch marks of William Sturton II (ligatured initials 'WM', the strokes of the 'M' vertical, and quatrefoil mark). RD 308mm; Max D 348mm; H 248mm. TTNCM 187/2004/114.

3. Small cauldron dated 1671 with the inscription 'I P' on one side and the scratch marks of William Sturton II on the other (ligatured initials 'WM', the strokes of the 'M' inclined, and quatrefoil mark). RD 170mm; Max D 190mm; H 126mm. Legs worn to points (as is often the case); repaired hole beneath the right-hand-side handle (as drawn). TTNCM B.1.

Fig. 3

4. Large skillet dated 1669 with the initials 'I' 'D' and 'B' (superimposed on a quatrefoil, perhaps in error), scratch marks of Thomas Sturton II (ornate initial 'T' and quatrefoil mark), and bearing the inscribed-motto handle 'WIL THIS PLES YOU'. RD 252mm; H 124mm; L of handle 288mm; Max W of handle 42mm (above 'W' of inscription); L of legs c. 100mm. TTNCM 43/2006. This piece was acquired from a resident of South Petherton in 2006 (S. Minnitt, personal communication). There is presumably a chance that it has been in the town since it was made, and that a couple with the initials 'I' and 'B D' who were married in 1669, might be identifiable in the parish. This would therefore be a good candidate for trying out the theory that such grouped initials represent marriage gifts (Butler and Green 2003, 12), but for the fact that there is a gap in the surviving parish registers between 1668 and 1676 (King 1938, 274).

5. Small skillet bearing the inscribed-motto handle 'FOR MY FRIEND' and scratch marks of Thomas Sturton II (ornate initial 'T' and quatrefoil mark). RD 154mm; H 78mm; L of handle 185mm. TTNCM 187/2004/99.

Fig. 4

6. Large skillet dated 1674 with the initials 'I' 'A' and 'F', both date and initials surrounded by borders of undulating lines (note the faint traces of the digits '16' beneath the '67' of the final date, presumably the remains of a setting-out error); scratch marks of Thomas Sturton II (ornate initial 'T' and quatrefoil mark). The handle bears inscribed ornament consisting of a run of five quatrefoils followed by the initials and date 'TS 1654'. This discrepancy of 20 years between the dates on the handle and the body of the vessel, presumably shows that the stamps or patterns used for handle designs remained in use for many years. The inner end of the handle is very worn and bears an unreadable series of worn strokes for c. 120mm (which are, however, certainly not further quatrefoils). RD 265mm; H 125mm; L of handle 300mm. TTNCM 187/2004/92. This vessel seems to have a row of chaplet-sized blemishes in the metal at just above the half-way point of the height of the body. If so, this would seem to disprove the assertion that chaplets were not used in the casting of skillets (Butler and Green 2003, 26); perhaps they were only employed in casting larger vessels.

Moulds for inscribed skillet handles

In the illustrations that follow, the inscribed mould fragments have been drawn with the lettering upside down, so the mottos read left to right, as on the illustrations of the complete vessels (Figs 17-20, 22).

Fig. 17 'THOMAS STURTON' and 'FOR MY FREIND'.

7. Skillet handle mould fragment with the inscribed legend 'AS ♥ [heart stop]'. Dimensions: L 45mm; W 43mm; Th 10-11mm; W of handle 29mm (the same above the 'A' and the heart stop); weight: 18g. The legend is almost certainly interpreted as '[THOM]AS♥[STURTON]' which appears on some extant vessels, most notably Butler collection cat. no. 103 (Butler and Green 2003, 109). This is attributed to Thomas Sturton II (?1629-83). As such this is one of the rare examples of an archaeological find providing internal documentary evidence to identify the occupants of a site.

8. Skillet handle mould fragment, with the inscribed legend 'FOR M'. Dimensions: L 61mm; W 62mm;

D 22mm thickening to 38mm at inner end; W of cast surface 27-31mm; weight: 73g. The legend would appear to be a fragment of the motto 'FOR MY FRIEND' (see also nos 9, which it joins, and 10, below). A very interesting piece in terms of the mould – as it preserves the end of the mould near to its junction with the body of the vessel, where the mould thickens considerably, complete with extra luting clay to reinforce the joint. It is highly likely that this fragment originates from the same pattern as the second fragment of the same motto (no. 10, below). Although no physical join survives between the two pieces, they have similar composition and colouring, and match closely in their dimensions.

9. Skillet handle mould fragment, with the inscribed legend 'Y FRE'. Dimensions of mould: L 57mm; W 51mm; W of cast surface 25-27mm; weight 40g. The legend is another fragment of the motto 'FOR MY FRIEND' (see also no. 8, above, which it joins, and 10, below), except that in this case the final word is spelt 'FREIND'. The legend occurs only in Thomas Sturton I skillets according to Butler and Green (2003, 108, 119). As yet there is no example of the variant spelling known on a surviving vessel. Since this reading has been doubted by some observers, it is worth noting that the spelling 'Freind' was in common use in the 17th century (see the OED). An example may be drawn from the correspondence of William Laud, Archbishop of Canterbury (1573–1645), in a recently-published edition (Fincham 2018). Laud was in the habit of signing off his letters with the phrase 'your loving freind' or similar; poignantly, in one of his very last letters, 'your dyeing freind'. Of the 223 letters published in the volume Laud uses the word friend in 194. Spellings are split more or less equally between 'Frend' (63 examples), 'Freind' (63 examples), with 'Friend' forming a slightly less common spelling (47 examples, more towards the end of WL's life than earlier, perhaps a sign that this spelling was becoming more established?). Other variants were less common: 'freinde' (used 18 times); 'Friende' (twice) and 'frende (once). This really provides as good an example as one could wish for of the variability and mutability of 17th-century spelling in precisely the right context, and at the very highest intellectual and social level.

10. Two joining skillet handle mould fragments, with the inscribed legend 'IND [plus a quatrefoil stop]'. Dimensions: L 79mm; W 51mm; Th 22mm; W of mould handle at end 19mm; W of mould at widest surviving point 24mm; weight: 54g. The legend is another fragment of the motto of 'FOR MY FREIND' (compare no. 9, above); and this piece could, in theory, complete the legend represented by the fragments 8 and 9 (above). Although no physical join exists between the two fragments, and they are from different contexts, so the two probably represent different moulds. The beginning of the curve of the back of the handle survives in the flange on one side of the mould. This is a relatively rare survival as this part was invariably broken on extraction of the casting; i.e. the mould broke away more easily from the flat inscribed surface than from the curved surface, which perhaps thus suffered more during extraction. It should be noted that this example is a different pattern to the single example of a skillet with this motto published by Butler and Green (2003, 108, 201, cat. no. 99), as it has a quatrefoil stop at the end of the motto. Alternatively, the published example (which appears to be the only example of a handle with this motto in the Butler collection) could presumably have been damaged by having the end of the handle removed and re-worked. There is nothing against this in the object itself, and the border does not continue around the rounded end of the handle, which simply frames the end of the 'D' of the legend (Fig. 3).

Fig. 18 'BEE CONSTANT'

11. Skillet handle mould fragment with the inscribed legend 'CON'. Dimensions: L 56mm; W 60mm; Max Th 22mm; W of flange on 'top' side 18mm; W of flange on 'lower' side 11mm; W of handle above 'C' c. 30mm; W of handle above 'N' c. 27mm; weight: 45g.

12. Skillet handle mould fragment with the inscribed legend 'TANT' plus the remains of a quatrefoil stop at the end. Dimensions: L 81mm; W 49mm; Max Th 18mm; Th of centre 14mm; W of flange on 'top' side 15-20mm; W of handle above first 'T' c. 27mm; W of handle above final 'T' c. 22mm; weight: 47g.

13. Skillet handle mould fragment, with the inscribed legend 'CON'. Dimensions: L 67mm; W 60mm; widening at end (nearing the body of the vessel) to 64mm; Th 28mm; W of handle impression 28-29mm at each end of the fragment; weight: 64g. Like no. 10, this mould retains a fragment of the curve of the rear surface of the handle.

14. Skillet handle mould fragment, with the inscribed legend 'ONS'. Dimensions: L 56mm; W 60mm; Th 23mm; W of handle impression 27-28mm; weight 49g.

15. Skillet handle mould fragment, with the inscribed fragment consisting of a part of a 'T' and an 'A'. Dimensions: L 23mm; W 33mm; Th 16mm; weight: 9g. This piece could be a part of no. 13, but not of no. 14, although none of the pieces joins.

16. Three joining skillet handle mould fragments with the inscribed legend '[S]TANT [plus two quatrefoil stops]'. Dimensions: L 110mm; W 58mm; Th 23mm; W of handle at end (not quite the true end,

the nearest measurable point): 24mm; W of handle at broken end: 28mm; weight: 86g.

17. Skillet handle mould fragment, with the inscribed legend 'TA' and a fragment of the S surviving before the T. Dimensions: L 50mm; W 52mm; Th 18mm; W of handle above 'T' c. 27mm; weight 31g.

Fig. 19 'THIS IS GOOD WARE. TS'

18. Skillet handle mould fragment, with the inscribed legend 'RE [diamond stop] TS [quatrefoil stop]'. Dimensions: L 85mm; W 50mm at end, 62mm at bottom end; W of handle at end 24mm; ditto at broken end, above 'E' of inscription 28mm; weight 67g. Direct join to no. 19, adding more to the legend.

19. Skillet handle mould fragment, with the inscribed legend 'WAR'. Dimensions: L 59mm; W 50mm; Th 24mm; no W of handle preserved (Min W 28mm); weight 41g. Joins no. 18.

20. Skillet handle mould fragment, with the inscribed legend 'OD'. Dimensions: L 47mm; W 34mm; Th 26mm; no W of handle preserved; weight 29g.

21. Skillet handle mould fragment, with cabled border, but only fragments of the (unidentified) inscribed legend (the edge of two characters, without enough to read). Close examination of the fragment when making a rubbing suggested that the two characters could be parts of 'O' and 'D' from 'THIS IS GOOD WARE [stop] TS' (compare no. 20, with which this fragment compares very closely when juxtaposed). Dimensions: L 42mm; W 31mm; Th 11mm; no W of handle preserved; weight 11g.

22. Skillet handle mould fragment, with the inscribed legend 'TH'. Dimensions: L 43mm; W 38mm; Th 13mm; no W of handle preserved; H of letter 'H' c. 21mm; weight 17g. Could be part of the skillet handle legend 'THIS IS GOOD WARE [STOP] TS' or of 'WIL THIS PLES YOU', in view of the size of the characters more probably the former.

Fig. 20 'WIL THIS PLES YOU' and unidentified mottos

23. Skillet handle mould fragment with the inscribed legend 'WIL' and a quatrefoil stop. Dimensions: L 60mm; W 71mm; Th 21mm; W of handle above 'L': 40mm; weight: 54g. The legend is a fragment of the motto 'WIL THIS PLES YOU'; it matches the inscription on the handle of an example in the Butler Collection (Butler and Green 2003, 113, cat. no. 112) exactly in width: 39mm above the vertical of the 'L', very slightly less than the mould, which presumably is to be accounted for by wear, or shrinkage (or both?). A particularly broad handle (and this motto is said to occur on the largest of the size-graduated set of skillets, with a rim diameter of 235mm and a capacity of 6¾ pints: Butler and Green 2003, 108, 201; see also no. 4, above and Fig. 3), with a zig-zag border rather than a billeted, cabled or ribbed one. The impression, presumably from a wooden pattern, appears to be very worn and/or shallow.

24. Skillet handle mould fragment with the inscribed legend 'ES [diamond stop] F'. Dimensions: L 40mm; W 45mm; Th 13mm; W of handle (approx: very edge broken): 27mm; weight: 22g. The legend probably reads 'ES[stop]F' or conceivably 'ES[stop]E', and does not appear to fit any of the existing/established Sturton legends, and moreover is not transcribed in Green and Butler (2005, 22). The border also appears to be different in that it is a series of semicircular impressions, giving a scalloped edge, rather than the typical (and otherwise near ubiquitous) billet, cable or ribbed patterns. The final character is certainly not readable as a 'Y', i.e. as the end of 'WIL THIS PLES YOU', the motto which incorporates the only combination of the letters 'ES' in the known corpus. Could the 'F' be an initial for Francis Sturton I (1640-98) or II (b. 1672)? There are no documented examples of these initials on a skillet handle (as opposed to the scratch marks on the body of the vessels), but the precedent of the 'THIS IS GOOD WARE [stop] TS' motto could be cited as supporting this. Equally the use of diamond-shaped stops to separate words of the inscriptions could be used to argue that what we see here is simply the gap between two words of an inscription. This fragment has been consolidated.

25. Skillet handle mould fragment, with fragment of unidentified inscribed legend. Dimensions: L 30mm; W 36mm; Th 10mm; no W of handle preserved; H of 'S' (the one complete character) c. 15mm; weight 12g. Small and worn, but the letter 'S' is legible with a diamond stop after it, then a character either 'F' or 'E', so quite probably a fragment of the same unidentified legend as cat. no. 24, above. The border again very worn but could be a similar 'scalloped' design as is well preserved in no. 24.

26. Skillet handle mould fragment with the inscribed legend consisting of a single letter 'S', with a fragment of a preceding letter, possibly an 'A', therefore probably either a fragment of a 'Thomas Sturton' inscribed handle (compare no. 7, above), or of an unidentified legend. Dimensions: L 37mm; W 50mm; Th 20mm; W of handle above 'S' 17mm; weight 20g.

Fig. 22 Skillet handle moulds with plain ribbed decoration

27. Skillet handle mould fragment with plain (uninscribed) ribbed decoration. Dimensions: L 60mm; W 54mm; Th 16mm; W of handle 24-27mm; weight 39g. Possibly a (non-joining) fragment of

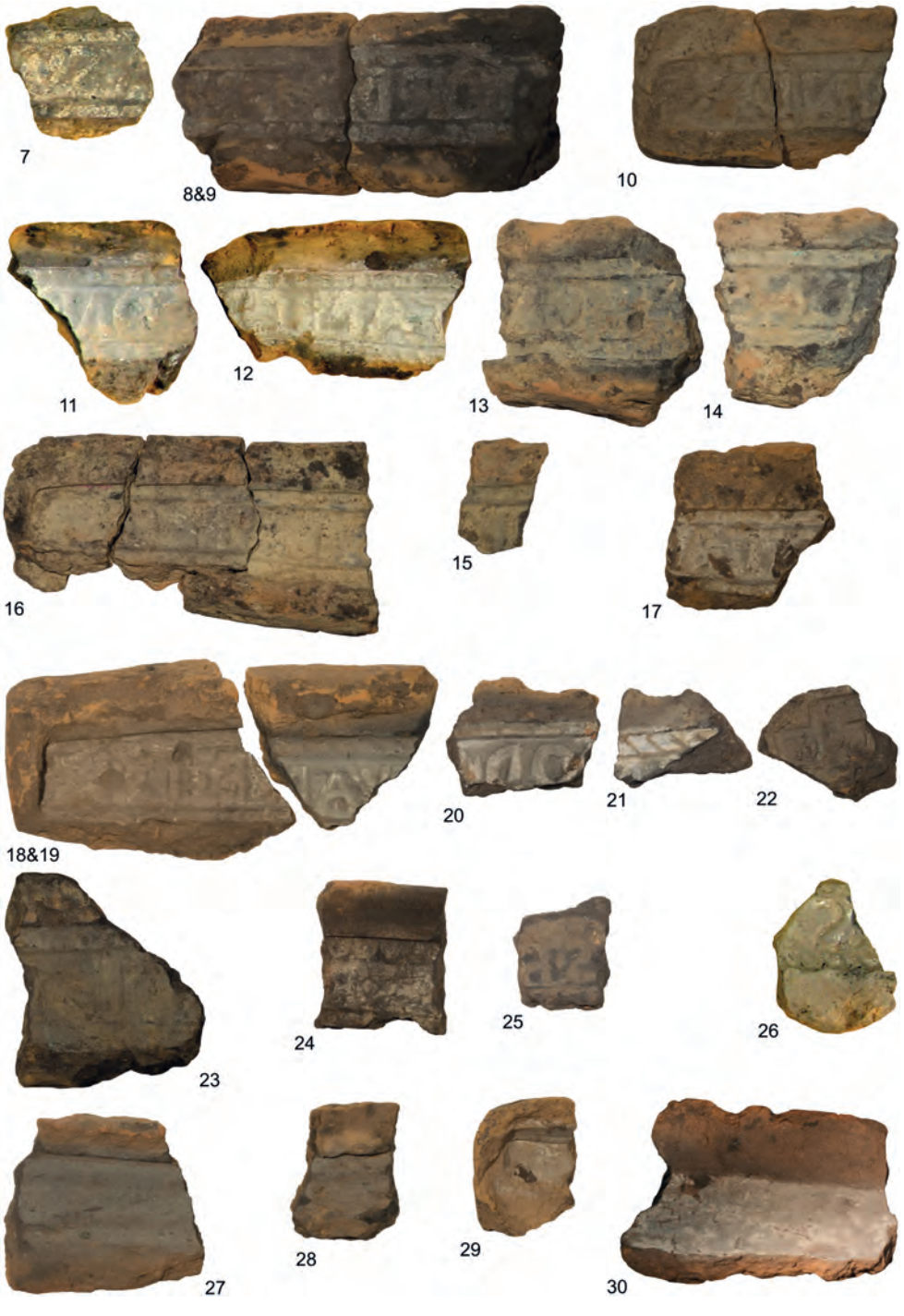

Fig. 22 Photographs of 19 mould fragments from inscribed skillet handles (cat. nos 7-26) and related material: ribbed skillet handles (nos 27-28), and rear surfaces of skillet handles (nos 29-30). Scale approximately 1:2

the same handle as no. 28, although the fact that the two fragments have the same minimum widths tends to argue against this.

28. Skillet handle mould fragment with plain (uninscribed) ribbed decoration. Dimensions: L 33mm; W 41mm; Th 13mm; W of handle c. 24mm; weight 12g. Possibly a (non-joining) fragment of the same handle as no. 27.

29. The end of a skillet handle mould, showing the lower rounded face. Dimensions: L 31mm; W 46mm; Th 24mm; W of handle c. 22mm; surviving L of handle 20mm; weight 17g.

30. Fragment of the rear of a skillet handle mould (or possibly a large plain leg mould?). Dimensions: L 84mm; W (max) 57mm; Th 7-21mm; weight 75g.

Cope body fragments with scratch marks

Fig. 21

31. Large rim/upper body fragment of cope mould, extending from just below the moulding wire to just short of the rim of the vessel. Spans the junction of the shoulder and rim, at which point moulds are almost always broken (because of the relative thinness at this point and the stresses on the mould as it was broken off the finished casting). A profile spanning the junction is therefore a rare survival. Includes the greater part of a scratch mark consisting of a ligatured 'WM' stretching from the moulding wire to the top of the shoulder. The outside surface contains the remnants of a jacket of luting clay, suggesting that the fragment is close to the join in the mould or a handle mould that was sealed in with such clay. Dimensions: W 113mm; H 110mm; typical Th 24-53mm (including the additional luting clay); H of scratch mark 59mm; W of scratch mark 60mm (minimum); weight 331g. The fragment has been consolidated.

32. Cope mould body fragment with moulding wire and inscribed scratch mark fragment consisting of part of the 'W', presumably of a 'WM' mark. Dimensions: D at moulding wire c. 300mm; W 140mm; H 99mm; Th 20-27mm; W at base of scratch-mark (i.e. base of 'W') 35mm; Max H (surviving) of scratch-mark 40mm; weight 193g. Right hand edge of fragment preserves a length of the edge of the mould, with slight thickening of the fragment on the outside face representing sealing of the seam in the mould with luting clay.

Fig. 23

33. Fragment of cope body mould with part of a scratch-mark surviving, part of the 'W' of 'WM'. Dimensions: Diameter not measurable, other than to guess that it is the region of c. 200-220mm; W 53mm; H 26mm; Th 19mm; scratch-mark c. 20mm wide (half of the 'M' preserved was 10mm wide); and c. 40mm high; weight 15g.

34. Cope mould body fragment with moulding wire and inscribed scratch mark fragment consisting of part of the base of a 'WM' mark. Dimensions: D at moulding wire c. 320mm; W 81mm; H 60mm; Th 18mm; W at base of scratch-mark (i.e. base of 'W'/junction with 'M') 33mm; Max H (surviving) of scratch-mark 12mm; weight 64g.

35. Cope mould body fragment with fragment of inscribed scratch mark consisting of part a 'WM' mark. Dimensions: no D measurable; W 43mm; H 40mm; Th 26mm; Max H (surviving) of scratch-mark 28mm; weight 27g.

36. Cope mould body fragment with moulding wire and inscribed scratch mark fragment consisting of a single vertical stroke, probably part of the 'M' from a 'WM' mark. Dimensions: D at moulding wire uncertain, c. 360-380mm; W 112mm; H 70mm; Th 24-35mm; Max H (surviving) of scratch-mark 20mm; weight 141g.

Fig. 21

37. Cope mould body fragment with fragment of inscribed scratch mark consisting of part a 'T' or 'I' mark. Dimensions: no D measurable; W 47mm; H 42mm; Th 18mm; weight 24g.

38. One fragment of cope body mould consisting of the angle of the turn of the base up to mid-way point of the profile. Dimensions: Body diameter c. 140mm; W 92mm; H 75mm; Th 17-26mm; H of profile preserved 48mm; weight 108g. Diameter is small (c. 140mm), and in view of this and the vertical nature of the profile this is judged to be probably a fragment of a skillet mould. There is a poorly preserved scratch-mark, probably the base of a 'T' or conceivably part of an 'F'.

39. Cope mould body fragment with quatrefoil scratch mark, just a little more than half of the mark is present. Dimensions: H 63mm; W 53mm; Th 31mm (max); approximate H of scratch mark 42mm; weight 63g. The fragment has been consolidated.

Fig. 23

40. Cope mould body fragment with moulding wire and part of an inscribed quatrefoil scratch mark. Dimensions: no D measurable; W 67mm; H 83mm; Th 19-37mm; L of one 'arc' of mark 35mm; reconstructed W of full mark c. 70mm; weight 126g.

41. Cope mould body fragment with trace of moulding

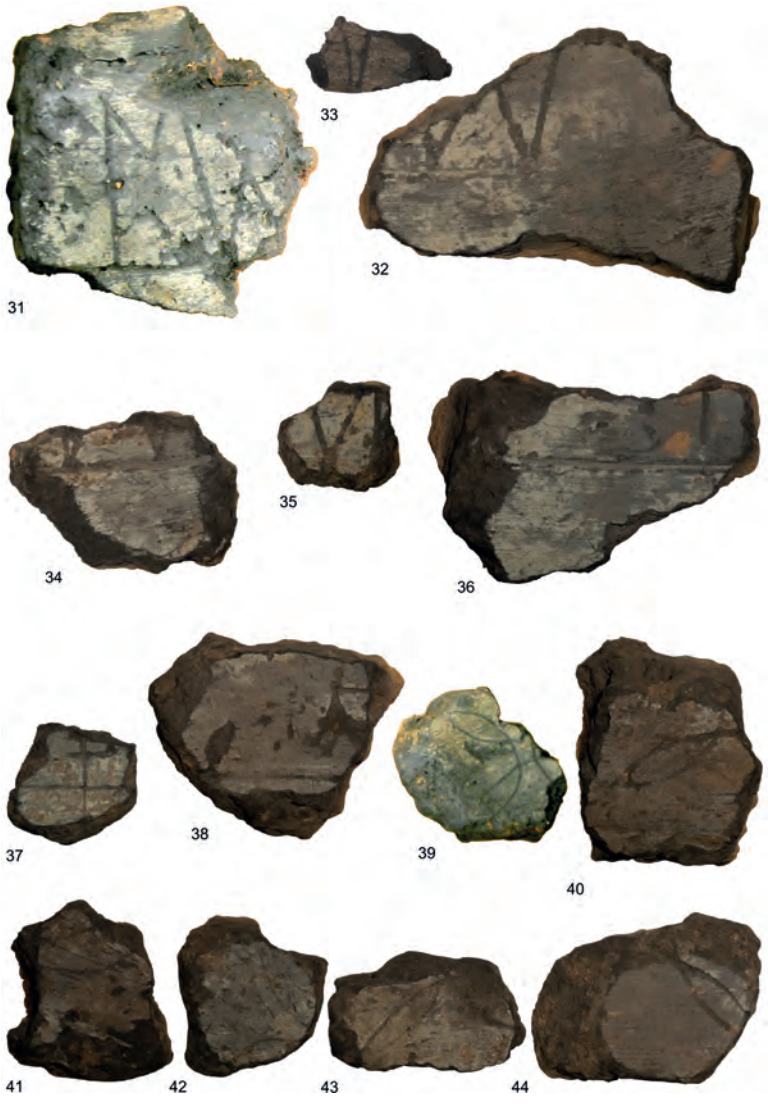

Fig. 23 Photographs of 14 cope-mould fragments with inscribed foundry marks ('scratch marks'), initials (above, catalogue nos 31-38); quatrefoils (below, nos 39-44). Scale approximately 1:2

wire and part of an inscribed quatrefoil scratch mark. Dimensions: no D measurable; W 60mm; H 59mm; Th 18-24mm; weight 46g. Incised line thinner than usual.

42. Cope mould body fragment with part of an inscribed quatrefoil scratch mark. Dimensions: no D measurable; W 54mm; H 57mm; Th 18-23mm; L of one 'arc' of mark c. 36mm; weight 46g. Surviving part of inscribed mark consists of two arcs; lines of quatrefoil are markedly thinner than average.

43. Cope mould body fragment with part of an inscribed quatrefoil scratch mark. Dimensions: no D measurable; W 70mm; H 45mm; Th 27mm; L of one 'arc' of mark 40mm; reconstructed W of full mark c. 70mm; weight 55g. Two arcs of the mark are present.

44. Cope mould body fragment with part of an inscribed quatrefoil scratch mark. Dimensions: no D measurable; W 82mm; H 59mm; Th 21mm; weight 65g.

Measured rim moulds (cope and core), identifiable skillet mould fragments and other miscellaneous body mould

Fig. 24

45. Fragment of cope rim and upper body mould. Dimensions: RD 280mm; W 104mm; H 73mm; Max Th 33mm; weight 156g. One arc of a possible quatrefoil scratch-mark present against the broken edge (uncertain).

46. Two joining fragments of cope rim and upper body mould. Dimensions: RD 280mm; W 154mm; H 92mm; Max Th 42mm; weight 296g (234g + 61g). Thicker on one side than the other, suggesting the left-hand side (as viewed from the front) was

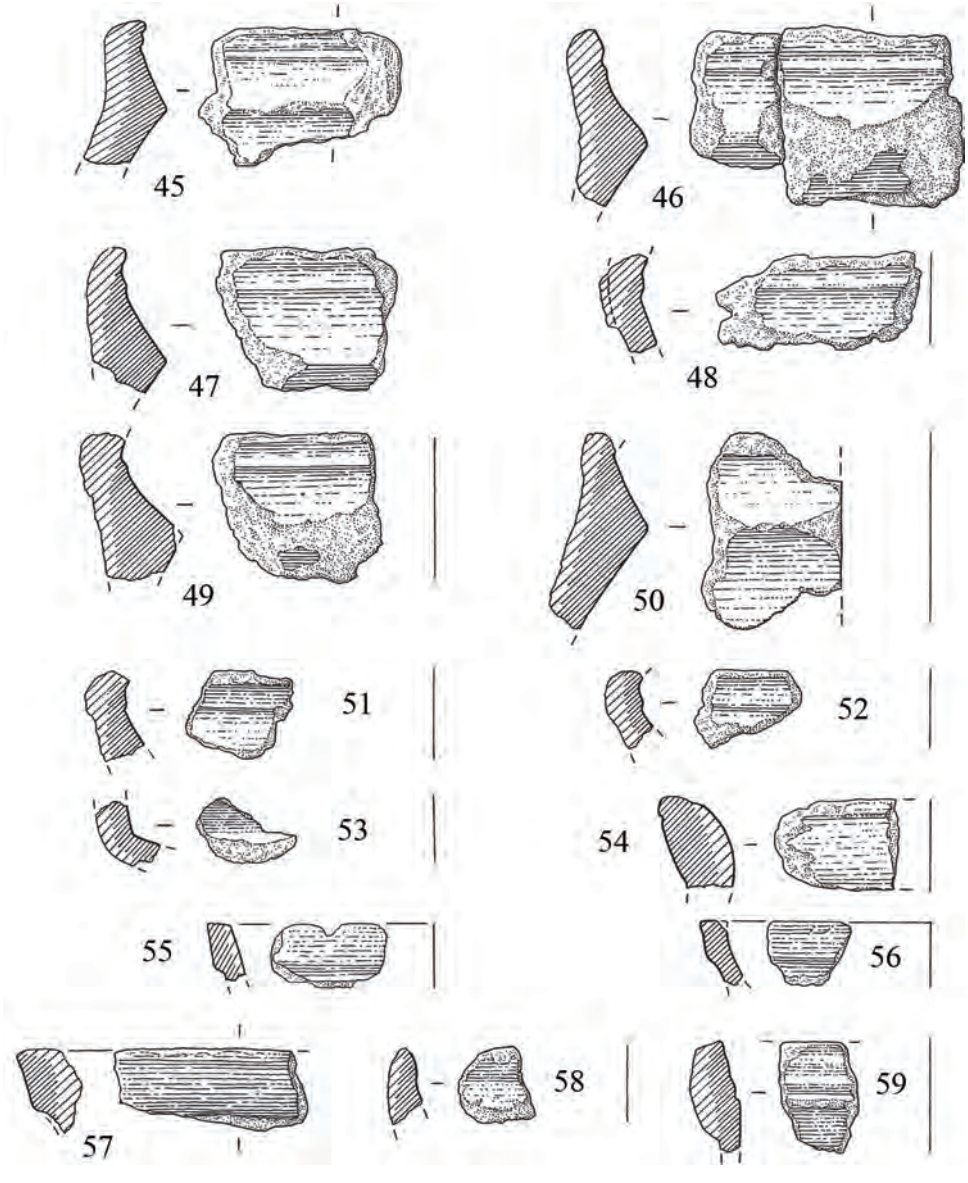

Fig. 24 Cauldron cope rim fragments nos 45-52, and core rim fragment no. 54. Skillet cope fragment, no.53, base angle, skillet core rim fragments nos 55-57 and cope rim fragments nos 58-59. Vertical lines show the probable radius of the vessel. Scale 1:4

approaching a handle mould, and the additional thickness represents luting clay.

47. Fragment of cope rim mould. Dimensions: RD 320mm; W 96mm; H 73mm; Max Th 35mm; weight 140g. Just preserves the turn from the rim to the shoulder of the vessel.

48. Fragment of cope rim mould. Dimensions: RD 320mm; W 117mm; H 54mm; Max Th 27mm; weight 95g. Prominent registration mould.

49. Fragment of cope rim mould. Dimensions: RD 340mm; W 86mm; H 82mm; Max Th 37mm; weight 150g. Just preserves the turn from the rim to the shoulder of the vessel.

50. Fragment of cope and upper body rim mould. Dimensions: RD [not measured]; W 77mm; H 106mm; Max Th 46mm; weight 185g. Quite a lot of the profile preserved, and one edge of the half-mould, represented by a straight left-hand edge to the fragment. The rear of the fragment is thickened towards this edge, where luting clay has been applied to cover the seam in the mould.

51. Fragment of cauldron cope rim. Dimensions: RD c. 300-320mm; W 57mm; H 47mm; Th 22-25mm; weight 39g.

52. Fragment of cauldron cope rim. Dimensions: RD hard to measure, but possibly c. 300mm; W 55mm; H 40mm; Th 18mm; weight 28g.

53. Small cope mould fragment with the turn of a base profile preserved, probably from a skillet mould, since the angle of the profile is quite tight. Dimensions: Max D c. 140mm (certainly not much more); W 53mm; H 36mm; Th 15-18mm; weight 22g. Wipe marks on the casting surface of the mould indicates the orientation of the fragment in relation to the vessel (concentric marks on the 'base'; parallel marks on the 'body'). This indicates that the wall of the vessel was nearly vertical, and it thus is likely to represent a skillet rather than a cauldron. [It is possible that these fragments of skillet mould might be from the ?earlier type of Thomas I Sturton skillet with a flared rim and a more convex base. The potential interest of being able to demonstrate the difference in profile justifies drawing this piece albeit that it represents a very small part of the profile.]

54. Core mould rim fragment for a cauldron, with a distinctive 'bead-type' registration moulding. Notable for coming from a vessel with a fairly narrow rim, c. 40mm, and for preserving the turn at the base of the rim to the shoulder of the vessel (a point at which the moulds are nearly always broken). Dimensions: RD c. 280-300mm; W 66mm; H 51mm; Th 34mm; weight 68g.

55. Core mould rim fragment consisting of just the registration moulding and the beginning of the profile of the rim of the vessel, but of similar profile to the flared profile, no. 56, therefore probably from a skillet mould with a flared rim. Dimensions: RD c. 160mm; W 61mm; H 37mm; Th 20mm; H of registration moulding (flat profile) 25mm; weight 27g. The base of the registration moulding contains a V-shaped nick, perhaps with a function in mould assembly.

56. Core mould rim fragment with a distinctively flared profile, possibly from a skillet mould with a flared rim. Dimensions: RD c. 140mm; W 45mm; H 35mm; Th 15mm; H of registration moulding (flat profile) 20mm; weight 14g.

57. Core mould rim fragment consisting of just the registration moulding and the beginning of the profile of the rim of the vessel. Dimensions: RD c. 220mm; W 95mm; H 45mm; Th 23-30mm; H of registration moulding (flat profile) 35mm; weight 88g. Of similar profile to the other examples (nos 55 and 56), but considerably larger; again possibly from a skillet mould with a flared rim.

58. Fragment of skillet cope rim mould, rather tiny, but does represent a mould rim. Dimensions: RD hard to measure, but possibly c. 240mm; W 40mm; H 39mm; Th 18mm; weight 19g. One of only two such pieces identified; thus drawn, although too small to show much of the profile (compare no. 59, below).

59. Fragment of skillet cope rim mould. Dimensions: RD hard to measure, but possibly c. 240-260mm; W 40mm; H 58mm; Th 22-24mm; weight 38g.

Leg, foot, cauldron handle and related mould fragments

Fig. 25

60. Complete leg mould (from a failed casting, therefore preserving the form of a leg nearly to the point where it is broken off at the body of the vessel). Dimensions: H 115mm; W 80mm; De 50mm; surviving void for leg: H 102mm; W 32mm; De 15mm; weight 235g. An extremely informative fragment (a) for showing the form of a more-or-less complete leg; (b) for showing the mould-making technique. In the latter category the key points are that the leg moulds were closed at the bottom (i.e. top during casting), that the mould was made as a 'box', with walls c. 8-10mm thick, then luted into the main mould; sealed with a thickness of luting clay of 20-34mm. The fragment shows the five-ribbed form of leg, the collar articulating the base of the leg, and a fragment of wall of the vessel mould adjacent to the central rib at the top of the mould, marking the transition to the body of the vessel.

61. Fragment of leg mould, showing the base of the foot

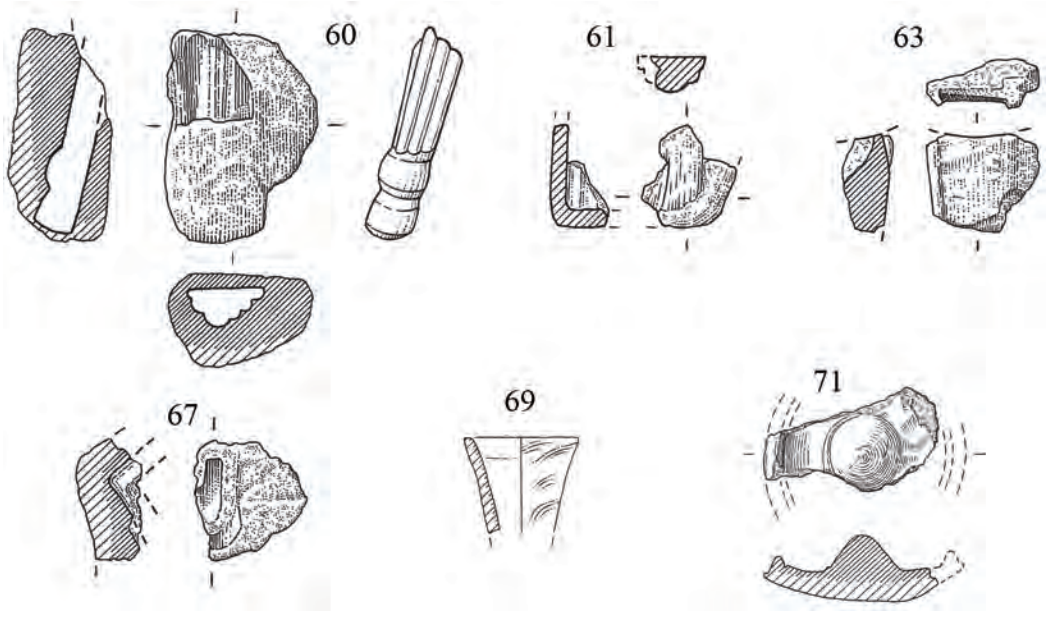

Fig. 25 Mould fragments for legs nos 60, 61 and 63 and cauldron handle no. 67. Sprue-cup fragments no. 69 and 'lid' no. 71. Scale 1:4

in plan. Dimensions: L 52mm; W (max) 50mm; De (front to back) 33mm; Approx W of leg at back (reconstructed) 28mm; Surviving H of leg 40mm; weight 29g. Half of the leg is preserved, showing the broad front rib and narrower side ribs to one side. The form can be reconstructed in full in plan. This fragment, along with no. 60, is important for showing that the South Petherton legs were cast with closed leg moulds (and were therefore filled through a single, centrally placed sprue-cup).

Fig. 26

62. Fragment of leg mould, showing the ribbed form of the leg and a fragment of the collar marking the base. Dimensions: L 75mm; W (max) 59mm; Th 33mm; surviving H of leg 64mm; weight 79g.

Fig. 25

63. Fragment of leg mould showing the flat rear face of the leg with a fragment of the return to the exterior surface of the vessel at the top (see the top view in Fig. 25). Dimensions: H 51mm; W 60mm; De 26mm; W of leg 35mm at top (at junction with the body of the cope mould); 29mm at bottom (broken); weight 44g.

Fig. 26

64. Fragment of leg mould, showing the central rib of the leg and the transition to the body of the vessel. Dimensions: L 53mm; W (max) 54mm; Th 23mm; weight 44g.

65. Fragment of cauldron cope mould with a moulding wire and the lower half of a cauldron handle. Dimensions: approx. diameter at moulding wire: c. 240mm; H 70mm; W 43mm; Th 27mm; surviving L of handle 38mm; weight 49g. Important for showing the relationship of the handle to the shoulder of the vessel in a fairly small cauldron (the handle springing from the wall of the vessel only c. 18mm above the moulding wire).

66. Fragment of cauldron handle mould, showing the angle of the handle. Dimensions: H 48mm; W 30mm; Th 25mm; surviving L of handle 35mm; weight 17g.

Fig. 25

67. Fragment of a cauldron cope mould, showing the 'elbow' of a cauldron handle and the jacket of luting clay around it. Dimensions: W 57mm; H 65mm; Th 35mm; L of handle 40mm; approximate diameter of handle c. 17mm; weight 62g. Just a tiny fragment, no more than 5 x 12mm, of the surface of the vessel shoulder(?) or rim(?) survives. Although this is a tiny fragment it does present a drawable profile, and contributes to the cumulative picture of mould-making technique at this foundry. It also

Fig. 26 Photographs of selected mould fragments, details including legs (cat. nos 60-64); cauldron handles (nos 65-68); sprue-cup fragments (nos 69-70); and 'lids' (nos 71-75). Scale approximately 1:2

enables the length of one 'arm' of the handle to be established – 40mm – and thereby a good deal of further information about the size of this vessel to be gleaned. The original thickness of the handle mould is visible, showing that it was made as a separate mould in thin mould clay (thickness of the wall c. 6mm), inserted into the main mould, and then sealed in with luting clay.

Fig. 26

68. Fragment of cauldron handle mould, showing the thin wall of the mould. Dimensions: L 28mm; W 25mm; Th 12mm; surviving L of handle 21mm; diameter of handle 15mm; weight 4g.

Sprue-cups and lids

Fig. 25

69. Two joining fragments of sprue-cup in mould clay. Pit 23. Dimensions: RD c. 60mm; H 55mm; W 43-60mm; Th 5-7mm; weight 35g (19+16g). Flared profile curving out markedly at the rim. Rather better baked than most fragments, presumably because of the thin walls. Interior surfaces heavily

reduced to dark grey-black. There are dribbles of surplus metal adhering to the inside surface of the mould fragments.

Fig. 26

70. Five non-joining fragments of sprue-cup in mould clay. Dimensions: varied (not individually given); one fragment is 82mm high without either rim or join to mould, showing the potential height of the sprue-cups (which must always have been slightly greater than the length of the legs). Rim fragments are flared out (typical diameter c. 60mm); body fragments have more vertical sides (typical diameter c. 40-50mm).

Fig. 25

71. Lid fragment with flanged rim and central nipple, or boss. Dimensions: diameter c. 120mm; L 97mm; W 53mm; Th 13mm; diameter of nipple 40mm; H of nipple 24mm; Max H of object 35mm; weight 77g. Convex 'lower' surface (oxidised); concave 'upper' surface, bearing flange and nipple (reduced). Similar fragments have been identified in previous foundries as lids to fit over sprue-cups to inhibit cooling of the metal in the mould. If this is correct then these items from South Petherton must have been used with the 'lower' (i.e. convex) surface uppermost. If not, then they must have some other function. Of mould clay, durably baked.

Fig. 26

72. Lid fragment with flanged rim and central nipple, or boss. Dimensions: diameter c. 110mm; L 72mm; W 45mm; Th 8-12mm; diameter of nipple 40mm; H of nipple 20mm; Max H of object 34mm; weight 64g. Details as no. 71.

73. Lid fragment with central nipple, or boss, no rim surviving. Dimensions: diameter unknown; L 65mm; W 59mm; Th 13mm; diameter of nipple 38mm; H of nipple 20mm; Max H of object 35mm; weight 64g. Details as no. 71.

74. Lid fragment with flanged rim and remains of central nipple, or boss. Dimensions: diameter c. 100mm; L 70mm; W 52mm; Th 11-16mm; diameter of nipple c. 40mm; Max H of object 22mm; weight 44g. Details as no. 71.

75. Lid fragment with central nipple, or boss. Dimensions: no diameter measurable; L 63mm; W 56mm; Th 11mm; diameter of nipple 40mm; H of nipple 21mm; Max H of object 34mm; weight 49g. Details as no. 71.

Discussion

This group of material is significant for the identification and study of the cauldron and skillet casting industry in South Petherton, and in South Somerset at large. The town had been identified as the likely site of the Sturton family foundry by Roderick and Valentine Butler in the course of research for the catalogue of their collection of vessels in 2001-2003, but the specific location of a foundry workshop on this site in Lightgate Road is a very significant development in the study of the industry and of this family's great contribution to it in the 17th and early 18th centuries.

The main importance of the mould collection is that it provides stratified archaeological material that enables the foundry to be linked with the Sturton family. The identification of mould fragments with scratch marks that can be related to given members of the family and parts of skillet handle moulds bearing Thomas Sturton's name and initials represent rare examples of an archaeological site yielding its own documentary evidence for the identity of its residents (for the directly comparable example of the Birdall foundry in Exeter being identified by mould fragments from inscribed skillet handles, see Blaylock 1990, 13, 43). These marks comprise those identified on vessels as the foundry mark of the Sturtons (the so-called 'four-arc mark', here termed a 'quatrefoil') and of individual members of the family in the shape of William Sturton II (born in 1636 and flourishing in the 1660s and early 1670s) and possibly of Thomas Sturton I (flourishing c. 1630-58; died in 1661) and Francis Sturton I (1640-98). The skillet handle mould with the fragment of Thomas Sturton's name in the form of AS and a heart-shaped stop, forms an equally compelling documentary link to the Sturton family. The pattern is paralleled in an inscribed handle attributed to Thomas II in the Butler collection (Butler and Green 2003, 109, cat. no. 103), although there are also records of similar handle inscriptions ascribed to Thomas I (*ibid.*, 101, 105). The third type of inscription, the motto reading 'THIS IS GOOD WARE♦TS' superficially also provides a documentary link to Thomas Sturton, although the value of this is diminished by the fact that this motto occurs in association with the scratch marks not only of Thomas, but also of Francis I and William I, demonstrating that this pattern was used by several individuals within the Sturton family business (*ibid.*, 119).

Effectively this 'documentary' evidence breaks down into several categories of reliability as information, varying according to their context: the scratch marks are deemed to be wholly reliable, since they are formed from the initials of the individual founders and there is no reason to suspect that any founder or mould-maker would

have intentionally misled us by using another's mark. The cast-in handle inscriptions, however, must take a lower degree of reliability, since they can be shown to have been used over a long period of time (compare the use of the 'TS' handle in combination with scratch marks of other founders: above). The use of a pattern bearing the date 1654 in conjunction with an applied date 20 years later on the body of the vessel (Butler collection no. 92; illustrated here in Fig. 4 as cat. no. 6) also provides a salutary lesson against attaching too much reliability to these inscribed dates. Was this a slip of the inscribing tool? Perhaps the date 1654 had some significance in the family or business history of the foundry (rather in the way firms still include foundation or other dates in their advertising)? Or does it represent the laziness of the mould-makers (and the clients), in tolerating such a wide discrepancy in the dates on a single vessel?

Subsidiary items of significance in the general interpretation of the collection comprise a number of key details relating to mould-making and the manufacture of the vessels: the evidence of leg moulds, and the details of leg casting and mould manufacture that they provide (above); skillet handle moulds; exotics, lids, and the relatively high incidence of sprue-cup/in-gate fragments and their concentration in Pit 23.

In taking an overview of the growing number of excavated vessel and bell foundries of 16th- and 17th-century date (mentioned above, Introduction), it is worth noting that the character and condition of mould is an aspect of the foundries that varies considerably from site to site, depending on details of composition of the clay from different sources and variation in mould-making technique. The South Petherton mould is especially friable, whereas that recently excavated at Crediton, for example, was (by comparison) much more solid and durable, and stood up easily to being cleaned by washing (Blaylock forthcoming).

The overall scarcity of skillet mould (other than legs and handles) in the South Petherton collection is consistent with that observed previously at Cowick Street in Exeter (Blaylock 2000, 42, 86) and a similar general scarcity observed during my examination of other collections. I have previously reflected that this is caused by a failure of recognition, or by the vagaries of survival. But, faced with the phenomenon again, I have come to the conclusion that it is more likely to be connected with the circumstances of removing these vessels from their moulds. Both the vessels themselves (in the form of the 'wiped' surfaces visible in well-preserved examples) and the occasional identifiable fragments of mould with a skillet profile (plus, of course, the many clay mould fragments for the handles with mottoes and other designs), testify that the vessels must have been made using clay moulds in the same way as the cauldrons (see the discussion of clay versus sand casting in the Somerset foundries: Butler and Green 2003, 23, 27-28). The form of the skillet perhaps meant that the mould tended to disintegrate on being broken up, with the result that less mould survived, in smaller fragments (rather in the same way that there is always much less core mould of cauldrons than there is cope: above). Perhaps the smaller size of the vessels relative to the legs and handles (distributed around the 'perimeter' of the vessels at 120° intervals) meant that there was a multiplicity of weak points that promoted fragmentation.

One detail to emerge from the study of the mould is the variety of border designs on the handle moulds: zig-zag, billet, cable, scallop and reeded (plain linear) designs appear in the mould. The surviving vessels do show a similar (though lesser) variety, but the border designs clearly tended to wear quite easily, giving the impression of a linear border in many of the surviving vessels. The relatively shallow articulation of the border designs in many of the moulds (not to mention the coarse character of the mould clay: above) must have resulted in equally shallow moulded detail, that would readily wear down to a plain linear border.

It is worth emphasising a point about the practical function of the inscribed or decorated handle: that this aided the ease of use of the vessel by promoting grip. Even the ribbed handle helped in this way and all of the patterned or inscribed handles must have served to provide an enhanced grip on the handles of vessels, a very necessary attribute since all vessels would have been awkward to handle when hot and full of liquid, especially the larger ones. The fashion for inscribed handles from the late 16th century onwards (Blaylock 2000, 25; and which lasted into the 19th-century Bristol foundries of Wasbrough, Blinman and the like), incorporating either mottoes or maker's names may thus have been driven initially by a practical expedient, albeit one that was then turned to ornamental advantage.

Another point to make about the ornament of Sturton vessels is the ubiquity of the quatrefoil mark, used throughout the work of these founders. Not only was it used as the 'foundry scratch mark', but it also appears as a stop between the words of the inscriptions, and at the end of handle designs and, occasionally, as a repeating handle design in its own right in one instance of a vessel in the Butler collection (Fig. 4, cat. no. 6). This was used far more by the Sturtons than its equivalent (the trefoil mark) in the Fathers' foundry in nearby Montacute, for example. Although there is one example of a trefoil used as a stop (Butler and Green 2003, no. 20), the Fathers also used quatrefoils as stops in their handle inscriptions (e.g. *ibid.*, no. 26; in worn examples it is sometimes hard to distinguish a quatrefoil from the device of two addorsed hearts: *ibid.*, no. 25). As a practical aspect of design, it nevertheless carried with it an element of self promotion;

this ubiquity displays a notable hint of acumen and ability for self-promotion on the part of the Sturton foundry.

The continuing discrepancy between the picture of this industry deriving from archaeological investigation of foundry sites and that suggested by the surviving vessels as assembled in museum and other collections is notable and requires some further discussion. Particularly that it is a lesson in the limitations of both classes of evidence taken in isolation; the archaeology provides much detail on the methods of manufacture, nature of the foundry installations, decorative details of the vessels, and the sheer volume in which they were produced, but compared to the surviving vessels seems to under-represent some aspects of that production and offers a seriously skewed version of the proportions of vessel types (such as the very low proportion of skillets to cauldrons). The vessels survive in sufficient numbers for it to be reasonably thought that those in museum collections supply a representative sample of production in England, at least for the 17th and 18th centuries, if not for the earlier periods. Yet while evidence of production of lead-bronze cooking vessels is emerging in an increasing number of places in the West Country and beyond, this is not reflected by newly identifiable vessels in any of the museum or other collections on anything like a commensurate level. Although it will always remain instructive to examine questions of this industry from each perspective alone, the only way to obtain anything like a full and (we hope) accurate picture is through a combination of all types of evidence: the excavated mould and foundry installations; the surviving vessels; as well as the documentary record.

One specific point concerns the question of why vessels known to have been produced in vast quantities by the evidence of their moulds excavated from the foundry sites outside of Montacute and South Petherton are so elusive. The slight evidence for a preference for decorative over inscribed handles in the Exeter foundries might be a contributing factor, in the sense that the latter would probably have always been more attractive to collectors, but cannot represent the whole picture. In any case the handles with cast-in guilloche, diaper, and other decoration represented in mould material from Exeter (Blaylock 1996, fig. 8, nos 9-14) are self evidently as strong in decorative qualities as those with inscribed handles. Nor can the question of differential survival be wholly explained by an interpretation of relative quality, i.e. that the products of the Exeter foundries were somehow inferior to those of South Somerset, which because they were more durable, are therefore better represented in the surviving corpus of vessels. These unanswered (and on present evidence, unanswerable) questions serve to emphasise just how much there is still to learn about this industry and, despite the quality of the information in hand, provide a warning against complacency, lest we are tempted to think that we know or understand everything about it.

METAL AND METAL WORKING RESIDUES

As a bronze foundry site, all copper-alloy fragments may have some bearing on the working of the foundry and 84 fragments of copper alloy were recovered from the stratified sequence. The majority of this material comprised fragments of sheet metal rather than casting waste, including both off-cuts from sheet metal working and fragments of broken up sheet metal objects. Only four specific objects were found and though these could have been brought to the site as scrap metal for re-use, given their broad date range (the possible buckle may be Romano-British) they could be simply incidental finds on the site. The assemblage also included fragments of cast metal, usually combined with mould material, as well as spilt alloy splashes. Although this material is numerically a minority of the overall assemblage (Table 3), this is a result of the dominance of sheet metal in Pit 23. In both the floor sequence and the backfill of the quarry pits 12, cast metal debris is in the majority.

Separate from the 84 stratified fragments there is also a collection of metal from the initial discovery of the site, coming probably from the top of the quarry pits. This is generally cast metal and includes a rim fragment

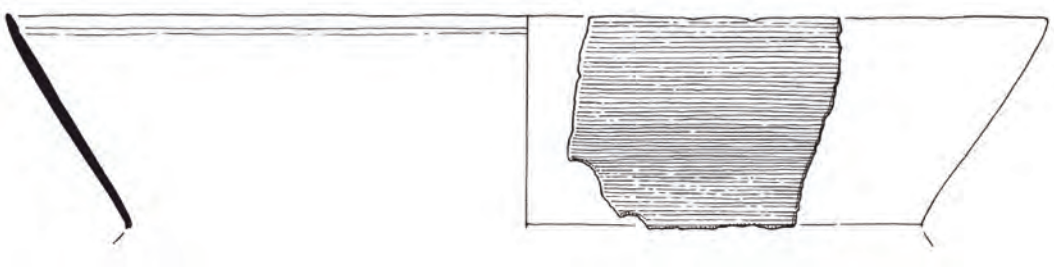

Fig. 27 Rim fragment of a medium cauldron recovered during the levelling of the site and probably scrap metal for re-use (rim diameter 248mm).

from a cauldron (Fig. 27) presumably brought to the foundry as scrap for re-use.

Twelve iron objects were also recovered from the stratified sequence most of which were fragments of sheet iron. There appears to be no specific relevance in the group to a foundry site.

In the text which follows, numbers in brackets (no. 1 etc.) are the object numbers allocated during excavation and under which the objects are stored. These numbers are also used in the analysis of copper alloy (below).

Copper-alloy objects
Nick Griffiths

Four copper alloy objects (as opposed to scrap or fragments) were recovered from the site (Fig. 28), comprising a spur rowel, a nail, a ring and part, possibly, of a buckle. It is not known whether these were simply items lost on the site over the years or elements of scrap metal present for reuse. The possible buckle and the nail came from the sequence of layers within terrace 60, the ring and rowel from the backfill of quarry pit 12. The numbers quoted in this section refer to the numbering of fragments in the site archive.

Descriptions by Nick Griffiths (Fig. 28, 1-4)
Spur rowel (no. 1), originally of six points, of which three survive. Each point is slightly faceted on both sides and decorated with a row of small, punched crescents along the centre, also on both sides. A very similar rowel from Exeter has traces of similar decoration (Read 1995, 127, no. 806). The form of the rowel is difficult to date, similar shapes being represented in monumental brasses from the early 15th century onwards (e.g. brass of Walter Cookesey, d. 1415, an eight pointed rowel, Ward Perkins 1954, 104, fig. 32, no. 7). The decoration of punched crescents is, however, commonly seen on objects of early post-medieval date, for example a button from South Somerset (Read 2005, 44, no. 53) and a buckle from Nonsuch Palace, Surrey (Biddle 2005, 359-60, fig. 168, no. 2). The form of the Nonsuch buckle is seen in Colonial America, where a plain buckle is dated to the second half of the 17th century (Hume 1970, 85, fig. 20.1)

Nail (no. 88) with a shallow convex head, 24mm in diameter and a square section shank, 42mm in length. Nails of this size occur in all periods and were probably used for furniture or other large items.

Ring (no. 66), 21mm diameter. A very common item on both medieval and post-medieval sites about which little can be said other than that it is a functional ring, not a jewellery item.

Fragment of an openwork copper-alloy object (no. 90). The quality of the metal (identified as brass) suggests a possible Roman origin and the design is similar to openwork buckles and belt fittings of the 2nd century (Cunliffe 1968, 94 and plate 35, no. 105).

Copper-alloy sheet fragments and casting waste

The other copper alloy from the stratified sequence, comprising 80 fragments with a total weight of 535g (Table 3), can be grouped into the following categories.

Category 1; Sheet metal scrap This material is generally clean, with smooth surface of a deep green hue. It is sheet alloy, no thicker than 1mm and some of it is clearly offcuts and from sheet metal working, often long, curled, narrow strips indicating the use of tin snips. Some fragments have rivets through more than one thickness of sheet indicating scrap from previously repaired items. Analysis of two fragments of this category showed one to be brass (no. 63) the other (no. 22) a leaded copper alloy comparable to the cast vessels.

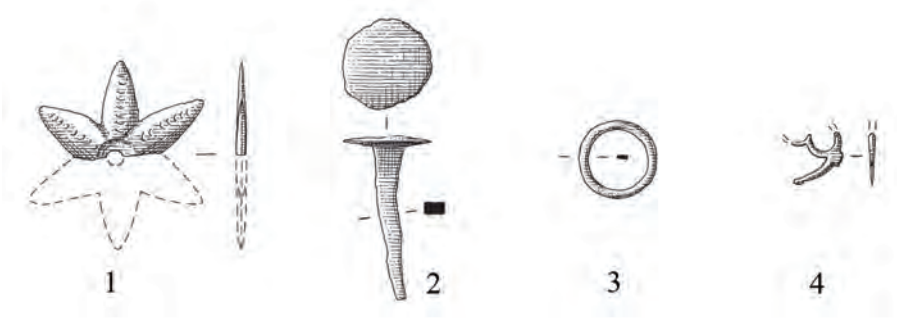

Fig. 28 Copper-alloy objects nos 1-4. Scale 1:2

Category 2; Burnt sheet metal scrap This material appeared to be thin sheet metal, up to 1mm thick, often in strip form, but distorted and twisted with irregular, corroded pale green surfaces, generally encrusted with dark grey gritty material (clinker or coal ash). The material appears to have been burnt, though within this group, the degree of corrosion and encrustation varies, with some fragments only marginally different from those of category 1. These examples are clearly cut metal strips, but the greater the degree of corrosion, the more imprecise the identification. It is possible that some of this material may be thin splashes or dribbles of hot casting metal. Because this material was found with category 1 material (the bulk of the whole copper-alloy assemblage comes indeed from the infill of Pit 23) it is clearly a pre-depositional process that has resulted in this degree of corrosion. All analysed samples of this material were leaded copper alloy comparable to the casting metal.

Category 3; Casting waste This is generally denser/heavier than categories 1 and 2 and with thicker metal up to 3-4mm. It lacks the corrosion of category 2, and some of it is characterised by remnants of mould material on at least one side. It appears to include fragments of both cast metal and examples of spilt, molten metal lost during casting. Analysed fragments were identified as leaded copper alloy.

For the purposes of description, the assemblage can be divided into three stratified groups summarised in Table 3.

Alloy from the sequence within Terrace 60 Besides the two objects described above, six fragments of clean, sheet metal scrap (Category 1) came from this sequence (total weight 17g). Two were miniscule fragments; three were cut strips up to 60mm long and between 4 and 11mm wide; and one piece (no. 82) was 30mm wide with one end cut as a zig-zag and fragments of a second sheet riveted on (cf. no. 63, below, *Alloy from Pit 23*). In addition, two small fragments (total weight 4g) of corroded sheet (category 2) were found. There were also ten fragments (largest 20 by 40mm) of the denser metal casting waste (total weight 94g) several of which had mould material adhering to them with a metal thickness of c. 3mm. One piece (no. 81) was 3mm thick and could be a distorted fragment of a cast vessel rim; its analysis showed it to be a 'leaded gunmetal'. Another piece had a flowed surface and would seem to be a splash of casting metal. It should be noted that the only two fragments of lead from the excavations came from this sequence of deposits and one of these (no. 99) was clearly a spillage of molten lead.

Alloy from Pit 23 The majority of copper alloy from the excavations came from the dark, homogenous, ashy infill 19 of this deep pit, though only two fragments of what has been defined as casting waste were in the assemblage.

Of clean sheet metal scrap there were ten pieces with a total weight of 42g. One (no. 63), which the analysis defined as brass (high zinc/low lead), comprised several strips of metal c. 14mm wide riveted onto other, fragmentary sheets, being part of an object or vessel previously repaired. The object or repair is complex and at one point there are three layers of metal visible. All the other fragments are cut strips of sheet, up to 140mm long, generally tapering to a point from a maximum width of 12mm, and often curled up. Two examples of this are very narrow, no more than 2.5mm and are tightly curled as happens to sheet metal when trimmed with snips. Clearly these are offcuts from sheet metal working. An analysis of one of these small offcuts (no. 22) showed a leaded copper alloy comparable to the majority of the other tested fragments.

Burnt sheet metal (Category 2) formed the majority of the assemblage with 32 pieces (largest up to 50mm) with a total weight of 206g. The assemblage included sheet metal which, apart from the corrosion, is comparable to that described above, though the thin, curled offcuts are absent. There are strip-like pieces up to 20mm wide, with some cut edges visible; one (no. 54) appears tapered with a possible rivet in it; another (no. 28) has two clear layers of metal, though perhaps one sheet folded. There are also larger sheet-like fragments up to 35mm by 25mm. These appear distorted and corroded and clear-cut edges are not visible. It is possible that these are thin spillages of molten metal.

Only two fragments can clearly be identified as casting waste (nos 61 and 62; total weight 39g). One small fragment shows metal 3mm thick; the other is a thinner fragment partly within mould material.

TABLE 3 COPPER-ALLOY FRAGMENTS, NUMBER/WEIGHT BY STRATIGRAPHIC LOCATION

	Category 1	Category 2	Category 3	Totals
Terrace 60	6 / 17g	2 / 4g	10 / 94g	18 / 115g
Pit 23	10/ 42g	32 / 206g	2 / 39g	44 / 287g
Pit 12	6 / 8g	1 / 7g	11 / 118g	18 / 133g
Total	22 / 67g	35 / 217g	23 / 251g	**80 / 535g**

Twelve fragments of this assemblage were analysed. The brass scrap no. 63 has been mentioned above as has the sheet offcut no. 22 of leaded copper alloy. The other fragments analysed were nos 40, 41, 44, 46, 52, 53, 62, 64, 65 and 203. Of these 41, 53 and 203 are relatively uncorroded and fairly conclusively sheet metal fragments; no. 62 is casting waste. All samples, however, are of leaded copper alloy though no. 44 is particularly high in lead, comparable to the sheet offcut no. 22.

Alloy from the infill of quarry pit 12 Six fragments of clean sheet metal scrap were recorded with a total weight of 8g. Of these three were parts of cut sheets up to 35 by 25mm. The narrow offcut strips as in Pit 23 were absent. Of the more corroded sheet (category 2) only a single example (no. 79; 7g) was present, though directly comparable in nature and encrustation to the larger group from Pit 23.

The rest of the group comprised casting waste (category 3), being eleven pieces with a total weight of 118g. Though two pieces appear to be fragments of cast vessels (nos 72 and 68) the rest appears more like molten metal splashes. Analysis of the vessel fragments showed a standard leaded copper alloy.

Unstratified material

This group of material was collected from spoil during the initial recognition of the foundry site. It includes the same range of material as described above, though with often larger pieces dominated by cast metal, and includes a fragment of a cauldron rim (Fig. 27) identified during analysis as leaded copper alloy (no. 200).

Copper-alloy slag

Slag was present throughout the stratified sequence, but the overwhelming majority came from the latest phase of deposits, infilling the quarry pits. These layers were made up mainly of mould debris, but also contained elements of the furnace structure from which the slag would have been derived.

From the earliest deposits, actually in the base of Terrace 60, beneath the metalled surface, six slag fragments were recovered from layer 58, weighing 217g and all being a hard, dense, glassy slag of which four had a 'flowed' surface. The surface of one of these was also stained and spotted green indicating copper. This material differs from the rest of the slaggy material from the excavation, and given its stratigraphic position at the base of the excavated sequence, need not have derived from bronze founding at this specific location. It may be evidence of founding at an earlier date in a different though not necessarily distant location.

From the sequence of accumulated deposits within the terrace, a scatter of small fragments was also recovered (ten fragments, total weight 175g). This material was akin to that described above but also included a lighter fuel ash slag comparable to the main group described below.

A single piece of slag came from the infill of Pit 23; about 60mm across and weighing 77g, it was a very vesicular glassy slag with clear copper staining within its matrix.

The main group of this material, from the backfill of the quarry pit 12, comprised 32 varied fragments (20mm up to 100mm) with a total weight of 1,681g. The material was very dense, amorphous slaggy lumps with a great deal of green copper colouration throughout the matrix. Several fragments have one (generally convex) surface with burnt or fired clay traces, and had evidently been in contact with the concave surface of the furnace structure.

A single piece of unstratified material, identified as possible furnace (no. 201), was chosen for analysis. This is a very dense slaggy material, not really akin to the hearth/furnace lining from the stratified material described above, but its high silica content could indicate that it was an element of the furnace structure.

Analysis of copper alloy
Eleanor Blakelock

Quantitative analysis of various samples of copper alloy was undertaken to characterise the nature of the alloys being used. The samples included amorphous *casting waste* (some of which was still attached to pieces of mould), a fragment of a *copper alloy vessel* (which may have been cast on site) and *scrap* (consisting of thin strips). All samples were cut and mounted in epoxy resin to reveal cross-sections. These were examined using a scanning electron microscope (SEM) and the chemical composition determined using an energy dispersive spectrometer attached to the SEM.

All of the samples of casting waste are composed of complex alloys containing high proportions of lead, tin, antimony and arsenic (Table 4). The fragment of a vessel has a composition which is similar to the casting waste. Three pieces of scrap are similar to the casting waste, two are brasses and the last is a leaded gunmetal. The scrap metal probably represents fragments of vessels and other artefacts brought to the site to be reused during the cauldron making process.

The complex leaded antimony bronze used at South Petherton is similar to that used for casting medieval and post-medieval domestic vessels in Britain and beyond (Dungworth and Nicholas 2004). Dungworth and Nicholas (2004, 30-31) suggest that this alloy was a waste material from the liquation of argentiferous copper obtained by smelting complex polymetallic ores.

TABLE 4 CHEMICAL COMPOSITION OF THE COPPER-ALLOY SAMPLES

Location	Context	Category	Fe	Ni	Cu	Zn	As	Sn	Sb	Pb
Sequence	35	3	<0.1	0.1	73.7	3.4	0.2	7.7	0.2	14.3
Sequence	42	Buckle	0.7	0.4	73.6	16.7	0.3	2.3	0.5	4.8
Pit 23	19	2	0.2	0.5	67.9	0.4	1.3	5.7	3.7	19.0
Pit 23	19	2	<0.1	0.5	77.8	0.6	1.6	6.3	4.3	8.4
Pit 23	19	2	<0.1	0.6	76.8	0.3	0.9	4.6	3.3	13.3
Pit 23	19	1	0.3	0.2	60.8	35.2	<0.1	0.1	<0.1	3.0
Pit 23	19	1	<0.1	0.7	66.1	1.2	1.2	5.1	3.5	21.6
Pit 23	19	2	<0.1	0.6	65.1	0.2	1.2	5.4	3.2	23.5
Pit 23	19	2	<0.1	0.5	74.8	0.3	1.0	4.7	4.9	12.6
Pit 23	19	2	<0.1	0.5	75.9	1.1	1.2	5.8	4.0	10.9
Pit 12	3	3	<0.1	0.4	75.3	1.3	0.9	9.6	2.4	9.6
Pit 12	24	3	0.3	0.7	72.0	0.8	1.2	6.6	3.6	14.4
Pit 12	24	2	<0.1	0.4	75.7	1.9	1.1	4.2	3.9	12.3
Pit 12?	US	Vessel fragment	0.2	0.7	63.2	0.5	1.2	5.7	2.8	24.9

Iron objects

J. M. Mills

Iron objects were recovered from layers throughout the stratigraphic sequence, though the majority came from the backfilling of the quarry pits of Phase 2. All were x-rayed and the images and catalogue descriptions are in the archive.

A nail and two nail shanks, a strip with triangular cross-section, an object with a shaped terminal, perhaps a fitting from a box and a knife blade fragment were the only objects found. The rest of the assemblage comprised fragments of sheet iron. The incomplete nature of all the fragments and the fact that several appear to have been burnt prior to or on deposition underlines the lack of significance of this collection to the work of a bronze foundry.

The sheet iron nearly all looks as if it has been burnt and has a very particular appearance with one surface being bubbly and free of corrosion products whilst the other face is usually encrusted with soil and, in one instance, much mould material. The radiographs show spots and flecks of non-ferrous metal, presumably within the corroded encrustation, on most of the sheet fragments. The largest sheet fragment (no. 110) has a rod or bar apparently strengthening one edge which suggests that this and possibly all the other sheet fragments derive from iron vessels; perhaps bowls rather than cauldrons.

GENERAL DISCUSSION AND CONCLUSIONS

The excavations at Lightgate Road in South Petherton revealed the remains of a foundry used for the production of the leaded bronze vessels, such as cauldrons and skillets, commonly used in down-hearth cooking. The group of vessel-mould fragments recovered from the excavations identifies the foundry as that of the Sturton family, with six examples of the four-arc or quatrefoil symbol known from surviving vessels in the collection of the Museum of Somerset to have been used as their foundry mark (Figs 1-4, 16, 23). From the evidence of both the surviving vessels and the documents, the Sturtons are known to have been founders throughout the 17th and early part of the 18th centuries, covering at least three generations, with four pairs of father and son with the names William, Thomas, Francis and John. The mould fragments also made possible a more specific allocation of the site to individual members of the family. Scratch marks on the moulds, being the initial of the individual founder, showed moulds by William II, with six examples of his conjoined WM. A single example of an I or T was recognised, and a single T or F, being the initials of John, Thomas or Francis. The inscribed skillet handle mould fragments, however, include the name of Thomas II (Fig. 12, no.7) and examples of all four of the handle mottos known to have been used by the Sturtons in the later 17th century (‘FOR MY FRIEND’; ‘BEE

CONSTANT'; 'THIS IS GOOD WARE TS'; and 'WIL THIS PLES YOU'). Of these four mottoes, three occur on surviving vessels by Thomas II, the other on a vessel by Francis I. The foundry at Lightgate Road is likely therefore to have been the workplace of William Sturton II and his first cousins, the half-brothers Thomas II and Francis I. Together, they represent the second generation of the Sturton founders, as known from the documents, and worked from around the middle of the 17th century, into its closing decades.

The excavations, however, showed two clear phases of activity on the site. In the first, the area was occupied by a foundry shed, with a metalled floor on which was constructed the base for a furnace, with an adjacent pit which may have been used to bury the moulds during casting. In the second phase, the furnace had been demolished or dismantled and the continuing build-up of working surfaces was eventually encroached upon by a series of shallow pits for the quarrying of mould-making material. Almost the entire collection of vessel-mould fragments that linked the site with the second generation of the Sturton family came from the dump of material backfilled into the top of these quarry pits. Only a single identifiable fragment (Fig. 21, no. 37, part of an initial I or T) came from an earlier context, being in the infill of the possible casting pit, 23. It is only, therefore, the end of the stratigraphic sequence that can be dated with any certainty and the chronological gap between the use of the furnace and the digging and subsequent infilling of the quarry pits is unknown. The site may therefore have been in use for a much longer period than suggested by the excavated mould material, being the foundry site of all three known generations though with the focus of activity on the site shifting over time. The presence of copper-alloy slag in the primary layers of the excavated sequence could be evidence of an earlier phase of founding nearby. On the plot known as Sterton's Orchard on the 1840 tithe map, the excavated foundry site lies about midway along the plot's eastern boundary. The rest of the plot could have been extensively quarried over time in a way similar to that at the Birdall foundry in Exeter, where quarry pits covered a significant proportion of the foundry plot (Blaylock 2000, fig. 5).

The evidence of the dateable artefacts from the excavations does little to define the chronology and pottery from the site was very limited. In Phase 1, a handful of sherds can be dated no more precisely than 16th-17th century and in Phase 2 a total of three sherds were of 17th-century date. A single sherd, however, was identified as later 17th-century Delft ware, probably Dutch, significantly from the infill of the possible casting pit (layer 19, Pit 23). In addition, the stamped base of a clay pipe dated 1650-1700 came from the top of the sequence of deposits in the terrace, post-dating the removal of the furnace, but predating the quarry pits.

The likely form of a furnace at this time is the reverberatory furnace, in which heat from the firebox is drawn over and across the charge of metal in the hearth. This would then be tapped to allow the outflow of molten metal. The remains of furnaces of this type have been excavated in Exeter (the Pennington Foundry at Paul Street and the Birdall Foundry at Cowick Street, Blaylock 1996, figs 3, 5, 10 and 12), at Keynsham Abbey in North Somerset (Lowe *et al.* 1987, 147-49) and in Worcester (Taylor 1996, figs 2 and 3), and their position and arrangement can clearly vary according to the circumstances of the foundry. At Lightgate Road the excavated base suggests these two parts, with a long rectangular firebox, to the west of which lay a circular hearth for the metal charge. The whole structure, however, appears to have been above ground level, with no evidence of a subterranean stoking pit. The most likely material for the construction of the furnace would have been fired brick, bonded with the same material as that used for the vessel moulds. Such material could also have been used for sealing the furnace after charging and for the regulation of tap holes and channels for molten metal. Such material would subsequently form the pulverised mould-type debris abundant on the site in Phase 1.

A casting pit adjacent to the hearth end of the furnace would be expected. Its precise location can vary, being either to one side of the furnace as at Paul Street, Exeter, or in line with the firebox and hearth as at Cowick Street, Exeter. The reason for this variation may simply be limitations of the available space. At South Petherton a large pit was located to the north side of the furnace, immediately outside the area of metalled surface upon which the furnace was located. It was distinct from the quarry pits, both in shape and infill and one edge had been cut away by the quarry, indicating it was of an earlier period and possibly, therefore, contemporary with the furnace. It was oval in plan with vertical sides and a stepped base at least 1.5m below the contemporary ground surface. That it had functioned as a casting pit in which moulds were buried during casting to provide stability and support, seems likely. Its depth, however, suggests that it may have been used at least once to cast a bell and Thomas II is known to have cast a bell, dated 1678. Though stones were found in the base of it, there was no clear evidence of the type of foundation used beneath bell moulds in Exeter (Blaylock 2000, plate 5) parts of which generally remained in the pit after casting. Nor was any trace of bell mould, or bell metal, recognised on the site. That the pit was used over a long period of time for the casting of vessels can nevertheless be suggested. Though during excavation no different periods of infilling could be seen in the very homogeneous, dark infill, this may

simply be due to the homogeneity of what may have been selected and sifted material, kept dry, and used beneath and around the moulds during casting. The material may have been put in and taken out countless times with the depth and size of the pit being changed according to what was being cast.

This material appears to be a typical foundry soil deposit that has been observed on most of the excavated bronze foundry sites, the function of which was probably as a reserved stock of material kept aside and, most especially kept dry, for filling casting pits around moulds to stabilise them during casting and for similar uses around the foundry. Any moisture was inimical to the casting process and founders went to great lengths to ensure that moulds and anything that came into contact with them was thoroughly dried out (compare Theophilus' account of bell casting: Dodwell 1961, 153, etc.).

A number of features recorded by the excavation may reflect the working practices of the foundry. The concentration of sprue-cup fragments in the fill of the casting pit suggests that this part of the mould was broken off as the moulds were recovered from the pit after casting. Perhaps the plug of metal in the sprue-cup after casting was a useful handle by which to hoist the mould out. The moulds then, however, seem to have been taken away to be broken up, the resulting debris accumulating elsewhere. Both the fill of the pit and the accumulation of debris as surfaces around the furnace contained very little recognisable mould debris, though partly at least this may be because any mould fragments in this area would become quickly pulverised. Much of the burnt loam in the highly laminated surfaces around the furnace base may indeed derive from the furnace structure and reflect the activity of loading, sealing and tapping the furnace. At least one patch of clay loam, trampled into the floor, could indicate the type of material used to seal the furnace and form the channels to conduct the molten metal to the moulds.

The copper-alloy fragments from the pit may similarly reflect the working practices of the foundry. Most of this material comprised sheet metal which included both fragments of broken-up objects as well as well as what were clearly offcuts from sheet metal working. The most likely reason for its presence on the site is that it was scrap metal brought in for use in the casting alloy. Analysis has shown that these scraps were a leaded copper alloy, not very different from the alloy used for the vessels but with a generally slightly lower lead content (Table 4). How this analysis tallies with the perceived wisdom that a leaded copper alloy such as used in cast vessels would be too brittle for use in sheet metal working is unclear. The presence of the material at the site, and predominantly in those layers contemporary with the use of the furnace and the casting of vessels seems clearly, however, to show that scrap metal was used (or re-used) in the casting alloy. That it was sorted and melted on site to produce the correct leaded bronze for the vessels seems evident, and indicates the high level of metallurgical knowledge and skill possessed by the founders.

For over a century, the Sturton foundry would have been a feature of South Petherton, probably operating continuously on the site identified by the excavations and shown on the 1840s map as Sterton's Orchard. The excavations identified the foundry itself, comprising furnace and casting pit, occupying the middle of the plot's eastern boundary, and probably being within a shed or similar structure. The whole process of vessel production may have taken place on this part of the site, with much of the remaining area given over to the quarries to extract the raw materials for the moulds. Though this material, which must have been used in great quantities, was available on the plot the metal and the fuel to melt it must all have been brought in. This, with the finished vessels and occasional bell leaving the site, must have made it a centre of activity and commerce. There is no evidence of a dwelling on the site, though the excavations covered only a tiny area, and the records show the Sturtons living elsewhere in the village. The nearest location to the site is on Roundwell Street, which forms the southern boundary of the block of land in which Sterton's Orchard lies. Throughout the 17th century and into the 18th the Sturton founders would have been important figures in the village, and their connection with the comparable Fathers Foundry in Montacute underlines the importance of the founders' trade in this small part of South Somerset at this time. Clearly masters of their craft, their legacy is visible today in the fine collection of bronze vessels in the Museum of Somerset.

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REFERENCES

Allan, J. P., Alcock, N. W. and Dawson, D. (eds), 2015. *West Country Households, 1500–1700*, Woodbridge: Society for Post-Medieval Archaeology Mono. 9.

Allan, J. P., Blackmore, S. and Passmore, A. J., 2010. 'Archaeological investigations around Crediton parish church, 1984–2007', *Proc. Devon Archaeol. Soc.* 68, 113-98.

Anund, J., Bergquist, U., Bäck, M. and Pettersson, K., 1992. 'A Medieval Cauldron Foundry: Craftsmanship and Craftsmen in Pantern, Uppsala', in L. Ersgård, M. Holmström and K. Lamm (eds), *Rescue and Research: Reflections of Society in Sweden 700–1700 A.D.*, Stockholm: Riksantikvarieämbetet, 221-51.

Bayley, J., Dungworth, D. and Paynter, S., 2001. *Centre for Archaeology Guidelines: Archaeometallurgy*, Swindon: English Heritage.

Bearnes, 2020. *The Butler Collection, Auction Catalogue, Tuesday 10th March 2020*, Exeter: Bearnes, Hampton and Littlewood.

Biddle, M., 2005. *Nonsuch Palace*, Oxford: Oxbow Books.

Blakelock, E., 2005. *Analysis of Copper Alloy residues from the Sturton Foundry in South Petherton, Somerset*, Centre for Archaeology Report 30/2005, Portsmouth: English Heritage.

Blaylock, S. R., 1996. 'Bell and Cauldron Founding in Exeter', *Hist. Metallurgy* 30:2, 72-82.

–, 2000. 'Excavation of an early post-medieval bronze foundry at Cowick Street, Exeter, 1999–2000', *Proc. Devon Archaeol. Soc.* 58, 1-92.

–, 2001. Preliminary Assessment and Analysis of Cauldron-mould Fragments from Whirligig Lane, Taunton, Somerset, 2001, Exeter Archaeology Report 01.81.

–, 2015. 'The Archaeology of the West Country Bronze Foundries', in Allan *et al*. 2015, 271-307.

–, forthcoming. 'Bell and Cauldron Moulds from 35 East Street, Crediton, Devon', *Proc. Devon Archaeol. Soc.*

Brears, P., 2008. *Cooking and Dining in Medieval England*, Totnes: Prospect Books.

Butler, R. and Butler, V., 1994. 'The mysterious John Fathers - Potcaster', *J. Antique Metalware Soc.* 2, 1-4.

Butler, R. and Green, C., 2003. *English Bronze Cooking Vessels & their Founders, 1350–1830*, Honiton: Roderick and Valentine Butler.

–, 2006. *English Bronze Cooking Vessels*, Taunton: Somerset County Council Heritage Service.

Christies, 1996. *The John Fardon Collection, A selection of Oak Country Furniture and Works of Art*, Sale catalogue Christies, South Kensington, 1 May 1996.

Cunliffe, B. W., 1968. *Fifth Report on the Excavations of the Roman Fort at Richborough, Kent*, Oxford: Society of Antiquaries of London.

Dodwell, C. R., 1961. *Theophilus: De Diversis Artibus*, London: Thomas Nelson and Sons.

Drescher, H., 1968. 'Mittelalterliche Dreibeintöpfe aus Bronze', *Rotterdam Papers* 1, 23-33.

Dungworth, D., n.d. [2004]. Preliminary assessment of ceramic mould material from South Petherton, illustrated typescript report, English Heritage, Fort Cumberland.

–, and Nicholas, M., 2004. 'Caldarium? An antimony bronze used for medieval and post-medieval cast domestic vessels', *Hist. Metallurgy* 38:1, 24-34.

Dunning, R. W. (ed.), 1974. *A History of the County of Somerset, Volume 3: The histories of the parishes of Kingsbury (east), Pitney, Somerton and Tintinhull hundreds*, Victoria County History, London: Oxford University Press for the Institute of Historical Research.

–, 1978. *A History of the County of Somerset, Volume 4*, Victoria County History, London: Oxford University Press for the Institute of Historical Research.

Eveleigh, D. J., 1986. *Old Kitchen Utensils*, Princes Risborough: Shire Album 177.

–, 1994. 'Cooking Pots and Old Curios - The Posnet and Skillet', *Folk Life* 32, 7-32.

Fincham, K. (ed.), 2018. *The Further Correspondence of William Laud*, Woodbridge: Church of England Record Society 23.

Green, C., 2015. 'Cast bronze cooking pots in England, 1500-1720', in Allan *et al*., 309-19.

–, and Butler, R., 2005. 'Bronze Founding in 17th-Century Somerset: Documentary and Archaeological Evidence', *J. Antique Metalware Soc.* 13, 18-23.

Hume, I. Noel, 1970. *A Guide to Artefacts of Colonial America*, New York: Knopf.

King, J. E. (ed.), 1938. *Inventory of Parochial Documents in the Diocese of Bath and Wells and The County of Somerset* (Somerset County Council, County Records Committee, Book I), Taunton: Somerset County Council.

Lowe, B. J. *et al.*, 1987. 'Keynsham Abbey: excavations 1961–1985', *SANH* 131, 81-156.

le Patourel, H. E., 1968. 'Documentary evidence and the medieval pottery industry', *Med. Archaeol.* 12, 101-26.

Massey, G. W., 2011. *The Church Bells of Somerset*, Taunton: SANHS.

Read, B., 1995. *History beneath our feet*, 2nd edn, Ipswich: Anglia Publishing.

–, 2005. *Metal Buttons: c. 900 B.C. - c. A.D. 1700*, Langport: Portcullis Publishing.

Salzman, L. F., 1923. *English Industries of the Middle Ages*, 2nd revised edn, Oxford: Clarendon Press.

Scott, J. G. M., 1968. 'Casting a Bell for Exeter Cathedral, 1372', *Rep. and Trans. of the Devonshire Assoc.* 100, 191-203.

Singer, C., Holmyard, E. J., Hall, A. R. and Williams, T. I. (eds), 1957. *A History of Technology, Volume III: From the Renaissance to the Industrial Revolution,* c.*1500*–c.*1750*, Oxford: Oxford University Press.

Taylor, G., 1996. 'Medieval Bronze Founding at Deansway, Worcester', *Hist. Metallurgy* 30:2, 111-15.

Tylecote, R. F., 1976. *A History of Metallurgy*, London: The Metals Society.

Vellev, J., 1998. 'Eine mittelalterliche Bronzegießerwerkstatt in Odense – und etwas über Glocken und Grapen des Mittelalters', in R. Busch (ed.), *Festschrift für Hans Drescher zu seinem 75. Geburtstag*, Neumünster: Wachholtz, 195-224.

Ward Perkins, J. B., 1954. *London Museum: Medieval Catalogue* (reprinted 1967), London: HMSO.