

A Roman Well at Dunstable

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SUMMARY

This paper describes the excavation of a Roman well in Dunstable, Bedfordshire. The finds suggested that it was dug during the second century A.D. and abandoned and refilled more than one hundred years later. It would appear that the water table was much lower in Roman times than it is today. The finds included bucket hoops and lead weights, agricultural implements as well as adornments and pottery.

INTRODUCTION

A Roman well was discovered in 1967 during excavations at the Dominican Friary site in Dunstable. The position (TL 019217) is indicated on the site plan (fig 1). During that and the following year the well was totally excavated by members of the Manshead Archaeological Society.

Roman material has been found in eight wells during building operations in this vicinity, (as noted in fig 1). These could not be thoroughly investigated because of damage done during mechanical digging and the lack of facilities and time. However, six appeared to have been infilled during the Roman period while the other two contained both Roman and twelfth and thirteenth century material. Later excavations showed that the present well was in an outhouse of a Roman timber building, the sill beams of which were parallel with Watling Street. The building has not yet been completely excavated but associated with it is a corn drying kiln sealed with early third century silver coins and a latrine pit which contained first century pots. These excavations have firmly established occupational evidence of the Roman Durocobrivae.

All depth measurements are taken from the modern ground level at the top of the well.

THE EXCAVATION

EXCAVATION METHOD

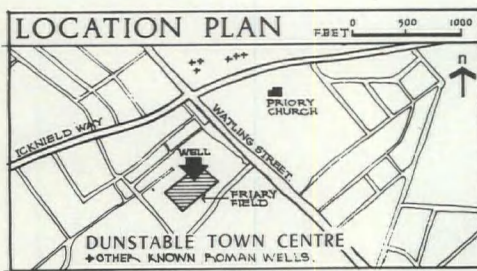
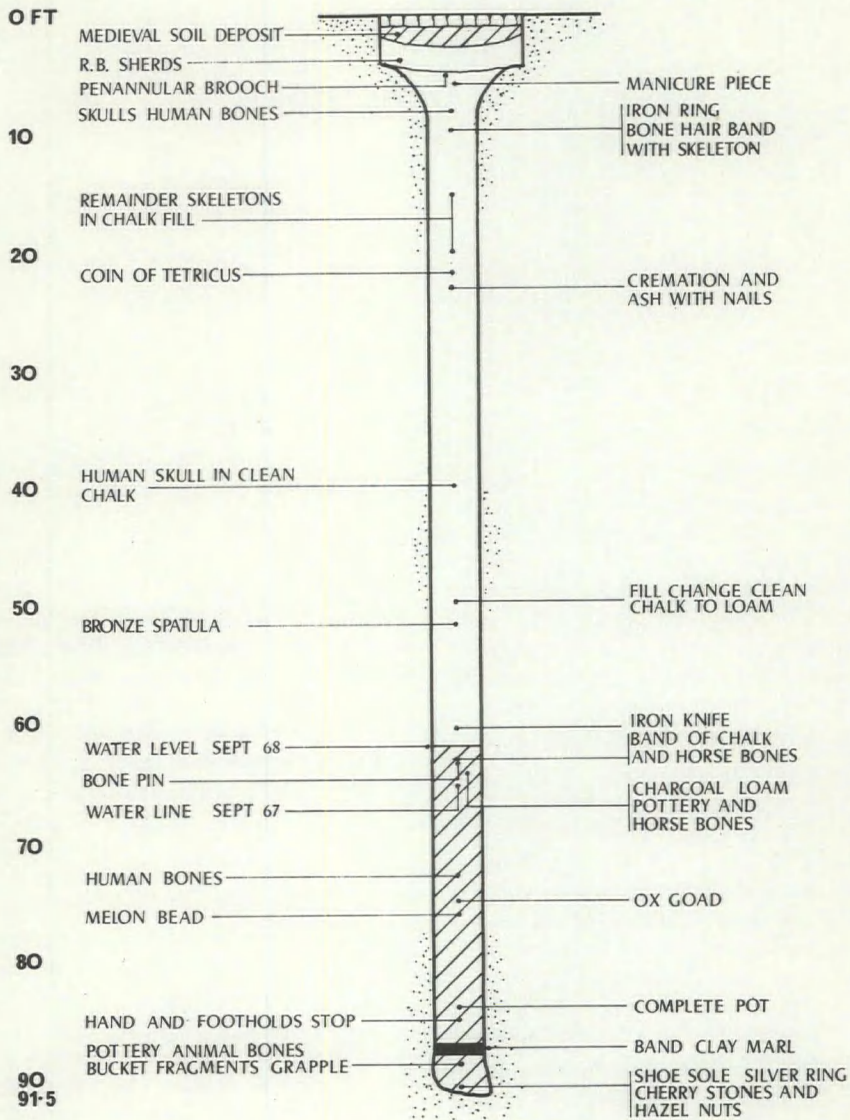
The well was discovered when a slight subsidence occurred after the removal of a medieval occupation layer. It was sunk into the chalk bed rock and was unlined. When excavation reached water level the well was constantly pumped but, despite this, the water level could not be lowered below a depth of 62ft (18.9m) in 1967 and 65ft (19.9m) in 1968.

Stringent safety precautions had to be observed during the excavation and, as digging progressed, three sets of staging were fitted. The sets of staging were joined by ladders and the lowest set was at a depth of 55ft (16.76m). The well shaft was lit by waterproof lighting suspended at depths of 30ft (9.14m) and 60ft (18.29m). All excavators, while in the well, wore safety harness and helmets. Below the water level excavations were carried out by aqualung divers who were lowered into the water by rope. Their air bottles were lowered and the diver fitted them whilst standing in the Roman hand and foot holes in the side of the shaft. The well and the stagings were too narrow for the diver to descend with the air bottles on his back.

Difficulties of depth measurement and recording were experienced by the excavators when working below water level, hence all depths in this part of the well are quoted only to the nearest one foot. During digging the finds were put into a perforated bucket, and, when the excavator had surfaced, the bucket was raised manually to the top of the well.

GENERAL DESCRIPTION OF THE WELL

The well was unlined, square cut and measured 4ft (1.22m) across at the top. It narrowed to 3ft (0.914m) across at a depth of 62ft (18.9m) but



ROMAN WELL AT THE
FRIARY FIELD
DUNSTABLE

JMB

Fig 1 The location and section of the well

opened out to a bell shape approximately 5ft (1.52m) from the bottom. The square of the shaft twisted slightly throughout its depth and the corners of the square had been rounded by bucket wear. Hand and foot holes had been cut on opposite sides of the well at 15in (381mm) intervals. These depressions were staggered on each side and ceased at 85ft (25.9m). There were two staging slots cut into the sides at 25ft (7.62m) and 45ft (13.71m).

On top of the well was a 3ft (0.914m) layer of dark loam under which was a 3ft (0.914m) sealing layer of Roman occupation debris. Below this, to a depth of 50ft (15.24m), was a clean chalk fill which covered a chalk and loam mix. Between 75ft (22.86m) and 82ft (26m) the fill was chalk with large flints and below this was a 4ft (1.22m) layer of chalky silt. Beneath this was a 2ft (610mm) band of clay lying on a further 2ft (610mm) of chalky silt. The bed rock of clunch stone was below this.

CONTENTS OF THE WELL

A section through the well is shown in figure 1, and this also indicates the depths at which the major finds occurred.

A top sealing stratum of Roman material was found dipping towards the centre of the filled-in well at a depth of 3ft (0.914m). This consisted of sherds that included a fourth century mortarium, with hammer rim, and so-called imitation samian wares together with large fragments of roofing tiles, coarse building bricks and sea shells of oyster, whelk and scallop.

Below this was a dark loam which produced fragments of a large storage jar and Belgic butt beaker which had probably been carried into the mouth of the well by subsidence from an adjacent site of that period. Other pottery included fragments of Castor ware, coarse wares and samian. This stratum also produced a small penannular brooch and bronze nail cleaner (figs 5.8 and 4.2).

At 7ft 4in (2.236m) the partial remains of five human skeletons were found. These included 3 skulls and portions of articulated bodies. Between 15ft 6in and 20ft (4.7 – 6.1m) the remainder of the skeletons were found with the bones still articulated. These five bodies had been placed in the funnel of the partially filled well at one time and at different angles on top of one another. Later subsidence of the well had occurred before the bodies had completely decomposed, leaving the skulls and feet at the well mouth.

A coin of Tetricus (270-273) was found at a

depth of 22ft (6.71m) and 1ft (0.305m) below this were burnt human bones. Iron nails were found amongst the bones and ash. A single human skull was found at 40ft (12.19m) isolated in clean chalk fill.

At 50ft (15.24m) the fill changed from chalk to loam and this contained a bone pin, iron knife, sherds and horse bones. A considerable amount of pottery was found at 64ft (19.41m) with charcoal and more horse bones. At 70ft 4in (21.54m) a further layer of pottery was discovered and at 72ft (22.05m) parts of a human skeleton were found. Between 75 and 82ft (22.86 – 25m) there was a stratum of chalk flints and this contained the ox goad and melon bead (figs 4.4 and 5.3). Below this was a 4ft layer of chalky silt containing a complete pot (fig 2.7).

A 2ft (0.61m) band of clay had been used as a plug and beneath this bucket fragments, a piece of wooden conduit and a grapple (fig 4.6) were found. The 2ft (0.61m) of chalky silt lying on the clunch bed contained a silver ring, shoe sole (fig 5.1) together with cherry stones and hazel nuts.

THE POTTERY (Figs 2 and 3)

Pot sherds were found throughout the filling but the most complete vessels came from near or at the bottom.

The well was kept very clean during its long period of use and little can be made of the stratification of the wares. It is nevertheless interesting to note the number of small vessels at the lowest levels. These were probably used as drinking cups.

Castor Ware

Sherds from 6 vessels were found in the bottom of the well and one fragment at a depth of 5ft 7in (1.7m), in the depression of the filled-in well, carried the head of a deer.

- 1 Castor ware cup with hunting scene: late second, early third century.
- 5 Small vessel in Castor ware: third century.
- 7 Castor ware beaker with two bands of rouletting. This was recovered unbroken from near the bottom of the well. Mid third century.

Sand-Cast Wares

- 2 This type of vessel is rare in the Dunstable area and was the only one found throughout the fill of the well: late second century. (Gillam, 1957, 190, type 75).¹ Depth 90 ft.

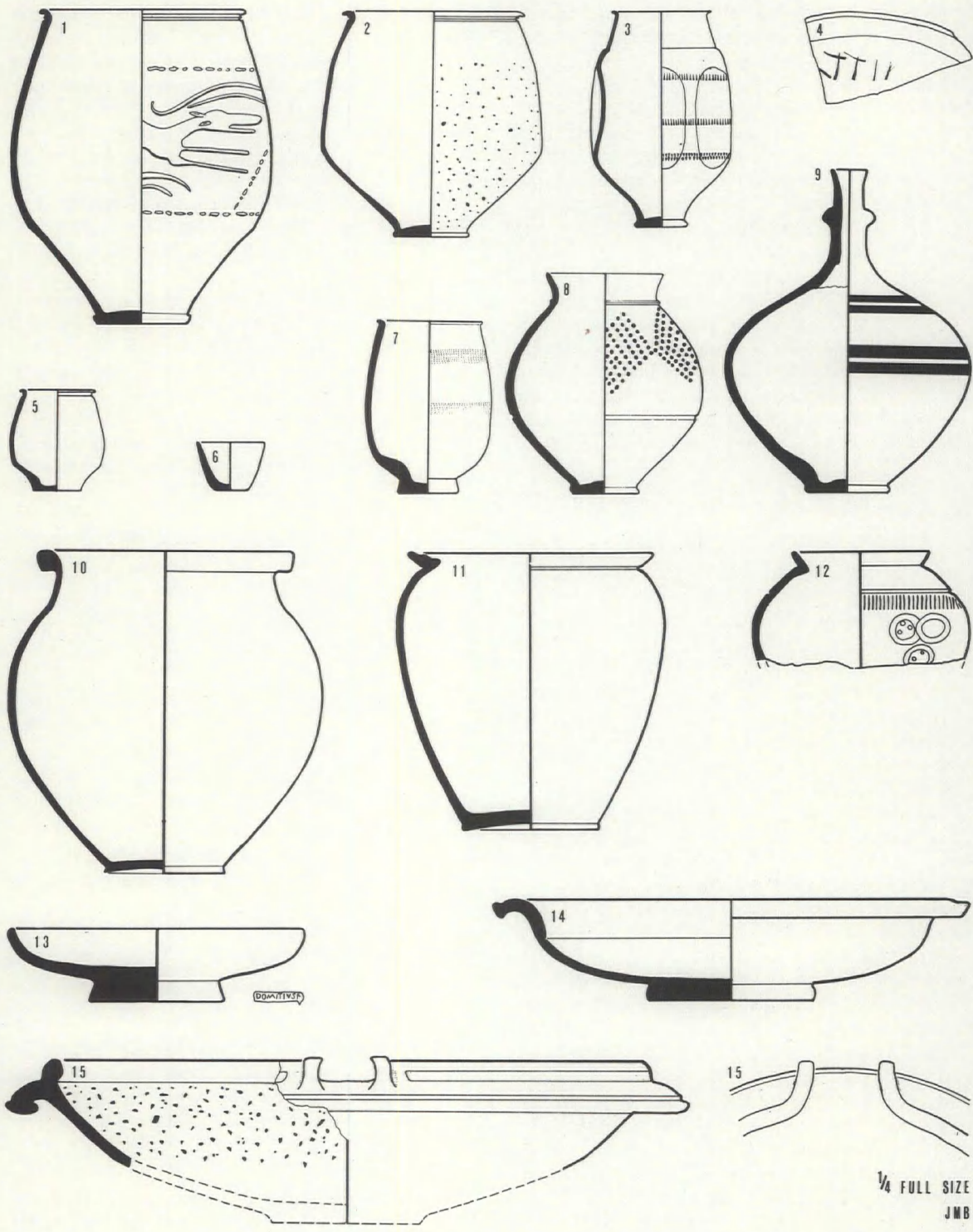


Fig 2 Pottery from the well

1/4 FULL SIZE
JMB

Folded Beakers

Three were found all near the bottom of the well. The vessel illustrated (3) is highly burnished with 6 flutes and 3 bands of rouletting (third century). Gillam 1957, 187, type 46. The other two also had flutes but with a metallic slip coating.

Samian Wares

A total of 15 vessels were recovered all of them plain wares. One potters stamp and part of a stamp were found and one fragment with gravitti.

Fragments of the wares were found throughout the filling from 3 feet deep to the bottom.

- 4 Fragment of samian bowl with part of an inscription scratched into the exterior fabric. Antonine period, late second century (Walters type 79).
- 18 Samian bowl type, depth 40ft (12.2m).
- 13 Samian bowl from bottom of well. Stamp DOMITIUS Dragendorf Form 32. Probably from Eastern Gaul kiln site of Rheinzabern, Germany. Antonine period, late second century.

Copies of Samian Wares

Total of 5 dishes. These vessels are copies of samian forms with applied red slip. One vessel was found sealing the well at 28in (0.71m) deep. Two vessels were found at a depth of 12ft (3.66m) and 16ft (4.88m) the remainder were found at 86ft (26.21m).

- 14 Copy of samian bowl found at 86ft (26.21m) Very eroded red slip of poor quality.

Terra Nigra

A single sherd was found in the sealing layer of the well at a depth of 26 in (0.66m).

Poppy Head Beakers

Two vessels were found. One with a fine black metallic slip came from the bottom of the well.

- 8 Found 12ft (3.66m) deep. Very eroded surface. Dark brown slip on grey ware. Decorated with irregularly applied lozenges of dots. Groove around body of pot.

Flagons

Total of 7 vessels. One fragment of white ware was found at a depth of 36in (0.914m) sealing the well. The remainder were found at different levels.

- 9 Flagon in biscuit ware from 85ft (25.9m) decorated with painted red bands, third century. Also in this same context but not illustrated were one long necked flagon with single handle and a ring necked flagon, both in biscuit ware.

Crucible

Single pot at a depth of 64ft (19.51m). Crucible in hard grey ware.

Mortaria

Nine of these vessels were found at varying depths. One of white ware with brown grits was at a depth of 24ins. This was similar to No.15 but the underside of the rim was more flattened. One Samian mortarium as No.26 was found at 16ft and one hammer head type (not illustrated) as No.25 but with flange pressed into the body of the pot was found at a depth of 84ft (25.61m).

- 15 White ware with brown grits. Depth 84ft (25.61m). Probably third century.
- 25,26 & 27 All in white ware with brown grits at 64ft (19.51m).

Fine Wares Bowls etc.

- 12 Bowl of red ware decorated with applied triple circles. Second to third century. Depth 91ft (27.735m)
- 16 Bowl of grey paste fired red. Depth 64ft (19.51m).
- 17 Tazza with bands of rouletting and pinched frilling on neck. Fired biscuit. Depth 64ft (19.51m).
- 19 Bowl with red slip on biscuit ware. Depth 89ft (27.1m).
- 20 Rounded vessel with bead rim in grey ware with burnished surface. Depth 64ft (19.51m).

Storage Jars

Large rolled rim vessels. The remains of 12 were found at varying depths from 14ft to the bottom of the well (not illustrated).

Amphora

- 23 One fragment of vessel with part of a handle in biscuit ware. Depth 26ft (7.91m)

Odd Vessel

- 28 Vessel in red tile ware. Burnt on interior and

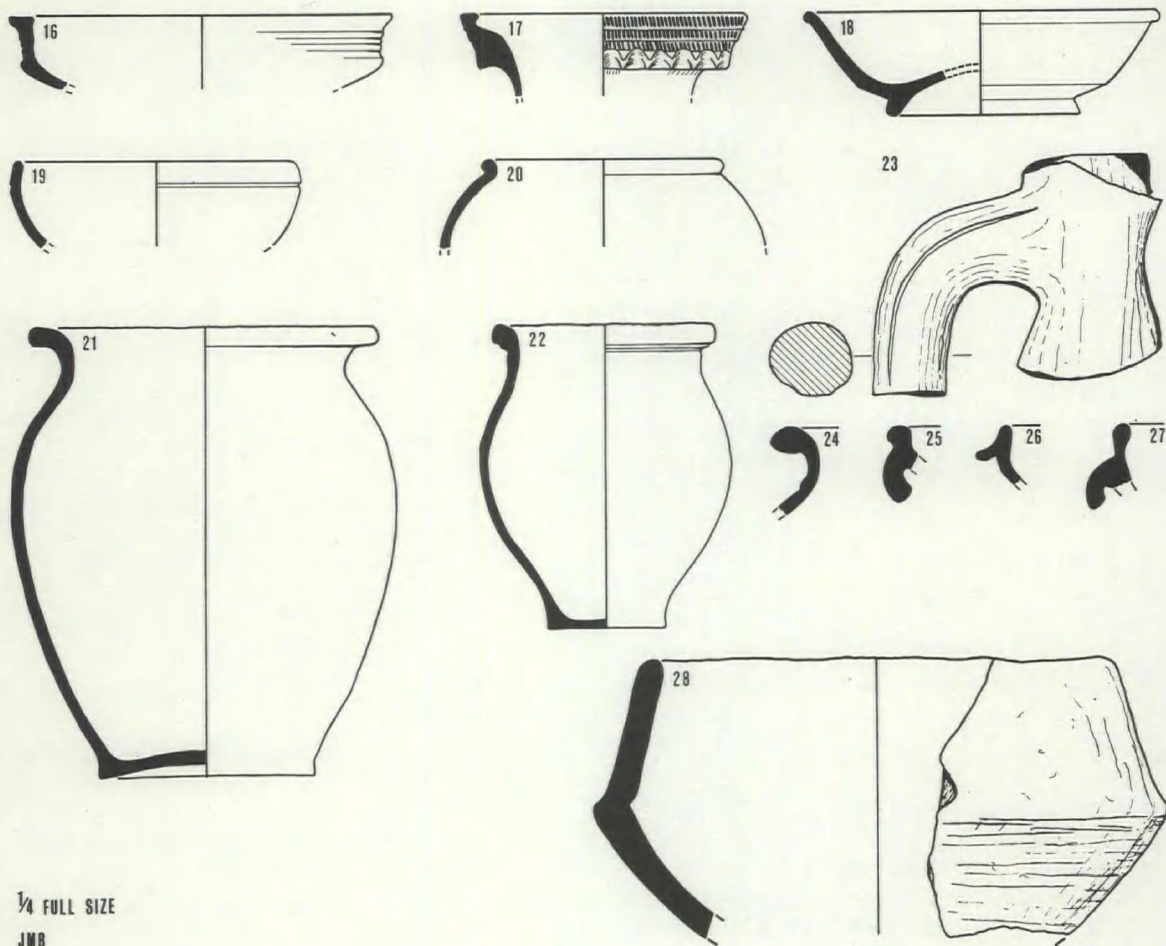


Fig 3 Pottery from the well

slightly on exterior near rim. Potter's finger marks on inside. Depth 90ft (27.43m). This thick solid vessel may have been used as a water carrier but the flange and the burning suggests a use as a kiln chimney.

Jars or Cooking Pots

Approximately 116 vessels of grey wares found at varying levels throughout the filling. Five (10, 11, 21, 22 and 24) have been illustrated as typical.

Three vessels of type 21 were found almost complete at the bottom of the well. These contained shell grits and had a soapy feeling fabric. Probably late first or early second century.

METAL OBJECTS

Metal objects are described in metal groups — silver, iron, bronze, lead and within these in order of depth of discovery.

IRON

- a Ring at 9ft 8in (2.94m). Ring from top of a ring headed spike, external dia. 1.6in (40mm) internal dia. 1.4in (35mm). Found with bone hair band and skeletons.
- b Nails at 23ft (7m). Several with human bones and ashes and throughout the well fill.
- c Knife at 60ft 3in (18.37m).
- d (fig 4.4) Ox goad at 75ft (22.86m). Common in

- the locality, five found on friary site, others elsewhere in Dunstable and at Puddle Hill. Compares with others from Lydney, Woodyates, Silchester.² There is one from Kempston found in a poppyhead beaker with a cremation.³ They also occur in bronze and bone but usually with a tubular socket.
- e Knife at 77ft (23.47m). Part of wooden handle survived adhering to tang. Common type, at least as far as the blade is concerned. Best parallel for blade and stop ridge is from Silchester.⁴
- f (fig 4.1) Rake at 89ft (27.1m). A rare type in excellent condition, part of wooden handle survived in the socket. Prongs are 7.1in (180mm) long and the socketed handle 13.4in long (340mm). Example in British Museum from Walbrook, the prongs of which are 7.1in long (180mm) and the handle 8.8in (223mm) long, firmly dated to the last 20 years of the first century A.D. There is a parallel in Landesmuseum Trier.²
- g Bucket bands at 89ft (27.1m). Three bands used for iron bound wooden buckets, probably they were from the same bucket.
- h (fig 6.1 and 2) Handles at 89ft (27.1m). 3 handles, overall lengths 10, 11, 12in. (254mm, 279mm, 305mm).
- i (fig 6.3 and 4) Handle supports at 89ft (27.1m) Two plate supports 6in long with holes at each end for the handle and for fixing to the top hoop of the bucket.
- j (fig 4.6) Grapple. 89ft (27.1m). This has 4 grapples of 4 hooks fixed to a ring plate external dia. 9.3in. This is suspended by an iron handle to a ring which allows the grapple to swivel. Similar grapples were used locally within living memory, to recover buckets from wells. No ancient parallels have been found.
- k Bucket ring at 89ft (27.1m). Used for keeping neck of leather buckets open: square in section 0.4in (10mm) thick, overall dia. 9.3in (236mm).
- l (fig 4.3) Part Band at 89ft (27.1m). Incomplete band, perhaps part of ox goad.
- m Hob Nails. 89ft (27.1m). Many from near the bottom of the well perhaps from leather sole found adjacent.
- Fowler's type D⁵ which first become current in late first century B.C. or early first century A.D. but continued into third century or even later.
- b (fig 4.2) Nail Cleaner at 5ft 7in (1.7m). A fair parallel to type found at Richborough⁶ common in Roman and Saxon contexts.
- c (fig 5.4) Ring at 7ft 4in (2.235m). Plain, common type. Found on third finger of right hand of skeleton 1.
- d (fig 5.5) Part of Buckle at 9ft 8in (2.96m). As illustrated, quite common.
- e Bronze Spatula at 52ft 0in (15.85m) length 4in (102mm), common type.
- f (fig 5.2) Bronze plate brooch at 89ft (27.1m). The underside of this brooch is smooth with one iron stud surviving (5). The bronze face plate (4) has been chip carved to provide channels for enamelling. Decorated with an outer band of very light blue enamel which has red enamel spots (1). This was divided from the centre piece by red enamel (2) and the centre was light blue enamel with white enamel circles centred by spots of red enamel (3). The red enamel spots were surrounded by a halo of darker blue probably caused during the fusing process in manufacture. Not common.
- g (fig 7.2) Two bronze eyelets with traces of leather at 89ft (27.1m).

LEAD

- a (fig 4.7) Lead Plug at 7ft (2.134m). Probably from a pot.
- b Two lead plates at 89ft (27.1m) probably bucket weights. Oval shaped with half inch flange on edges. The ends are bent upwards and contain round holes. Diam 1.3in (33mm). The plates measured 9.8in by 6in (223mm by 152mm) and 9.5in by 6.3in (241mm by 160mm) The height of the flange was 6in (15mm). There were some small holes approx. 2mm diam round the edge of the flange which were probably for attaching to the bucket leather.

SILVER

- l (fig 5.11) Silver Finger Key Ring at 91ft (27.735m). The centre piece is a small key. Usually made of bronze or less commonly, in iron. Key is for lever lock. Compare with bronze example from Finsbury Circus, London.⁷

BRONZE

- a (fig 5.8) Penannular Brooch at 4ft 10in (1.473m). Rolled terminals. Example of Elizabeth

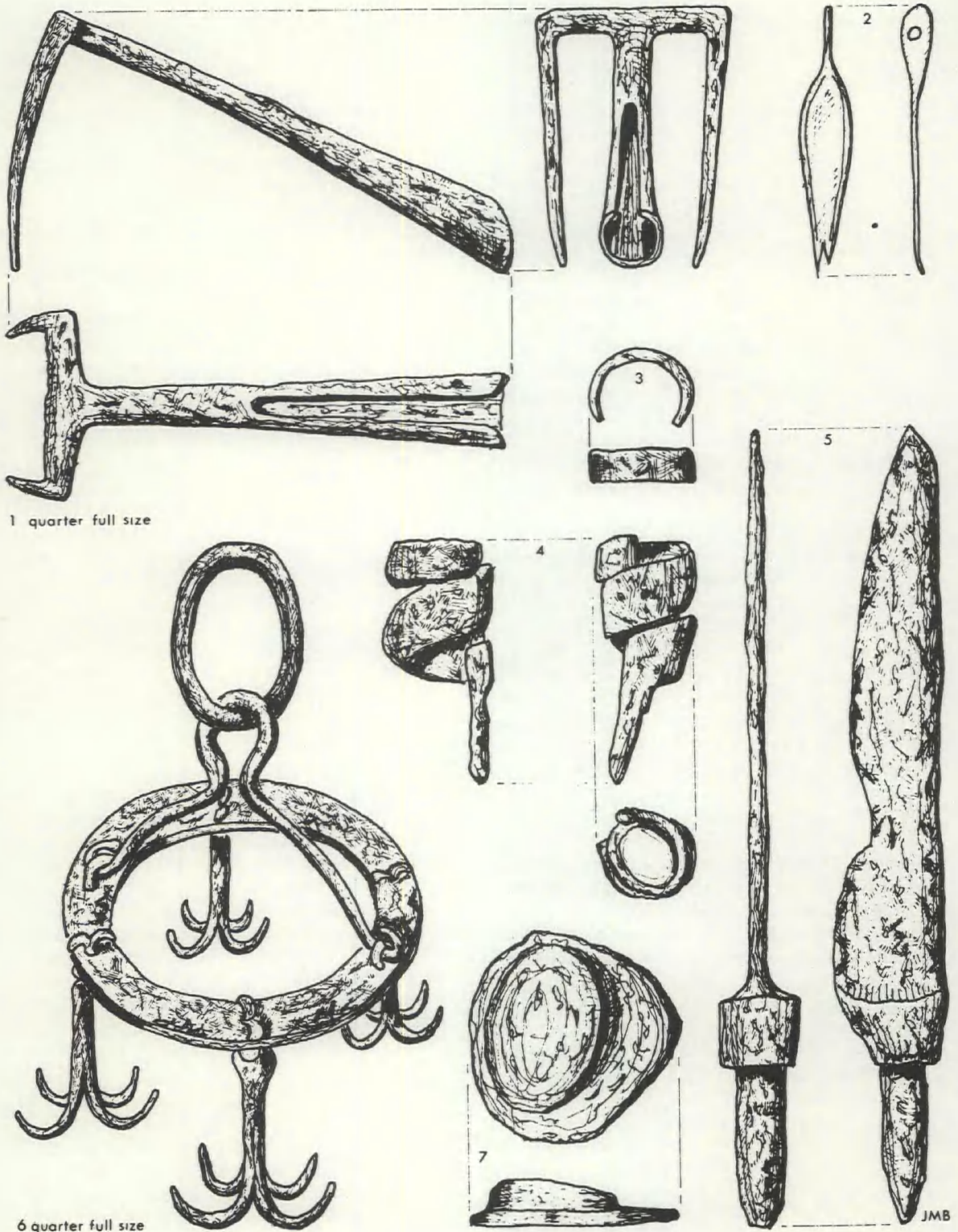


Fig 4 Iron (1, 3-6), bronze (2), and lead (7) objects from the well.

HUMAN BONES By Dr E V Jones

Parts of 7 skeletons were examined. From the upper fill they were of an elderly female, two adult females, an adult male, and a boy aged 14 years. From 40ft (12.19m) was a skull of a female aged 25-35 years, and from the bottom of the well parts of the post cranial skeleton of a middle-aged man.

In the upper fill, the 3 skulls at the rim of the skulls from 16ft (4.88m) and 17ft 8in (5.39m) agreed in sex, age and number with the bones scattered through the upper fill and are assumed to come from five complete skeletons.

Most of the skulls had suffered from crushing to varying degrees from the nature of the dig and those bones from the bottom also from water.

Skull 1 from rim and bones from 16ft (4.88m)

Skeleton of an elderly female with considerable wear on all teeth, buccal caries in a molar and 7 molars had been lost ante-mortem. There was considerable osteophyte formation on dorsal and lumbar vertebrae. Hip and shoulder joints showed early arthritic changes. Height (Fe Hu) 1.56m.

Skull 2 from rim and bones from 16ft (4.88m)

Skeleton of an adult female aged 25-35 as deduced from dental wear and unfused sutures. There was a carious first molar and there was an aberrant tooth entering the nasal cavity. Post cranial remains were those of a healthy female. Height (Fe Ti) 1.54m.

Skull 3 from rim and bones from 20ft (6.10m)

Skeleton of 14 year old boy as shown by unfused depiphyses of long bones and metacarpals. The skull was thin and disintegrated on excavation. There were caries in an upper molar and an incisor. Upper third molars were just erupting. Post cranial bones showed no pathology. Estimated height (Fe Ti) 1.61m.

Skull 4 and bones from 16ft (4.88m)

Skeleton of an adult male aged 35-45 years as judged from dentition. The sutures were unfused and there was a mediofrontal suture present. The teeth remaining with the skeleton showed caries in an upper molar and absent third molar. The post cranial bones showed early arthritic changes in femoral and humeral heads. Height (Fe Tl) 1.60m.

Skull 5 and bones from 17ft 8in (5.39m)

Skeleton of a female aged 25-35 years from dental wear. Sutures were fused. Maxilla was missing from the collection of bones. First lower molar was malinserted and nearly horizontal and the second lower molar had been lost ante-mortem. There was considerable lingual wear on the lower incisors and canines which may have been due to protrusion of the lower jaw.

Skull from 40ft (12.19m)

This was a female skull with unfused sutures, mediofrontal suture and three Wormian bones. Age estimated from teeth 25-35 years. Roots only were remaining of an upper molar and premolar. There were no associated bones or mandible with the skull and the skull had certainly rotted elsewhere and had been cast into the well which by this time was being used as a waste pit.

Remains from 72ft (21.95m)

These were parts of humerus, femur, tibia and 5 vertebrae of a heavily muscled middle-aged man as deduced from the size and markings on the bones including the femoral head and the degree of arthritis in the part of the vertebrae found. The first three cervical vertebrae were present and the presence of these suggests that there was originally a skull, and that this had degenerated beyond recognition at the bottom of the well. One joint between axis and third cervical was fused by an arthritic process. The breakages in the bones were in part post mortem and could not be related to a fall into the well.

The osteology agrees with a mass burial of 5 skeletons at the mouth of the well and the casting of a single skull into the well when it was partly filled.

Two skulls, skull 4 from the rim and skull from 40ft (12.19m) both had mediofrontal sutures. This was not seen in the other skulls from the well or from a small series of Roman and Dark Age interments from the same field. It is tempting to suggest that there was a blood relationship between the two skeletons as this is an inherited trait. The Wormian bones seen in the skull from 40ft (12.19m) were not seen in any of the other skulls.

Caries was seen in all the skulls even that of the 14 year old boy and must reflect the soft diet. There

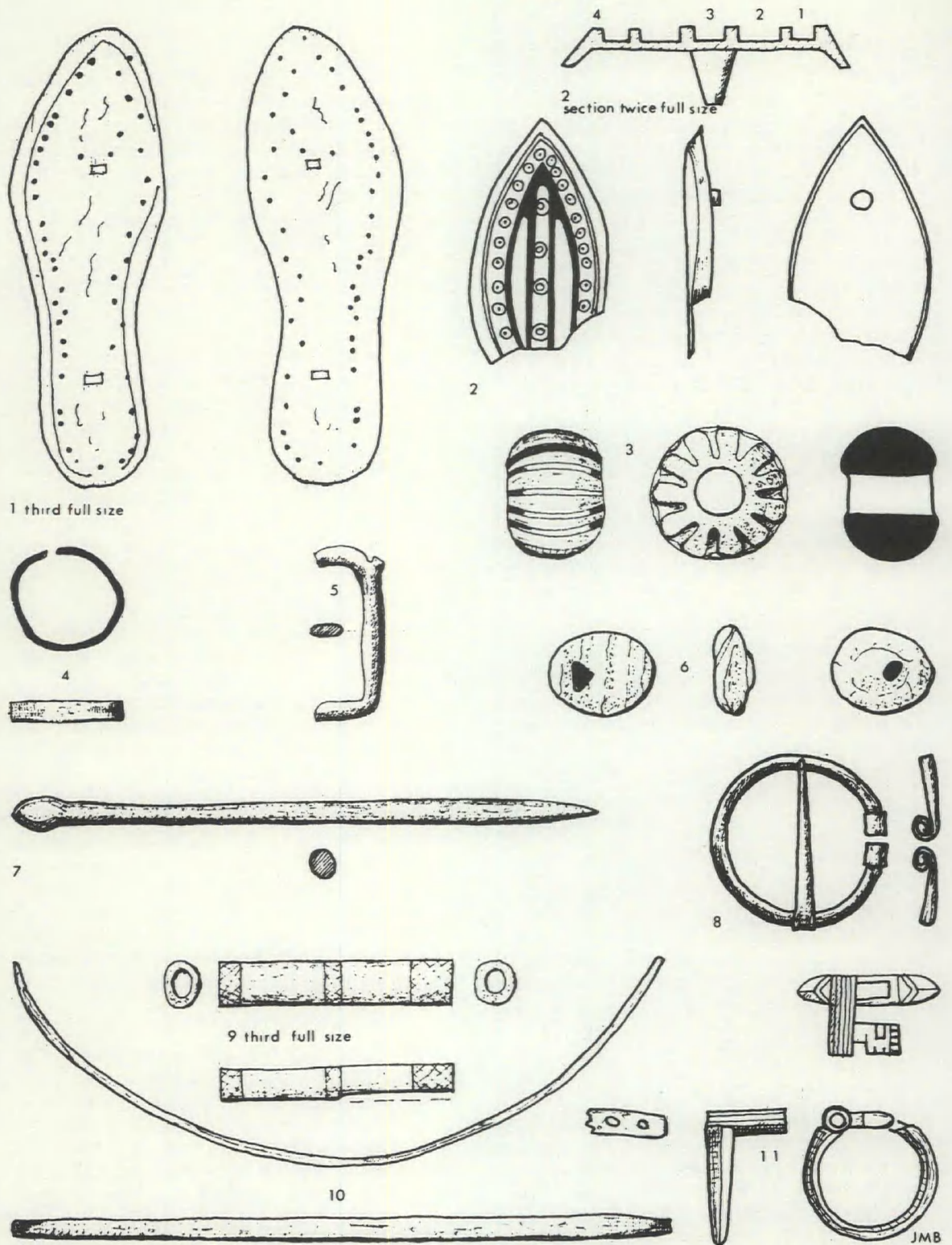


Fig 5 Bronze (2, 4, 5, 8), silver (11), glass (3), and organic (1, 6, 7, 9, 10) finds.

was the unusual finding of an aberrant tooth entering the anterior nasal cavity in skull two.

The principal other pathological finding was of arthritis which was mainly in the dorsal and lumbar vertebrae and only slight in the large joints and this was related to age.

ORGANIC FINDS

- a (fig 5.10). Bone Band at 9ft 8in (2.94m). Two small holes drilled either end, possibly a hair band from a skeleton.
- b (fig 5.7). Bone Pin at 63ft (19.2m). A common type.
- c Wooden Pole at 82ft (25m). Round, hedge cut, possibly a fork handle.
- d Dressed Timber at 82ft (25m). Fragments, probably the remains of the well top.
- e Wooden staves at 82ft (25m). Staves belonging to wooden buckets.
- f Half Cylinder of hollow wood at 82ft (25m). Nearly half round section, probably of conduit. Internal dia. 3.5in thickness 1in.
- g (fig 5.9) Bone Handle at 89ft (27.1m). Very typical incised decoration, probably knife handle. Many in Silchester collection² and in most large Roman collections.
- h (fig 5.6) 'Shell' Bead, 90ft (27.43m). A dermal tubercle of a ray fish, genus *Raja*, found in European waters. Similar item was found, as a survival from the Roman period, in an adjacent medieval context.
- i Hazel nuts at 91ft (27.735m). Two found.
- j Small seeds at 91ft (27.735m). Cherry Stones two.
- k (fig 5.1) Leather Shoe Sole at 91ft (27.735m). The inner sole of a small shoe. Has a small groove on one surface. There were nail holes round the periphery and several in the interior. On the instep and the ball of the foot were small oblong holes for hob nails. Iron hob nails were found adjacent.

OTHER FINDS

- a Building bricks. 3ft to 6ft (0.91 - 1.8m). Fragments.
- b (fig 5.3) Glass Bead, 76ft (23.17m). A blue glass melon bead, broken. Wide date range beginning in the Claudian period.
- c Quern Stones at various depths throughout the fill. Several broken, from Hertfordshire pudding

stone and from millstone grit.

- d Roofing Tile, fragments found at various depths throughout the fill.

CONCLUSIONS

The well was 91ft 6in deep and was situated in an outhouse of a Roman building. The finding of a piece of conduit at the bottom of the well indicated that the water was probably piped into the building from the well top.

The main dating evidence for the well consists of the poppy beaker and Samian ware of the second century, the coin of Tetricus (270-273) and the mortaria and other sherds typical of the late fourth century. All sherds from a greater depth than 70ft (21.34m) were of early second and third century date. Therefore the finds suggest that the well was dug during the early second century and was in use for more than one hundred years. It also appears that the well was at least partly open until the late fourth century. Confirming the long use was the observation that, although the section was originally square, continued operation of the well and polished the sides and eroded the corners.

After the well had been abandoned it was used as a rubbish pit and debris of animal bones and occupational waste had filled it to a depth of 50ft (15.24m). There was much clean chalk in this which suggests that a deliberate attempt may have been made over a short period to fill the well. When the filling had reached 50ft (15.24m) the top of the well collapsed. The well head had probably been protected from frost and weathering during its useful days and when this had been removed the top and surrounding chalk had slipped into the well leaving a large funnel shaped depression. Twenty three feet of the well had been filled by this collapse which had been lodged up, perhaps by a wooden lining of the top, leaving a cavity of at least 15ft (4.5m) within the well.

The resulting surface depression had then been used probably at first for the burial of a person whose cremated remains had been placed in a wooden box, held by nails, and later for a mass inhumation of five people. At some time after the mass burial, and while the bodies were in a state of partial decomposition, parts of the five bodies fell 14ft (4.27m) when the well subsided. It was still slightly cavitated when the modern excavators uncovered the top 4ft (1.22m) and it sank nearly a foot under one of them. It is not possible to date this mass inhumation as the only object found in

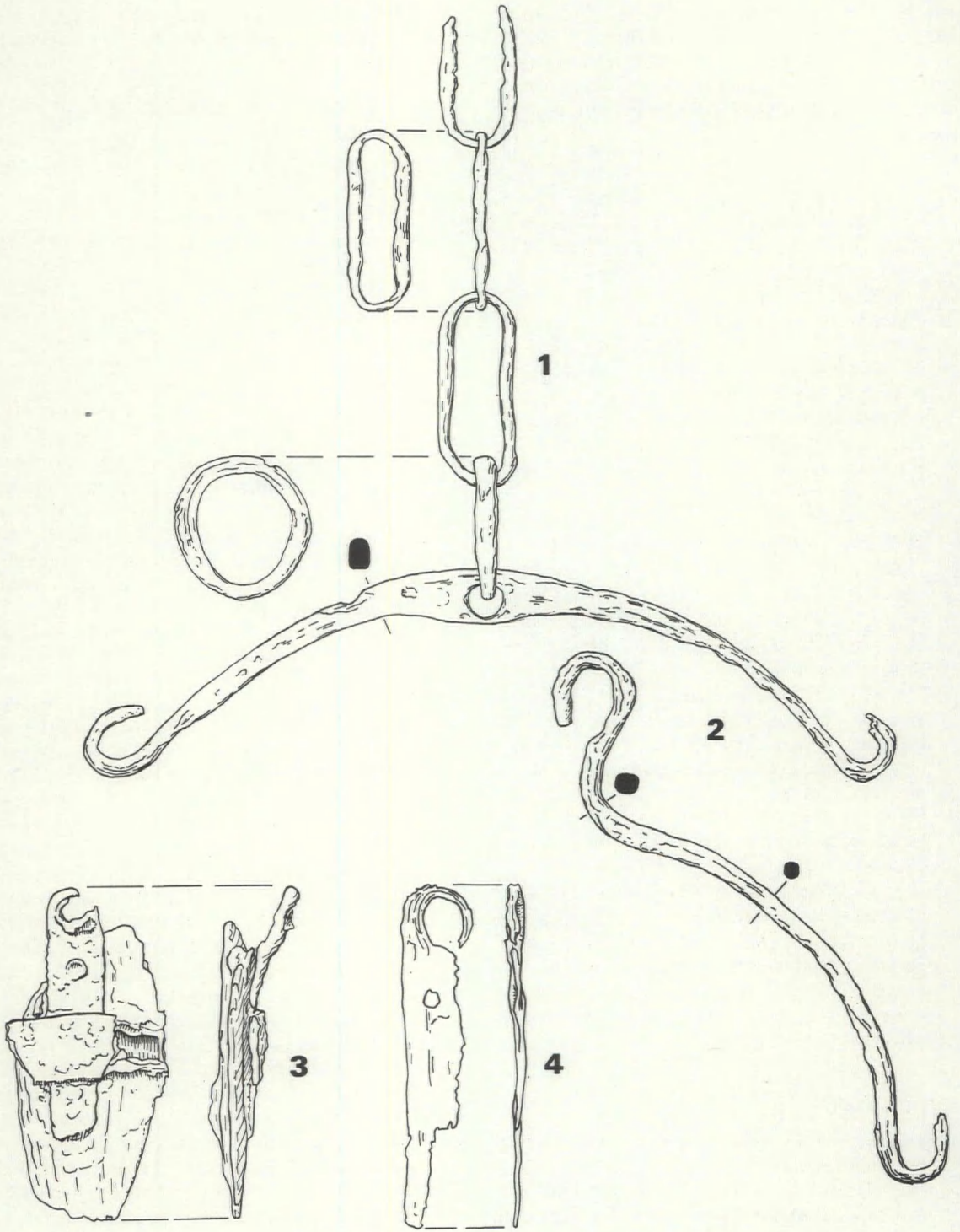


Fig 6 Bucket fragments. (Scale: $\frac{1}{3}$)

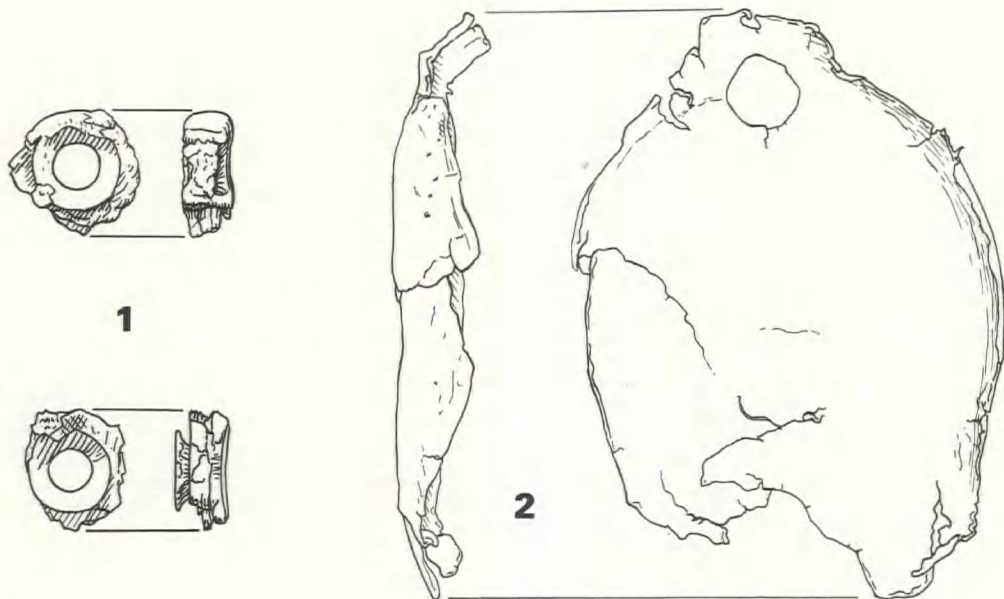


Fig 7 Bronze eyelets (1) and lead weight (2) (Scale $\frac{1}{3}$)

direct association with them was a plain bronze ring (fig 5.4) on the third finger of the right hand of skeleton 1. The bone hair band found near may also have belonged to a member of the group. After the burials the site continued to be occupied and the funnel shaped depression was filled and sealed by a layer of Roman debris 3ft (0.91m) below the present surface.

No evidence was found to suggest a later Saxon occupation. Immediately above the sealing Roman layer were medieval sherds which persisted to the modern turf level. The 3ft (0.91m) of medieval material was a dark loam which probably represents a deposit of top soil placed there when the site was levelled for the building of an adjacent Dominican Friary.

For drawing water, iron bound wooden buckets and also skin buckets had been used. Reconstruction of the finds 7, 8 & 9 showed that the shape of the former type of bucket was a tapering cylinder, with a bottom diameter of 15in (381mm) a top diameter of 13.5in (343mm) and a height of 18in (456mm). The skin buckets were reinforced and weighted with lead plates, two of which were found. It is suggested that the legs of the skin had been pulled through the centre holes and tied underneath. The mouth of the skin was probably kept

open by an iron ring, one of which was found at the bottom of the well in association with the lead plates. It seems likely that the grapple (fig 4.6) for which no parallels have been found, was used to retrieve lost buckets.

One complete pot was found (fig 2.7) and it would seem unlikely that this cup had survived a 90ft (27.43m) drop into the well. It had probably been used as a drinking cup and had been left in a bucket. Most of the small, fine wares came from the bottom of the well; the Castor ware cups and folded jars were probably the drinking cups of the period.

It is interesting to note that the water level in this area today is higher than in Roman times. This is the second Roman well excavated to water by the Society in Dunstable and in both cases the hand and foot holes continued down below the modern water level. The present well was open for two seasons and during this period the modern water table only varied a few inches and could not be reduced below 65ft (19.83m) despite constant pumping for nearly three months. The clay packing was probably used to plug the well and its presence suggested that, even at a depth of 88ft (26.82m) the well had run dry during the Roman period. The poor condition of the iron work and wood also suggests that the

well had run dry since it was first dug.

During extensive redevelopment of the town very little Roman roofing tile has been discovered and the fact that very little building or roofing tile was found in the well seems to confirm that Roman Dunstable was a very small township with few substantial buildings at least up to the third century. The roof tiles found in the top of the well with the burial were probably late fourth or early fifth century.

APPENDIX

Ironwork Analysis by Robert Taylor

A microsection of Roman iron from the bucket rings from the well on the Friary site has been examined and a microphotograph taken. The photograph shows grains of ferrite (alpha iron, relatively free of carbon) which are equiaxed and a small amount of iron oxide which shows the direction of forging of the implement.

The specimen is relatively good wrought iron in that it contains very little carbon and is quite clean (slag free).

The implications of these observations are that firstly, a good deal of trouble has been taken to produce a good wrought iron which will be capable of considerable cold forging without fracture. Secondly, the slag inclusion shows directionality but the ferrite grains do not, which is sufficient to tell us that the smith responsible for these implements has sufficient knowledge to anneal his work after forging. This had the effect of relieving stresses set up during forging and lessening the risk of fracture, a practice which is not always carried out by today's metal workers.

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The Staff of the British Museum (Natural History) kindly identified the 'shell' bead.

NOTES

- 1 J P Gillam, 'Types of Roman Coarse Pottery in Northern Britain', *Arch Aelq* 35 (1957) 180-251; reprinted with corrections as a separate offprint, 1970.
- 2 Information from Dr W H Manning.
- 3 Bedford Museum, accession numbers 3221 and 3221A.
- 4 Reading Museum, Silchester Collection, information from Dr W H Manning.
- 5 E Fowler, 'The Origin and Development of Penannular Brooches in Europe', *P P S* 26 (1960) 149-177; E Fowler, 'Celtic Metalwork of the Fifth and Sixth Centuries A.D.', *Arch J* 120, (1963) 98-160.
- 6 B W Cunliffe, *Richborough* 5, 1970, 100 pl 43.178.
- 7 R E M Wheeler, *London in Roman Times*, 1930, 75 pl 21.10.

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